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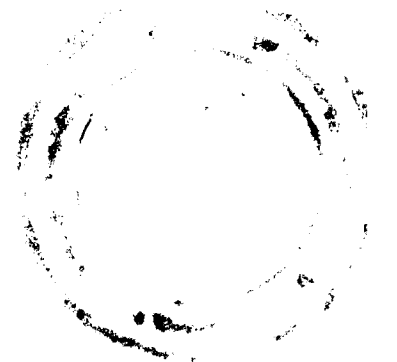
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THE AETIOLOGY OF CANCER AND ALLIED DISEASES DEVELOPMENT OF A CONCEPT BASED ON RECENT EXPERIMENTS DEALING WITH A CELL-FREE TRANSMISSION OF MOUSE LEUKAEMIA

BY

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It has long been suspected that cancer and allied diseases may be caused by transmissible viruses. This concept appeared particularly plausible as a hypothetical explanation of the obscure aetiology of various forms of leukaemias, lymphosarcomas, and Hodgkin's disease. The course of either disease in humans with the accompanying fever; the frequent temporary improvements followed by relapses; the general systemic manifestations, including the gradual loss of weight and anaemia; the striking, though rare, reports of familial incidence in humans and in animal hosts, were consistent with the assumption of a chronic infectious nature of these diseases.

The main difficulty, however, in accepting the infectious concept of the aetiology of malignant tumours, including leukaemias, has been the well-established observation that in humans, and in animal hosts, tumours are not transmissible from one host to another, at least not in a manner similar to that observed in other infectious diseases. When speaking of a communicable disease we are conditioned to think automatically of a disease spreading from one host to another within the same generation; by contact (smallpox), through infected food or carriers (typhoid fever), through airborne droplets (common cold, influenza), etc. In each case both the infecting and the infected hosts belong to the same generation; a brief interval of time, most frequently not exceeding a few days, or weeks at the utmost, elapses between the individual cases forming successive links in the chain of a conventional transmission of the common communicable disease.

In the typical cases the human observer can actually follow the spread of a communicable disease, tracing it in either direction, back to the infecting carrier, or ahead to the infected host. Thus, a child suffering from chicken-pox, or measles, for instance, could readily cause a rapidly spreading epidemic, progressing from one child to another in the neighbourhood. Similarly, a mouse infected with the salmonella organism would spread typhoid rapidly to other mice within the same cage. Malignant tumours, including the various forms of leukaemias, are obviously not transmissible in such a manner. A leukaemic or sarcomatous chicken could be placed for the balance of its life in close quarters with a flock of healthy chickens; a leukaemic mouse, or a mouse bearing a large, perhaps even ulcerated mam-

mary carcinoma, could be placed in the same cage with a group of healthy mice; yet no transmission of the disease would occur in either case. A similar observation has been repeatedly made, over the period of decades, in human tumours and leukaemias. It appeared logical to conclude, therefore, that malignant tumours, including leukaemias, are not transmissible diseases.

Thus the viral theories of cancer, advanced now and then during the past decades, appeared to be doomed at the onset, and fell in disrepute when confronted with common observations in clinical medicine and experimental laboratories. Actually, however, upon reviewing clinical and experimental observations thus far accumulated, it does not seem necessary to conclude that cancer and leukaemias are not caused by transmissible agents. It can only be concluded that malignant tumours do not appear to be transmitted from one host to another in the conventional manner hitherto observed in the common communicable diseases.

"Vertical" Transmission of Oncogenic Agents

The transmission of oncogenic agents from one host to another may take place in a different manner, not usually observed in the common infectious diseases. Instead of spreading "horizontally" among hosts of the same generation, a potentially pathogenic agent may instead be transmitted from a carrier host to the host's offspring, thence to the offspring's offspring, thence, in turn, to the next generation, and so forth. Such a transmission would obviously require much more time than that observed in those communicable diseases which spread in the conventional manner within the same generation. The term "vertical transmission" or "vertical epidemic" was suggested (Gross, 1944) to designate the transmission of potentially pathogenic agents from one generation to another, usually through germinal cells, occasionally through mothers' milk, as in the case of mouse mammary carcinoma (Bittner, 1936). The agent, though potentially pathogenic, would remain latent for a long period of time, often perhaps throughout the entire life-span of a given carrier host. During such an interval of time the potentially pathogenic agent would remain frugal and moderate in its requirements, causing no harm to its carrier host. Thus the host would remain in perfect health, while carrying and transmitting the seeds of the disease.

In some of the hosts, however, particularly in those reaching middle age, the agent may become activated. Triggered by intrinsic or extrinsic stimuli, the hitherto latent and harmless agent would then change into a formidable pathogen, causing rapid multiplication of

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cells harbouring it, and killing its carrier. In most instances, however, activation of the agents would not occur. The hosts would remain in good health, even though they would carry the agent and transmit it to their offspring.

The triggering factors responsible for the activation of the hitherto latent agents would be of varied nature, generally non-specific. Essentially, these triggers would be either intrinsic (metabolic or hormonal) or extrinsic (such as x rays and other forms of ionizing radiation energy, certain chemical poisons, physical factors such as prolonged irritation, etc.).

Viral Aetiology of Cancer and Leukaemia

On the basis of this working hypothesis, one could regard the development of a malignant tumour or that of leukaemia as the result of an activation, perhaps accidental, of oncogenic agents, hitherto latent, and carried by the host. Fortunately, in most instances no activation of the oncogenic agents would occur during the life-span of the host, even though such agents would be transmitted to the host's offspring. Thus only now and then malignant tumours or leukaemia would develop in some of the members of those families in which the agents would be transmitted from one generation to another. Such instances, however, representing only unhappy "accidents" in the otherwise harmonious relationship between the host and its usually well adjusted and latent oncogenic agents, would often be separated by two or three generations of healthy carrier individuals. In humans, therefore, two cases of leukaemia or other malignant tumours representing successive links in the generation-to-generation transmission of the same oncogenic agent might frequently be separated by a century or two. It is quite obvious that the tracing of the "vertical" host-to-host transmission of oncogenic agents in man would be extremely difficult.

The concept of vertical transmission of oncogenic agents may be new as applied to tumours. Actually, however, there exist in nature numerous examples of pathogenic agents transmitted from one generation to another. A virus disease of the silkworm, pebrine, is transmitted through the eggs from one generation to another (Pasteur, 1865). The mosaic disease of lettuce, tomato, or potatoes is caused by viruses transmitted from one generation to another through the seeds, or in the case of potatoes through the tubers; these viruses may remain latent for long periods of time (Kunkel, 1928). The infected plant may grow next to a healthy one, yet no transmission of the virus will occur among hosts of the same generation, unless an intermediary carrier, such as an insect vector, is interposed. In certain instances the vertically transmitted agents may be so adapted to their own hosts that they will not cause harm to their own carriers but may become pathogenic when transmitted to other breed or species. The Rocky Mountain spotted-fever rickettsiae, or the tularemia organisms, for instance, are transmitted in the tick, through the eggs of these insects, from one generation to another. They cause no harm to their carrier hosts, but may become pathogenic and cause disease when transferred to other species, such as humans.

The temperate phage may also be transmitted from one generation to another in certain lysogenic bacterial clones (Lwoff, 1953). The phage may remain perfectly harmless to its hosts, as a prophage. In very rare instances it may spontaneously become pathogenic, destroying its own host by lysis. The activation may be prompted at will, however, by certain inducing agents, such as ultra-violet (Lwoff *et al.*, 1950) or x-ray irradiation (Latarjet, 1951).

It is obvious that the vertically transmitted pathogenic agents can readily escape detection, since they are sub-microscopic, and since they only occasionally cause symptoms of disease.

Transmission of Tumours by Filtrates

It is difficult to determine the nature of an obscure disease with the rather limited means available in an experimental laboratory. One of the first steps consists usually in an attempt to transmit the disease from one host to another.

It should be stressed that there are no particular criteria to indicate, *a priori*, whether a given disease is caused by a transmissible agent. In many instances, when studying a new and obscure disease, the investigator may be confronted with symptoms appearing to develop "spontaneously." Yet the disease may be communicable, even though it may be quite difficult to trace the mode of transmission of the pathogenic agent. If experimental transmission succeeds in the laboratory by means of inoculation of filtrates, it can be assumed that the investigated disease is actually caused by a transmissible filterable agent, presumably of viral nature. It still remains to be determined, however, how the actual transmission of the agent occurs under natural conditions of life (Tables I and II).

TABLE I.—Transmission of Tumours by Filterable Viruses in Animals

1898 Rabbit myxomatosis	Sanarelli
1908 Chicken leukaemia (erythromyaloblastosis)	Ellermann and Bang
1911 Chicken sarcoma	Rous
1932 Rabbit fibroma	Shope
1932 Dog oral papilloma	DeMott and Goodpasture
1933 Rabbit papilloma	Shope
1933 Chicken lymphomatosis	Furth and Braxid
1934 Dog lymphosarcoma	DeMott and Goodpasture
1936 Mouse mammary carcinoma	Blattner
1936 Rabbit oral papilloma	Parsons and Kidd
1938 Frog kidney carcinoma	Lucke
1946 Chicken lymphoid tumours and osteopetrosis	Burmester <i>et al.</i>
1951 Mouse leukaemia	Gross
1951 Mouse cutaneous papilloma	Cook and Olson
1953 Mouse parotid carcinoma	Gross
1955 Mouse sarcoma	Gross
1955 Deer fibroma	Shope
1957 Swiss mouse leukaemia	Friend
1958 Hamster sarcoma	Eddy <i>et al.</i>

TABLE II.—Transmission of Human Tumours from Man to Man by Filtered Extracts

1907 Warts	Ciuffo
1919 Warts	Wile and Kingery
1917 Condyloma acuminatum*	Wuolich
1923 Laryngeal papilloma	Ullmann

* Extract not filtered.

The discovery by Ellermann and Bang in 1908 that leukaemia in chickens could be transmitted by cell-free extracts provided the first experimental support of the concept of viral nature of leukaemia. Even though the cell-free transmission was accomplished only in the fowl, it strengthened the suspicion that in mammals also leukaemia may be caused by similar filterable agents.

"Spontaneous" Mouse Leukaemia

Leukaemia occurs as a spontaneous disease in various strains of mice. In some strains, such as C3H or C57 Brown, it develops only occasionally. In other strains it is more frequent, and in two outstanding inbred strains of mice—namely, C58 and Ak—leukaemia develops spontaneously in up to 90% of middle-aged animals. (Over 25 years ago mice of the strain designated by the symbol C58, and bred by MacDowell and Ritcher (1935), were observed to die with large spleens; it was then realized that mice of this particular strain develop leukaemia spontaneously. On the other hand, Furth and his associates (1933) developed purposely a high leukaemic strain of mice by breeding selectively relatives of leukaemic mice and continuing such selective inbreeding through a number of successive generations; they designated this particular leukaemic strain by the symbol Ak. Leukaemia, usually of the lymphatic type, develops in middle-aged Ak mice of both sexes, though the onset begins slightly earlier in females. The incidence of spontaneous leukaemia in a sample of 500 Ak females was in our laboratory 94% at 8.6 average age (Gross, 1958b). It begins to develop approximately at 4 to 4½ months of

age; this incidence rises rapidly, reaching its peak at 7 to 9 months, then declines gradually.

The development of spontaneous leukaemia in over 85% of middle-aged mice in certain inbred lines of mice, such as C58 or Ak, raised immediately the question whether a virus transmitted from one generation to another in certain families of mice may not be actually responsible for the development of this disease. The existence of a leukaemic agent, though long suspected, was not established, however, until the experimental conditions were recognized under which mouse leukaemia could be transmitted by filtrates. All previous attempts to transmit mouse leukaemia by filtered extracts failed prior to 1951 (Gross, 1958b). Transmission of leukaemia in mice appeared possible only when live cells were transplanted from a leukaemic mouse to another host usually of the same or of a genetically related inbred line.

Transmission of Mouse Leukaemia by Filtrates Inoculated into Newborn Mice

A few years ago it was unexpectedly found in our laboratory (Gross, 1951a) that naturally occurring "spontaneous" mouse leukaemia could be transmitted by filtered extracts, provided that certain experimental conditions were met. Thus, newborn, less than 16 hours old, mice of a low leukaemic but susceptible inbred strain—namely, the C3H inbred line (with an incidence of spontaneous leukaemia less than 0.5%)—could be successfully inoculated with filtered extracts prepared from spontaneous Ak leukaemia.

Leukaemia developing in C3H mice following inoculation of the leukaemic filtrates was usually of the lymphatic type, and resembled essentially that which develops spontaneously in mice of the Ak strain. Of a total of 328 newborn C3H mice inoculated with filtrates, 28% developed leukaemia at an average age of 10 months. This compared with an incidence of less than 1% among 166 litter-mate controls (sister and brothers), either not treated or inoculated simultaneously with heated (65° to 68° C. for half an hour) leukaemic extracts, and surviving to an average of 16 months (Gross, 1951-8).

Surprisingly, among the inoculated C3H mice, some developed, instead of leukaemia, bilateral parotid gland carcinomas, and a few developed subcutaneous fibrosarcomas (Gross, 1953). These results were later confirmed and extended by Woolley and Small (1956), Furth *et al.* (1956), Rudali *et al.* (1956), Dulaney *et al.* (1957), Hays *et al.* (1957), and Kassel and Rottino (1958).

One of the initial difficulties in transmitting mouse leukaemia by filtrates was due to the difference in susceptibility among the strains used for inoculation of the extracts (Gross, 1955); furthermore, it soon became evident that the results of individual experiments may vary to a considerable degree, depending on the extract used. Of 70 leukaemic filtrates, each prepared from a different donor, and tested in our laboratory, 18 were found to be completely inactive on inoculation tests (Gross, 1957b).

Selecting a particularly potent extract, and passing the agent serially through several successive inoculations of newborn hosts, made it recently possible to develop a very potent filterable mouse leukaemia strain (Gross, 1957a). Filtrates prepared from this passage virus can now be inoculated into suckling C3H mice 1 to 14 days old, inducing leukaemia in up to 97% of the inoculated mice after a latency of only three to four months (Gross, 1958a).

It is quite interesting that leukaemic filtrates inoculated into C3H mice less than 16 hours old induce leukaemia, and in some instances parotid gland tumours, whereas the same filtrates inoculated into suckling C3H mice 1 to 14 days old induce leukaemia but not parotid tumours (Gross, 1958a). It appears, therefore, that in order to induce parotid tumours, newborn, less than 16-hours-old, C3H mice have to be inoculated with the leukaemic extracts.

Previous attempts to transmit Ak leukaemia by inoculation of filtrates into adult C3H mice were seldom successful. After the potency of the leukaemic agent has been increased

through serial cell-free passage, it is now possible, however, to induce leukaemia also by inoculating passage leukaemic filtrates into adult C3H mice; the incidence of induced leukaemia is approximately 37% after a latency of seven months (Gross, 1958a). Suckling, 1 to 14 days-old, C3H mice, however, are substantially more susceptible to the inoculation of the leukaemic filtrates than adult hosts.

It is apparent, therefore, that the induction of different types of tumours requires the use of a suitable recipient strain for inoculation of the leukaemic extracts. Moreover, the cell-free extracts must be inoculated into newborn mice less than 16 hours old, if the full array of the different types of tumours is to be induced.

The development of leukaemia in some of the mice inoculated with the filtrates, and that of parotid carcinomas or subcutaneous fibromyxosarcomas in others, raised immediately the fundamental question whether a single agent may be able to cause different types of tumours, or whether several distinct agents were present in the leukaemic extracts.

One could assume that one agent may be able to induce different types of tumours. It is also possible to speculate, however, that certain tumours, at least, may carry, either accidentally or for a good reason, a number of distinct oncogenic agents. Under proper experimental conditions some of these hitherto latent agents may assert themselves, inducing a wide spectrum of different tumours. Such a hypothesis would explain the puzzling results of experiments reported by Graffi *et al.* (1956) and Friend (1957).

Development of Leukaemia Following Inoculation of Newborn Mice with Cell-free Extracts from Transplanted Mouse Tumours

The use of newborn, less than 1 day old, mice for inoculation of oncogenic agents, so successful in studies on cell-free transmission of mouse leukaemia (Gross, 1951-3), soon became a useful tool, and proved a source of unexpected findings also in other laboratories.

Thus, Graffi and his co-workers prepared filtered extracts from Ehrlich ascites mouse carcinoma, and from several other mouse tumours. These extracts were then inoculated into newborn mice of a low leukaemic inbred strain (designated by the symbol Agnes-Bloom and having an incidence of spontaneous leukaemia less than 1%); newborn non-inbred mice designated by symbols M and W were also injected. As a result, 34% to 75% of the inoculated mice developed a myelogenous form of leukaemia, after an average latency varying from 113 to 224 days. The most potent extracts were those prepared from Ehrlich carcinoma and from three closely related mouse sarcomas. Of 332 control mice inoculated with either normal organ extracts from mice, rats, chickens, or rabbits, or with rat-tumour filtrates, less than 1% developed leukaemia (Graffi *et al.*, 1956).

Friend inoculated cell-free centrifuged extracts from Ehrlich ascites carcinoma into newborn Swiss mice. After a latency of 14 months, some of the inoculated mice developed a form of myelogenous leukaemia. This leukaemia was found to be transmissible by intraperitoneal inoculation of filtrates into young adult Swiss mice, inducing leukaemia after only several weeks (Friend, 1957).

It is quite possible, therefore, that there exist different forms of mouse leukaemia, caused by distinct though probably related viruses, requiring different experimental conditions for cell-free transmission. Certain leukaemic agents may require newborn hosts for transmission; others may also infect adult hosts of a suitable line. In this respect, mouse leukaemia would not be different from the various forms of chicken leucosis (Furth *et al.*, 1933; Burmester *et al.*, 1946; Beard, 1957).

Electron Microscopical Studies of the Mouse Leukaemia Agent

Electron microscopical examination of the leukaemic filtrates in drop preparations, shadowed with chromium,

revealed the presence of spherical particles, varying in average diameter between 60 and 70 m μ (Gross, 1956).

More detailed studies were possible on thin sections of the leukaemic tissues. In collaboration with L. Dmochowski, sections were prepared from thymus, cervical glands, and livers from C3H mice in which leukaemia was induced by inoculation of the leukaemic filtrates. Characteristic spherical virus-like particles, most of them averaging approximately 100 m μ , and showing dense centres, were found in large numbers in the cytoplasm and in extracellular spaces (Dmochowski and Grey, 1957). Examination of normal mouse tissues did not reveal the presence of similar virus-like particles; additional studies are necessary, however, to clarify this point further. It is possible that the particles visualized in drop preparations represent the dense centres of the large particles observed on the sections. Technical differences in the manner of preparing the drop preparations compared with ultra-thin sections may also account for the difference in size of the particles.

Multiplication of the Parotid Tumour Agent in Tissue Culture

In a series of experiments Stewart and her associates (1957) at the National Cancer Institute succeeded in demonstrating the survival and possibly also multiplication of mouse-leukaemia-derived parotid tumour agent in tissue culture media. After passing the agent through monkey kidney, or chicken chorion allantoic membrane culture media, inoculation into newborn, less than 12 hours old, (C3H $\times$ AKR) F₁ hybrid mice induced in up to 51% of the mice the development of parotid tumours and other neoplasms after a latency varying from 2½ to 10 months. Control mice injected with fluids from uninoculated tissue cultures failed to develop tumours. More recently Eddy and her associates (1958) at the National Cancer Institute made the remarkable observation that the mouse-leukaemia-derived agent passed through tissue culture media induced multiple malignant tumours, most frequently sarcomas, following inoculation into young, less than 4 weeks old, Syrian hamsters.

Attempt to Transmit Radiation-induced Leukaemia by Filtrates

One of the greatest difficulties in the proper interpretation of results obtained with experimental transmission of tumours and leukaemia by means of filtrates has been the fact that in many instances morphologically similar tumours could be obtained with chemical carcinogens, hormones, or ionizing radiation.

The fact that ionizing radiation, hormones, or carcinogenic chemicals may be able to induce tumours and/or leukaemia does not necessarily imply, however, that these tumour-inducing factors are similar in their pathogenic action to oncogenic viruses.

Theoretically, at least, it may be possible to assume that carcinogenic chemicals, hormones, or ionizing radiation may induce leukaemia in mice indirectly only, by activating latent viruses carried in an inactive form by apparently healthy hosts.

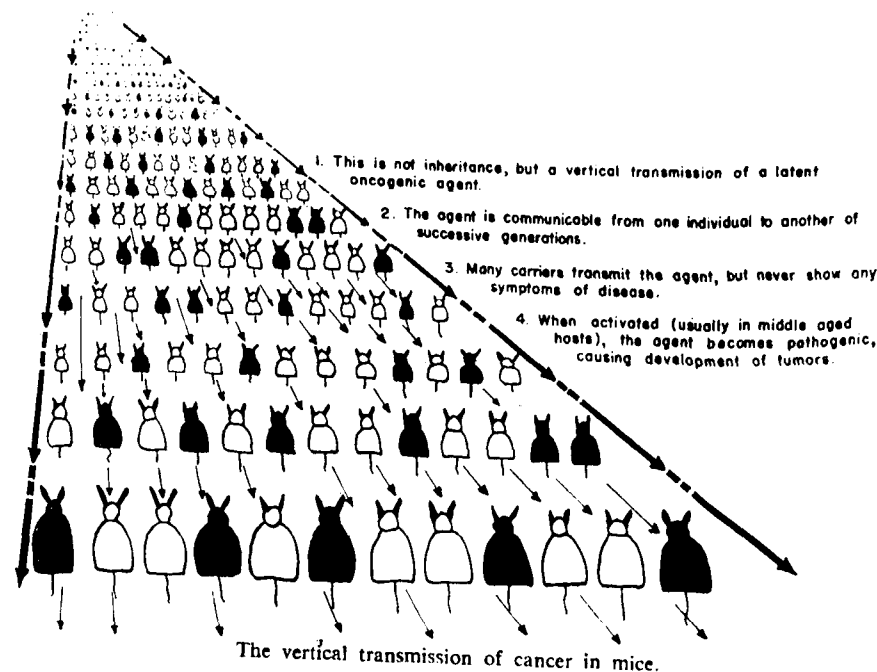
In order to determine whether radiation-induced leukaemia could be transmitted by filtrates, the following experiment was carried out (Gross, 1958c).

Leukaemia was induced in mice of a low-leukaemic strain (C3H)

by fractionated total-body x-ray irradiation (150 r once a week for four to six consecutive weeks). Up to 50% of the irradiated mice developed leukaemia after seven to nine months. An attempt was then made to recover from such mice an oncogenic agent; filtered extracts were prepared from livers, spleens, and thymic lymphosarcomas from the leukaemic donors; the filtrates so prepared were then inoculated into newborn C3H mice. Of 148 inoculated mice, 16 (11%) developed leukaemia after approximately one year, and 7 (5%) developed parotid gland tumours (Gross, 1958c). Similar results have been recently obtained by Kaplan (1958) on C57 Black mice. These experimental findings suggest that mice of a low leukaemic strain may carry a latent leukaemogenic agent of a low pathogenic potential. When triggered by repeated total-body x-ray irradiation such an agent may become pathogenic, and induce leukaemia in its hosts. Once activated, this agent may then, at least in some instances, be separated from cells by filtration, and transmitted by inoculation into newborn hosts of a susceptible strain.

There may exist a large variety of tumours which, although similar in their morphology, may be individually distinct. It is entirely possible that ionizing radiation, hormones, or chemical carcinogens merely activate latent oncogenic viruses; their tumour-inducing action could thus be compared to the experimental induction of bacteriophages in lysogenic bacteria (Lwoff, 1953). Accordingly, oncogenic viruses could be compared to temperate bacteriophages, transmitted from one generation to another in lysogenic bacterial hosts, only very occasionally killing their carriers (Gross, 1954; Latarjet, 1954).

Should this hypothesis prove to be correct, it would then logically follow that individuals with symptoms of tumours or leukaemia would represent only a small fraction of those actually carrying the seeds of either disease. This concept would also explain the striking though not too frequent cases of familial occurrence of tumours and leukaemia not only in animals but also in humans. Although in most instances cancer or leukaemia occurs in man only sporadically, yet numerous instances, some of them striking, have been recorded in which malignant tumours and/or leukaemia developed in two or more members of the same family, either within the same or in successive generations. Cases of either tumours or leukaemia developing in brothers, brothers and sisters, or in a child and in one of its parents, grandparents, aunts, uncles, or cousins, have been recorded by numerous observers. One of the most striking families



has been reported by Anderson (1951): five out of eight siblings developed leukaemia when 5 to 8 years old.

Vertical transmission of potentially pathogenic agents should not be confused with inheritance. The differentiation is not always easy. When observing a disease appearing in several descendants of successive generations within the same family of hosts, a casual observer may consider such cases to be caused by some obscure inherited genetic factors. Yet inheritance is conditioned by genetic factors, transmitted in an orderly and foreseeable manner, and is not acquired. Vertically transmitted diseases, on the other hand, are caused by viral agents, and represent a form of infection. The potentially pathogenic agents had been most probably at one time acquired, even if this might have happened in individual families many thousands of years ago; transmitted, since that time, from one generation of their hosts to another, invisible and completely adapted, such agents represent examples of "perfect parasites," causing in most instances no harm to their hosts. Only now and then, prompted by obscure reasons, they may change into formidable pathogens, causing symptoms of fatal disease and destroying their hosts. Such "accidents," however, would be usually separated by several generations of apparently healthy carrier-hosts.

It is quite possible that not only in animal species but also in humans malignant tumours, including the various forms of leukaemias, are caused by oncogenic agents seeded in millions of apparently healthy hosts and transmitted from one generation to another (Gross, 1954).

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EFFECT OF INSULIN AND GLUCAGON ON TUMOUR GROWTH

BY

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During the past few years we have been working on certain problems related to both insulin and glucagon (Salter and Best, 1953; Salter *et al.*, 1957a, 1957b; Davidson *et al.*, 1957). There is considerable evidence in the earlier literature that insulin may cause some inhibition in the growth of malignant tissue (Piccaluga and Cioffari, 1925; von Witzleben, 1925; Silberstein *et al.*, 1927; Gomes da Costa, 1931).† The results of experiments carried out in this laboratory are in general agreement with these earlier reports. We find that, although the effects of giving insulin to rats bearing the Walker carcino-sarcoma vary considerably, a small but significant inhibition of the growth of this tumour is produced in most instances. The findings presented in this preliminary communication show, for the first time, that glucagon alone also produces a significant inhibition in the growth of this tumour, while the simultaneous treatment with both glucagon and insulin consistently causes an inhibition that is considerably greater than the sum of their individual effects.

Methods

Female Wistar rats weighing approximately 150 g. were used in all experiments. The animals were fed powdered Purina chow containing 5% corn oil.

Walker carcino-sarcoma tissue was collected from several donor rats, pooled and macerated with three parts (by weight) of 0.9% saline until the resultant brei would pass through a 23-gauge hypodermic needle. Each animal was then injected in both gastrocnemii with 0.2 ml. of the suspension. Treatments were started three days after the inoculations. At this stage the tumours were just palpable. In every experiment all rats had palpable tumours at the start. Protamine-zinc insulin (P.Z.I.) was injected once daily at 3 p.m. Crystalline glucagon suspended in 0.9% saline was administered subcutaneously at 9 a.m., 3 p.m., and 9 p.m. The rats were sacrificed after 10 to 15 days of treatment. The back legs were skinned, carefully disarticulated at the hip-joint, and removed. Tumour weights were determined by subtracting from the weight of the tumour-bearing leg the average weight of the normal hind limb in rats of the same size. The doses of insulin and glucagon and other relevant data are given in the Table.

Results

The results of the experiments are also presented in the Table. In Experiment 1 the administration of insulin inhibited the growth of the tumour by 10%, while in

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†Our former colleague, Dr. Spencer Monroe, now of the Sloan-Kettering Institute for Cancer Research, has recently discussed with us his observations on the dramatic inhibition by insulin of the growth of Rous sarcoma in chickens.

Experiment 5 no inhibition was discernible. In a large series of other trials not reported here, insulin consistently produced a small but significant slowing of the tumour growth. This inhibition occurred only when the food intake of the treated animals was restricted to the level of the controls.

The retardation of growth of the tumour induced by glucagon alone has varied from 20 to 40%. This inhibition can be attributed, in part, to the reduction in food intake and the adverse effect of glucagon on the growth of the rat as a whole (Salter *et al.*, 1957b). Although the rats treated with both insulin and glucagon lose less weight than animals given glucagon alone, inhibitions of tumour growth of 60-70% have been obtained invariably. The inhibition is not therefore proportional to the weight loss. In each experiment the carcinostatic action of the combined therapy has been much greater than the sum of the individual effects of the two substances.

Discussion

The data show that both insulin and glucagon produce some inhibition, which is, on the average, about 10% for insulin and approximately 30% for glucagon. Together

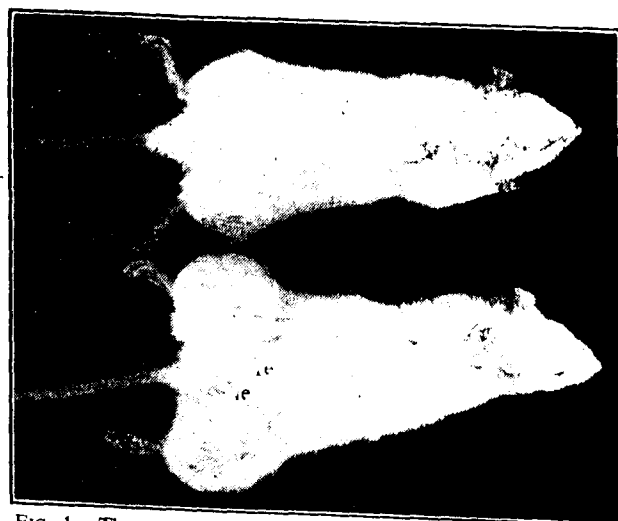


Fig. 1.—The upper animal was treated with both glucagon and insulin. The tumours present in the back legs are barely discernible, while those in the control animal, immediately below, are obviously much larger.

that a prolonged remission may have taken place, but there is no proof as yet that this can actually be made to happen.

Hypoglycaemia still presents a serious problem, but the experience we have gained enables us to control the level of blood sugar better than was possible initially. A long-acting glucagon would be of great value in these studies.

If we consider for the moment only the control animals and those which have received insulin and glucagon together there have been in all 67 controls and 77 treated with the two substances. The inhibition of tumour growth produced by glucagon and insulin together has been remarkably consistent, but a great deal of further work will have to be done on this tumour and on others to determine the maximum extent and duration of the inhibition and the frequency with which it takes place in various species of animals. Dr. E. S. Goranson, of the Ontario Cancer Institute, working with one of us (J. M. S.), has already repeated our experiment, and has found that an extensive inhibition (80%) is exerted by insulin and glucagon together on the growth of the Novikoff tumour in rats. There was a negligible difference in the weight of the control and test animals at the end of the experiments. Studies of various other tumours are under way.

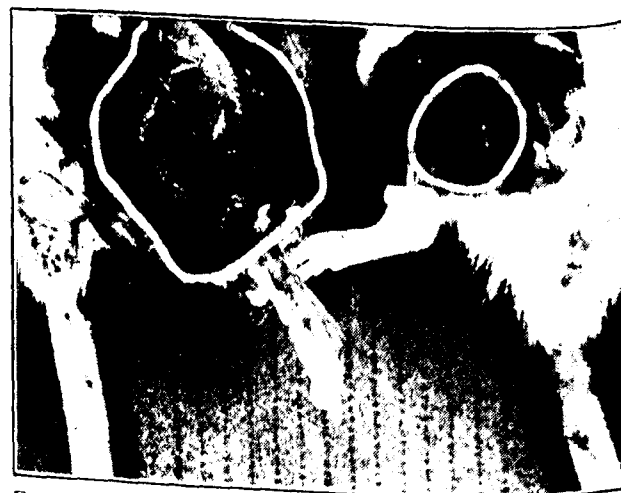


Fig. 2.—The tumours of the rats from Fig. 1 are shown after surgical exposure (circled in white). The tumour on the right is from the glucagon-insulin treated rat. The inhibition evident here is slightly greater than usual, but we have seen even more pronounced inhibition in some instances.

they exert from 60 to 70% inhibition of growth of this particular tumour (Figs. 1 and 2).

We have thus far only established that the inhibition persists while insulin and glucagon are being administered. Cessation of treatment is followed by resumption of growth of the tumour. There has been a suggestion in a few cases

It is abundantly clear that these findings demand, and that they will probably stimulate, an even more vigorous exploration of the metabolic effects of insulin and glucagon given together. No attempt will be made here to review the controversial literature on this subject. If glucagon supplements the peripheral action of insulin on normal

tissue, the effects of the two together in "starving" the tumour may be supplementary. Equally plausible suggestions may be based on the possible katabolic effects of glucagon on the tumour itself. Both mechanisms could be involved.

The field of tumour growth is notorious for the frequency of pitfalls. We have seen no indication that the effect we are investigating is due to a contaminating infectious agent or to other artifacts. These may, of course, emerge later and necessitate a change in the interpretation of our findings. We have obtained glucagon from two sources—Indianapolis and Toronto. The various lots of insulin have been made in Toronto.

It is obvious that, if this phenomenon of the extensive inhibition of tumour growth by insulin and glucagon together is observed in a large number of other tumours in various species of animals, a clinical trial of the substances may become very tempting. Some aspects of the investigation would be easier to control in the hospital than in the experimental laboratory. Clinically the two substances could be given by continuous intravenous drip and the hypoglycaemia which has plagued us could be detected at an early stage. Frequent blood-sugar estimations have not been considered advisable in the small animals. A sufficient number to establish low blood sugar as the cause of death in the insulin-treated animals which succumbed have been made. A great deal more should be learned in experiments on animals before any clinical study is seriously considered. An inhibition which persists only during the administration of the substances would be of limited clinical interest. The obvious possibility of using other substances to supplement the inhibition produced by insulin and glucagon is being explored.

We are indebted to Mrs. H. Vilup, Mrs. C. Hooper, and Mr. Gunther Brunet for their efficient technical assistance. This work has been supported in part by funds from the Foster Bequest of the University of Toronto and the National Research Council of Canada. We wish to thank the Connaught Medical Research Laboratories for the insulin and some of the glucagon which we have used. Our major source of glucagon has been Eli Lilly and Company.

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Dr. A. J. DALZELL WARD, medical director of the Central Council for Health Education, said at a recent press conference on the dangers of the common housefly, "Eggs laid last autumn are now hatching out. It takes about 12 days for the egg to hatch and another 12 days to reach maturity. During its brief life the housefly can lay about 900 eggs. Within a couple of months or two generations, therefore, some 800,000 (certainly half a million) flies can come from one fly. In other words one fly can have 800,000 grandchildren." Dr. Ward went on to describe prophylactic measures against the housefly. Obviously the best way to stop this menace to health was to prevent them breeding, he said. The lids of dustbins should be tight and not battered. The bottoms of dustbins should be kept clean and dry, and if possible sprayed with insecticide, preferably one containing D.D.T. It was a good thing to line the bottoms of dustbins with newspaper and renew this whenever they were emptied. As much rubbish as possible should be burned and the remainder, if burning was not possible, kept wrapped and covered until disposed of.

The housefly could and did travel as much as 10 or 12 miles (16-20 km.) from its breeding-place.

OOPHORECTOMY IN BREAST CANCER AN ATTEMPT TO CORRELATE CLINICAL RESULTS WITH OESTROGEN PRODUCTION

BY

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The treatment of metastatic breast cancer by surgical castration is the oldest rational method of palliation for this disease (Beatson, 1896). In the series reported by Thomson (1902) and Lett (1905) objective signs of growth regression in pre-menopausal women were observed in 25% of cases. On the other hand, and in sharp contrast, growth regression was limited to a single instance in a series of 25 post-menopausal women.

From 1910 onwards the usefulness of surgical castration was seriously questioned. For over thirty years it was generally discredited, and it was not reinstated until 1942 (Farrow and Adair, 1942) and Beatson's original and cautious claims were confirmed (Adair *et al.*, 1945; Sicard, 1947; Dargent, 1949). Objective remissions in post-menopausal cancer were again shown to be very uncommon.

The therapeutic purpose of surgical castration in pre-menopausal breast cancer is to arrest the progress of the disease by removing the source of ovarian oestrogen production. The palliation induced by this surgical manoeuvre is clearly and intimately related to the regressions which are frequently observed during the "physiological castration" of a natural menopause in breast cancers which, arising during the pre-menopausal period, have already metastasized by the time the patient enters the menopausal phase (Clemmesen, 1948; Hadfield and Holt, 1956).

Laboratory studies of the effectiveness of oophorectomy in abolishing oestrogen production have not been numerous. Bio-assays or biochemical estimations of urinary oestrogens have been reported by Smith and Emerson (1954), Dao (1953), Bulbrook and Greenwood (1957), and McBride (1957), and studies of vaginal cytology were published by Struthers (1956). These investigations revealed that, whilst surgical castration does not abolish the excretion of oestrogens, it does significantly reduce the excretion in pre-menopausal women.

None of the above authors attempted to correlate the immediate and long-term fluctuations in urinary oestrogens with the clinical consequences of the operation. In the present communication this correlation has been attempted.

Material and Methods

All clinical regressions recorded have been based exclusively on observable objective improvement in superficial lesions or in deep lesions visualized by radiography, and all clinical assessments were made without prior knowledge of the biochemical estimations.

Oestrogen-excretion studies were carried out in hospital. Patients were divided into two groups. Those

Results of Experiments

Exp. No.	Treatment	No. of Animals		Days' Duration	Av. Daily Food Intake (g.)	Final Wt. (g.)	Wt. Change (g.)	Tumour Wt. (g. S.E.)	Inhibition (%)
		Initial	Final						
1	None	25	25	10	12.8	156	14	11.4 ± 0.42	10
	P.Z.I. (1.6 u./day)	50	35		12.8*	154	16	12.0 ± 0.33	
2	None	25	25	12	10.3*	151	3	16.4 ± 1.00	20
	Glucagon (150 µg./day)	25	25		10.3	142	10	13.1 ± 0.78	
3	None	25	20	15	9.5*	138	6	18.2 ± 2.10	27
	Glucagon (300 µg./day)	20	20		6.8	111	29	13.2 ± 1.00	
4	" (300 µg. + P.Z.I. 3 u./day)	50	28†	10	9.5	129	13	6.1 ± 1.18	67
	None	20	20		10.5*	148	5	13.5 ± 1.67	
5	Glucagon (900 µg./day)	20	20	10	5.6	116	19	9.2 ± 0.88	32
	" (900 µg. + P.Z.I. 3 u./day)	40	25†		10.5	132	18	5.4 ± 1.35	
6	None	27	27	10	10.1	159	10	7.0 ± 1.12	40
	P.Z.I. (1.6 u./day)	30	16		11.6*	150	3	7.0 ± 0.81	
7	Glucagon (210 µg./day)	25	22	10	9.4	121	13	4.1 ± 0.93	70
	" (210 µg. + P.Z.I. 1.4 u./day)	34	24†		10.3	130	18	2.1 ± 0.48	

* Food intake restricted to this amount. † All deaths due to hypoglycaemia.

Figure represents weight of carcass exclusive of tumour.

in the first group had been oophorectomized before this investigation began and no pre-operative oestrogen levels were available. In the second group pre- and post-operative values were determined and the change in oestrogen excretion induced by the operation could be clearly defined.

After discharge all patients attended hospital at monthly intervals, whenever possible bringing a 24-hour specimen of urine. Some were readmitted for several days for clinical assessment and further oestrogen estimations. In a few cases the 24-hour urine specimen was collected from the patient's home. All patients were warned against the use of the several aperients which interfere with oestrogen analysis.

Vaginal smears were taken from the majority of patients and were graded as showing high, moderate, or low oestrogenic activity.

Chemical Methods.—Urinary oestrone, oestradiol-17 β , and oestriol were measured by the method of Brown (1955a) or by the modification proposed by Brown, Bulbrook, and Greenwood (1957a). Results are expressed in $\mu\text{g./24 hours}$ for each oestrogen, or as their sum. Analyses are shown as zero when the amounts of each oestrogen were less than the calculated limits of sensitivity of the method (Brown, Bulbrook, and Greenwood, 1957b). In Case 10, 17-oxosteroids and 17-oxo-genic steroids were estimated by the methods of Norymberski, Stubbs, and West (1953) and Gibson and Norymberski (1954), and pregnanediol by the method of Klopper, Michie, and Brown (1955). The results of both analyses are expressed in mg./24 hours .

1. Clinical Effects and Hormone Excretion After Oophorectomy in Pre-menopausal Women

All patients in this group had a regular menstrual history up to the time of operation. Analyses were carried out on 230 urine specimens from 24 patients in whom progressive metastatic breast cancer had developed after oophorectomy. The mean daily amount of oestrogen was calculated for each patient. These amounts showed no correlation with the time after oophorectomy, and the amounts shown in Table I are the overall means for the 24 patients studied from 1 to 60 months after operation.

TABLE I.—Oestrogen Levels 1 to 60 Months After Oophorectomy in 24 Pre-menopausal Women (230 Analyses)

	Oestrone	Oestradiol-17 β	Oestriol	Total
Arithmetical mean	1.8	0.6	2.9	5.3
Standard deviation	1.0	0.8	2.2	2.6

Results expressed in $\mu\text{g./24 hours}$.

Table I shows that in this group of women the level of oestrogen excretion was much lower than has been found during the normal menstrual cycle.

Four patients treated by oophorectomy for metastatic breast cancer were studied individually at intervals after operation. These patients had shown a regular menstrual history up to the month of operation. In two cases pre-operative oestrogen levels were not estimated, and it was assumed that these were within the normal range (Brown, 1955b). The detailed results are shown in Figs. 1 to 3.

Case Reports

Case 1 (Fig. 1).—This patient was a single woman aged 36. Eleven months after mastectomy, metastases appeared in the ribs, spine, and pelvis; no ovarian or other soft-tissue deposits were detected. Bilateral oophorectomy was carried out. Oestrogen analyses were started two weeks after operation, and up to one month after operation the mean amount of oestrogen was only $2.8 \mu\text{g./24 hours}$. A substantial fall

in oestrogen excretion from the pre-operative level may be assumed to have taken place accompanied by objective

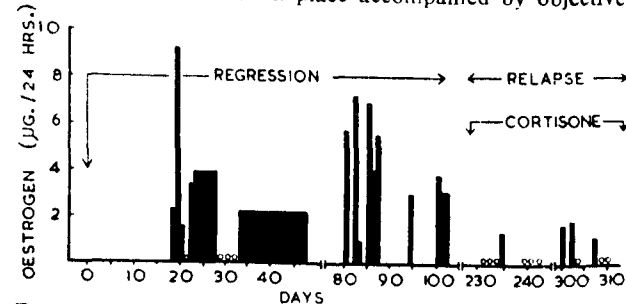


FIG. 1.—Case 1. Excretion of oestrogen after bilateral oophorectomy. In all figures the day of operation is marked with a vertical arrow. Oestrogen excretion is shown as total oestrogen—the sum of the oestrone, oestradiol-17 β , and oestriol values. In Figs. 1-6 each vertical column gives the mean of a duplicate determination on a 24-hour specimen of urine. Open circles on the abscissa indicate no detectable oestrogen.

remission of the disease for four months following operation. Intermittent analyses from two to three months showed an increase in the mean oestrogen level to $3.9 \mu\text{g./24 hours}$. The patient was readmitted to hospital seven months after oophorectomy, and cortisone therapy was initiated, and for a period of three months only trace amounts of oestrogen were detected. In spite of this, from the fourth to the tenth month after oophorectomy there was progressive growth in the skeletal metastases.

Case 2 (Fig. 2).—This patient, aged 53, married, had been menstruating regularly until 10 to 12 months before she was first seen; during that time she had serious menorrhagia.

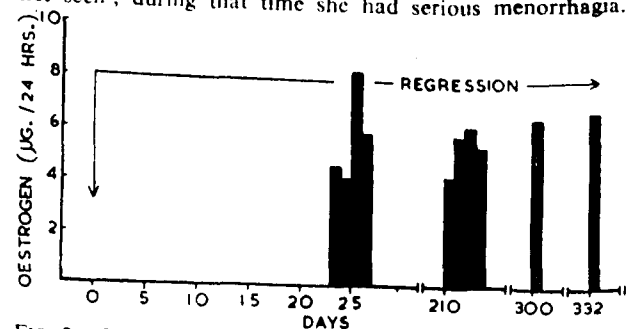


FIG. 2.—Case 2. Excretion of oestrogen after bilateral oophorectomy.

On admission she had gross pseudo-inflammatory malignant extension in the left breast, hard axillary glands on the same side, and the liver was palpable one fingerbreadth below the costal margin. No skeletal metastases were detected. There were multiple uterine fibromyomata. Hysterectomy and bilateral oophorectomy were performed. Examination of the liver at operation showed multiple metastases in the right lobe. The mean total oestrogen in the first month after oophorectomy was $5.8 \mu\text{g./24 hours}$. Analyses at 7, 10, and 11 months later showed similar values, suggesting that at no time had oestrogen excretion reached zero. Over this period the breast became shrunken and softer, the skin reaction faded, and the nodes decreased in size.

Case 3 (Fig. 3).—This patient was aged 54 and married. Over the previous eight years, and after a left radical mastectomy, the intermittent appearance of clavicular, intercostal, sternal, costal, and supraclavicular swellings had been treated by deep x rays. When admitted to hospital she had pelvic bone metastases and a left pleural effusion. Admission interrupted an otherwise regular history of menstruation. The vaginal smear indicated high oestrogenic activity. Urinary excretion of oestrogen was irregular but showed a normal excretion pattern of the individual oestrogens and a total amount within the normal range (Brown, 1955b). 17-oxosteroid excretion was normal and relatively constant at 3.4 mg./24 hours . Operation revealed metastatic deposits in both ovaries. Oophorectomy produced an arrest in growth but no objective regression for a period of three

months, associated with a reduction in mean oestrogen excretion from 15.5 to $3.9 \mu\text{g./24 hours}$, and a change in the appearance of the vaginal smear from high to moderate activity in the first two months after operation. The pre-operative lesions were virtually unchanged over the three-

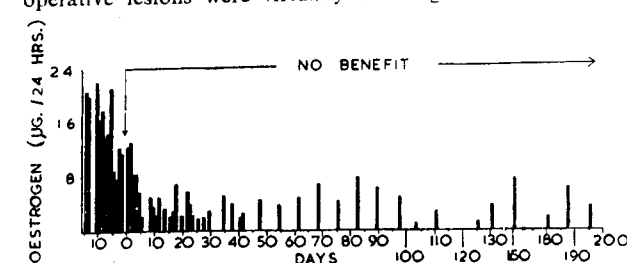


FIG. 3.—Case 3. Excretion of oestrogen before and after bilateral oophorectomy.

months period and a return to active growth and the reappearance of other skeletal secondaries was preceded by a slight rise in oestrogen excretion ($5.3 \mu\text{g./24 hours}$) and a return of the vaginal smear to one of high oestrogen activity. Intermittent analyses from the fourth to the sixth month after operation showed an irregular excretion around a mean value of $3.2 \mu\text{g./24 hours}$. The patient died seven months after operation. Post-mortem examination revealed diffuse carcinomatosis; secondary deposits were found in the adrenal glands.

Case 4.—This patient, aged 44, married, had a history of recurrence of growth after a previous mastectomy similar to that described in Case 3. Oestrogen excretion before operation showed a similar picture—irregular excretion but a normal pattern and total amount; the mean pre-operative level was $14.4 \mu\text{g./24 hours}$. Clinically, oophorectomy had no effect, but regression of the lesions was obtained by irradiation from one to three months after operation. Oestrogen levels were investigated only at the fourth month. At this time oestrogen was still present, although in amounts ($3.3 \mu\text{g./24 hours}$) well below the mean pre-operative level. The patient died seven months after operation. Post-mortem examination showed diffuse carcinomatosis.

Summary of Findings in Pre-menopausal Group

The mean excretion of Cases 3 and 4 before operation was about $15 \mu\text{g./24 hours}$. Similar figures have been given for pre-menopausal women with breast cancer (Birke *et al.*, 1958) and for normal women (Brown, 1955b). The results shown in Table I, and Figs. 1 to 3, afford further evidence that oophorectomy in pre-menopausal women removes a major source of oestrogen production. Although well marked in Cases 3 and 4, the reduction in oestrogen excretion was not accompanied by objective remission of the disease.

The range and mean levels of oestrogen excreted after oophorectomy demonstrate that adrenal secretion of oestrogen is always detectable after operation and can vary within wide limits. The results obtained in the first few days after operation (Case 3) suggest that the adrenal glands contribute to excretion before oophorectomy, and this component may be temporarily increased by operative stress.

The finding that adrenal secretion of oestrogen is usual after oophorectomy would afford at least a rational explanation for the clinical failure of the operations in Cases 3 and 4, but remission of the disease was obtained in Cases 1 and 2, although oestrogen was always detectable in the urine. The levels of oestrogen in the latter cases do not differ from the levels found in the group with progressive disease (Table I).

2. Clinical Effects and Hormone Excretion After Oophorectomy in Menopausal Women

For the purpose of this paper we have defined as "menopausal" those women who last menstruated less than a year before oophorectomy. A group of six patients who had been oophorectomized for metastatic breast cancer during

the menopause was investigated. Oestrogen studies after oophorectomy were made at a time when the disease had recurred, from 1 to 24 months after operation, in these patients. Table II shows the mean oestrogen levels based upon the analysis of 50 urine specimens from the six patients. The amounts and pattern of oestrogen excreted do not differ from that found in the pre-menopausal group (Table I).

TABLE II.—Oestrogen Levels 1 to 60 Months After Oophorectomy in Six Menopausal Women (50 Analyses)

	Oestrone	Oestradiol-17 β	Oestriol	Total
Arithmetical mean	1.8	0.4	3.9	6.1
Standard deviation	1.5	0.5	5.3	6.4

Results expressed in $\mu\text{g./24 hours}$.

More detailed studies were made on four menopausal patients with metastatic breast cancer.

Case 5 (Fig. 4).—This patient, aged 45, married, had a previous history of mastectomy, with the later appearance

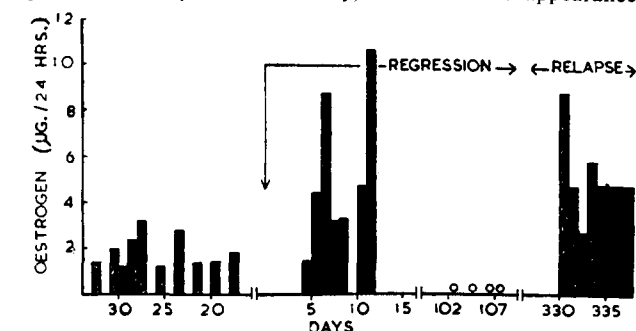


FIG. 4.—Case 5. Excretion of oestrogen before and after bilateral oophorectomy.

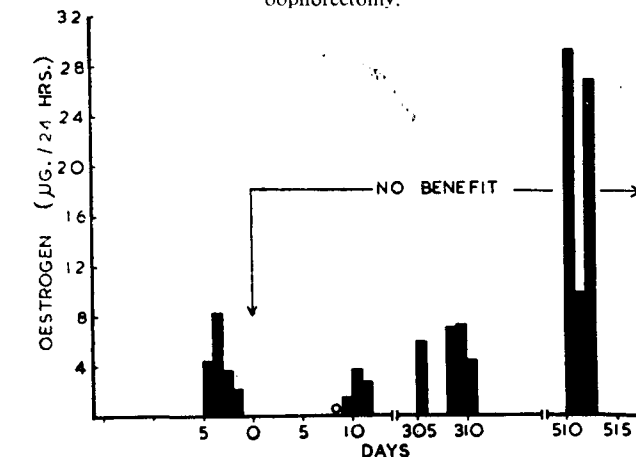


FIG. 5.—Case 6. Excretion of oestrogen before and after bilateral oophorectomy.

of supraclavicular nodes. These and subsequent pelvic bone deposits were treated by deep x-ray therapy. Periods were regular until nine weeks prior to oophorectomy but had ceased at this time incidental to the deep x-ray therapy. Excretion of oestrogen was very low, but oophorectomy occasioned a transient though pronounced rise in excretion. An objective regression of five months' duration followed oophorectomy. No oestrogen could be detected three months after operation. The disease progressed from the sixth month until death, 13 months after operation. Oestrogen excretion during this period had returned to a mean value of $5.2 \mu\text{g./24 hours}$, above the pre-operative level of $1.9 \mu\text{g./24 hours}$.

Case 6 (Fig. 5).—This patient, aged 55, married, had a six-months history of a lump in the breast with involvement of the axilla. Treatment by deep x rays to the breast and axilla was started. Menstruation had been regular until six months before operation. Just before operation the

vaginal smear showed moderate to high oestrogen activity, but the total amount of oestrogen was low. The immediate effect of oophorectomy was difficult to evaluate, since deep x-ray treatment was continued. A very low level was found in the first month after operation. Clinically some subjective improvement was noted for the first post-operative month, but by the third month deep x-ray treatment to the breast and axilla was resumed. Subsequent progression of the disease, with the appearance of new lesions, was noted over a period from the fifth to the seventeenth month after operation. Oestrogen excretion had increased by the tenth month, and a further very marked rise was shown in the seventeenth month, a few days before death.

Case 7.—This patient was single, aged 42. Fifteen months after mastectomy and deep x-ray treatment for carcinoma of the right breast she developed a pleural effusion and metastases in the spine, ribs, and pelvis. Pre-operative oestrogen (2.6 μ g./24 hours) and 17-oxosteroid excretion (1 mg./24 hours) were low. At operation both ovaries contained secondary deposits. Both oestrogen and 17-oxosteroid excretion were raised above the pre-operative levels in the month after oophorectomy (7.6 μ g./24 hours and 5 mg./24 hours respectively). The progress of the disease was not affected by operation. Some palliation was obtained with deep x-ray treatment, but the patient died four months after oophorectomy with widespread pleural and pulmonary metastases and skeletal deposits. At post-mortem examination deposits were found in both adrenal glands.

Case 8.—This patient, aged 51, married, had a seven-months history, before oophorectomy, of an inoperable carcinoma of the left breast with gross skin and axillary node involvement. Improvement had been obtained by deep x-ray treatment and the disease appeared to be responding. Four months prior to operation vaginal smears showed high oestrogenic activity. At operation oestrogen excretion was not high (3.6 μ g./24 hours) and an atypical fall to zero was obtained up to the time of discharge, the 17-oxosteroid excretion being unchanged by operation. An objective regression lasting for three years followed oophorectomy, but as it has been impossible to carry out further investigations it is not known whether oestrogen secretion has returned or not.

Summary of Findings in the Menopausal Group

The oestrogen levels of the individual patients before and after operation do not differ from those found in the group of patients studied after operation (Table II). The pre-operative levels are low compared with those found in pre-menopausal women, and suggest that in the menopausal cases an ovarian contribution was absent before operation. The immediate effects of operation on oestrogen excretion in this small series show three variations: unchanged, increased, and decreased excretion.

The immediate effects of oophorectomy on oestrogen secretion would appear to be determined by the degree of operative stress and the individual reaction to this. In the two cases followed for some time after operation the immediate effects were not maintained. In Case 5 the excretion fell to zero over a period of remission, and rose with the progression of the disease; in Case 6 the oestrogen excretion, unchanged by operation, rose as the disease progressed.

The four cases show a clear association between the effects of oophorectomy on oestrogen excretion and the clinical state. The operation was not effective in two cases showing an increased or unchanged excretion, but objective regressions were produced in the two cases in which oestrogen excretion fell to zero. In one of the latter, oestrogen excretion returned when the patient relapsed.

3. Clinical Effects and Hormone Excretion After Oophorectomy in Post-menopausal Women

We have defined as "post-menopausal" those women who had not menstruated for at least one year before

TABLE III.—Oestrogen Levels 2 to 8 Years after the Menopause in 16 Post-menopausal Women (81 Analyses)

	Oestrone	Oestradiol-17 β	Oestriol	Total
Arithmetical mean	1.8	0.9	2.4	5.0
Standard deviation	1.3	1.3	2.1	2.6

Results expressed in μ g./24 hours.

TABLE IV.—Oestrogen Levels 2 to 36 Months After Oophorectomy in Six Post-menopausal Women (31 Analyses)

	Oestrone	Oestradiol-17 β	Oestriol	Total
Arithmetical mean	1.8	0.9	3.5	6.3
Standard deviation	1.0	0.6	1.9	2.7

Results expressed in μ g./24 hours.

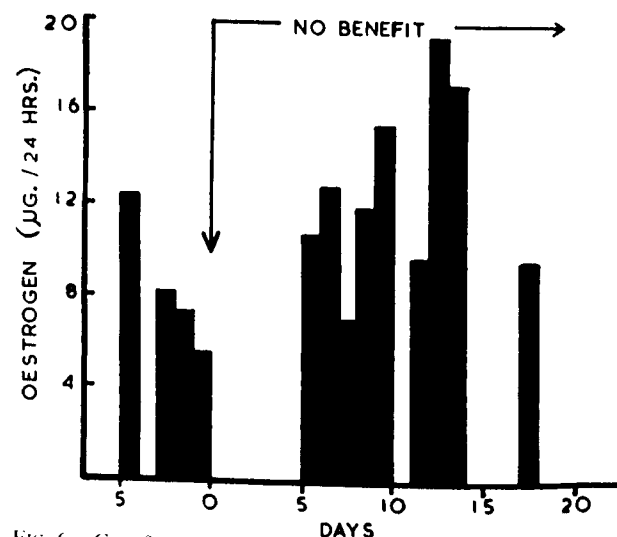


Fig. 6.—Case 9. Excretion of oestrogen before and after bilateral oophorectomy.

oophorectomy. A comparison of the oestrogen excretion levels of a group of post-menopausal women with metastatic breast cancer with the readings from a similar group after oophorectomy shows that the results are the same in the two groups (Tables III and IV) and suggest that oophorectomy has no effect on oestrogen excretion.

Four cases studied before and after oophorectomy conform to this general pattern, and in these no regression of the disease was obtained. In addition, three of the four cases showed an increased excretion of oestrogen within the first weeks after operation. Case 9 illustrates the general findings in this group.

Case 9 (Fig. 6).—The patient, aged 52, married, had a one year's history of inoperable breast cancer treated by deep x rays, and subsequently by oophorectomy for skeletal metastases, with no effect. The disease slowly progressed, and by the ninth month after opera-

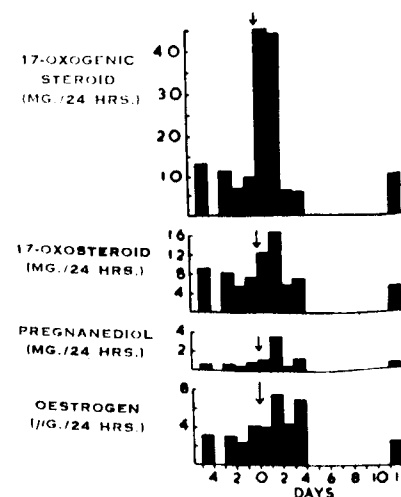


Fig. 7.—Case 10. Excretion of steroids before and after mastectomy. Each vertical column gives the mean of a duplicate determination for oestrogen, pregnanediol, 17-oxosteroid, and 17-oxogenic steroid on a 24-hours specimen of urine.

tion the breast had ulcerated and the bone metastases had spread. The patient died 11 months after operation. The immediate effects of operation are shown in Fig. 6. The mean pre-operative level was 9.2 μ g./24 hours, and in the first two weeks there was a marked adrenal reaction to operation, the mean level being 12.7 μ g./24 hours.

A more detailed study of operative stress is shown in Case 10.

Case 10 (Fig. 7).—The patient, aged 56, married, was post-menopausal, had an operable breast cancer, and was treated by mastectomy only. The rise in oestrogen excretion was not marked and took place from the first to the fourth day after operation before reaching pre-operative levels. The increase in 17-oxosteroid, 17-oxogenic steroid, and pregnanediol excretion was more marked, and occurred on the first and second days after operation.

Summary of Findings in the Post-menopausal Group

As with the group of menopausal women, the immediate effect of oophorectomy may be an increase in oestrogen excretion due to operative stress. The overall effect of oophorectomy in the post-menopausal women is that both the clinical course of the disease and the oestrogen levels remain unaltered.

Discussion

The levels of urinary oestrogen found after oophorectomy in pre-menopausal, menopausal, and post-menopausal women with metastatic breast cancer are similar in amount and pattern to those of normal menopausal and post-menopausal women. It is only in pre-menopausal women that a post-operative fall invariably takes place. In all three groups there are considerable variations in the total amount of oestrogen excreted after operation, and the quantity varies from one patient to another and in each patient at different times. In many instances the levels approach those found in normal menstruating women. On the other hand, oestrogen excretion is rarely recorded as being below 1 to 1.5 μ g./24 hours, the arbitrary limit imposed by the sensitivity of the chemical method used.

The failure of surgical castration to reduce oestrogen excretion in menopausal and post-menopausal women is probably related to variations in the relative amounts of oestrogen contributed by the ovary on the one hand and the adrenal on the other. No fall in oestrogen could be expected if the ovarian contribution were negligible, whilst a post-operative suppression of ovarian oestrogen production could be offset by an increase of adrenal oestrogen production, such adrenal overactivity being a possible result of operative stress. This interpretation of our clinical and biochemical observations in menopausal and post-menopausal women affords some justification for further endocrine ablation as the subsequent treatment of choice. Adrenalectomy would be expected to accomplish both a steep fall in oestrogen excretion and a reduction below a critical level, which in all probability varies from patient to patient.

The removal of the pre-menopausal ovaries, although reducing oestrogen excretion, is not always accompanied by regression of the disease. There are several possible explanations for this observation, but no definite conclusions can be drawn from the data presented in this paper. For example, the beneficial effects of oophorectomy in some pre-menopausal women may depend upon the extent of the post-operative fall in oestrogen production. This is unlikely to be constant in all patients submitted to oophorectomy, since it depends upon the relative contributions of the ovaries and adrenal glands pre-operatively, the stressing effect of the operation on adrenal secretion, and the "resting" level of adrenal oestrogen production. Each of these factors is known to vary widely from patient to patient (Brown, 1958; Pirke *et al.*, 1958; this paper), and this would

provide an adequate basis for the variation to be expected in the extent of the fall in oestrogen production after oophorectomy.

Alternatively, the clinical success of oophorectomy may depend upon the reduction of circulating oestrogen below a critical level irrespective of the pre-operative level. If this be attained regression might follow. On the other hand, such a period of growth remission could be interrupted by a period of progressive growth if adrenal oestrogen production were increased by a sustained episode of traumatic stress. The well-attested variation in the capacity of the adrenal glands to take over oestrogen production after surgical castration has already been emphasized and the absence of oestrogen in two cases in objective remission may well be significant examples of this phenomenon.

For this discussion we have used the simple example of oestrogen reduction. It must be appreciated that the effects of oophorectomy, like the effects from the natural menopause, are not those of simple oestrogen removal or reduction, but involve a complex of changes which result in a gross disturbance of both adrenal and pituitary function in addition. It is probable that tumour regression is not related to simple changes in oestrogen, but is related to the whole complex of changes by alteration in oestrogen, progesterone, and pituitary hormone variation.

Summary

The effects of bilateral oophorectomy upon the clinical state and oestrogen excretion have been studied in patients with metastatic breast cancer.

Objective remission in pre-menopausal women after oophorectomy was not invariable, despite a fall in oestrogen excretion. Possible reasons for this are presented.

Objective remission in menopausal and post-menopausal women appeared to be unlikely unless the ovarian contribution of oestrogen was significant and adrenal secretion of oestrogen unaffected by operation.

Oestrogen derived from the adrenal glands appears to be present in all patients after oophorectomy. The removal of this source of production by further endocrine surgery appears to be indicated when oophorectomy fails to arrest the progress of the disease.

We are grateful to the surgical staff and the staff of the radiotherapy department of St. Bartholomew's Hospital for allowing us to investigate patients under their care, and particularly to Professor Sir James Paterson Ross, who has also been most helpful with his advice and criticism.

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ADRENALECTOMY IN BREAST CANCER

AN ATTEMPT TO CORRELATE CLINICAL RESULTS WITH OESTROGEN PRODUCTION

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Continued excretion of oestrogen produced by the adrenal cortex occurs after oophorectomy in the majority of women with breast cancer. In 1945 Huggins and Scott performed bilateral adrenalectomy in four cases of advanced breast and prostatic cancer in an attempt to remove the second source of oestrogen production from the body. One patient survived for 116 days in a hypo-adrenal state, with some objective improvement in skeletal metastases. When cortisone became available the operation was carried out in 18 cases (Huggins and Bergental, 1952). Seven were women suffering from cancer of the breast, and clinical improvement was induced in all of them. The results stimulated great interest in the subject, and since 1952 many series of cases have been reported. It seems that bilateral adrenalectomy can play a definite and sometimes valuable part in the palliative treatment of breast cancer.

When adrenalectomy fails to induce a growth regression in breast cancer, oestrogen independence is generally assumed to be the cause. A second possible explanation was suggested by the reports of Scowen (1955) and of Struthers (1956), who found that oestrogen secretion could continue after bilateral adrenalectomy, as judged by the appearance of the vaginal smear. This was an unexpected result at that time, but these findings have since been confirmed by urinary oestrogen estimations, using Brown's (1955) chemical method (Greenwood and Bulbrook, 1956; Bulbrook and Greenwood, 1957), and also by biological assay (Dao, 1957; Bulbrook *et al.*, 1958c).

We have been unable to find any published reports in which an attempt has been made to correlate oestrogen excretion with the patient's clinical state after adrenalectomy. This paper reports such a survey of 13 cases of metastatic breast cancer in women treated by bilateral adrenalectomy.

Methods

Chemical.—The chemical method of Brown (1955) for the determination of urinary oestrone, oestradiol-17 β , and oestriol was used initially. This technique gives an underestimate of the amount of oestradiol-17 β and oestriol when cortisone is administered to the patient. A minor modification removes this source of interference, but a variety of drugs and aperients can lead to an overestimate of the amount of oestrogen in the urine (Brown *et al.*, 1957). Oestrogen excretion is recorded as below the limit of sensitivity of the chemical

method. This is an arbitrary limit which can be lowered by the more sensitive biological assay (Bulbrook *et al.*, 1958c).

Clinical.—In this series regression is defined as objective improvement in either surface lesions or in deep metastatic lesions visualized by radiography. Clinical assessments were carried out without prior knowledge of the biochemical results. The patient's age quoted is that at the time of adrenalectomy. Thirteen patients with metastatic breast cancer were studied; in seven cases urinary oestrogen estimations were carried out before and after adrenalectomy and at intervals after operation; in the remaining six, only post-operative estimations were carried out.

The cases are divisible into two groups: those in objective remission, and those in relapse.

Oestrogen Excretion in Patients During Objective Remission

Of the 13 patients studied, only three were in remission at the time the oestrogen estimations were carried out. The detailed results are described below.

Case 1 (Fig. 1).—The patient, aged 48, was married. Ten years after left radical mastectomy the wound ulcerated. Seven years later, when she was 46 years old, she was treated by oophorectomy, with some benefit for six months, although the wound did not completely heal. Two years later there was gross ulceration of the chest wall spreading into the axilla; there was no evidence of distant metastases. Bilateral adrenalectomy was performed and induced

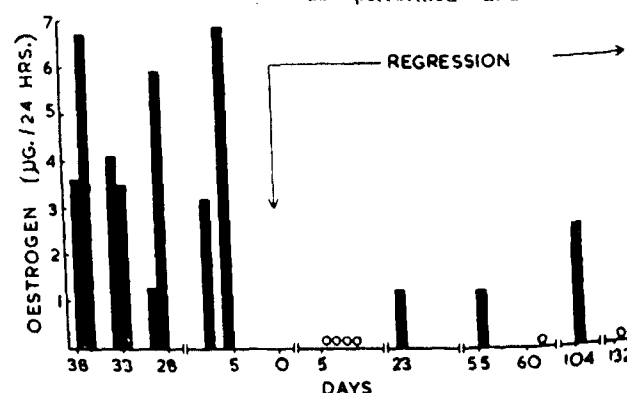


FIG. 1.—Case 1.—Excretion of oestrogen before and after bilateral adrenalectomy. In Figs. 1, 2, and 4 the day of operation is marked with a vertical arrow. In all Figs. the oestrogen excretion is shown as total oestrogen—the sum of the oestrone, oestradiol-17 β , and oestriol values. Each vertical column gives the mean of a duplicate determination on a 24-hour specimen of urine. Open circles on the abscissa indicate no detectable oestrogen.

regression of the growth, which has been maintained for eight months. Before adrenalectomy the mean total oestrogen level was 3.7 μ g./24 hours; after operation zero levels were frequent, with occasional small amounts of oestrogen found in some specimens of urine. At subsequent follow-up at intervals after operation, oestrogen was occasionally detected in the urine. Thus in this case regression of the tumour was associated with the virtual disappearance of oestrogen from the urine.

Case 2 (Fig. 2).—This patient, aged 42, married, underwent oophorectomy three and a half years after radical mastectomy because of the appearance of metastases in the left axilla and supraclavicular glands. There were no pulmonary or skeletal secondaries. The operation led to a short symptomatic regression, but skeletal secondaries ultimately developed. Two years and nine months after oophorectomy, bilateral adrenalectomy was carried out. An objective remission was induced. This lasted for four months, during which time a pathological fracture of the ulna healed and secondary deposits in the skull became smaller and calcified. During this period oestrogen excretion was reduced but not entirely abolished. Zero values were uncommon, and the mean total level of oestrogen over the first post-operative month was 1.9 μ g./24 hours.

At a subsequent examination, eight months later, the disease was progressive, metastases being present in the clavicles, spine, lung, and brain. At this time oestrogen excretion had risen to a relatively high level and was persistent (mean total=8.5 μ g./24 hours). Two months before death—which occurred 11 months after adrenalectomy—only one

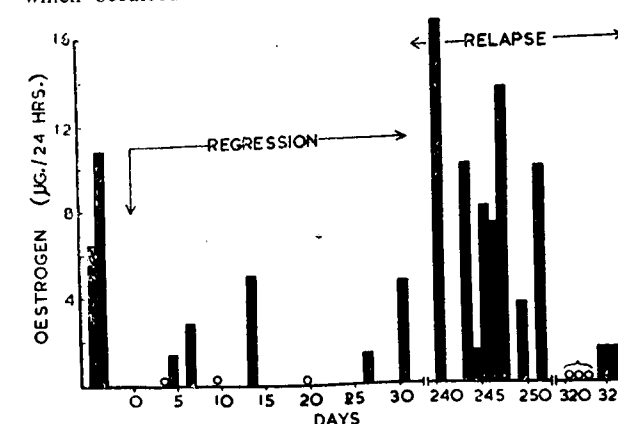


FIG. 2.—Case 2. Excretion of oestrogen before and after bilateral adrenalectomy.

of three urine specimens contained detectable amounts of oestrogen. This case illustrates the transition from regression to relapse. During the short remission oestrogen excretion was persistent and rose considerably in relapse until just before death.

Case 3.—From this patient, a married woman aged 46, no pre-operative specimens were obtained. A radical mastectomy was performed at the age of 45. Ten months later skeletal metastases developed, and at oophorectomy, which had no effect, liver secondaries were found. Adrenalectomy was carried out three months later and led to an objective regression of both skeletal and hepatic metastases. During the period of regression oestrogen estimations were carried out 15 and 40 months after operation. No oestrogen was detected in any of the 11 specimens analysed. Four years after adrenalectomy there was evidence of progressive disease. Seven analyses were carried out, and in only one was there detectable oestrogen (approximately 1.5 μ g. of oestriol). Unlike Case 2, the transition from remission to relapse was not accompanied by a rise in oestrogen excretion.

In these three cases the period of remission was associated with either no detectable oestrogen (Case 3) or with a negligible and spasmodic excretion (Case 1). Case 2 shows that the continued excretion of oestrogen, admittedly small, is not incompatible with objective remission. Progression in this case was accompanied by a rise in oestrogen excretion but in Case 3 this did not occur.

Oestrogen Excretion Before and After Bilateral Adrenalectomy*

Group	Case No. and Age	Pre-Adrenalectomy				Post-Adrenalectomy							
		O	D	T	Total	In Remission				In Relapse			
						O	D	T	Total	O	D	T	Total
1	1 (48)	1.5	0.0	2.2	3.7 (9)	0.5	0.0	0.0	0.5 (7)	0.9	0.7	3.0	4.6 (12)
	2 (42)	4.5	1.4	2.8	8.7 (2)	1.3	0.6	0.0	1.9 (8)	0.0	0.0	0.0	0.0 (7)
	3 (46)					0.0	0.0	0.0	0.0 (11)				
	4 (51)	2.8	0.3	0.0	3.1 (5)					0.9	0.9	3.6	5.4 (10)
2	5 (38)	1.8	1.4	0.0	3.2 (2)					0.0	0.0	0.0	0.0 (2)
	6 (43)	4.9	4.3	4.6	13.8 (4)					0.5	0.0	1.3	1.8 (7)
	7 (66)	1.0	0.0	2.2	3.2 (5)					1.3	0.8	7.3	9.4 (24)
	8 (44)									0.9	1.0	0.4	2.3 (7)
	9 (47)									0.0	0.0	1.1	1.1 (4)
	10 (37)									0.0	0.0	0.0	0.0 (7)
	11 (46)									0.0	0.0	0.0	0.0 (5)
	12 (52)									0.0	0.0	0.0	0.0 (5)
	13 (46)									0.0	0.0	0.0	0.0 (5)

*The case numbers are those referred to in the text; the age of the patient at adrenalectomy is given in parentheses in the first column. O, D, and T refer to oestrone, oestradiol-17 β , and oestriol respectively, and the figures given are arithmetical means. Figures in parentheses in the columns headed "Total" refer to the number of estimations carried out. All results are expressed in μ g./24 hours.

All patients had been previously oophorectomized, with the exception of Cases 4, 11, and 13, who were subjected to bilateral oophorectomy and adrenalectomy at the same time.

months of objective remission followed and a pathological fracture of the humerus consolidated. Thereafter the disease progressed and adrenalectomy was carried out. No benefit was obtained, and the patient died of progressive disease 22 months after operation. It can be seen from Fig. 4 that bilateral adrenalectomy had virtually no effect on oestrogen excretion.

A further seven patients were studied in relapse. In four oestrogen was found in the urine, in one case in remarkably high amounts—up to 50 $\mu\text{g./24 hours}$. This abnormal level of excretion was followed by a period when the patient excreted over 9 $\mu\text{g./24 hours}$. This level, subsequently confirmed by quantitative biological assay, is greater than the mean amount of oestrogen produced by the adrenal glands and excreted in the urine of post-menopausal women.

In the 10 cases described in this section, five either derived no benefit from adrenalectomy or, when the oestrogen estimations were carried out, were in relapse and not excreting detectable amounts of oestrogen. The remaining five were excreting oestrogen whilst the disease was progressing. A summary of the findings for the 13 patients is presented in the Table, in which the mean total pre-operative oestrogen values are given and the mean levels found in relapse or in remission are also shown. It must be pointed out that the mean figures should be accepted with some reserve. Reference to Figs. 1 and 2 shows the intermittent nature of oestrogen excretion after adrenalectomy, and from this it can be concluded that the estimation of the oestrogen content of single 24-hour specimens of urine may be misleading. Short periods, during which oestrogen excretion is relatively high, may be followed by periods during which little oestrogen can be detected. This phenomenon therefore reduces the value of a mean figure. Nevertheless, the table illustrates the mean excretion before operation and the extent to which adrenalectomy causes a diminution in excretion. The mean pre-operative figure is within the range given for post-menopausal women or oophorectomized women with cancer of the breast given in a previous paper (Bulbrook *et al.*, 1958a). Average oestrogen levels in remission are less than 1 $\mu\text{g./24 hours}$ (total), with a considerable increase when the levels in relapse are considered.

Discussion

It must be emphasized that the series of patients described is small and that of a total of 13 cases six were studied only during relapse. Any conclusions based on the results must therefore be tentative.

It is clear that adrenalectomy reduces, even if it does not always abolish, oestrogen excretion. There is a significant difference between the mean pre-operative level and the mean post-operative level for the patients shown in the Table. This affords clear evidence that the post-oophorectomy or post-menopausal excretion of oestrogen described in a previous paper (Bulbrook *et al.*, 1958a) is of adrenal origin in the human (see Brown, 1958). Remission of the disease, however, does not always follow the reduction or abolition of oestrogen excretion.

It seems that continued oestrogen excretion is not necessarily exclusive of objective regression of the disease. The amounts excreted by Case 1 after operation were negligible and inconstant. But Case 2 showed a definite and persistent excretion. If this result can be confirmed by a wider study of more cases, the implication is that the cessation of secretion of hormones other than the oestrogenic steroids produced by the ovaries and adrenals may be decisive in causing the regression of human breast cancer. The complex nature of the dependence of normal breast growth on a group of hormones acting together is well established in experimental animals (see, for example, Lyons *et al.*, 1955; Hadfield, 1957), but such data are almost entirely lacking for the human. The participation of a pituitary factor is suggested by the finding that two patients (Cases 11 and 13) in relapse after adrenalectomy were without detectable oestrogen but obtained remission after subsequent hypophysectomy (Bulbrook *et al.*, 1958b).

Half the patients in relapse in this series showed continued excretion of oestrogen after adrenalectomy, compared with roughly one-third in a larger series studied without consideration of clinical state (Bulbrook and Greenwood, 1958). It seems unnecessary to postulate oestrogen independence of the tumour as the cause of the failure of treatment in these cases. In considering the six patients in relapse in whose urine no oestrogen could be detected, some caution must be used before continued tumour growth is ascribed to oestrogen independence or to dependence upon pituitary factors. With the use of the more sensitive biological assay (Bulbrook *et al.*, 1958c) it has been shown that oestrogen excretion may continue in some oophorectomized adrenalectomized patients, although in amounts not detectable by the chemical method.

The source of the continued oestrogen remains obscure. The literature describes the occurrence of microscopical ectopic adrenal tissue, but no macroscopic rests have been found after death in four of the patients in this series. One (Case 8) was excreting considerable amounts of oestrogen. Furthermore, Strong *et al.* (1956) could not elicit an increased oestrogen excretion by the administration of adrenocorticotrophin in adrenalectomized patients. On the other hand, Bulbrook and Greenwood (1958) have found that continued oestrogen excretion after adrenalectomy tends to be present with the continued excretion of androsterone and aetiocholanolone, compounds which are not considered to be derived from administered cortisone. This result therefore indicates that the probable source of the steroid hormone production is likely to be adrenal tissue; otherwise it is necessary to postulate an alternative source with adrenal-like properties.

It has also been suggested that the tumour itself may be responsible for the production of oestrogens. Chemically and biologically detectable amounts of oestrogens have been found in all cases in a series of adrenalectomized patients with diffuse carcinomatosis (Daniel and Mitchell, personal communication). This theory is supported to a certain extent by the results in this paper, which show that oestrogen excretion may be associated with progression of the disease. In a previous paper (Bulbrook *et al.*, 1958a) oestrogen excretion rose as the disease progressed in a patient following oophorectomy until, just before death, relatively enormous amounts of oestrogen were recorded (four times the mean post-oophorectomy level). These results could be interpreted as indicating tumour production of oestrogen. Similarly, in Case 8 (see Table) the mean oestrogen level after oophorectomy and adrenalectomy was almost twice that found for patients after oophorectomy alone. In this patient a careful search at post-mortem examination failed to reveal macroscopic adrenal rests. If the tumour itself produces oestrogen, this does not occur in all cases of progressive disease (see Cases 3, 4, 6, 11, 12, and 13 in the Table), where no oestrogens were detected by the chemical method.

Finally, oestrogen analyses of urine obtained from patients after adrenalectomy afford no reliable guide to the clinical state of individual patients. Every permutation may occur, remission or relapse being accompanied in some cases by oestrogen excretion, while in others no oestrogens were detectable. Only when the patients in this small series are considered as a group does it appear that there is a tendency for remission to be accompanied by low or zero excretion and for relapse to be associated with higher levels of excretion.

Summary

The effect of adrenalectomy on both the clinical state and oestrogen excretion has been studied in 13 women with metastatic breast cancer.

Bilateral adrenalectomy caused a marked reduction in the amount of oestrogen excreted, but complete abolition of excretion was not always achieved. However, continued oestrogen excretion did not exclude objective regression.

Conversely, progression of the disease might take place in spite of the fact that no oestrogen could be detected in the urine. In general, continued oestrogen excretion was found more often in cases in relapse than in remission.

We are grateful to the surgical staff and the staff of the radiotherapy department of St. Bartholomew's Hospital for allowing us to investigate patients under their care, and particularly to Professor Sir James Paterson Ross, who has also been most helpful with his advice and criticism.

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HYPOPHYSECTOMY IN BREAST CANCER

AN ATTEMPT TO CORRELATE CLINICAL RESULTS WITH OESTROGEN PRODUCTION

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In 1953 Luft and Olivecrona reported that hypophysectomy was an effective means of palliation in a significant proportion of cases of metastatic breast cancer. Subsequent work has confirmed these results (Luft and Olivecrona, 1955; Pearson *et al.*, 1955). The beneficial effects of the operation were ascribed to the inhibition of ovarian and adrenal function due to the removal of the relevant pituitary trophic hormones, and to the removal of those pituitary hormones which might have a direct influence on human breast cancer.

The technical difficulties in totally removing the pituitary gland are formidable, and reports on post-mortem findings suggest that complete removal is infrequently achieved (Hortling *et al.*, 1957; Luft *et al.*, 1958). Post-operative investigations of the living patients are therefore of value in deciding if removal has been complete; and, whilst methods are available for the bio-assay of pituitary gonadotrophin and for measuring the functional capacity of the thyroid, adrenals, and ovaries, it is possible that repeated oestrogen measurements provide reliable information on pituitary function following attempted ablation

(Dodds *et al.*, 1956). It has been shown (Greenwood and Bulbrook, 1956, 1957) that many patients still excrete appreciable quantities of oestrogen in the urine after hypophysectomy, but no correlation of these or subsequent results with the clinical state and/or the post-mortem findings has been attempted.

The present paper reports an effort to correlate oestrogen excretion with the clinical state of 16 breast-cancer patients on whom hypophysectomy was performed.

Methods.—The clinical and chemical methods were exactly as described in previous papers (Bulbrook *et al.*, 1958a, 1958b).

In the 16 patients studied, oestrogen estimations were carried out before and after operation. The results have been divided into groups: the first showing oestrogen levels found in 11 patients who obtained regression at hypophysectomy, the second showing the oestrogen levels in the five patients who derived no benefit from surgical hypophysectomy. One in the latter group was a male. The ages given refer to age at hypophysectomy.

Oestrogen Excretion in Patients in Whom Objective Remission of Growth was Induced by Hypophysectomy

Of the 11 patients included in this group, five were post-menopausal, four had previously been treated by oophorectomy, and two by oophorectomy and adrenalectomy. All but two (Cases 1 and 11) had undergone radical mastectomy. Remission of the disease varied from 2 to 16 months after hypophysectomy, and in five patients remission has continued to the time of writing. Oestrogen studies were carried out before operation and at least one month after operation—with one exception, Case 4. The mean oestrogen levels were calculated from serial analyses of 24-hour specimens of urine. Table I summarizes the clinical and biochemical findings of the 11 patients studied in this section, and the salient features of the cases are considered in detail below.

Case 2 (Fig. 1).—This patient, aged 55, had a ten-years history of breast cancer treated in turn by mastectomy, deep x-ray therapy, and cortisone. At hypophysectomy, when

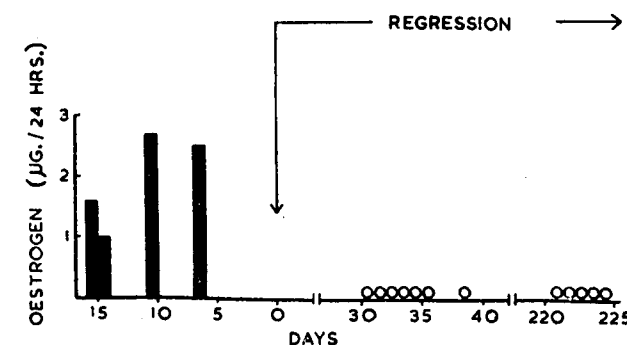


FIG. 1.—Case 2. Excretion of oestrogen before and after hypophysectomy. In Figs. 1–4 the day of operation is marked with a vertical arrow; oestrogen excretion is shown as total oestrogen—the sum of the oestrone, oestradiol-17 β , and oestriol values. Each vertical column gives the mean of a duplicate determination on a 24-hour specimen of urine. Open circles on the abscissa indicate no detectable oestrogen.

aged 55, she was three years post-menopausal. She had metastases in the lumbar spine, an ulcerated chest wall, and skin nodules in the neck. Oestrogen excretion was low compared with the mean level for post-menopausal women with breast cancer and was reduced in the first post-operative month to levels indistinguishable from zero. Growth regression followed hypophysectomy, and this has continued up to the time of writing, 15 months after operation. Follow-up specimens obtained 13 months after operation showed the continued absence of oestrogen in the urine. The

oestrogen excretion in this patient (Fig. 1) illustrates the expected effect of hypophysectomy in abolishing oestrogen excretion.

In five further cases (Nos. 1, 3, 4, 6, and 8) a similar unequivocal fall to zero in oestrogen excretion was found after the first post-operative month, accompanied by regression of the disease.

Case 4 (Fig. 2).—This patient, aged 65, was studied within two weeks of operation, and oestrogen was detectable in the urine in amounts greater than those found before

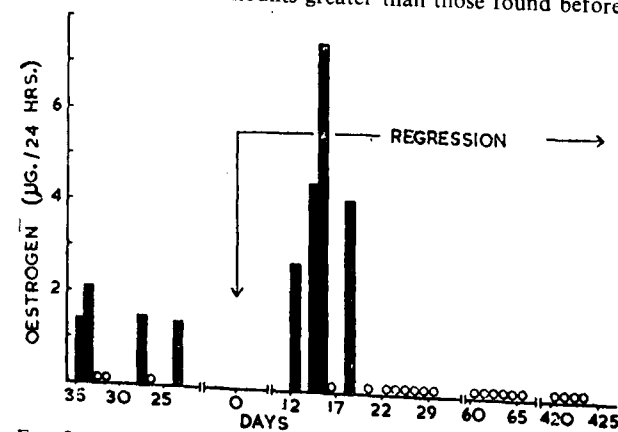


FIG. 2.—Case 4. Excretion of oestrogen before and after hypophysectomy.

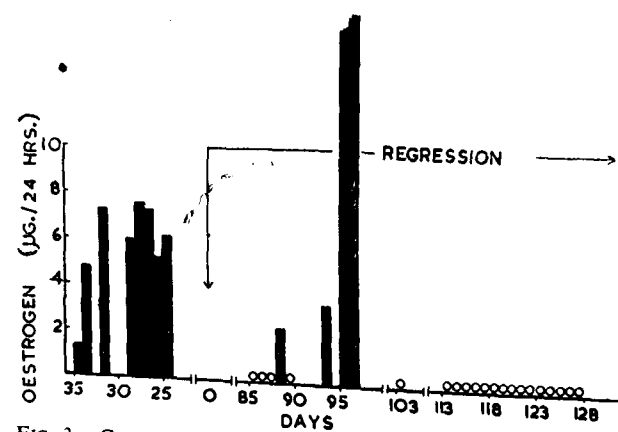


FIG. 3.—Case 5. Excretion of oestrogen before and after hypophysectomy.

operation. This increase in oestrogen was confirmed by biological assay. No oestrogen was detected three weeks after operation, and follow-up specimens at nine weeks and 14 months suggest that the fall to zero continued. Skin and glandular metastases decreased after operation, and remission has been maintained up to the time of writing, 16 months after operation.

Case 5 (Fig. 3).—In this patient, aged 42, an initial fall of oestrogen excretion to zero was associated with regression of cutaneous and skeletal lesions. Although this marked regression continued, oestrogen was detected in the urine for a short period some three months after operation. Biochemical estimations of urinary oestrogens, confirmed by biological assay, showed that the predominant urinary steroid was oestriol with trace amounts of oestrone. The total amount of oestrogen was equivalent to that found in normal menstruating women, and eight times the mean pre-operative level. In this case it would seem that regression of the disease following hypophysectomy is not invariably accompanied by a persistent fall in oestrogen excretion to zero.

Case 7.—This patient, aged 44, showed little fall in total oestrogen after hypophysectomy with remission of the disease: oestrogen was detectable in three of six specimens collected after operation.

Case 9.—In this patient, aged 40, hypophysectomy was accompanied by a remission of skeletal metastases, and this has continued to the time of writing, 15 months after operation, in the absence of detectable oestrogen. Hypophysectomy in this patient reduced oestrogen excretion to levels indistinguishable from zero by the chemical method used, but oestrogen was detectable on one occasion, one month after operation, by the more sensitive biological assay.

Two patients were studied with progressive disease after a previous oophorectomy and adrenalectomy. Case 10 had not benefited from this treatment, while Case 11 had been in regression for two years before exacerbation of breast and skin symptoms occurred. Oestrogen was not detectable either before or after operation, which was followed by remission of symptoms for three months in both cases. The disease thereafter progressed in Case 10, death taking place four months after operation. In Case 11, however, mastectomy had not been performed and the patient was still in regression up to the time of death from an acute bacterial infection following post-operative necrosis in both the involved breasts.

Mastectomy had not been performed in Case 1 and a marked regression of growth of the breast tumour accompanied a fall in oestrogen excretion at hypophysectomy. This

TABLE I.—Oestrogen Excretion by Patients in Objective Remission after Hypophysectomy*

Oestrogen Excretion by Patients in Objective Remission after Hypophysectomy*																		
Case No.	Age	Pre-Hypophysectomy					No. of Analyses	Post-Hypophysectomy										
		Mean Oestrogen, µg./24 hrs.				Total		Mean Oestrogen, µg./24 hrs.				No. of Analyses	Months After Operation	Period of Regression (Months)	Survival Time in Months			
		O	D	T	Total			O	D	T	Total							
1†	58	1.3	1.0	2.3	4.6	9	No Previous Endocrine Surgery								6	1	2	2
2	55	0.9	0.0	1.1	2.0		0.0	0.0	0.0	0.0								
3	61	1.9	0.4	2.5	4.8		0.0	0.0	0.0	0.0								
4	65	0.9	0.0	0.0	0.9		0.0	0.0	0.0	0.0								
							0.0	0.0	0.0	0.0								
5	42	2.1	0.7	3.2	6.0	7	1.3	0.7	1.5	3.5	4	1	10	12				
						8	0.0	0.0	0.0	0.0	16	1-14	16	6				
						3.3	0.0	0.0	48.3	51.6	7							
						0.0	0.0	0.0	0.0	0.0	2							
6	50	1.6	0.6	1.0	3.2	24	Previous Oophorectomy								1	2	5	6
7	44	0.9	0.3	5.7	6.9		0.0	0.0	0.0	0.0								
8	49	1.0	0.6	3.0	4.6		0.8	0.0	4.0	4.8								
9	40	1.6	0.6	0.0	2.2		0.0	0.0	0.0	0.0								
							0.25	0.0	0.0	0.25								
10	46	0.0	0.0	0.0	0.0	9	0.0	0.0	0.0	0.0	13	1-8	11	15				
11*	48	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0								
*Age=That at hypophysectomy. O=Oestrogen. D=Oestradiol. T=Oestrone.																		
						9	0.0	0.0	0.0	0.0	10	1	3	4				
						0.0	0.0	0.0	0.0	0.0	6	1	3	3				

*Age—That at hypophysectomy. O=Oestrone. D=Oestradiol-17β. T=Oestriol. In Cases 4, 5, and 9 post-hypophysectomy oestrogen excretion was confirmed by parallel biological assay. † Not previously mastectomized.

regression continued up to the time of death three months after operation. As in Case 11, post-mortem examination showed gross necrosis of the mass in the involved breast, and it is not improbable that death was caused by the liberation of toxins from rapid autolysis of necrotic tumour tissue.

The anticipated effect of hypophysectomy is to reduce and abolish oestrogen excretion. The overall results in this section confirm that this is generally true for women after the menopause or those who are in remission after oophorectomy. In seven of the nine patients no oestrogen could be detected after the first post-operative month, and the effect appears to be persistent. In two cases no oestrogen could be detected before operation, and oestrogen analyses, although zero after operation, provided no evidence of the completeness of the removal of the pituitary in these cases. However, in 2 of the 11 patients oestrogen was detected although remission of the disease followed operation.

If the pre-operative levels of oestrogen are considered the mean total oestrogen for the nine patients is somewhat lower than the mean level found for 39 women with metastatic breast cancer after the natural menopause or bilateral oophorectomy.

Oestrogen Excretion in Patients not Benefited by Hypophysectomy

Four women were studied in this group (Table II). All had previously been treated by mastectomy; three had undergone subsequent oophorectomy; the fourth had not menstruated for a year following a course of testosterone treatment. At the time of operation all patients showed evidence of progressive skeletal metastases, and these were unaffected by hypophysectomy. The average survival time after operation was eight months. In no case was oestrogen excretion reduced or abolished by operation. A typical example of the variation in amount and pattern of excretion is shown in Fig. 4 (Case 12). The mean level of oestrogen

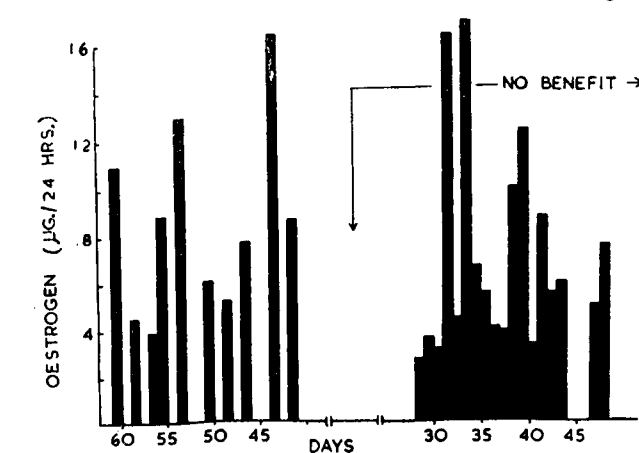


FIG. 4.—Case 12. Excretion of oestrogen before and after hypophysectomy.

TABLE II.—Oestrogen Excretion by Patients Deriving no Benefit from Hypophysectomy

Case No.	Age	Pre-Hypophysectomy				No. of Analyses	Post-Hypophysectomy						
		Mean Oestrogen $\mu\text{g.}/24 \text{ hrs.}$					Mean Oestrogen $\mu\text{g.}/24 \text{ hrs.}$				No. of Analyses	Months After Operation	Length of Survival in Months
		O	D	T	Total		O	D	T	Total			
Previous Testosterone Treatment													
12	41	1.9	1.6	4.9	8.4	10	1.5	1.3	3.9	6.7	19	1-2	4
Previous Oophorectomy													
13	41	2.9	1.2	4.9	9.0	10	1.6	2.9	2.4	6.9	9	1	7
14	49	1.9	0.4	0.0	2.3	3	0.8	2.3	7.1	10.2	13	1	9
15	46	0.8	1.8	5.6	8.2	7	0.3	0.3	11.0	11.6	8	1	7
Male Patient with Breast Cancer—Previous Orchidectomy													
16	59	0.4	0.3	7.7	8.4	11	1.1	0.6	0.0	1.7	4	2	8

All patients had previously undergone mastectomy. Age—That at hypophysectomy. O=Oestrone. D=Oestradiol-17β. T=Oestriol.

before operation of these four patients appears to be greater than the mean pre-operative level of the patients recorded in Table I obtaining benefit from hypophysectomy.

Of incidental interest is the fact that Case 16 was a male suffering from breast cancer with widespread metastases. Neither orchidectomy nor subsequent hypophysectomy altered the progress of the disease. The latter operation reduced but did not entirely abolish oestrogen excretion.

Discussion

The object of this study was to decide if the excretion of oestrogen was correlated with the pre- and post-operative clinical state of patients suffering from metastatic breast cancer and subjected to hypophysectomy. Although the series is small, a correlation seems clearly established, since oestrogen excretion was generally absent in urine from patients in regression after hypophysectomy and present when the operation failed to benefit the patient. In four cases in remission oestrogen was demonstrated in the urine, but this was a transitory phenomenon in three of these patients. For example, Case 4 (Table I) was excreting more oestrogen two weeks after operation than before. This patient was studied at an earlier stage after hypophysectomy than the remaining cases. The presence of oestrogen 12 to 18 days after operation, followed by a period of 14 months in which no oestrogen could be detected, suggests that it may take two weeks for the elimination of circulating pituitary and adrenal hormones.

The amounts of oestrogen detected only by biological assay in Case 9 suggest that the grouping of patients in regression showing no oestrogen excretion by the chemical method may be an arbitrary classification depending only upon the sensitivity of the chemical method. No oestrogen could be detected in the urine of Case 5 for a long period. Three months after operation relatively large amounts of oestrogens were excreted for two days; this was followed by a prolonged period when again no oestrogen could be found in the urine. In both instances the chemical results were confirmed quantitatively by biological assay. We have no satisfactory explanation for this result, but it is extremely unlikely that the oestrogen could have been derived from the diet, since a patient after adrenalectomy in the same ward and on an identical diet excreted no oestrogen during this period.

In only one patient (Case 7) did oestrogen excretion continue on the same level as before operation, and this patient had an objective regression. It may be significant that survival time and the period of regression were short. This finding is discussed later.

The first two sections in Table I show that the mean pre-operative levels for the post-menopausal and post-oophorectomy patients obtaining benefit from hypophysectomy tend to be below the mean level found for women with cancer of the breast in these categories (Bulbrook *et al.*, 1958a). The mean levels were 3.6 and 4.2 µg./24 hours (total oestrogen) respectively, compared with 5 to 6 µg./24 hours. On the other hand, the mean amount of

oestrogen excreted by the four patients who failed to benefit from operation (Table II) was 7 $\mu\text{g.}/24$ hours—a value slightly higher than the mean level for all patients in this category, and higher than the mean pre-operative level of patients obtaining remission at hypophysectomy (Table I). There are not enough patients in the series for these findings to have any statistical significance, but there may be a tendency for patients with a low pre-operative oestrogen level to benefit from hypophysectomy while those with a high level do not. Further work is needed to check the validity of this suggestion.

In two instances patients who had been previously treated by oophorectomy and adrenalectomy were subjected to hypophysectomy. In neither case was oestrogen detected in the urine either before or after hypophysectomy, yet in both patients their objective regressions were short. Unless they were excreting amounts of oestrogen not detectable by the chemical method, these results suggest a direct participation of pituitary hormones in the maintenance of human breast cancer, as opposed to an indirect trophic effect on target organs. Similarly, in the patient already referred to (Case 7) objective regression occurred in spite of continued oestrogen excretion. Again, this result is explicable on the assumption that the levels of growth hormone, prolactin, or both had been reduced below a critical level.

In the four patients referred to in Table II the most simple explanation for the failure of hypophysectomy to influence the growth of the breast cancer is the continued excretion of oestrogens due to incomplete hypophysectomy. We have, as yet, been unable to study the transition from remission to relapse in this series. However, Hortling *et al.* (1957), using the vaginal-smear technique, found that oestrogen secretion increased simultaneously with the deterioration of the patient's clinical condition.

The explanation of failure or success following endocrine ablation for breast cancer must be largely speculative until we are able to assess directly the functional capacity of the human hypophysis with a reasonable degree of precision. The results of the investigations on the small number of patients in the present series suggest that repeated biochemical estimation of oestrogens before hypophysectomy may prove to be of some value in forecasting the clinical outcome of this operation.

Continued post-operative excretion of oestrogen, by indicating incomplete removal, suggests that no significant clinical palliation is likely to occur, while cessation of oestrogen excretion would suggest the reverse. The exceptions to these generalizations provide cogent reasons for supposing that the growth of some human breast cancers is maintained by the direct action on the tumour cells of anterior pituitary hormones.

Summary

The effect of hypophysectomy on the clinical state and on oestrogen excretion has been studied in 15 women and one man with metastatic breast cancer.

Patients obtaining regression following hypophysectomy tended to have a low pre-operative level of urinary oestrogen, and in the majority oestrogen excretion virtually ceased after operation. On the other hand, continued oestrogen excretion was not always exclusive of objective regression.

Patients deriving no benefit from operation tended to have a high pre-operative oestrogen excretion and continued to excrete oestrogen after operation.

We are grateful to the surgical staff and the staff of the radiotherapy department of St. Bartholomew's Hospital for allowing us to investigate patients under their care. We would like particularly to thank Professor Sir James Paterson Ross and Dr. A. A. G. Flemming. All the operations for hypophysectomy were performed by Mr. J. E. A. O'Connell, and we are grateful to him for allowing us to continue the observations on these patients.

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A BIOCHEMICAL CONCEPT OF TUMOUR GROWTH, INFILTRATION, AND CACHEXIA

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Among the many perplexing properties of a growing tumour is its ability to build up protein and increase in weight in a host (experimental animal or man) which is fast losing weight. This ability to obtain the precursors of its protein from the metabolic pool at the expense and to the detriment of the host has been investigated in some detail by Mider, Tesluk, and Morton (1948) (see Greenstein, 1954), and from the results they obtained with the transplantable Walker 256 tumour in growing rats they have been able to show three distinct phases in the growth history of the tumour and tumour-bearing animal. During the first stage (while the tumour is relatively small) both the tumour and the host gain weight. In the second stage the tumour alone continues to gain weight, and at an increasing rate. The host tissues in this second stage at first fail to gain weight and later may even lose weight. In the third and terminal stage (often very brief) the rate of growth of the tumour falls, and eventually the tumour itself may lose weight, although not as markedly as that of the rapidly wasting tissues of the host.

Such observations in the experimental animal, and the well-known clinical fact that tumours continue to grow even in cachectic subjects, suggest that the tumour is an autonomous entity capable of thriving irrespective of the metabolic status of the tissues of the host. It is obvious, however, that even the most autonomous neoplasm must have an adequate supply of metabolites for the purposes of growth, and if the essential metabolites are not forthcoming then the rate of growth must suffer.

The effect of dietary restriction on the incidence and rate of growth of spontaneous tumours has been the subject of much careful study. Tannenbaum and his colleagues (see review, Tannenbaum, 1947), in a series of brilliant experiments, have shown that dietetic restriction can greatly reduce the incidence of both naturally occurring and carcinogen-induced tumours in experimental animals. Indeed, some 14 different tumours have been shown to be affected in this manner, and the statistical evidence from insurance companies' records collected by L. T. Dublin in 1927 (quoted by Tannenbaum, 1947) shows that the incidence of various neo-

plasms is higher in overweight humans than in underweight ones. The growth of established tumours is not as dramatically affected by dietetic restriction as is tumour incidence, but nevertheless the rate of growth is dependent upon the nutritional status of the host (Rous, 1914; Tannenbaum, 1947; Ghadially and Wiseman, 1956).

From a consideration of these fundamental studies emerges the concept of a contest between the host and the tumour for the capture of metabolites circulating in the blood and in the extracellular fluid. Although such antagonistic behaviour between tissues in an animal has been suggested for a long time, and superior ability credited to the tumour cell, detailed experimental evidence has only recently become available to indicate an aspect of the nature of the metabolic mechanism which gives the tumour cell an advantage over normal host tissues.

It seems to us that, from a consideration of the work of many investigators, the metabolic superiority of the tumour cell is largely due to its enhanced amino-acid concentrating power. It is the purpose of this paper to evolve a hypothesis to show how infiltration of normal tissues by neoplastic cells, tumour anorexia, tumour cachexia, and the paradoxical growth of tumours in a wasting host can be explained on this simple biochemical basis.

Nature of the Metabolic Competition

Undoubtedly one of the most important factors in the successful synthesis of protein, and hence tissue growth, is the availability of the essential amino-acids for this purpose. Once the extracellular fluid in which the cells live becomes rich in these amino-acids (via the blood stream or autolysis of cells) then the next important step is the uptake of the amino-acids by the cells concerned. In any multicellular tissue we must picture the cells which share a common volume of extracellular fluid as competing with each other for the available metabolites. The cells which are better endowed in regard to the mechanisms concerned for metabolite uptake are in a better position for synthesis of new protein.

In 1913 Van Slyke was able to demonstrate that the intact cells of the animal body are able to accumulate amino-acids from the extracellular fluid and that they can concentrate the amino-acids until their content of these substances is about 10 times that of the animal's plasma. Since that time many tissues of the normal animals have been shown to concentrate amino-acids actively, and recently such work has been extended to neoplastic cells. In 1948 Christensen, Streicher, and Elbinger found that glycine, and probably alanine, serine, proline, methionine, and histidine, are actively taken up (that is, against a concentration gradient) by normal liver and muscle in the intact rat. Sassenrath and Greenberg (1954) and Greenberg and Sassenrath (1955) have published results of experiments in which they estimated, by specific microbiological means, 18 free amino-acids in the livers, muscles, and plasma of fed and fasting tumour-bearing rats, and they showed that the amino-acids were all present in higher concentration in the liver and muscle cells than in the plasma. It is a pity that these latter workers did not estimate the concentration of the free amino-acids in the tumours that their animals possessed.

Work with isolated normal diaphragm by Christensen and Streicher (1949) showed that the muscle could concentrate free glycine *in vitro*. In 1953 Wiseman found that the isolated small intestine of the rat was able to concentrate the L-forms ("naturally" occurring) of alanine, phenylalanine, histidine, methionine, and isoleucine. He showed (Wiseman, 1955, 1956) that isolated small intestine of the hamster was able to concentrate 13 different amino-acids and also that they competed with each other for the concentrating mechanism of the cell. While this work with normal tissue

was being done, work with neoplastic cells was being carried out. In 1952 Christensen and Riggs found that the Ehrlich mouse ascites tumour cells actively concentrated amino-acids, and Christensen and Henderson (1952) showed that in the intact animal glycine, and possibly alanine, are concentrated by the Ehrlich ascites cells to a greater extent than by the liver. In 1955 Wiseman and Ghadially showed that suspensions of RD₃ sarcoma cells *in vitro* could actively concentrate histidine, proline, ornithine, lysine, and methionine. The results of our experiments indicated a qualitative difference in the capture of amino-acids by the sarcoma cells and normal intestine, in so far as the neoplastic cells could actively concentrate the diamino-acids, lysine and ornithine, while the intestine could not.

We were also able to show that apart from this qualitative difference there were two quantitative differences. Under similar conditions the sarcoma cells not only concentrated the amino-acids to a greater extent but the effect of methionine as an inhibitor of amino-acid uptake by cells was less marked. In the case of isolated normal intestine it was found that when methionine was present with an accompanying amino-acid in equimolecular amounts the methionine completely prevented the accompanying amino-acid from being concentrated. The effect of methionine on the isolated sarcoma cells, however, was only to depress, but not to abolish, the concentrative uptake of the second amino-acid.

Various earlier workers (Pilsun and Berg, 1950; Graham, Hier, Waitkoff, Saper, Bibler, and Pentz, 1950; Wretling and Rose, 1950) have noted that excess dietary methionine retards the growth of young rats, and the results obtained by Wiseman (1955) show that this growth retardation is probably due to the powerful inhibitory effect of excess methionine on the uptake of other amino-acids by normal tissues. A consideration of the differences of the action of methionine on isolated intestine and sarcoma cells (Wiseman and Ghadially, 1955) led to the conclusion that excess dietary methionine should increase the rate of growth of a tumour in a tumour-bearing animal while at the same time causing the host tissues to waste. This, in fact, was shown to be the case (Ghadially and Wiseman, 1956) when 4% DL-methionine was added to the diet of rats bearing RD₃ sarcoma. The results of those experiments strongly suggested that the excess methionine decreased the ability of the normal tissues to take up other amino-acids and thereby provided a readier source of amino-acids for the growing tumour, whose amino-acid uptake was not so greatly affected by the excess methionine. Thus there was confirmation *in vivo* of the earlier *in vitro* findings.

Metabolic Superiority of the Neoplastic Cell

Numerous other experiments have also demonstrated this metabolic superiority of the neoplastic cell over its normal counterpart. Zamecnik, Frantz, Loftfield, and Stephenson (1948) found that slices of rat hepatomata (induced by the use of 4-dimethylaminoazobenzene) incorporated more radioactivity from labelled alanine and glycine than did slices of normal rat liver. Rutman, Cantarow, and Paschkis (1954) have shown that mitochondria from preneoplastic livers and from hepatomata of acetaminofluorine-treated mice showed an enhanced ability (20 to 50% increase) in incorporating L-lysine-1-¹⁴C into peptide linkages. Studies by Burke and Miller (1956) revealed that in the preneoplastic phase during 3'-methyl-4-dimethylaminoazobenzene carcinogenesis the livers of rats incorporated into proteins between two and three times the normal amounts of L-lysine. This was associated with a depression of katabolism of the amino-acid as evidenced by a yield of ¹⁴CO₂ from the labelled lysine lower than expected, and a decreased urea production. Tumours other than hepatomata show an increased uptake of radioactive amino-acids.

Zamecnik *et al.* (1948) and Winnick (1950) found that the rate of uptake of ¹⁴C-labelled glycine and alanine into mouse mammary tumour homogenate was several times as great as that of normal mouse liver homogenate. LePage (1953)

has been able to demonstrate that the Gardner lymphosarcoma cells and the Ehrlich carcinoma cells can incorporate up to 50 times as much glycine- ^{14}C into protein as can normal mouse liver cells. Mouse mammary tumour mitochondria show essentially the same phenomenon (Winnick, 1950). Roberts and Tishkoff (1949) have found that the preneoplastic epidermis of mice receiving applications of methylcholanthrene can concentrate free amino-acids to a greater extent than normal mouse epidermis. It would seem, therefore, that the ability to outdo normal tissues in the capture of amino-acids is an early acquisition of the neoplastic cell, and this we would expect if the neoplastic cell is to compete rapidly and successfully for these essential metabolites.

The rapid rate of incorporation of amino-acids into cellular protein in the neoplastic and preneoplastic cell, as compared with its normal counterpart, would keep the level of free intracellular amino-acid lower than it might otherwise be and thereby help the movement of more amino-acid into the cell from the extracellular fluid. Thus not only is the rate of production of neoplastic tissue kept high, but also the field is set for the continued deprivation of the local normal cells of adequate amounts of the precursors of their protein. An added advantage occurs in the event of the neoplastic cell being able to concentrate an essential amino-acid actively while the local normal cells are unable to do so. Under these conditions the local normal cells would be largely deprived of one or more essential amino-acids, and they would then virtually cease to produce their own intracellular protein, as all the precursors of a protein molecule must be present at the same time for protein synthesis. In the absence of one or more essential amino-acids, cells are unable to retain for any length of time those amino-acids which are available, and a negative nitrogen balance occurs (Cannon, 1948).

Activity of *in vitro* Preparations

We must point out at this stage that the enhanced activity of many of the *in vitro* preparations to incorporate labelled amino-acids into protein has not always been demonstrable *in vivo* (Griffin, Bloom, Cunningham, Teresi, and Luck, 1950; Kit and Greenberg, 1951; Tyner, Heidelberger, and LePage, 1952). It seems likely, however (Zamecnik, Loftfield, Stephenson, and Steele, 1951), that this is a result of inherent technical limitations, for it was observed that, although the avascular portions of the tumours were relatively inactive, the regions with a good blood supply showed high activity. From these observations we may conclude that the rate of uptake found in the *in vivo* experiments indicates only the average activity of the whole tumour and not the true activity of its most rapidly growing periphery. A similar view is put forward by Caspersson and Santesson (1942), and by Rutman *et al.* (1954).

It might be argued that the increased rate of incorporation of amino-acids into cellular and mitochondrial protein does not indicate that new and extra protein is being produced and that the results obtained by many of the above experiments might be the result of exchange of an amino-acid for another molecule of the same amino-acid without new protein synthesis occurring. However, the ability of the neoplastic cells to capture and concentrate free amino-acids at a rate higher than that of normal cells has been clearly demonstrated, and when that fact is added to the well-known observation that tumour tissues grow at a rate far greater than the host tissues it seems that the most likely explanation is that the tumour cells do in fact incorporate amino-acids into protein more rapidly than their normal counterparts.

An enhanced power to capture amino-acids is, of course, seen in fast-growing tissues other than malignant tumours—for example, placental tissue (Christensen and Streicher, 1948). The malignant tumour cannot, therefore, be looked upon as being unique in this respect; furthermore, it must be emphasized that an increased ability to capture amino-acids cannot be regarded as the hall-mark of malignancy

or the essential neoplastic change. However, once this fundamental metabolic superiority is possessed by a tissue it has a potentiality to grow at the expense of its neighbours and will in fact do so whenever other growth-restraining influences fail to act. The understanding of this metabolic superiority enables many of the perplexing paradoxes of tumour-host relationships to be explained. It is, of course, possible that other important biochemical factors are involved at various stages in the neoplastic disease. Among such possible factors are competition for metabolites other than amino-acids, the production of toxic materials by established tumours, and changes in energy requirements.

Infiltration

The capacity of malignant cells to infiltrate into and destroy normal tissues is well known. One of the most recent and intriguing accounts attempting to explain the essential malignant change and the ability of neoplastic cells to wander is Green's (1954) antigenic theory of cancer. According to this hypothesis the ability of the malignant cell to wander and infiltrate is due to the failure of the antigenic mechanism of the body to "recognize" the cell once it has lost certain marker antigens. The growth of cells in unusual places and their extension beyond normal planes will therefore go unnoticed by the controlling mechanisms of the body. Loss of a series of such marker antigens, one by one, will confer an increasing independence upon a cell, and eventually such a cell will have the potential to infiltrate local tissues and spread beyond the normal physiological boundaries without arousing an adequate defence reaction on the part of a host. The development by a cell of the attribute to wander, however, seems to be in itself insufficient to account for its continuous growth unless such potentiality were aided by some metabolic superiority. Exploitation of its newly acquired growth independence, however acquired, must ultimately depend on its ability to outdo the local cells in a contest for available metabolites.

Infiltration by neoplastic cells does not only imply their growing between normal cells or along paths of least physical resistance, but it is essentially and ultimately a cell-by-cell destruction of the normal at the interface of the tumour and the normal tissue. In cases of low malignancy—that is, without marked metabolic superiority—there may be merely compression of neighbouring tissues and little real infiltration, but with highly malignant growths with overwhelming metabolic superiority it is not long before the normal cells are replaced by tumour tissue. Over a fairly broad zone surrounding a tumour one can as a rule detect islands of cells in various stages of disintegration, atrophy, and necrosis. Pressure exerted by the increasing tumour mass is usually the explanation given to account for the death of the normal cells at the tumour's advancing edge, but cannot in fact be the explanation (as already pointed out by Ghadially and Wiseman, 1957). The growing edge of the tumour derives its blood supply from vessels at the tumour/normal tissue interface (Algire and Chalkley, 1945), and any appreciable rise in pressure at this region would destroy the tumour cells as well as the normal cells.

It seems to us that the phenomenon of infiltration by a cell which has lost its marker antigens can best be explained on the basis of a metabolic competition of the type described in the early part of this paper. The advancing columns of tumour cells are bathed in the same extracellular fluid and share the same local environment as the adjacent normal cells. Thus it is inevitable that a local competition for available amino-acids will arise. The more efficient power of concentration possessed by the tumour will have a two-fold action. Firstly, it provides the tumour with material necessary for protein synthesis and growth, and, secondly, it deprives the adjacent normal cells of their basic metabolic requirements and thereby induces atrophy, degenerative changes, and finally necrosis. It is for this reason, in our opinion, that the normal cells at the periphery of a growing tumour suffer most. The disintegrating normal cell no doubt provides further metabolites for the insatiable

demands of the flourishing tumour. Thus our hypothesis explains not only why malignant cells flourish and infiltrate but also why the normal cells are destroyed.

Anorexia and Cachexia

As previously mentioned, three phases have been identified in the growth history of the tumour and the tumour-bearing animal. In the first stage the volume of tumour tissue is small and the needs of both the normal and the neoplastic cells are easily met from the general metabolic pool. By the time that the second stage is reached, however, the volume of tumour tissue has increased, and it is at this stage that the severe competition for essential amino-acids must arise. The tumour, by virtue of its more powerful amino-acid concentrating mechanism, deviates large amounts of the available amino-acids for its own protein synthesis, and the normal tissues begin to suffer as the metabolic pool is heavily depleted. The catabolic processes in normal tissues continue (perhaps at an increased rate), but the amino-acids for the anabolic process are no longer freely available.

One of the tissues to suffer early on in this metabolic competition is the intestine, and as a result food intake is reduced. The intestine of a tumour-bearing host is found to suffer a severe weight loss in common with most other normal tissues (Bloor and Haven, 1955), and in rats bearing a Walker carcinoma 256 the intestinal weight may be reduced to about three-quarters of that in control animals. Herein probably lies a good deal of the explanation of the anorexia seen both in patients and in experimental animals suffering from neoplastic diseases. The rate of turnover of cells in the intestinal mucosa has been demonstrated to be very rapid indeed, and the entire mucosa is replaced every 14 days in the rat (Leblond and Stevens, 1948) and every 24 days in the cat (McMinn, 1954). This rate of tissue production entails much protein synthesis and calls for a constant supply of amino-acids from the general metabolic pool. Such a demand on the metabolic pool will tend to become more onerous in the later stages of neoplastic disease, and when scarcity of essential metabolites begins to make itself felt the tumour will continue to grow at the expense of the intestine as well as of other normal tissues.

Increasing anorexia and cachexia then herald the third and terminal stage of the disease, for not only is the metabolic pool being rapidly drained of amino-acids by the tumour, but in addition the intestine is no longer able to replenish that pool from the diet efficiently.

As well as obtaining amino-acids in large amounts from the extracellular fluids of the body, there is an actual translocation of amino-acids from normal to neoplastic cells. The work of White (1945) showed that mouse mammary carcinoma continued to grow even when the diet contained almost no nitrogenous substances. Much of the amino-acids necessary for the growth of the mammary tumour could have come from no other source except the normal tissues.

In contrast to other normal tissues, the effect of the growing tumour on the liver is more complex. Instead of the wasting as seen in most other normal tissues there is often an actual gain in liver weight during the earlier stages of the disease (Medigreanu, 1910; Cramer and Lochhead, 1913; McEwan and Haven, 1941; Yeakel, 1948), and Abels, Rekers, Binkley, Pack, and Rhoads (1942) found that there was liver hypertrophy in 42% of patients suffering from gastro-intestinal cancer. The increase in weight of the liver is due to an increase in liver nitrogen (Yeakel, 1948; Sherman, Morton, and Mider, 1950) as well as an increase in liver water content (McEwen and Haven, 1941). It has been suggested that some growth-promoting factor is produced by the growing tumour and acts specifically on the liver (Paschkis, Cantarow, Stasney, and Hobbs, 1955).

The liver hyperplasia may, on the other hand, be due to an increased liver activity concomitant with the increasing metabolism of the growing tumour, and may be similar to the liver enlargement seen in pregnancy (Cramer and Lochhead, 1913; Walter and Addis, 1939; Poo, Lew, Lee, and Addis, 1940). The stimulating effect on the liver of a

growing transplanted tumour has also been shown by Annau, Manginelli, and Roth (1951) and by Malmgren (1956). The latter was able to demonstrate an increase in the number of mitoses in the liver, and similar changes in liver mitosis were observed after the administration of saline extracts of tumours (Malmgren, 1956). But eventually, in the third stage of the disease, when most of the normal tissues are rapidly losing weight and even the rate of growth of the tumour is reduced, the liver suddenly shows a marked weight loss (McEwen and Haven, 1941). It appears that when the last usable sources of nitrogen from the normal tissues of the body have been utilized by the growing tumour mass the liver suddenly surrenders its own nitrogenous materials to keep the malignant cells supplied with metabolites. At this stage of the disease the derangement of the host's nitrogen metabolism has proceeded so far that death rapidly brings the whole process to an end.

Conclusion

The success of the neoplastic cell once it has appeared in the host seems to us to be in the superior ability of such cell to capture from the internal environment, and to concentrate intracellularly, the free amino-acids essential for its protein synthesis. In this activity the neoplastic cell is superior to the normal cell, and the degree of such superiority decides the eventual history of the tumour. Those tumours which are only slightly more active than the normal in their ability to concentrate amino-acids will grow slowly and produce only minor metabolic disturbances, while the more active ones will infiltrate faster, cause anorexia, and produce rapid cachexia and eventual death.

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MONKEY-BITE ENCEPHALOMYELITIS

REPORT OF A CASE—WITH RECOVERY

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Those who handle monkeys are frequently bitten, usually without untoward results. Exceptionally, however, disaster may follow. Sabin and Wright (1934) first recorded a case of acute encephalomyelitis in a doctor who had sustained such a bite. Within three days vesiculo-pustular lesions developed at the site of the bite followed by regional lymphangitis and adenitis. A week later signs of motor and sensory disturbances began in the legs and bladder, and these were followed by an acute ascending myelitis. Death in respiratory failure occurred in a few days. From lesions in the cord, brain, and spleen a strongly neurotropic filterable virus was isolated which they named "monkey B." Sabin (1949) also reported a second case with a somewhat similar history, course, and termination, though there had been no bite and infection had presumably resulted from contamination of a laceration on the right hand with infected monkey saliva. A similar virus was again recovered.

Olitsky and Casals (1952) referred to two similar cases following monkey-bites; but they were not reported, but were presumed to be virus B infection; both showed encephalitis; both were bitten by monkeys prior to the disease; both, however, were not studied for virus isolation (Olitsky, 1958, personal communication). Sabin (1958, personal communication) believes that he has now traced 10 additional cases retrospectively, one of which recovered with severe disability. We have knowledge of one fatal case in this country, while two other fatal cases have been reported from Canada (*The Times*, March 22, 1958). How many of these have been studied virologically is unknown and none has been published. The following is the first complete account of the natural history of the disease, as well as the first recovery to be recorded. This is the more pertinent, since it is now clear that monkey-bite encephalomyelitis is not only a lethal but an increasing hazard.

(Virus B appears to be closely related to the herpes simplex virus of man, of which, indeed, it may be regarded as the simian variant. Most commonly it causes shallow ulceration on the dorsum of the tongue, though ulceration may occur elsewhere in the mouth or pharynx. Rarely it excites a vesiculo-pustular eruption on the lips. An important point is that the animal appears quite well, although at post-mortem examination the tracts of the cranial nerves may show multiple infiltrations by microglia surrounding cells containing what appear to be inclusion bodies. In tissue culture, virus B causes typical ballooning of the cells, frequently resulting in the formation of giant cells.)

Case Report

A monkey-handler aged 31 had been immunized against poliomyelitis in midsummer, 1957. On September 24 he was bitten in turn by two apparently healthy monkeys, once on the terminal phalanx of the left index finger and once on the dorsum of the third left finger. Both lesions were made to bleed and washed under the running tap, following which tincture of iodine was applied. They healed uneventfully. On September 30 he was vaccinated against influenza. On October 7 he went to his doctor complaining of a pain between the shoulder-blades, which the following day developed into a left-sided girdle pain and later passed off. (This was attributed to the vaccination against influenza.) For the next few days, apart from a headache, he felt well, but on October 13 his left leg gave way at work and he was sent home as a case of influenza. On the following day he could scarcely walk and was unable to pass water. He was sent to hospital as a suspected case of poliomyelitis.

When seen by one of us (G. E. B.) at Maidenhead Isolation Hospital on October 16 he was febrile but conscious and co-operative. He had been vomiting frequently. He could not sit up, but could bend his head freely—there was no true meningism. Pupillary reactions were normal, but there was marked anisocoria, with twitching of the face and trembling of the tongue. The abdominal reflexes were present. The left arm was weak and the triceps-jerk absent. The right arm appeared normal, but the reflexes were grossly exaggerated; the muscles of the back, pelvis, and abdomen were also weak; the left leg was almost immobile, with absent jerks; the right was weak and the reflexes were reduced; the plantars were equivocal. In addition there was loss of touch, pain, and vibration sense over the left lower leg and ankle, and a patchy loss of sensation over the lower half of the body generally. A lumbar puncture showed a clear fluid containing 75 cells per c.mm.; protein, 80 mg. per 100 ml.; sugar, 68 mg. per 100 ml. His was clearly not a case of poliomyelitis, and, in view of the history, the possibility of virus B infection had to be considered.

Two days later (October 18), because of developing weakness of respiration, he was transferred to the South Middlesex Hospital. On admission paralysis was found to have progressed. In addition to the signs previously noted there was weakness of the intercostals and of the left leaf of the diaphragm, and the vital capacity was down to 2 litres. The abdominal reflexes too were now absent. Both lower limbs were extremely weak, with absent reflexes, and the reflexes were also reduced in the left arm. The right arm still seemed normal, with increased jerks. There was now some left facial weakness, and, though the anisocoria had disappeared, there was marked nystagmus on looking upwards and to the right. Sensory loss over the lower half of the body was widespread and retention of urine was absolute. In the hope that it might contain some relevant antibody, he was given 10 ml. of human gamma-globulin.

On the morning of October 19 his vital capacity had fallen to 800 ml. and respirations were rapid and shallow. He was placed in a tank respirator and at first settled down well. High pyrexia continued, however, and vomiting was frequent. His vital capacity continued to fall—to 460 ml. at 8 p.m. At the same time his voice became hoarse, and pooling of secretions in the pharynx necessitated frequent suction. He was therefore removed from the tank respirator and, under general anaesthesia, a tracheostomy was made, a cuffed endotracheal tube was inserted, and he was placed on intermittent positive-pressure respiration, using a Radcliffe respirator. As the nose was impassable to a catheter, an intravenous drip was set up in which cortisone, 100 mg., was incorporated. A further 10 ml. of gamma-globulin was also given.

As is common in such cases, progress during the following week was somewhat chequered, though eventually the patient settled down fairly well. During the week, cortisone,

200 mg. daily, was administered by intramuscular injection, antibiotic cover being maintained. The temperature fell by slow lysis. Limb paralysis was now almost complete, with absent reflexes all round; facial weakness was notable and nystagmus pronounced. Fortunately, some improvement in swallowing soon began, so that by October 26 fluids could be taken by mouth and by October 29 semi-solids could be taken as well; intravenous maintenance was therefore discontinued. Shortly thereafter some increase in motor power in the limbs generally was noted, but painful involuntary spasms appeared in the left leg. On November 7 the patient went for two minutes without assistance to respiration, and breathing power continued to improve until November 9, when it was interrupted by massive collapse of the left lung which was cleared only by vigorous physiotherapy. Thereafter respiratory capacity increased slowly but steadily, and it was possible to substitute a rocking-bed for positive-pressure respiration for short periods. General progress was much influenced by an intractable bladder infection, at first with *E. coli* and later with *Pseudomonas pyocyanea* requiring treatment with polymyxin B. The pressure points also gave trouble, and an intractable bed sore developed over the sacrum which demanded the use of a ripple mattress. Daily enemata were also necessary. On November 8, for the first time, he felt an injection into the right buttock.

The patient's psychology presented a curious parallel to his physical condition. At first he was well controlled if occasionally confused, and he was always an unsatisfactory witness for sensory evaluation. When placed in the tank respirator he was fairly calm, but a few days later he became increasingly irritable, excitable, and emotional, often weeping spontaneously. Subsequently he stated that he had no memory of events from the time he was placed in the respirator on October 19 until about November 15. After that date, though still highly emotional, irritability diminished markedly, but he continued very apprehensive, thereby delaying his weaning from the respirator considerably. About November 15 bladder control became re-established. Gradual improvement in breathing resulting in a vital capacity of 2 litres enabled artificial respiration to be discontinued on December 9. About this time reflexes and sensation also began to appear in the limbs, and by January 15, 1958, power was regained almost fully in the right arm and leg and to a considerable extent in the left arm. The left leg, however, remained sharply contracted and tremulous and apt to go into painful clonic spasms on the least stimulation. On passive extension it gave a sensation reminiscent of that encountered in cases of post-encephalitis lethargica. The plantar reflexes remained extensor. By now the left facial nerve had quite recovered and the pupils were normal, but there was still some fine residual nystagmus, especially on looking upwards.

On January 27 the patient was transferred to a long-stay hospital for further rehabilitation. The latest report (April 9) stated that he was quite fit, and with elbow crutches and a full-length calliper could walk 25 yards without aid. The power in his arms was back to normal. There was no sensory disturbance left and bladder control had entirely returned. The spasm in the left leg was progressively diminishing and there was every indication that he would be able to resume an active life and return to full work in due course.

Comment

The picture is consistent with a virus infection which ascended along the peripheral nerves to the cord, producing widespread foci of inflammation throughout the whole central nervous system. It is remarkable that signs were much more pronounced and lasting on the left (the bitten side) than on the right, which recovered much more rapidly. The lesions appeared to affect the long tracts mainly, the anterior horn cells escaping undamaged. Sensory changes, while at one time widespread, also proved transitory.

Psychological changes were also notable—irritability and gross emotional lability. There was amnesia for a period of about three weeks. The patient's intelligence seemed to be unimpaired.

The value of the gamma-globulin and of the cortisone given in treatment is difficult to assess. Even if the former contained significant quantities of herpes simplex antibody valid against virus B, it would appear (by analogy with other virus disease) to have been given much too late to exert any appreciable influence on the course of the condition. From the time that cortisone was administered, the march of the paralysis appeared to halt and the temperature returned to normal by a slow lysis, but there was no dramatic fall such as is commonly seen in other conditions where it has proved effective.

A NOTE ON VIROLOGY

By W. Wood, O.B.E., M.B., B.S.

Attempts to isolate the causal agent from faecal and serum samples and determinations of virus B neutralizing antibody on acute and convalescent sera were carried out. All tests were run in monolayer tissue cultures of monkey-kidney tissue, employing a method outlined previously (Tyrrell, Keeble, and Wood, 1956). Samples of faeces were prepared for inoculation by making a 10% suspension in normal saline and clarifying by centrifugation at 2,500 r.p.m. Serum samples were titrated against two strains of virus B—one isolated at Sefton Park, the other isolated in Canada in 1953 (Wood and Shimada, 1954).

Specimens.—Faecal samples were obtained on October 16 and 28, 3 and 15 days respectively after onset of illness. Serum samples were obtained on October 16 and 21, November 8, and January 21; 3, 8, 26, and 100 days respectively after onset.

Results.—Tests for virus isolation on both faecal samples and the first three serum samples were negative. The final serum sample was not tested for presence of virus.

The virus B antibody titres in the four serum samples were as follows: day 3, 1:16; day 8, 1:25; day 26, 1:48; day 100, 1:32.

Conclusions.—Failure to isolate virus B from faecal samples is considered of no significance in that the route of infection via a wound would not necessarily involve alimentary infection. The results of the antibody tests are difficult to interpret, as we are ignorant of the degree to which neutralizing antibody develops in humans recovering from a virus B infection. It is also possible that the administration of cortisone in this patient depressed the antibody response in convalescence. However, a moderate rise in antibody did occur between the third and 20th days which, if considered in conjunction with the clinical data, suggests virus B encephalomyelitis as a probable diagnosis. It should be remembered, however, that monkeys may harbour many different viruses whose potentialities for causing disease in man are not yet fully known, so that it is not impossible that a virus of monkey origin other than virus B may have been responsible for this patient's disease.

Summary

A case of encephalomyelitis following monkey-bites is described. After a very stormy illness necessitating tracheotomy and intermittent positive-pressure respiration the patient made a good recovery and should be able to return to an active life.

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NEUROLOGICAL COMPLICATIONS OF PERTUSSIS IMMUNIZATION

BY

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Since Madsen (1933) first drew attention to the possibility of serious consequences following active immunization against whooping-cough, reports of neurological sequelae of such immunization have come from various parts of the world. These sequelae (post-inoculation poliomyelitis is not being considered here) have ranged from transient convulsions with complete recovery to gross crippling, mental retardation, and death.

A survey of the literature, greatly facilitated by Köng's (1953) review of cases reported up to 1951, revealed records of 107 cases. A further case is now reported (the seventh from Great Britain), together with a review of the literature.

Case Report

A male child was born at full term on September 28, 1954, weighing 5 lb. 13 oz. (2.635 kg.) following an uneventful pregnancy (apart from an attack of acute salpingitis at 11 weeks, associated with a negative Wassermann reaction and gonococcal complement-fixation test, which responded rapidly to chloramphenicol) and an uncomplicated labour. His parents and two elder brothers were normal, physically and mentally, and there was no family history of allergy, mental disorder, convulsions, or other neurological ailments.

No abnormalities were found in the neonatal period, apart from a minor degree of hypospadias not considered worth treating, and the child thrived from the outset.

Until May 25, 1955 (aged 8 months), progress was normal and he had had no illnesses. The mother, an intelligent woman, considered him more advanced than his normal brothers had been at the same stage, and the milestones of development were well in keeping with the criteria of normality enumerated by Illingworth (1953).

On May 25 he was given a first inoculation of 1 ml. of combined diphtheria-pertussis vaccine (containing a plain suspension of 20,000 million *Haemophilus pertussis* and 25 Lf of fluid diphtheria formol toxoid). That night he was whimpering and unsettled, an unusual feature for him. Early next morning he was drowsy, hypotonic, and pyrexial, and the following morning—that is, within 48 hours of the injection—convulsive episodes began, described by a doctor then attending him as “involving a preliminary cry which is not his usual sound, clutching at the chest, queer breathing, and spasms of all four limbs.” Rolling of the eyes was also noted. The pyrexia settled that day, but the fits persisted (one to four daily) despite bromides. That day, too, the child was no longer sitting up, could not support his head, and was indifferent to his environment.

Because the fits and associated features persisted, he was admitted to hospital three weeks after the inoculation. Observation revealed a child without interest in anything, who, if placed in a sitting position, could remain thus unsupported for only a few seconds, and who was having bouts of fits, each lasting a few seconds and each bout a few minutes. Apart from these findings, physical examination revealed no abnormalities, and the blood count, cerebrospinal fluid, and urine examinations were normal. The Wassermann reaction and Mantoux (1/100) were negative. Several weeks later skull x-ray films and lumbar encephalography showed no abnormality apart from the left lateral ventricle appearing slightly larger than the right.

At 11 months of age the child was severely retarded mentally, and phenobarbitone, $\frac{1}{4}$ gr. (16 mg.) twice daily, was needed to control his fits.

At 15 months grand-mal episodes became associated with the original convulsive pattern, and it was found necessary to increase the dose of phenobarbitone to 1 gr. (65 mg.) daily, and introduce phenytoin sodium, $\frac{1}{4}$ gr. (50 mg.) thrice daily.

Electroencephalography on May 16, 1956 (aged 19 months), was considered diagnostic of epilepsy with the epileptic activity generalized and no focus. The main activity was in the delta range and of high frequency.

At 2 years of age no significant progress had been made mentally; fits were controlled with phenobarbitone, 1 gr. (65 mg.) twice daily, and primidone, 250 mg. twice daily; and there were no focal neurological signs.

At 3 years the child remained grossly retarded mentally, with no speech or understanding of speech, inability to do anything for himself, and an I.Q. of 23 on the Griffiths mental development scale. Fits were less severe and were controlled with primidone, 250 mg. twice daily, alone. Localizing neurological signs were absent, as were signs of disease elsewhere.

In the accompanying review of the literature, the 107 case reports from 25 sources mentioned in Table I were examined.

TABLE I

Authors	No. of Cases	Source
Anderson and Morris (1950)	1	Britain
British Medical Journal (1949)	1	U.S.A.
Brody (1947)	2	U.S.A.
Byers and Moll (1948)	15	U.S.A.
Cohen et al. (1955)	2	U.S.A.
Doull et al. (1936)	3	U.S.A.
Escardo and Vazquez (1950)	1	Argentina
Globus and Kohn (1949)	2	U.S.A.
Grace (1950)	2	Canada
Halpern and Halpern (1955)	15	U.S.A.
Kendrick and Eldering (1939)	1	Switzerland
Köng (1953)	2	France
Laplane (1950)	1	U.S.A.
Livingston (1954)	7	U.S.A.
Low (1955)	1	Denmark
Madsen (1933)	2	Britain
Miller and Stanton (1954)	2	U.S.A.
Rambar et al. (1941)	1	U.S.A.
Sako et al. (1945)	2	U.S.A.
Sutherland (1953)	1	U.S.A.
Taylor (1938)	1	U.S.A.
Toomey (1949)	38	U.S.A.
Tudor (1951)	1	U.S.A.
Vahrman (1950)	1	U.S.A.
Werne and Garrow (1946)	2	U.S.A.

General Data

Sex of Affected Children.—Byers and Moll (1948) thought that the difference in sex incidence in their cases was similar to that encountered in relation to other substances causing gross injury to the developing nervous system. In the 22 other instances where the sex of affected children is stated a similar, though less striking, difference is present (Table II).

TABLE II

	Males	Females	Total
Byers and Moll	12	3	15
Others	14	8	22

Age When Inoculated.—This varied from 4 days to 3 years, most inoculations being done between 6 and 15 months. These figures simply reflect the ages when immunization is usually carried out, and the only conclusion to be drawn from them is that neurological sequelae may occur at any age in which immunizations are done.

Vaccines Used.—The vaccine used is recorded in 68 instances: in 28 a pertussis vaccine was used alone; in 12 a combined diphtheria-pertussis vaccine; and in 28 a combined diphtheria-tetanus-pertussis vaccine. The vaccines were prepared in a variety of ways by different manufacturers, and included fluid, alum-precipitated, aluminium hydroxide adsorbed, and detoxified formalized preparations. In Byers and Moll's (1948) study of 15 cases alone, the products of eight different manufacturers were identified, and in

Toomey's (1949) series of 38 cases at least six different pharmaceutical laboratories were concerned.

No significance can be attached to the number of times when pertussis vaccines alone or combined vaccines were used. These merely reflect the trends in immunization practice and the nature of the material under review. Thus, in the 10 cases reported up to 1945, pertussis vaccine was used alone in all, and thereafter combined vaccines became implicated too because of their increasing use. Further, in the report of Halpern and Halpern (1955), for instance, a triple vaccine was implicated in all 15 cases simply because their questionnaire was concerned only with triple vaccine immunization.

It is generally agreed that the pertussis antigen in all these vaccines is responsible for the reported neurological sequelae. There are good grounds for this view. Thus, the clinical manifestations of neurological complications following injections of pertussis antigen alone and of combined antigens containing pertussis are so strikingly similar that a common factor in all these vaccines is very probable. That this factor is pertussis antigen is suggested by the observations of Miller and Stanton (1954) that neurological complications of pertussis vaccination “are different from those encountered in other prophylactic inoculations in that the illness is always cerebral” and that “the neurological sequelae of a particular prophylactic inoculation appear to be similar in distribution to the neurological complications of the infective disease concerned.” Complications of whooping-cough include convulsions and upper-motor-neurone type paralyses (Banks, 1949), and Cockburn (1951) points out that the convulsions may be the precursors of mental deficiency in a small number of cases. This is precisely the sort of pattern observed in the cases under review, irrespective of whether pertussis antigen alone or combined vaccines containing pertussis antigen were used.

Dose of *H. pertussis* in Vaccines Used.—In 28 instances the number of *H. pertussis* organisms in the injection followed by neurological complications is recorded. This ranged from 1.5 to 45 thousand millions with no particular tendency for reactions to be associated with larger doses (Table III).

TABLE III

Dose (in 1,000 millions of organisms)	1-15	16-30	31-45
No. of cases	8	12	8

Injection Associated with Reaction.—In 61 instances where the injection order is given, neurological sequelae occurred for the first time, as shown in Table IV. These figures indicate that a reaction may occur with any injection, and, possibly, a decreasing likelihood for subsequent injections to provoke reactions the more previous ones there have been that have not done so. In seven cases neurological sequelae followed more than one of the injections (the first

TABLE IV

Injection order	1st	2nd	3rd	4th
No. of cases with neurological sequelae	26	20	12	3

of these injections producing sequelae is recorded in Table IV). It is notable that only one of these seven children recovered rapidly and completely (a case of Grace's, 1950). Of the remaining six children, two died 24 hours (Low, 1955) and 7 weeks (Brody, 1947) respectively after the last inoculation, and four were left with sequelae ranging from recurrent convulsions to gross physical and mental deterioration (Brody, 1947; Byers and Moll, 1948)—this despite the fact that earlier inoculations had not been thought to have had consequences serious enough to contraindicate subsequent ones.

Past Personal and Family Histories

An analysis of these data is difficult to interpret because in many instances no information is given, and when it is given the amount varies greatly from author to author.

TABLE V

	Personal History No. of Cases	Family History No. of Cases
Neurological abnormalities	7	6
Allergic manifestations	1	5
Normal	48	16
Not stated	51	80

Such an analysis is shown in Table V. It may be presumed that considerably more of the personal and family backgrounds were normal than is indicated by these figures, and this is often implied. Table V records only the instances where this was actually stated.

Clinical Features of Acute Illness

Time Interval Till Onset of Symptoms.—The early onset of neurological symptoms was characteristic, though not invariable. Table VI shows the time interval from inoculation to the onset of symptoms in the 63 instances in which it was recorded.

TABLE VI

Time interval in hours	Up to 12	13-24	25-36	37-48	49-72	Over 72
No. of cases	39	9	4	3	2	6

State of Consciousness.—In all instances where this is mentioned changes varying from listlessness to deep coma occurred.

Convulsions.—These, ranging from mild localized episodes to severe generalized ones, were an almost invariable and striking feature. There were, however, several notable exceptions: In one case reported by Brody (1947), four different inoculations (the last an intradermal one) between the ages of 6 and 41 months were associated with severe neurological sequelae at progressively shorter intervals, culminating in complete paralysis and death, apparently without associated convulsions; in Sutherland's (1953) case, listlessness and weakness of the limbs appeared some five to seven days after a third inoculation, with evidence of bilateral pyramidal-tract dysfunction about one month later, and apparent complete recovery within seven months, with no mention of convulsions; and in one of Miller and Stanton's (1954) cases neurological signs (drowsiness and right hemiplegia) were delayed for about a week after a third inoculation, with right hemiparesis still present two years later—here, too, convulsions are not mentioned.

Pareses or Paralyses.—These were specifically stated to have occurred in 19 cases.

Other Features.—Besides the above neurological signs, occasional cases presented additional features such as cyanosis, hiccups, diarrhoea, and vomiting. In 39 cases where the temperature is mentioned, it was elevated in 35. Pyrexia is, however, a not infrequent transient concomitant of immunization in which no question of neurological sequelae arises.

Mortality.—In 8 cases death was reported within 48 hours of inoculation, 7 of them within 24 hours.

Progress

Complete Recovery.—This was specifically reported in 41 cases, including 23 of Toomey's (1949) 38, and 11 of Halpern and Halpern's (1955) 15, and presumably occurred in at least nine other instances.

Persisting Morbidity.—Follow-up of the affected children for varying periods revealed evidence of persisting abnormality (Table VII). So far as could be determined from the case reports, in a number of cases in which absence of details makes a fuller analysis of the above signs somewhat hazardous, these signs were distributed as follows: A only, 9 cases; B only, 8; C only, 1; A+B, 2; A+C, 2; B+C, 3; A+B+C, 6. Thus a total of 31 children were specifically

TABLE VII

Major Signs	Follow-up Period	No. of Cases in Which Actually Reported
A=Recurring convulsions	2 months—5½ years	19
B=Pareses and paralyses*	1 month—3 years	19
C=Mental retardation	2 months—5½ years	12

* Varying from slight hemiparesis to gross crippling.

reported as having physical and/or mental signs of cerebral involvement one month to five and a half years after immunization.

Mortality.—Fifteen deaths (seven of them within 24 hours) were reported at varying time intervals since inoculation (Table VIII). Thus, an analysis of the available data indicates a recovery rate of about 50%, a persisting

TABLE VIII

Time interval since inoculation	1-48 Hours	1-2 Months	6 Months	20 Months	Unspecified
No. of deaths	8	2	1	1	3

morbidity rate of about 30%, and a mortality rate of about 15%. The small percentage of cases unaccounted for because of lack of information in the reports would not significantly alter these figures.

Aetiological Considerations

Various hypotheses to account for the complications discussed have been advanced from time to time, but each is open to objection and there is still no unanimity of opinion. Among the suggested causes are the following.

1. **A Sensitization Phenomenon.**—Miller and Stanton (1954) considered that "most neurological illnesses which follow prophylactic inoculation are manifestations of hypersensitivity," and Brody (1947) favoured a sensitization phenomenon as an explanation in the two cases reported by him, pointing out that both had a family history of allergic disturbances. However, allergy was recorded in only two other instances in the reviewed cases: the father of twins reported by Werne and Garrow (1946) as having died within 20 hours of a second diphtheria-pertussis inoculation had had two episodes of angioneurotic oedema of the lip; and one of Köng's (1953) cases had a personal and family history of asthma and eczema. An antigen-antibody response to previous specific sensitization has been suggested as a possible cause, but this is difficult to reconcile with the relatively large number of children who developed neurological sequelae following a first inoculation. It could well account, however, for some of the other cases—for instance, those of Werne and Garrow (1946), where necropsies "disclosed lesions consistent with death in anaphylactic shock."

2. **A Specific Toxin or Toxins Produced by *H. Pertussis*.**—Toxins have been isolated from *H. pertussis* cultures (Byers and Moll, 1948); and Miller (1951), who favours this view of the aetiology, points out that they are known to be neurotropic in experimental animals. However, Byers and Moll (1948) have raised the serious objection that as these toxins are unstable they can hardly survive in properly aged vaccines.

3. **Some Constitutional Predisposition in Affected Children.**—The sex ratio in Byers and Moll's series has been thought to suggest this possibility (*British Medical Journal*, 1950), but it is difficult to know what is meant by the term "constitutional predisposition." Certainly a large proportion of the patients reviewed were regarded as normal in all respects prior to their inoculations.

4. **Pyrogens Contaminating Vaccines.**—While this hypothesis has sometimes been postulated, there appears to be no definite evidence in favour of it.

5. **Accidental Intravenous Injection of Vaccine.**—As Faber and Miller (1948) have pointed out, this could be a

factor only in reactions occurring almost immediately after injection. In the reviewed cases, reactions within half an hour were reported only six times.

Contraindications to Immunization

Though complications following pertussis immunization may be serious and even fatal, they are extremely rare, and it is generally conceded that such immunization is undoubtedly worth while. It is well known that whooping-cough itself may produce serious complications, neurological and others, and the opinion of Brody and Sorley (1947) that "the risks of not immunizing against whooping-cough are vastly greater than the risks of immunizing" probably reflects the general view. Byers and Moll (1948) found that, in the same 10-year period during which their 15 cases of pertussis vaccine encephalopathy were admitted to the Boston Children's Hospital, 26 children suffering from the effects of encephalopathy complicating pertussis itself were admitted to the same hospital. Of these 26 children seven died during their acute illness, six had mental retardation, three had chronic convulsions, and one had cerebral palsy.

Opinions differ, however, on what constitute the contraindications to immunization. Some have regarded a personal or family history of convulsions or other neurological disorders as a definite contraindication (for instance, Cockburn, 1951; Tudor, 1951; Escardo and Vazquez, 1950; Köng, 1953; Sutherland, 1953). Others, while tending towards this viewpoint, have been less emphatic. Both Toomey (1949) and Grace (1950), for example, suggest a decreased dosage in these circumstances. As analysis of the reviewed data does not indicate any tendency for reactions to be associated particularly with larger doses, decreased dosage would not seem helpful, besides creating the problem of possible inadequate immunity. On the other hand, Melin (1953), basing his views on experience with epileptic children in Stockholm, actually recommends pertussis vaccination for children with convulsive disorders because he considers that "the risk of a seized child contracting pertussis and eventually developing complications is more pronounced than the risk involved in the immunization procedure itself." Peterman (1953), Livingston (1953), and Byers (1953) have agreed with Melin.

The small number of reported suspect nervous systems, based on personal and family histories, in the cases reviewed would seem to bear out Livingston's (1953) doubt about children with convulsive disorders or tendencies being more likely to develop cerebral complications from pertussis immunizations than other children. The whole question depends on whether a child, in any given circumstances, both personal and environmental, is more likely to contract pertussis with serious complications therefrom than he is to develop serious sequelae from pertussis inoculation, and this is a matter not easily settled. On one point, however, there appears to be no room for controversy, and this is that any suggestion of a neurological reaction to a pertussis inoculation should be an *absolute* contraindication to further inoculation. This is forcefully illustrated by the fact that of the seven patients who had neurological sequelae after more than one injection two died and four were left with grave complications.

Allergy is sometimes considered a contraindication to inoculation. Köng (1953) lists allergic diseases among his contraindications, and Miller (1951) considers fractional doses advisable in asthmatic children. Halpern and Halpern (1955) feel that it may be advisable to administer smaller doses more frequently in older, highly allergic children. The few cases among those reviewed where a personal or family history of allergy was reported suggest that it is perhaps over-cautious to consider this as a contraindication.

Some authors, amongst them Miller (1951), Cockburn (1953), and Sutherland (1953), have recommended that inoculations should not be undertaken while a child is unfit or suffering from acute illness of any sort. While there appears to be no direct evidence that reactions are more likely under such circumstances, it seems a reasonable

precaution to avoid provoking a possible reaction at a time when resistance is likely to be relatively low.

Summary

A case is reported of an 8-months-old normal child who, within 24 hours of a combined diphtheria-pertussis inoculation, became pyrexial, drowsy, and hypotonic. Convulsions and evidence of mental deterioration followed rapidly. At 3 years of age convulsions still persisted and mental retardation was gross (I.Q.=23).

Review is made of 107 cases of neurological complications of pertussis inoculation reported in the literature. Males predominated; reactions occurred in all age groups in which immunizations were done, irrespective of the dosage used, and followed first or subsequent inoculations. A wide variety of vaccines, single and combined, were implicated. Past personal and family histories indicated relatively few instances of neurological or allergic abnormalities. The early onset of neurological symptoms was characteristic, with changes of consciousness and convulsions as the most striking features. Pareses or paralyses were not infrequent, and eight children died within 48 hours of inoculation. Follow-up revealed a recovery rate of about 50%, a persisting morbidity rate (physical and/or mental) of about 30%, and a mortality rate of about 15%.

The question of aetiology is considered and contraindications are discussed. The value of pertussis immunization is emphasized, as is the grave danger of further inoculations when a previous one has produced any suggestion of a neurological reaction.

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THE NEUROLOGICAL COMPLICATIONS OF MUMPS

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The neurological complications of mumps have been recognized since the eighteenth century, and a number of reports have appeared in the European and American literature describing various forms and the frequency with which they occur. Thus in 1911 Doptor reviewed 1,700 cases of mumps and estimated that 9.8% showed meningeal symptoms. Laurence and McGavin (1948) found 60 cases in an epidemic involving 208 New Zealand Service men; and Frankland (1941), in discussing an outbreak of 234 cases, put the incidence of meningitis as high as 30%. On the other hand, Paddock (1932) and Coe (1945) found neurological involvement in only 0.15–0.5% of their series, which were less selective and covered a wider age range.

It has been suggested that differences in frequency of meningitis in various epidemics are due to variations in resistance to infection, perhaps due to racial factors or to an altered virulence of the mumps virus leading to an increased affinity for nervous tissue. It is partly accounted for by the different criteria which have been used in the diagnosis of meningitis, some authors relying on symptoms, others on symptoms and physical signs, and some on the alterations in cerebrospinal fluid. To add to the confusion, it has been repeatedly confirmed, since Lavergne's observation in 1938, that cerebrospinal pleocytosis may occur in uncomplicated cases of mumps (Finkelstein, 1938) or even in contacts showing no signs of mumps (Frankland, 1941), and that meningeal symptoms may precede parotitis by as much as ten days (Bedingfield, 1927; Frankland, 1941).

These facts led Doptor and others to the view that the mumps virus is primarily neurotropic and that involvement of the parotid glands occurs as a secondary and not invariable complication. The existence of a separate neurotropic strain of the virus has not received much support (Macrae and Campbell, 1949), and Gordon (1927) was able to produce a fatal meningo-encephalitis in a monkey by intracerebral inoculation of material from throat-washings of uncomplicated cases. No correlation has been found between the occurrence of nervous complications and the severity of parotid disease or of epididymo-orchitis (Holden, Eagles, and Stevens, 1946).

Mumps meningitis is a remarkably benign condition usually appearing within a few days of the parotid enlargement and recovering without complications in three to four days; occasionally it may precede parotitis or occur alone. The cerebrospinal fluid contains a variable number of lymphocytes (10–1,000 per c.mm.) with slight increase in protein and normal values for chloride and glucose. Mumps virus has been isolated from the spinal fluid (Henle and McDougall, 1947).

The major neurological complications are much less common (approximately 1 in 6,000) and have been

reviewed by Miller, Stanton, and Gibbons (1956). They may occur at the time of parotitis or up to 23 days afterwards, the average latent period being 7.2 days. Encephalitis cases are less rare than the other varieties—myelitis, polyradiculitis, and polyneuritis. Mental symptoms are prominent in encephalitis, and clinical features include drowsiness, convulsions, headache, psychoses, ataxia, and hemiplegia. Neck stiffness, involuntary movements, increased reflexes, and extensor plantar responses may be found. Deep coma may occur, and is an unfavourable prognostic sign. The cerebrospinal fluid often shows a lymphocytosis, but may be normal. Death occurs in approximately 20% of cases, and 33% of those who recover may show major sequelae consisting of hemiplegia, ataxia, and involuntary movements.

Fatal cases show a patchy perivenular demyelination similar to that seen following other post-infective encephalitides (Donohue, Playfair, and Whitaker, 1955).

Cranial nerve palsies involving the optic, facial, trigeminal, or oculomotor nerves may occur (Laurence and McGavin, 1948; Macrae and Campbell, 1949), and the important complication of labyrinthitis may be permanent and unassociated with signs of neurological damage. Local weakness of the limbs with transient loss of tendon reflexes and subjective sensory disturbance has been described (Lightwood, 1946; Laurence and McGavin, 1948).

In the following report 18 cases of meningitis and one of encephalitis occurring in the course of a mumps epidemic are described.

Incidence

During February–October, 1956, there was an epidemic of mumps in Gurkha troops stationed at Sungai Patani, Malaya. A total of 287 cases occurred, and 84% of the patients came from "Recruit Company" and "Boys' Company," aged 14–17. A number of those infected had arrived from widely scattered areas in Nepal two months previously.

The infection reached a peak in June, when there were 58 cases.

In the great majority the disease ran a benign course over a few days, but in the latter part of the epidemic meningitis began to appear, reaching a maximum in July, when there were 12 cases, one in every five being affected.

Thirteen cases had salivary glandular enlargement and meningitis; one had parotitis, orchitis, and meningitis; one had orchitis and meningitis; and three had meningitis alone.

TABLE I.—Onset of Meningitis Related to Appearance of Parotitis

	Days Before		Appearance of Parotitis	Days After									
	2	1	0	1	2	3	4	5	6	7	8	9	10
Cases of meningitis	1			1	1	2	4	1	1		2		1

The occurrence of these events is shown in Table I; it will be seen that in one case the meningitis preceded the parotitis by two days.

In the three cases presenting with meningitis alone there was no opportunity of confirming the diagnosis by serological means as described by Kilham, Levens, and Enders (1949), but, in view of their similar benign course and the presence of an epidemic, it was assumed that they were variants of the same malady.

The incidence of all complications is set out in Table II, and it will be noted that, in contrast to meningitis, orchitis occurred in sporadic fashion evenly distributed throughout the epidemic.

TABLE II.—Incidence of Complications

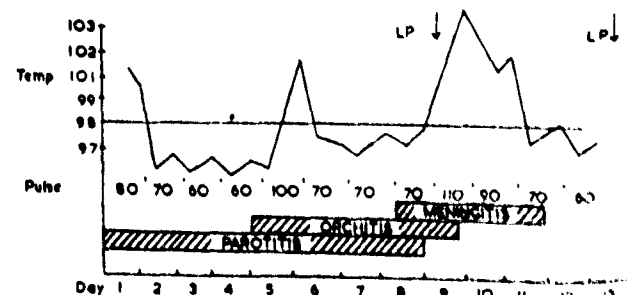
	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total
Cases admitted	13	39	29	41	58	51	35	21	287
Uncomplicated	11	33	24	31	50	32	23	15	219
Orchitis	2	6	5	10	6	9	7	3	48
Meningitis					2	12	1	1	18
Encephalitis									1
Percentage incidence of meningitis					3.4	23.5	8.6	5.0	6.3

Clinical Features

Meningitis (18 cases)

The patients reached hospital on the first or second day following the appearance of parotitis. They were usually pyrexial, but in good general condition and reluctant to be confined to bed.

The pyrexia settled in 48 hours, but with the onset of meningitis it recurred (see Chart), and the cheerful swollen



Case 14. Boy aged 15. Temperature and pulse rate during illness.

faces were transformed overnight by expressions of extreme misery. The patients lay curled up in bed, complaining of severe headache and photophobia and refusing food and drink with such persistence that some had to be given fluids by tube. Vomiting occurred frequently and some had pain in the muscles of the legs.

On examination the most prominent finding was rigidity of the spine, which moved "in one piece" if an attempt was made to flex the neck. Kernig's sign was positive and there was slight muscle tenderness in the calves but no other objective neurological signs. Nystagmus, which had been reported in this condition, was not seen, and tendon reflexes were unaltered.

All the patients were irritable when disturbed and resented examination, but when induced to talk they seemed rational. They tended to spend a large part of the day asleep, but there was no nocturnal restlessness. The headache responded to aspirin in large doses, and appeared to be somewhat relieved by lumbar puncture.

The urine often contained ketone bodies but no albumin, and white-cell estimations showed values of 8,000–12,000 per c.mm., with a normal differential count. Recovery was rapid and complete in two to three days, and neurological examination four months later was negative. Two boys were thought by their instructors to be slower mentally after the illness, but apart from this equivocal finding there were no sequelae.

Cerebrospinal fluid was examined in all cases, and was usually repeated after 10 days. The results are summarized in Table III.

The cellular reaction was predominantly lymphocytic, although up to 60% of polymorphs was not unusual in the early stages. Estimations done later in the disease invariably

TABLE III

Case No.	Day of Disease	Fluid	Cells/c. mm.	Lymphocytes %	Polymorphs %	Protein mg./100 ml.	Chlorides mg./100 ml.	Sugar mg./100 ml.	Remarks
1	3	Turbid	230	60	40	48	750	57	Parotitis, meningitis
	9	Clear	340	90	10	55	730	56	
2	5	Turbid	140	50	50	97	720	50	"
	8	Clear	60	70	30	37	690	52	
3	6	Turbid	940	50	50	240	690	35	"
	16	Clear	2	30	70	37	760	55	
4	5	Turbid	780	95	5	60	760	54	"
	12	Clear	10	30	70	64	730	45	
5	7	Turbid	430	84	16	62	715	54	"
	17	Clear	60	80	20	47	740	69	
6	11	Turbid	930	80	20	95	670	45	Meningitis preceded parotitis
	17	Clear	Nil	80	20	49	760	41	
7	4	Turbid	130	38	62	25	730	68	Parotitis, meningitis
	16	Clear	1	70	30	17	670	46	
8	3	Turbid	1,260	70	30	110	740	82	"
	14	Clear	3	88	12	47	720	64	
9	6	Turbid	86	70	30	80	740	36	"
	14	Clear	9	90	10	60	710	58	
10	6	Turbid	340	90	10	60	730	65	"
	13	Clear	80	90	10	25	710	34	
11	9	Turbid	370	90	10	70	710	49	Parotitis, meningitis, orchitis
	20	Clear	30	90	10	61	700	39	
12	9	Turbid	480	90	10	61	710	50	Orchitis, meningitis
	14	Clear	7	56	44	30	700	48	
13	5	Turbid	720	98	2	72	660	48	Meningitis alone
	16	Clear	80	28	72	100	720	45	
14	4	Turbid	250	96	4	90	700	45	"
	17	Clear	6	75	25	210	730	20	
15	2	Turbid	400	60	40	75	750	45	Parotitis, encephalitis
	7	Clear	29	75	25	210	730	20	
16	11	"	1						"

showed a preponderance of lymphocytes. Total counts in the acute stage varied between 200 and 800 cells per c.mm., falling rapidly in a few days, but in some cases being still significantly raised at the end of two weeks, when patients were asymptomatic and seemed fit for discharge. The protein was raised in proportion, with a usual reading at 60–100 mg. per 100 ml., and chloride and sugar estimations showed no significant abnormality. Six uncomplicated cases of mumps from the same epidemic and at the same time were subjected to lumbar puncture. Results were normal in every respect.

Encephalitis (1 case)

A previously healthy boy aged 14 with no past or family history of psychiatric disturbance was admitted with swelling of parotid and submandibular glands present for two days. He was slightly pyrexial on admission—temperature 99.4° F. (37.4° C.).

The swelling subsided over the first week, but on the ninth day he began to vomit and refused all nourishment. Over the course of 24 hours he became speechless and extremely drowsy, with episodes of mania when disturbed. In these he struggled violently with the attendants, grinding his teeth and biting anyone within reach, although never speaking a word. Headache was not prominent, but he appeared to have some abdominal pain. Temperature and pulse were normal. He was restless at night and slept fitfully during the day. He developed retention of urine, requiring catheterization.

Satisfactory examination of the nervous system was well-nigh impossible, but there was no gross disturbance of

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cranial nerves or limbs; there were no signs of meningeal irritation. The tendon reflexes were present and equal and the plantar responses were flexor. Lumbar puncture yielded normal cerebrospinal fluid under increased pressure. The urine contained no albumin or sugar and the urinary diastase was normal. Blood-sugar and blood-urea estimations gave no additional information.

After three days of mutism and grossly abnormal behaviour he began to improve; speech returned after a further 24 hours, and within a week he was completely recovered, having an amnesia extending over the encephalitis episode. Examination at this time and again three months later revealed no neurological or psychiatric abnormality and his subsequent mental state is reported as unchanged.

Comment.—There are many resemblances to previously reported cases, notably the acute onset nine days after the appearance of parotitis, and the predominance of mental over physical features. The absence of meningeal symptoms and of cerebrospinal fluid changes is well recognized. Unusual features are retention of urine unaccompanied by any signs of spinal-cord involvement, and the occurrence of mutism.

Discussion

The cases reported above conform to the description given by previous authors. They emphasize the important clinical distinction to be made between meningitis, a common and relatively trivial complication, and encephalitis, a serious condition with high mortality. The reason why the nervous system reacts in these two ways to infection with the mumps virus is not fully understood, although it has been the subject of much recent research.

The clinical syndrome of meningeal irritation, combined with the finding of cerebrospinal pleocytosis and the fact that the virus can be isolated from the spinal fluid, makes it likely that the changes of mumps meningitis are due to the direct action of the virus. In the present epidemic, an unusual one in that it occurred in an adolescent community only recently exposed to mumps, the overall incidence of meningitis (6.3%) is not unduly high, but it is significant that all the meningitic cases occurred in the course of a few weeks in the latter part of the epidemic. This suggests that the virus acquired an unusual degree of neurotropism during the epidemic, reaching a peak in July, when the incidence of meningitis was 23%. There was no increase in the frequency of orchitis or other visceral complication at this time.

If separate strains of virus with increased affinity for nervous tissue do arise in this way the incidence of meningitis in an epidemic of mumps is related more to the properties of the virus than to the state of immunity of the patients. This may help to explain the widely differing estimates of the frequency of meningitis as reported by various authors. It is, of course, also possible that the meningitic cases were due to a superadded infection with an unrelated virus, but this seems unlikely, and has received no support from serological studies (Kilham, Levens, and Enders, 1949).

The occurrence in the present series of two cases of meningitis without other features of mumps serves as a reminder that mumps should be included in the differential diagnosis of benign lymphocytic meningitis. The identity of the infection may be obvious during an epidemic, but isolated cases may give rise to difficulty, which is only solved by routine serological testing. In a recent series (Adair, Gauld, and Smadel, 1953) mumps was found to account for 12% of 854 cases of aseptic meningitis in America, and serological studies have been confirmed by the isolation of the virus from the spinal fluid (Kilham, Levens, and Enders, 1949).

Although most authorities agree in attributing meningitis to the direct action of the virus, there are conflicting views on the aetiology of encephalitis. This has been attributed to a further extension of the virus from the subarachnoid space into the neuraxis, possibly as a result of a high degree of neurotropism or a low resistance on the part of the patient

(Donohue, Playfair, and Whitaker, 1955). However, the latent period before the appearance of encephalitis and the occasional absence of meningeal symptoms and of cerebrospinal pleocytosis (as shown by the case reported here) do not support this view, and favour a primarily encephalitic process rather than a spread from the meninges.

The clinical resemblance between mumps encephalitis and the encephalitis which may follow measles, varicella, and rubella, and the fact that the histological appearances of perivascular demyelination are common to them all, suggest that they arise from the same pathological process (Miller, Stanton, and Gibbons, 1956). The nature of this process is unknown, but it may be a non-specific allergic reaction to virus protein (Miller and Evans, 1953), and similar lesions have been produced experimentally by the injection of brain material with adjuvants (Lumsden, 1949).

Summary

Previous reports on the neurological complications of mumps are reviewed. Lymphocytic meningitis is not uncommon, and recovery is full in a few days. Encephalitis is extremely rare, and has a mortality of 20%.

Eighteen cases of meningitis and one of encephalitis arising in an epidemic of 287 cases are described. The meningitic cases occurred only during the latter part of the epidemic.

The aetiology of the neurological sequelae is briefly discussed. Meningitis may well be due to the emergence of strains of viruses of increased neurotropism during an epidemic.

We wish to thank the Director of Medical Services, R.A.M.C., for permission to publish.

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Medical Memorandum

Advantages of "Polythene" Ring Pessaries

The advances achieved in surgical technique and, more particularly, in the art of anaesthesia in the past twenty years have made the surgical repair of genital prolapse the ideal method of treating this common disability. However, in spite of these advances there are some women whom it would be too great a risk to subject to an operative cure. We find this group to constitute less than 3% of the total number of patients with symptoms caused by a genital prolapse. A second group of patients complaining of genital prolapse, on whom a surgical repair is not immediately desirable, are the women of child-bearing years who have either been recently delivered or are about to embark on another pregnancy. A third group of patients refuse to undergo a surgical repair. These three groups can have their symptoms relieved by the fitting of a ring pessary into the vagina.

The ideal ring pessary should possess the following properties. (1) It should be made of a substance that is inert and produces no tissue reaction that will lead to a malignant change in the vaginal walls and no offensive vaginal discharge. (2) It should be sufficiently compressible to introduce through a small vaginal introitus, yet possess enough elasticity to regain its shape when introduced into the vagina, and it should not alter in shape or in its physical properties with prolonged use. (3) It should be technically easy to manufacture and cheap to produce.

The many varieties of material from which ring pessaries have been constructed can be divided into those of the pre-plastic era and those of the plastic era. The former group are the rubber watchspring pessary and the vulcanite pessary. The watchspring pessary is compressible, but it produces an offensive vaginal discharge. The vulcanite pessary has both the disadvantage of incompressibility and the property of producing leucorrhoea. Pessaries made from the many varieties of plastics can be constructed of compressible material or a plastic that is for practical purposes incompressible.

The flexibility of plastics such as P.V.C. depends on the presence of a plasticizer. The majority of plasticizers are toxic to tissues when in contact with them for any length of time and may induce a malignant tissue response. A plasticizer with a low vapour pressure, such as dioctylphthalate, does not produce a tissue reaction. It has, however, the disadvantage of escaping from the material with which it has been mixed, and brittleness and loss of flexibility follow.

Pure polythene, however, is chemically almost inert and has been buried in living human tissues for long periods of time without producing any toxic reaction. It is, furthermore, sufficiently flexible and compressible to use as a pessary and firm enough to support the vaginal walls and uterus in a genital prolapse. The material does not lose its flexibility whilst in the vagina. We have had experience of using the pessaries for three years in the vagina without any apparent physical change occurring in the material. The management of the cases treated with polythene pessaries does not vary from pessaries of other materials.

Patients are examined every three months, the vaginal walls are inspected for evidence of ulceration, and the pessary is washed and replaced.

Polythene is made in a number of different grades which, chemically speaking, differ only in their molecular weight. There is very little variation in the physical properties between different grades except at temperatures up to 100° or below 0° C. In particular the modulus of elasticity which determines the flexibility of the product is much the same for all grades at normal temperatures. The only advantage of using a grade of higher molecular weight is that it can be boiled without danger of deformation. From the manufacturer's point of view, however, the light molecular weights are easier to mould. For these reasons the choice of grade is not very important. A $\frac{1}{4}$ in. (0.6 cm.) diameter cross-section provides the necessary flexibility and at the same time is thick enough to support the vaginal walls yet will not cause ulceration.

Cost.—The polythene pessary is cheaper to manufacture than the rubber-ring pessary and its life is infinitely longer; while a rubber ring has a life of only six months at the most, a polythene pessary retains its shape, smooth surface, and flexibility for years.

We are indebted to Mr. D. Annat, M.P.S., chief pharmacist, Stoke Mandeville Hospital, for negotiating the original samples of plastic and polythene and organizing the supplies of the polythene pessaries from the manufacturers, Portland Plastics Ltd., Hythe, Kent.

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Reviews

LAW AND ETHICS FOR DOCTORS

Law and Ethics for Doctors. With a Section on General Practice in the National Health Service. By Stephen J. Hadfield, M.A., M.B., B.Chir.(Cantab.). With contributed sections on Negligence, by W. G. Hawkins and the late W. Mair; Superannuation, by L. S. Potter, M.B., Ch.B.; and Income Tax, by W. Donald, C.A. (Pp. 399+xvi. 42s.) London: Eyre and Spottiswoode. 1958.

This excellent book treats with accuracy and judgment the many practical problems which may nowadays confront a doctor outside the purely clinical field. Some of these problems are happily rare in their incidence, but a doctor's career may nevertheless be a good deal influenced by the way in which he handles, for example, a complaint by a colleague of unethical conduct on his part, an allegation of negligence, or an appearance in a court of law. Other difficulties, such as those raised by cases of mental disorder, by questions of certification, or by dangerous drugs and poisons, may be less acute in themselves but are apt to recur more frequently. In his book, which rests on a comprehensive plan, Dr. Hadfield sets out the legal, ethical, and practical considerations which should guide a doctor when he encounters these and many other problems. While offering balanced and realistic advice, in which he has been able to draw on his experience as an Assistant Secretary of the British Medical Association, Dr. Hadfield does not omit to stress the need for seeking early advice in some cases—for example, from a defence organization—before any "home-composed reply" is posted or other irremediable action is taken.

Much of the latter part of the book deals more particularly with general practice in the National Health Service. Apart from supplementary information given in appendices, the aim has been to summarize and throw light upon the lengthy regulations, as distinct from reproducing their terms in full.

A foreword to the book has been contributed by Dr. Solomon Wand.

WALTER PYKE-LEES.

SURGERY AND THE LABORATORY

An Introduction to Experimental Surgical Studies. By W. J. Dempster, F.R.C.S. (Pp. 463; illustrated. 50s.) Oxford: Blackwell Scientific Publications. 1957.

The experimental laboratory has made notable contributions to the progress of modern surgery—sometimes in respect of technical problems that are purely surgical, but often in respect of fundamental physiological, biophysical, and biochemical problems that are equally the concern of all the disciplines of medicine in its widest sense. In fact, it is the almost automatic reference of clinical difficulties to the laboratory—the complete if tardy permeation of medicine by the experimental outlook and method of Harvey and by the experimental and Lister—that has transformed medicine from an art to a science. Unfortunately the fruits of much research are scattered widely in a now voluminous literature; the tyro has difficulty in finding out what has or has not been submitted to critical experimental scrutiny; and the ageing clinician has certainly not the time, even if he has the inclination, to plough through so many original papers. An introduction—or a guide—to what has been accomplished or is at present under investigation is therefore a welcome and important addition to medical literature. Nevertheless—and possibly because one had hoped for more—the present book is a little disappointing. The author is widely recognized as a distinguished and versatile and original research worker, and in those sections of his text that deal with his own interests—the regeneration of tissues, wound healing, and transplantation and tissue and organ grafting—his account is, on the whole, judicious and critical and

comprehensive, though he makes some surprising and incorrect pronouncements—for example, that surgeons have abandoned arterial grafts. He is on less sure ground in his review and criticism of research in such special fields as the gastro-intestinal tract and the liver; here there are some surprising omissions, some obviously personal—and unsupported—opinions, and a bibliography that is less comprehensive than elsewhere. This may be due to a desire to keep the book within reasonable compass; equally it may reflect the impossibility, as on the clinical side, of a single individual's being able to master all facets of surgery.

These friendly criticisms do not detract from the value of a book which I have vastly enjoyed, and greatly admired for its erudition. Indeed, it could form the basis for a longer and more comprehensive book—possibly collaborative—that would enhance the reputation of both the author and his school. If this should happen, or when a second edition of the present work is called for, perhaps Mr. Dempster would delete the somewhat pontifical injunction on page 203 to the effect that "the reader is well advised to take cognizance of the contributions being made to medicine by the basic sciences." There are disadvantages in long residence in any "ivory tower."

JOHN BRUCE.

FAMILY LIFE OF THE AGED

The Family Life of Old People: An Inquiry in East London. By Peter Townsend. Foreword by J. H. Sheldon. (Pp. 284+xvi. 30s.) London: Routledge and Kegan Paul. 1957.

Mr. Townsend has carried out an interesting and important inquiry into the lives of a random sample of 200 old people living in the borough of Bethnal Green. This survey, and the conclusions to be drawn from it, make an important contribution to our knowledge of how the old, and in particular the needy old, live. Mr. Townsend is careful to point out that his inquiries were confined to one only of the metropolitan boroughs, and that his conclusions cannot therefore be universally applied. But there is little, if anything, in his conclusions which differs from those arrived at in comparable, if not precisely similar, surveys that have been carried out in other parts of the country.

Although a large number of the old persons interviewed lived alone, it was interesting to read how few were really isolated: most had relatives living in the borough who were in regular touch with them, and it is heartening to read of the important part still played by the grandmothers in what may be called the "three tier" family. They help to prepare meals, to take care of the grandchildren, and in many other ways continue to play their full part in the life of the family. Retirement of men, particularly if it is enforced on healthy persons of 65, is a real tragedy. The fall in income and in status leads to a loss of friends and diminution of social activities. Jobs for the retired are not easy to find, and are only too often of a character which is uninteresting and humiliating. Yet occupation can be of considerable value in maintaining health, both mental and physical. It is interesting to note the increased proportion of the unmarried or childless who enter the wards of the local geriatric hospital; this further emphasizes the ill effects that loneliness and friendlessness have upon the aged. Boredom, due to lack of suitable occupation, is one of the terrors of old age: one has only to examine any of the well-organized schemes for the employment of the elderly to realize their value. Mr. Townsend's book will provide much valuable information for those who have the welfare and the well-being of the aged at heart.

AMULREE.

THE HINDU PERSONALITY

The Twice-Born: A Study of a Community of High-caste Hindus. By G. Morris Carstairs. Preface by Margaret Mead. (Pp. 343. 30s.) London: The Hogarth Press. 1957.

This is a strangely old-fashioned book for a young author to write. It is perhaps the last of attempts begun in the 1930's to apply psychological theories and psycho-analytical

methods elaborated in the cultures of the West to people and to groups in alien societies. Apart from the epistemological objections, such works (associated notably with the name of Margaret Mead, who provides a brief preface to the present book) have been criticized for their lack of the prerequisite analysis of the social forms within which personalities emerge, loose handling of the evidence, and an over-reliance upon the popularity of the topic. Dr. Carstairs, more sober and modest in style, does not entirely avoid the failings of his predecessors.

The material offered is drawn from a village in Rajputana where the author compiled 45 case histories derived from four castes. The argument attempts to show that there are recognizable personality types corresponding to each of the first three castes (the fourth is marginal), that there is a more basic personality type common to all three, and that finally this basic personality is not without relevance to an understanding of the Hindu personality as such. Dr. Carstairs by no means makes it clear at which level of abstraction his generalizations are to apply. I am surprised to find him ready to comment, from his village data, upon the behaviour of politicians in Delhi.

The most satisfactory sections of the book are the case histories of three informants together with the Rorschach tests analysed by Dr. Rosemary Gordon. There are only three objections to be made here. First, on methodological grounds one may wonder whether Dr. Carstairs is correct in taking as his examples his English-speaking informants. It seems probable that "the distorting influence of translation" which he seeks to avoid is a lesser hindrance to understanding than the imperfect English of villagers. Secondly, the paranoid and suppressed homosexual tendencies which are stressed as elements in the basic Hindu personality do not emerge in the first two examples, and there is only a possible element of homosexuality in the emotional friendship of the third, who is not in fact a member of the local community studied. Thirdly, a query by Dr. Gordon raises serious epistemological doubts. She suggests (p. 325) that differences in cultural life, religious symbolism, and so on make it difficult for a European analyst to score confidently upon the Hindu responses to Rorschach tests. One cannot prevent this doubt extending itself to the range of technical vocabulary derived from psychopathology in the West. Terms like "paranoia" have significance and value only in relation to their opposites—that is, to states of mind regarded as normal in a given society. If paranoia characterizes a whole society and is consequently normal in that society, we have either to redefine our terms completely or else be a good deal more circumspect in our dealings with any of our friends who happen to be Hindus.

The over-all criticism rests finally not upon the relation of evidence offered to conclusion drawn, unsatisfactory as it is. More fundamental are doubts concerning the kind of knowledge sought and the logical premises of the attempt.

D. F. POCOCK.

ALDOSTERONE

An International Symposium on Aldosterone. Edited by Alex F. Muller, M.D., and Cecilia M. O'Connor, B.Sc. (Pp. 232+x; illustrated. 40s.) London: J. and A. Churchill, Ltd. 1958.

This book is a detailed report of contributions by recognized authorities to specialized fields of research on aldosterone. It is based on 13 papers of high standard, followed by detailed discussions, which as usual contain a mass of useful information. The organizers of the symposium, held in Geneva last year—Professor R. Mach and his Swiss colleagues—are to be congratulated, and the editors too have done their work well. I feel that the technical production of the book itself does not give the ease of reading characteristic of earlier volumes by the same publisher; in particular, some of the diagrams are a little obscure and some are accompanied by liberal amounts of excessively small print.

It would be invidious to draw distinction between the various contributions, but chapters that might be expected

to have the most general appeal include those on the site of aldosterone secretion by Giroud and colleagues, its metabolism by Tait and colleagues, and oedema by Wolff and colleagues. Those by Garrod and colleagues and Stanbury and colleagues contain useful review material on so-called primary aldosteronism and renal abnormalities in relation to aldosterone respectively.

F. T. G. PRUNTY.

MEDICINE FOR DENTISTS

Oral Medicine: Diagnosis and Treatment. By Lester W. Burket, A.B., D.D.S., M.D., Sc.D. With a Chapter on Oral Cancer by S. Gordon Castiglano, B.A., B.S., M.D., F.A.C.S. Third edition. (Pp. 558+xxi; illustrated. £5.) London: Pitman Medical Publishing Co., Ltd. 1957.

This is a further edition of an already well-known book. Many chapters have been rewritten and therapy has been brought up to date. A special colour atlas of common oral lesions is now included with a chapter on oral cancer. The attempt to bridge the gap between general medical conditions with specific signs and symptoms in the oral cavity, and purely local conditions, is difficult to achieve. It might perhaps at times have been better to have left these conditions as something of which the dental surgeon should have some knowledge, rather than try to link them, often on very tenuous grounds, with some oral manifestations—for example, urogenital conditions, appendicitis, etc. On the whole, however, this is a very useful book, but I hesitate to think what would happen in this country if the over-worked dental hospitals and practitioners were asked to use the questionnaire as given to all patients at the University of Pennsylvania School of Dentistry, where 80 questions have to be answered by the patient before treatment is started, including ones such as No. 78, "Do you wish that you always had someone at your side to advise you?" and No. 80, "Do you feel you mix well with people?" The instructions are "to answer all questions and if you are not sure—guess."

A. B. MACGREGOR.

REGIONAL BLOCK

Regional Block: A Handbook for Use in the Clinical Practice of Medicine and Surgery. By Daniel C. Moore, M.D. Second edition. (Pp. 393+xvi; illustrated. 80s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

The first edition of this excellent manual achieved the success which was predicted for it. The second edition will be as eagerly sought after as its predecessor. On every page it bears the hallmark of long personal experience by the author. The illustrations and text, as before, are particularly clear, and enable anyone who takes sufficient care to attain success with these methods of local analgesia. The production is once again of a high standard, paper, printing, and binding being excellent.

W. W. MUSHIN.

A small handbook on *Respiratory Disease and the General Practitioner*, by C. H. C. Toussaint, has been published by the National Association for the Prevention of Tuberculosis (28 pages, illustrated; 7s. 6d.). It contains practical advice on the diagnosis of respiratory tuberculosis and bronchial carcinoma and on the management of bronchitis. Special emphasis is laid on the value of diagnostic radiography.

Modern Drug Treatment in Tuberculosis, by J. D. Ross (National Association for the Prevention of Tuberculosis, 47 pages; 5s.), is intended primarily for nurses. It describes the use of streptomycin, P.A.S., isoniazid, viomycin, pyrazinamide, oxytetracycline, cycloserine, and thiosemicarbazones. A chapter on drug resistance is included.

The National Library of Medicine Catalog for 1957 provides an author and subject catalogue of the additions to that library during the period January-October, 1957. Besides new works the catalogue records titles of older material recatalogued during the period. It is obtainable from the Card Division, Library of Congress, Washington, 25, D.C., U.S.A., price \$17.50.

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TEN YEARS

Ten years ago, as both of the plebiscites of 1948 showed, a majority of the profession was opposed to entering the National Health Service. A plebiscite to-day, exactly ten years later, would undoubtedly show a majority to be highly critical of the Service and in favour of reform. Our correspondence columns have shown that the desire for reform is widespread. At Birmingham next week the Representative Body will hear from the Chairman of Council, Dr. S. Wand, that the Royal Colleges in England, to be joined soon, it is hoped, by the Royal Scottish Corporations, the Society of Medical Officers of Health, and the College of General Practitioners, will co-operate with the B.M.A. in a review of the health services of Great Britain. A committee widely representative of the whole profession will thus set out to discover just what general practitioners, consultants and specialists, professors and teachers, and medical officers of health think of the N.H.S. The intention behind this exercise is to bring together the facts, to sort them out and to classify them, to make comparisons with similar facts in other countries, and to make recommendations which may lead to a service in which doctors can work more happily and efficiently than they do at present. The end of the first decade of a social revolution finds the profession in no mood for jubilation. The politicians must inwardly regret their enormous errors of calculation. Whatever benefits it has received the public is beginning uneasily to wonder whether the price has not been too high in this free-for-all scramble for medical attention. It is at least good that the doctors of this country are entering the second decade with a determination to put aside their internal differences in order to find out just what the past ten years of experiment have added up to, and to decide what direction the medical profession shall take in the coming ten years.

In the *Supplement* this week is a symposium of articles written to mark the end of the first decade of the N.H.S. In it we have also brought together the principal resolutions on various aspects of the N.H.S. passed by the Representative Body: here-for

ready reference is a summary of the official policy of the Association. The two principal protagonists in the medical arena ten and more years ago were Dr. H. Guy Dain as Chairman of the Council of the B.M.A. and Lord Moran as President of the Royal College of Physicians. We have invited them to put down some of their reflections on the past decade. What they say has behind it the weight and authority of two men who more than any other were, ten and fifteen years ago, intimately involved in the intricacies of medical politics—the one predominantly concerned with the Association and the interests of the general practitioner, and the other with the problems of the hospital and consultant world. What is of special interest is that both these experienced Elder Statesmen of the profession throw out more than a hint that some form of direct charge should be made at least for some services. This is not exclusively a political issue. Doctors are, of course, concerned to see the N.H.S. solvent, to make sure that money that should be available for hospital development, for instance, is not thrown away on household remedies everyone used to buy for himself but now gets out of the Health Service. The politician averts his gaze from this and pretends it is the expensive proprietaries that send the drug bill soaring. The doctor wants to ensure that there is no barrier between the patient and the life-saving or disease-preventing remedy. He also wants to ensure that the public uses the Service in a responsible way. He casts an envious glance at Australia, where, as Dr. Ronald R. Winton puts it in his article in the *Supplement*, "the view has prevailed that the benevolent but bureaucratic grandfather who presides over the Welfare State is not for us. Various social services provide for those with genuine needs, but a premium is still put on self-reliance and independence of spirit." This is well said, and many doctors in Britain would echo his words. Quite apart, therefore, from any question of financial solvency, many doctors now would like to see the patient taking a greater share of direct responsibility for his own physical welfare, and it is interesting to note the views of Dr. Dain and Lord Moran on this.

We should, Dr. Dain says, have a look at health services in other countries, and in this connexion he refers to the fee-per-service system: "Both doctors and patients would seem to set a better value on a service if some payment was made at the time." The articles in this week's *Supplement* show that our colleagues in Australia, Canada, and New Zealand are firmly opposed to the capitation method. What seems to be behind this opposition is a dislike of a uniform levelling of reward for work done which

takes little regard of the diversity of human ability. The great virtue of the merit awards for consultants was—and is—that they take this diversity into account. We have criticized certain aspects of this system in the past, but at the end of ten years it is true to say that consultants as a whole accept merit awards as a valuable stimulus to effort and a practical recognition of the results of that effort and ability. Lord Moran's name has been closely linked with this novel experiment, and at the end of a decade of operation he can with justifiable satisfaction record that he has converted the Treasury to his view as well as his fellow consultants. But he has his fears for the future of medicine. Does medicine offer a challenge to achievement to those seeking to enter its portals? Or is it just one more port of security for the safe but mediocre minds for whom the Welfare State has such a dreary appeal? There is reason to fear that medicine may be attracting less of the available top talent than it used to do: and if this can be laid at the door of the N.H.S. then the aims of the Spens Reports have not been fulfilled—which is not surprising, as their terms have not been carried out.

Most people would agree with Dr. Dain that from the point of view of the public the Health Service has been a success. Many barriers that existed before have been removed, especially for those of moderate means. There has been a more even distribution of consultants throughout the country and a general increase of hospital facilities. But many of the benefits laid at the door of the N.H.S. more properly could be credited to the advances of modern medicine. One of the most remarkable of these has been in the field of medicinal therapeutics: yet we already hear the State managers growling at the pharmaceutical industry, whose participation in this phenomenal progress has been indispensable. British medicine to-day is at a high peak of achievement. In research, in ingenious experiment, in speculative energy, we can hold a candle to any other country in the world. But those who are paramount in these fields came into medicine before 1948. Will British medicine stand so high ten years hence? Unless we can be sure that it will, or at least create the conditions that make for excellence, then the N.H.S. may a decade from now be a perfect machine manned by an army of uniformed conductors but without a driver.

Among the articles in this week's *Supplement* appears one by Professor Paul F. Gemmill, who is a professor of economics in the University of Pennsylvania. He conducted a survey of his own in this country in 1956. It would be fair to judge that his conclusions were favourable to the N.H.S., and he has

certainly tried to bring some kind of measurement into the matter. Yet his figures are disquieting. Nearly 40% of the general practitioners in his survey found the "paper work" burdensome. Nearly 50% of the doctors questioned said their time was often taken up with "very minor ailments." Only 11% said that these complaints of "very minor ailments" led to the prevention or detection of something more serious. But what will surprise many is the reply to the question put to patients by Professor Gemmill about a comparison of the medical services under N.H.S. with those before 1948: only 37% said the N.H.S. was better than what went before; 50% said the medical service to-day was about the same as it used to be; and 13% said conditions were actually worse. It is to be hoped that the implications of this result will be understood by the Conservative M.P. whose stupid and ill-informed observation is reported at the end of Professor Gemmill's interesting paper.

In this week's special *Supplement* we have not attempted to review the Act and its deficiencies, the numerous reports issued since 1948 such as the Goodenough, the Guillebaud, the Bradbeer, and so on. We have chosen, instead, to bring together by selection or by invitation contributions from men who are first and foremost individuals with minds of their own, and in particular from the two opening contributors, whose views have a historical interest in that they were the first actors on the stage set by Sir William Beveridge (as he then was) in 1942. No one—not even Professor Gemmill's slightly absurd politician—would repeat in all its detail the experiment of 1948 if given the chance to do so. It is no good crying over the milk that was spilled then by the pailful. The urgent task is to look into the future, to repair, to reconstruct, to liberate the spirit of medicine from the inept embrace of the bureaucrat.

The most promising sign is the coming together of the Royal Colleges with the B.M.A. and others to examine the immediate past ten years in order to plan more wisely for the next ten. It will be no easy task—there are bound to be setbacks and disappointments. But the leaders of the profession to-day recognize there is far more at stake than the prerogatives of this or that organization or institution. If July 5, 1968, is to witness a more happy kind of celebration than is possible to-day it will be the result, as much as anything else, of the co-operative movement towards reform being undertaken by the committee now moving into action as a result of the initiative of the B.M.A. and of its Chairman of Council, Dr. S. Wand.

CANCER RESEARCH

Under the auspices of the Union Internationale contre le Cancer, the Seventh International Cancer Congress will be held in London from July 6 to 12, with Sir Stanford Cade as president. It is now thirty years since the last international cancer congress took place in London, sponsored by the British Empire Cancer Campaign. In the interval congresses have been held in Madrid (1933), Brussels (1936), Atlantic City (1939), St. Louis (1947), Paris (1950), and Sao Paulo (1954), under the aegis of the Union Internationale. The proceedings of this series of meetings naturally provide a useful record of the development of cancer research over a period sufficiently long to show its main trends; and much will be learned from comparison of the London meeting of 1928 with that about to take place. The earlier meeting had Sir John Bland-Sutton as president, and its membership embraced a host of famous names. Its official report (edited by the late Professor Archibald Leitch, then director of the Research Institute of the Cancer Hospital) contained many useful papers on aetiology, the causative role of viruses, occupational cancer, the relative values of surgery and radiation, chemotherapy with heavy metals, early diagnosis, the biological effects of radium and x rays, and cancer of the lung—with a contribution by Sir Robert Hutchison on the increased frequency of this disease, which was then beginning to be suspected and defined, though very far from attaining its present spectacular dimensions. The expansion of cancer research in the intervening years is to some extent exemplified by the numbers who will attend the forthcoming Congress: in place of two or three hundred there will be nearly 2,000 from 63 different countries, including some 500 from the United States and 50 from the Soviet Union.

What is the present situation of cancer research and what are the prospects for the future? The two major aspects, clinical and experimental, are reflected in the programme of the Seventh Congress. The beginnings of cancer research in the earlier part of the nineteenth century—coincident with the rise of the cell theory—were followed by a long period of description and classification. This period certainly laid the foundations of our modern knowledge, but it was followed, inevitably, by a phase in which doubts arose about how much further progress could be expected from study of the disease in man alone. In turn this led to wider application of the experimental method—in this country through the establishment in 1902 of the laboratories of the Imperial Cancer Research Fund under the auspices of the Royal College of Surgeons of England and of the Royal

College of Physicians of London, and in 1909 of the Research Institute of the Cancer Hospital. The clinical and pathological approach on the one hand, and the experimental approach on the other, are of course complementary, and must remain so. In spite of the difficulty in extracting fresh knowledge from study of the human disease alone, advances are still being made along this path, notably in the fields of statistics, demography, geographical pathology, and endocrine control, which is the subject of three papers in this issue by R. D. Bulbrook, F. C. Greenwood, G. J. Hadfield, and E. F. Scowen. We must not forget that the first essential clues to cancer causation came from clinical and occupational medicine alone. Yet there is equally no doubt of the power and flexibility of the experimental method. Employing it, the great E. F. Bashford, first director of the Imperial Cancer Research Fund, was able, in the ten years prior to the first world war and with the aid of a small but brilliant staff, to elucidate the basic characteristics of the cancer cell. Starting with a demonstration of the almost universal zoological distribution of the disease in nature, he was soon able to define, in terms of tissue immunology, the capacity of the cancer cell to propagate itself in serial transplantation. His genius is shown in a statement which he left us, forecasting in prophetic fashion the needs and development of cancer research. He realized, as did others, that the next great step forward must depend on the artificial production of the disease under experimental conditions at will. This is not the place to recount the many failures of such attempts. Eventually success came to the Japanese Yamagiwa and Ichikawa in 1915, when they were able to induce undoubted cancer by long-continued application of coal-tar—already incriminated in the causation of many forms of cancer occurring as an industrial hazard—to the skin of rabbits. The new Japanese discovery provided the means of tracing and identifying the agent responsible, and from the work of the late Sir Ernest Kennaway and his school at the Cancer Hospital in the nineteen-twenties and thirties the cancer-producing agent in pitch and coal-tar was ultimately defined as the polycyclic aromatic hydrocarbon 3:4-benzpyrene. Since that time many other types of chemical substance have been discovered, equally capable of producing cancer, and ranging from azo-dyestuffs and aromatic amines to polymers, plastics, and metals. In the past ten years fundamental information of great importance has been derived from study of the so-called alkylating carcinogens—nitrogen mustards, epoxides, ethyleneimines, and dimesyl compounds—the reactive side-chains of which may conceivably exert their chief effects against the integrity of the

nucleic acid structure. In addition, the same cancer-producing property is to be found in many kinds of radiation—infra-red, ultra-violet, x and gamma rays, alpha and beta radiation, and protons and neutrons.

Early in the history of cancer research two main conclusions were quickly reached: first, that the cancer cell and the normal embryonic cell are in many ways remarkably similar; and, secondly, that malignant change involves a reversion to a more primitive state and less specialized function. Modern research not only supports these conclusions but has added to them. Far from the cancer cell having acquired any new property, it appears to have lost something present in normal cells which is required for controlling their growth, so liberating permanently the suppressed growth potential that they had all along possessed. In the past ten years interest has extended from carcinogenic agents in their own right towards the means by which so many agents, chemically and physically diverse, can bring about malignant change. As to the production of cancer by chemical carcinogens, it appears that these may combine with substances responsible for cellular heredity and growth control, thus leading to elimination of the forces which ordinarily restrain the change to malignancy. Although the evidence is not yet conclusive this supports the view already suggested that the cancer cell is biochemically deficient, either in its growth-regulatory systems or in the hereditary material responsible for their synthesis. Apart from this as it were chemical interpretation, research workers, particularly in the U.S.A., have made notable advances in the past few years in the field of tumour viruses—advances in many cases proceeding directly from the discoveries of Ludwik Gross, whose paper on the viral aetiology of mouse leukaemia is printed in the opening pages of this issue. Discussion of these viruses will certainly have a prominent place in the proceedings of the Congress.

Complete knowledge of the attributes of the cancer cell, when this is obtained, will perhaps suggest, on a rational basis, the means of control. Meantime the chemotherapy of cancer has been making good progress, and it has been gratifying to see how the results of experimentation in animal species—in many instances, although not, of course, in all—have proved capable of clinical application in man. But cancer chemotherapy is still in its merest infancy, and the few advances that have been made do not as yet affect the treatment of cancer as a whole. Almost certainly the present chemical remedies will be superseded by far more specific molecules, which will possibly restore the control of cell division and growth which the cancer cell appears to lack. When the suppression

of the disease is achieved, the success will have been made possible by one thing alone—that international co-operation in science and medicine which will be the underlying theme of the Seventh International Congress.

CAUSATION OF CANCER

A special number of the *British Medical Bulletin* has been issued by the British Council devoted exclusively to the causation of cancer.¹ It includes 27 contributions from sixteen different cancer research centres. A similar special number of the *B.M.B.* appeared in 1947, and was concerned chiefly with chemical carcinogenesis. Professor A. Haddow, F.R.S., in his introduction compares these two cancer surveys and points out that the period 1947 to 1958 has witnessed a revival of interest in tumour immunology, with considerable and unexpected advances in our understanding of transplantation immunity and immunogenetics. The nature of the autonomy of tumours and their hormonal dependence has also been much clarified during the last few years and much more is now known about endocrine carcinogenesis.

The advent of the nuclear age has not only brought startling scientific advances, but has also created innumerable problems of hazard and control, many of which have a direct bearing on the incidence of cancer. These secondary consequences of scientific research are referred to more than once, but considered most fully by Dr. W. M. Court-Brown. After discussing the incidence of leukaemia among survivors of atomic explosions, and among radiologists and patients irradiated for diagnostic or therapeutic purposes, the author summarizes his conclusions as follows:

"The findings of the Atomic Bomb Casualty Commission, the results of surveys on the incidence of leukaemia in irradiated patients, and the increased leukaemia mortality recorded among radiologists, all suggest that ionizing radiations can cause leukaemia in man. Difficulties in interpretation have arisen in some of these investigations, but if all are taken together the data provide convincing evidence of man's susceptibility to the induction of leukaemia by irradiation. It now seems established that radiations do not increase the incidence of chronic lymphatic leukaemia but that they increase the incidence of the acute leukaemias and of chronic myeloid leukaemia. There is some conflict of evidence, in regard to the average length of the latent period, between the Japanese data and the findings of both the spondylitic and Danish surveys. It seems reasonable, however, to conclude that in Western Europe the latent period before the appearance of the acute types of leukaemia is usually from three to five years, but that it may well be longer in some cases of chronic myeloid leukaemia."

The carcinogenic effect of radiation and the manner of its operation are discussed also in papers contributed by Dr. R. H. Mole and Dr. A. Glücksmann, but most of the articles in this special number of the *Bulletin* are concerned with chemical carcinogenesis, and of them the most comprehensive is Professor Haddow's. His masterly survey of a very complex subject ends by pointing

¹ *Brit. med. Bull.*, 1958, 14, No. 2.
² Green, H. N., *Brit. med. J.*, 1954, 2, 1374.

out that, whatever the precise chemical mechanism of the action of carcinogens, there can be little doubt of the importance of their combination with genetical material or its precursors. It seems at present as if the primary step in carcinogenesis may be the inhibition of certain fundamental processes of genetical or enzyme synthesis.

The papers of chief clinical interest are those on cancer of the bladder contributed by Dr. Georgiana Bonser and her co-workers at Leeds and by Professor E. Boyland, of the Chester Beatty Research Institute. Occupational cancer is discussed by Dr. M. W. Goldblatt, and aromatic amines by Drs. A. L. Walpole and M. H. C. Williams. Both these papers condense much new and valuable information into a few pages.

The article by Professor J. W. Orr which is listed on the cover under the rather misleading title of "Irreversible Changes in Chemical Carcinogenesis" is really a plea for the renewed study of a much neglected subject—namely, the effect of a carcinogenic agent on the nutrient stroma by which a tumour is supported. It is more than twenty years since Orr pointed out that in the case of epidermal tumours there is a progressive alteration of collagen and elastic fibres throughout the latent period which follows the application of a carcinogenic agent, and that the rate at which this change advances is correlated with the potency of the carcinogen used. His subsequent series of grafting experiments has certainly given support to the view that the effects of a carcinogen on the supporting tissues are of first importance.

Many cancer research workers will be glad to have the opportunity of rereading Professor H. N. Green's article on the immunological basis of carcinogenesis, because the theory on which it is based has been considerably expanded and to some extent modified since first published in this *Journal* four years ago.² Dr. F. Bielschowsky, of Otago University Medical School, New Zealand, and Professor E. S. Horning, of the Chester Beatty Research Institute, have collaborated in a general review of the influence of endocrines in the development and control of tumours; this is a carefully documented paper with a long list of references.

The "Causation of Cancer" is a subject which looms large in the programme of the International Congress being held in London next week (see leading article at p. 35), though, understandably, no opening speaker has dared to choose it as the title for a communication. From the programme of the Congress it seems most likely that the general subject of the causation of cancer will be a central theme in the discussion of the Biology Sections on Monday and Tuesday afternoon, at the Congress Plenary Session on Thursday afternoon, and in the Biochemistry Section on Friday afternoon, but in one form or another the general aetiology of cancer will form part of the programme of the Experimental Group at each of the morning sessions also.

HEALTH SERVICE EXPERIMENTS

Of all the criticisms of the administration of the National Health Service lack of co-ordination is the one most regularly repeated. Time and time again "the

various branches of the Service have been urged to work more closely together, yet glaring instances of failure to co-operate are always in evidence. Often these are not the fault of individuals but rather of the system, and it has been one of the important functions of the Nuffield Provincial Hospitals Trust to diagnose organizational defects in the N.H.S. and to see how they can be put right. The Trust's most recent report,¹ published this week, mentions with particular satisfaction the development in the new town of Harlow of comprehensive medical services on which the Trust is spending over £250,000. Co-ordination of services has always been the principal aim of the Trust, and at Harlow "the administration of the various medical and dental services is a divided responsibility, but the whole appears as one service to the patient, because the (group practice and clinic) centres are properly planned and equipped to this end and encourage those working there to co-operate naturally."

One of the most useful services which the Trust, as an unofficial body, can perform is to take unproved but promising ideas and base practical experiments upon them. The report is full of accounts of such experimental studies in all branches of the N.H.S., clinical and administrative. For instance, many patients leave hospital still needing help, and the effect of bringing all the available social services to their aid is being studied; the whole problem of bringing a new hospital (the Princess Margaret Hospital at Swindon) into use is being investigated; the incidence of leukaemia in adults is to be surveyed; the rehabilitation of elderly invalids has been successfully carried out in their own homes instead of in hospital; and a general practitioner is collecting sociological and medical data about his patients with a view to correlating morbidity with as many of the known environmental and hereditary factors as can be obtained.

Some of the most rewarding of the Trust's activities are in the field of mental health. The taking over by a regional hospital board of a home established by the Trust for deaf children with emotional difficulties is yet another example of a successful social experiment by a voluntary body being adopted officially by the State. Another regional hospital board, with the help of a grant from the Trust, has established a "day hospital service" in an ordinary hospital for mental defectives. The patients are brought to the hospital for the day and "absorbed into the hospital routine." The relief to the relatives of the patients is great, and the scheme also helps to avoid the blocking of much-needed beds, by long-stay cases. A plan to ease pressure on mental hospitals is being tried out in Worthing, where a district mental health service has been set up. The object of this experiment is to see if a comprehensive psychiatric out-patient service can materially affect the steady annual increase of patients admitted to mental hospitals. Another way of relieving pressure on the hospitals is to see whether some of the long-stay psychotic patients can be improved to the point where life outside the hospital becomes a possibility. The report of the Trust suggests

¹ The Nuffield Provincial Hospitals Trust. *A Record of the Progress of Schemes and Descriptions of New Projects, 1955-1958: Fourth Report*, 1958. Oxford.

that "under certain conditions the mentally ill patient will react to such accepted stimuli from the outside world as incentives." A grant has therefore been made towards the establishment of a work-therapy unit in the grounds of a mental hospital. Here patients will work side by side with normal people in a simple series of manufacturing processes, and they will have the same incentives as are offered to other workers. This is an experiment which will be watched with special interest.

HAZARDS FROM COSMETICS

The incidence of reactions to cosmetics is probably very low, but cannot be accurately assessed. Most women experiencing some irritation or discomfort after using a particular product will change to another without consulting a doctor. Only if the symptoms are severe or prolonged or appear to be provoked by the products of more than one manufacturer is medical advice likely to be sought. Most reactions to modern cosmetics result from the development of a simple allergic sensitivity or from the action of certain ingredients as photosensitizers. Accumulated experience and controlled trials enable manufacturers to avoid incorporating in their products chemicals which are known to be potential sensitizers.

Advances in cosmetic science are often followed by the introduction of new chemicals into cosmetic products. Despite the manufacturers' precautions, untoward reactions, sometimes of bizarre or unexpected pattern, may occasionally be provoked. Recent examples are granulomatous papules in the axillae after the use of deodorant sticks containing sodium zirconium lactate,¹ and dermatitis of the hands apparently caused by the synergistic action of household detergents and triethanolamine in a hand lotion.² Such special hazards are rare and can be eliminated once their existence and cause have been satisfactorily established. It may fairly be claimed that cosmetics employed for the purpose for which they are intended provoke reactions in only a very small proportion of users, and that these reactions seldom cause more than temporary discomfort and inconvenience, though they may present the dermatologist with intricate problems in differential diagnosis.

A recent report to the Committee on Cosmetics of the American Medical Association³ discusses the dangers arising from the misuse of cosmetics. Review of over 15,000 reports of poisoning due to the accidental ingestion of chemicals showed that cosmetics were involved in 3% of cases. Nail lacquers and polish removers, shampoos, permanent-waving solutions and neutralizers, scents, and various lotions were most frequently implicated. Whether cosmetics are responsible for a similar percentage of cases of accidental poisoning in Great Britain is unknown. Deaths from accidental poisoning in England and Wales are classified according to the toxic agent involved and not according to the substance in which the agent was present. However, the Registrar-

General has been able to trace since 1950 records of two fatal cases of poisoning in girls under 5 in which a hair lotion was specifically mentioned. The American report draws attention to the increasing use of pharmacologically active substances in cosmetics; even the more conventional ingredients include petroleum distillates, metallic salts, and a multitude of organic chemicals. That manufacturers of cosmetics are aware of the need to consider the consequences of possible misuse is certain; potassium bromate was widely employed to neutralize cold-waving solutions (salts of thioglycolic acid). Since fatal cases of poisoning⁴ have been reported less toxic substances have largely replaced bromates.

CONGENITAL DISLOCATION OF THE HIP

From the time of Hippocrates, who associated congenital dislocation of the hip with uterine pressure or birth trauma, various opinions have been advanced to account for the abnormality. The emphasis on environmental factors at the beginning of the present century later gave way to genetical hypotheses; to-day it is thought that both factors play a part and that actual dislocation and subluxation are generally secondary to the more common condition of flat socket associated with genetic dysplasia of the hip.¹ The average age at which the dislocation becomes complete is not known, but usually the femoral head is only partly dislocated during infancy and before weight bearing.² Most cases in this country are diagnosed at the age of 1 or 2 years; the earlier the diagnosis is made the better are the results of treatment. A recent paper by R. G. Record and J. H. Edwards,³ of the department of social medicine at Birmingham University, provides a useful objective analysis of some environmental factors which, they suggest, may be associated with the 186 cases of the abnormality studied in that city. The incidence (0.65 per thousand live births) is low compared with other estimates, but the sex ratio (85% female), the preponderance of left-sided dislocation (64%), and the association with breech deliveries is in conformity with previous reports. The birth weight of affected babies was found to be below the expected figures, and the incidence in the winter was double that in the summer months. The risk of the condition occurring in subsequent pregnancies was about 5%, but this figure naturally depended on the sex and season of birth. Record and Edwards suggest that the seasonal incidence may be associated with the heavier clothing and wrappings used during the cold winter months with a consequent restriction of limb movements, and that similar mechanical factors may be associated with the high incidence of the abnormality among some Lapp and Red Indian communities. This is a controversial hypothesis, but any possible aetiological factor which may be subject to control requires careful study. The Birmingham report as a whole underlines the opportunities for further research into environmental factors associated with congenital abnormalities.

ENUMERATION OF THE "CRAVINGS" OF SOME PREGNANT WOMEN

BY

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The strong desires experienced by pregnant women for various items of food, and even for inedible substances, seem to be a matter of common knowledge, but there is considerable disagreement about the reasons for, and the significance of, these "cravings." It is sometimes stated—for example, by Drummond and Wilbraham (1939)—that a pregnant woman's increased requirement of vitamin C and calcium leads her to crave foods which are rich in these substances; but it is also thought that her desires may be purely psychological in origin. Thus Yudkin (1956) suggests that "the pregnant woman may well demand not oranges but peaches out of season." A search of the literature has revealed only meagre factual information on the subject, and the object of this paper is to describe a collection of such "cravings"—an inadequate record from many points of view, but one which may serve as a stimulus to a more systematic inquiry.

The Records

Early in 1956, during one of a series of broadcasts under the title "Is There a Doctor in the House?" given in the Light Programme of the B.B.C., pregnancy was discussed briefly, and the phenomenon of strong desires for, and aversions from, certain items of food was mentioned. Listeners were invited to write to the B.B.C. on this subject, and the letters received in response to this request have been made available through the kindness of Miss I. D. Benzie, who produced the series.

The nature of the records is such that they do not provide a statistically adequate sample. In the first place, it seems likely to be biased on the side of the unusual, since correspondents to the B.B.C. may tend to write only when there is something remarkable to write about. Secondly, the sample cannot be assumed to be random or representative, since it might be biased both geographically and by the broadcast which gave rise to the letters. Conclusions may therefore be drawn only with caution, and cannot be applied to pregnant women in general; but where a number of women, however unrepresentative they may be, agree in "craving" the same substances to the exclusion of others, some explanation is necessary, though it may of course be psychological rather than physiological.

Results

There were 514 letters, of which 509, reporting 820 pregnancies, have been used in the present report. The remaining five described likes and dislikes for colours, types of music, etc. Most of the letters came from the Home Counties, 102 of the cases reported being in London. There were 36 from Yorkshire, 36 from Lancashire, 23 from Scotland, 20 from Wales, and 1 from Northern Ireland. Most of the reported cases were in 1955 and 1956, but there were many recollected from earlier years, the earliest being in 1894.

The 991 cases of "cravings" have been classified in Table I, which shows the frequency with which various groups of substances were desired. The grouping of substances was decided on as convenient, and it was also considered advisable to separate the records of demands for vegetables and cereal products, according to whether they

TABLE I.—Reported Frequency of Cravings Among 991 Cases

Fruit (see Table II)	261	Alcoholic drinks	17
Vegetables (raw 72, cooked 33)	105	Ice-cream and iced lollies	17
Confectionery	79	Spices and condiments (eaten neat)	17
Pickled foods	66	Milk and milk products	15
Cereal products (prepared 17, dry raw 48)	65	Sugar and preserves	12
Fish (including shellfish)	49	Eggs	10
Nuts	35	Other food products*	17
Mineral waters	20	Non-food substances (see Table III)	187
Meat and meat products	19		

*Coffee grounds (5); fat (unspecified) (3); tea leaves (2); aspirin, coconut milk, custard powder, dog biscuits, "health salts," jelly, and "stomach powder" (one each).

were eaten raw or cooked, because of the high frequency of the former. By cooked (prepared) cereal products is meant bread, biscuits, cakes, and breakfast foods, whereas a considerable number of the demands were specifically for such foods as macaroni, Indian corn, rice, oatmeal, and maize, eaten dry and raw.

In view of the large number of cases of cravings for fruit, these are shown in greater detail in Table II. It is noteworthy that most of those craving apples wanted green sour ones.

TABLE II.—Details of 261 Cravings for Fruit

Apples	76	Tomatoes	31	Pineapples	4
Oranges	68	Soft fruit	25	Bananas	3
Other citrus fruits	24	Stone fruit	16	Dates	3
		Pears	5	Other fruit*	6

*Melon (2), plantains, pomegranates, raisins, and rhubarb.

The frequency of desires for substances normally considered inedible is shown in Table III, and the 193 reports of substances normally liked, but disliked during pregnancy, are detailed in Table IV.

TABLE III.—Details of 187 Cravings for Substances Other Than Food

Coal	35	Petrol	10	Soil	7
Soap	17	Polish (metal)	10	Chalk	4
Disinfectant	15	Tar	10	Charcoal	4
Toothpaste	14	Paraffin	9	Cinders	4
Mothballs	10	Wood	8	Others	30

TABLE IV.—Details of 193 Reports of Substances Normally Liked, But Disliked During Pregnancy

Tea	78	Bacon	7	Beer	4
Tobacco (smoking)	24	Chocolate	6	Fish	4
Coffee	22	Eggs	5	Oranges	4
Marmalade	8	Sweet foods	5	Others	26

There are also certain features common to a sufficient number of the letters to make them worthy of note, though in each case the writer volunteered the information, so that their number is no indication of incidence.

Many correspondents stated that, though they were able to joke about a "craving" after the baby was born, at the time it was overpowering. There are many statements of the specificity of the desire, and there are several descriptions of the temptation to steal in order to satisfy a particular appetite. Though the tone of many letters is amused as well as amusing, written after the event, there is general agreement about the seriousness of these "cravings" during pregnancy.

Also mentioned on numerous occasions is the sense of secrecy which surrounds the phenomenon. Many women state that they went to great lengths to keep their "cravings" secret even from their husbands. Several experienced a sense of shame.

There is no mention in any of the letters of a "craving" not being satisfied. Though there are many descriptions of how the required substance was obtained there are no reports of failure to obtain it. A few state that the satisfaction of their particular demands was capable of unbalancing the family budget.

The stage of pregnancy at which the "craving" was experienced is mentioned in 135 of the letters. Only six state that it was experienced for the full term; 59 report that it was experienced from the first to the fourth month of pregnancy; and generally it seems that the desire is usually felt fairly early.

¹ Sheard, C., Cormia, F. E., Atkinson, S. C., and Worthington, E. L., *J. Amer. med. Ass.*, 1957, 164, 1085.

² Thyresson, N., Lodin, A., and Nilzen, A., *Acta derm.-venereol. (Stockh.)*, 1956, 36, 355.

³ Conley, B. E., *J. Amer. med. Ass.*, 1958, 166, 638.

⁴ Dunsky, I., *Amer. J. Dis. Child.*, 1947, 74, 730.

¹ Hart, V. L., *Minn. Med.*, 1947, 30, 889.

² Hindenach, J. C. R., *Lancet*, 1955, 1, 15.

³ Record, R. G., and Edwards, J. H., *Brit. J. prev. soc. Med.*, 1958, 12, 8.

"Cravings" for two or more substances during the same pregnancy are mentioned in 76 of the reported instances. These have been examined separately for the food items but exhibit no pattern, either of similar or of contrasted substances being craved at the same time. Apart from following the general pattern of Table I they are fairly randomly distributed.

There are 57 cases of the same substance being craved in each of several pregnancies by the same person. Of these, 15 are for fruit and 11 for inedible substances, the others being scattered amongst various foods in too random a fashion to exhibit a pattern or to be reported in detail.

Discussion

The word "craving" commonly applied to this phenomenon may be an unfortunate one. It indicates desire of the strongest possible intensity, and it can be argued that ordinary preferences or likings for various foodstuffs have been called "cravings" in retrospect, the phenomenon being dismissed as due largely to this effect. On the evidence of the present letters there can, however, be little doubt that these desires are real, though it is possible that on occasion they are complicated by the intrusion of ordinary likes and dislikes.

Dietary surveys of groups of pregnant women—for example, People's League of Health (1942) and Burke *et al.* (1943)—make no mention of such large quantities of certain items of food as must have been consumed if these letters are any guide. Whether this is because of infrequent occurrence it is hard to say, but the impression left by the letters is that the women themselves surround their desires with such an aura of secrecy that they may well be more common than the evidence from ordinary dietary surveys would lead one to expect. Also relevant in this connexion, though by no means conclusive, is the total number of letters received. It is, of course, impossible to estimate the proportion of pregnant women who experience these "cravings," but we understand from the B.B.C. that the response rate was striking in view of the casual nature of the request for information, made at a time when the Light Programme is faced with the massive competition of Children's Hour.

In assessing the results of the present inquiry the large number of "cravings" for inedible substances must be largely discounted because of the possibility of bias in favour of the unusual, though many of the items shown in Table III lend support to psychopathic explanations. The preponderance of coal may be due to its having been mentioned by one of the speakers in the broadcast that gave rise to the letters. It was also apparent in many cases that it was the smell of such substances as disinfectant and petrol that appealed during pregnancy; but so many letters were vague on this point that separate results for eating and smelling have not been quoted.

So far as food items are concerned there is no doubt about the preponderance of fruit. Further, some 70% of the recorded cases are for varieties of fruit available virtually all the year round—apples, oranges, tomatoes, and lemons. Availability seems to be a more reasonable explanation of the order of popularity shown in Table II than vitamin C content, though with the exception of apples the more popular fruits are reasonably good sources of this vitamin. Such substances as wall-plaster and chalk are also said to be common objects of "cravings" during pregnancy because of increased requirements of calcium, but the number of such cases recorded in this series is very small.

A more probable explanation is that the expectant mother takes light refreshing snacks of those substances which "go down well" in order to counter the sickness and nausea which often accompany pregnancy, and fruit may be an ideal substance from this point of view. Another is that the snacks may be occasioned by the need for more calories during pregnancy—a general hunger which would hardly justify the use of the term "craving." But why in this case are the "cravings" so specific?

A theory advanced by one correspondent who had gathered considerable information on her own account was that the desire is for something to crunch. The texture of the food, she states, is more important than the flavour. This theory, which was also mentioned in the original broadcast, certainly finds some support in the present data in the high frequency of pickled foods, confectionery, nuts, such unusual foods as dry raw cereals, and the preference for uncooked vegetables.

Clearly, the data are inadequate to prove or disprove any of these hypotheses. They indicate, however, that these "cravings" are real, that they are kept secret so far as is possible, and that there seems to be a preponderance of "cravings" for fruit. Few solutions have been obtained to the many problems which arise in this connexion, but these results may help to pose them in such a way that they could be unravelled by a more systematic inquiry.

Summary

A series of 991 cases of "cravings," and 193 cases of aversions during pregnancy is reported from a collection of letters received by the B.B.C.

A preponderance of the "cravings" for food items was for available fruit, with a relatively high incidence of desires for raw vegetables, confectionery, pickles, and raw cereals. In addition, 187 cases of desires for inedible substances are detailed, the most popular item being coal.

It was clear from the letters that genuine cases of serious "cravings" did occur, and that there was a compulsion on the part of the women themselves to keep their desires secret, which may explain the lack of evidence in published reports of dietary surveys among pregnant women.

ADDENDUM.—Since these findings were reported to the Nutrition Society in May, 1957, our attention has been drawn to a paper by L. B. Posner, C. M. McCottry, and A. C. Posner (*Obstet. and Gynec.*, 1957, 9, 270) which describes a more systematic inquiry carried out at the Harlem Hospital, New York, where 600 patients in the third trimester of pregnancy were asked, "Is there some special food you crave during this pregnancy?" 394 answered "Yes," 196 answered "No," and 10 admitted "pica." The most common of the 30 items craved were Argo starch (106 cases), sweets (68 cases), and fruit (47 cases). Also noticed were a desire for secrecy and a preponderance of "foods commonly found in the average home kitchen." The paper also gives further references.

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WORLD CONGRESS OF GASTRO-ENTEROLOGY

[FROM A SPECIAL CORRESPONDENT]

A World Congress of Gastroenterology was held in Washington during the last week of May. It represented the third international congress of gastroenterology, the first having been held in Brussels in 1935, the second in Paris in 1937, while the third was to have been held in London in 1940 but was prevented by other international events. This first World Congress amply demonstrated the growth of gastroenterology as a special field in medicine, for it was attended by more than 1,100 delegates from fifty different countries. The American Gastroenterological Association was the official host organization.

The programme was a busy one, comprising five main symposia and a very large number of individual communications. The proceedings will fill a large book (to be published in about six months), and even a brief conspectus of the congress cannot be expected from a single pen. I shall confine myself to some of the more interesting points which emerged in the symposia.

Peptic Ulcers

Dr. REINHOLD BOLLER (Vienna) described the medical treatment of duodenal ulcer in his hospital, emphasizing the rapid rehabilitation now being achieved chiefly through the education of the patient in diet, nutrition, and regular habits of living. For gastric ulcers he used a special milk, consisting of "yoghourt" made poor and acid by the use of liquorice, but enriched with fat, and which was known in Austria as "lakhurt." Both duodenal and gastric ulcers were increasing in incidence in Austria, but the loss of work due to them was diminishing with these treatments.

Dr. J. M. DE LA VEGA (Mexico) described sharp differences in the clinical behaviour of peptic ulcer in Mexico compared with the United States. Dr. F. AVERY JONES (London) described studies which had shown duodenal ulcer to be common in all social classes in Great Britain, although those holding responsible positions were somewhat more likely to suffer from it than others. By contrast, gastric ulcer was more prone to affect labouring classes than professional workers. A controlled study had shown that patients advised to give up smoking showed improved healing of a gastric ulcer compared with those who were not so advised; the best results were obtained in those who followed the advice and actually ceased to smoke. Dr. SARA M. JORDAN (Boston, Massachusetts) stated that 10% of the population of the United States suffered from a peptic ulcer at some time in their lives, there being 3.5 men for every woman affected. She estimated the mortality of the disease as 4%, but remarked that the morbidity was great and was very detrimental to the economic life of the nation, especially as the condition was particularly prone to affect men in responsible and executive positions.

Dr. A. LAMBLING and his colleagues (Paris, France) reported interesting features of peptic ulcer in France. At the beginning of this century gastric ulcer in women was the prevalent type of peptic ulcer. Up to 1939 the disease then steadily became more and more represented by duodenal ulcer in men. During the war the disease reverted to the characteristics of a half-century earlier, while since the end of the war it had gradually swung back to the features shown in 1939. The wartime shift was attributed to the emotional shock of the Occupation, coupled with a sudden change in nutritional habits, but not to under-nutrition of itself. Alcoholism did not appear to play any significant role in France. Drs. G. GARRIDO-KLINGE and LUIS R. PENA (Lima, Peru) described the high incidence of gastro-duodenal ulcer among miners working in the Peruvian Andes at an altitude of more than 12,000 ft. (3,660 m.). Among these miners, gastric ulcer was many times more common than duodenal ulcer and haemorrhage was a frequent complication. They concluded that vascular changes played an important role in this liability to gastric ulcer at high altitudes. Other speakers dealt with peptic ulcer in Venezuela, India, and Brazil. The discussion was notable for an excellent summing up by Dr. MORTON GROSSMAN (Los Angeles).

Malabsorption Syndromes

Special interest attached to the symposium on this subject, because it is a field of gastroenterology which has shown great progress during the past decade, and especially since the announcement in 1950 by Dicke, of Holland, that removal of the gluten from the diet of children with coeliac disease would bring about normal growth and development. In addition, quantitative methods of studying intestinal absorption have been greatly developed and widely

used, while recently biopsy of the small intestine by means of tubes introduced through the mouth has enlightened us on pathology.

Dr. E. E. WOLLAEGER (Rochester, Minnesota) described the behaviour of non-tropical sprue in the United States, emphasizing the fact that impairment of absorption was not confined to fats but applied to all nutrients, including proteins, carbohydrates, vitamins, minerals, and even water. Its diagnosis rested on the demonstration of defective absorption coupled with the exclusion of diseases which might give rise to a secondary steatorrhoea.

Dr. H. A. WEIJERS (Utrecht, Netherlands) described work done in collaboration with Dr. J. H. VAN DE KAMER on coeliac disease and wheat sensitivity, a communication of great interest, as they were pioneers in this field following Dicke's original clinical observations. As well as the generally accepted criteria for making the diagnosis, the establishment of wheat sensitivity must also be shown before idiopathic coeliac disease could be regarded as proved. The existence of such sensitivity could be established by measuring the amount of fat in the faeces after introducing wheat into the diet, but could be established more rapidly by determining the rise of blood glutamine following ingestion of gliadin. In normal people there was little rise in blood glutamine levels, whereas patients with coeliac disease showed a rise of more than 40% with a peak two hours after ingestion. The abnormal increase in blood glutamine suggested that there was defective proteolysis in the intestinal cells.

Dr. MARGOT SHINER (London) described the histological findings in non-tropical sprue as judged from small biopsy specimens obtained by peroral intubation (of which she was the pioneer). There was atrophy of the intestinal villi together with partial atrophy of the crypts of Lieberkühn. The post-gastrectomy and pancreatic types of steatorrhoea did not show any abnormality of the mucosa. In tropical sprue changes resembling those of non-tropical sprue might be found, but they were reversible with treatment with folic acid and antibiotics. By contrast, in patients with non-tropical sprue (idiopathic steatorrhoea) there was no improvement in the histological picture even though the patient had shown complete symptomatic recovery with appropriate treatment. Later in the symposium, Drs. C. E. BUTTERWORTH and E. PEREZ-SANTIAGO (Washington, D.C.) reported somewhat similar histological changes in tropical sprue to those observed by Dr. Shiner. They based their remarks on specimens obtained by means of a very ingenious instrument devised by Dr. W. H. CROSBY (Washington) consisting of a capsule at the end of a fine polythene tube, the capsule being swallowed by the subject. (This instrument seems likely to become a standard research tool, and possibly even a routine diagnostic one. When the capsule has reached a suitable place in the small intestine, suction applied to the free end of the polythene tube causes a knuckle of mucosa to enter a hole in the side of the capsule; this is followed by the creation of negative pressure, which in turn causes the release of a spring-loaded knife which cuts off the knuckle of mucosa. The polythene tube is then used to withdraw the capsule.)

Dr. J. M. FRENCH (Birmingham, England) described the successful results obtained from treating adult cases of non-tropical sprue (idiopathic steatorrhoea) with a gluten-free diet. "Almost all patients respond if appropriate measures are taken." The most important point to realize was the very slow nature of the response in some patients, so that it was necessary to persist with the gluten-free diet for three to six months before abandoning it as useless.

Professor A. C. FRAZER (Birmingham, England) discussed the pathogenesis of the malabsorption syndrome. He recognized two main classes of patient. There were those without intestinal disease who were chiefly examples of lack of pancreatic enzymes, with consequent failure to digest food efficiently. The others had intestinal disease and could be divided into examples of gluten-induced enteropathy (coeliac disease or non-tropical sprue), folic acid deficiency (which dominated some cases of tropical sprue),

altered bacterial flora (which applied in some of the other patients with tropical sprue), enteropathy due to dietary factors such as the ingestion of rancid fats, or one of the diseases in which the bowel wall was grossly abnormal, such as regional ileitis, Whipple's disease, gastro-colic fistula, and "blind-loop" syndromes.

Tropical sprue was dealt with by Dr. F. HERNANDEZ MORALES (Santurce, Puerto Rico), who described both florid and larval forms of the condition, the former being less common now than formerly because of the use of liver extracts and, later, of folic acid and vitamin B₁₂.

Amoebiasis

Amoebiasis remains one of the most important diseases in the world, and the session at the Congress showed how many problems of its epidemiology and treatment remain to be solved. Thus Dr. R. ARMAS CRUZ reported work from Santiago, Chile, based on the study of 700 cases of intestinal amoebiasis in which the diagnosis was supported by both clinical and parasitological findings. Therapeutic trials had been carried out which gave the astonishing result that a placebo had been found to give a 70% cure rate, whereas some drugs widely used in treating amoebiasis gave results which were no better or even worse.

Dr. ELSDON-DEW (Durban, South Africa) discussed the factors influencing the pathogenicity of *Entamoeba histolytica*, and showed that the mere presence of the organism was not sufficient to cause the disease. The accessory factors were probably complex, and several might need to operate simultaneously to evoke the disease.

In the subsequent discussion Dr. Armas Cruz's results evoked a good deal of critical comment, especially in view of the fact that a majority of his patients carried "small-strain" amoebae, which some parasitologists consider to be non-pathogenic.

Cancer of the Stomach

Cancer of the stomach remains common in almost all countries of the world, although varying greatly in incidence from one to another, with Japan holding the doubtful distinction of having the highest level. The results of treatment are still disappointing, and there is great need to improve early diagnosis as well as to learn the reasons for the geographical variations in its incidence, which presumably reflect important environmental factors concerned with the aetiology of the condition.

Dr. JOHANNES CLEMMESSEN (Copenhagen, Denmark) gave the results obtained by the Danish Cancer Registry for the period 1943-53 and compared the findings with those of other countries. In Denmark, gastric carcinoma accounted for 30% of all cases of cancer, which was somewhat higher than in England, but lower than in the other Scandinavian countries. Gastric cancer was particularly prone to affect the lowest-income groups in Denmark, as was also true for England. On the other hand, the condition was scarce in Africa, so specific carcinogens might be involved.

Dr. LEO RIGLER (Los Angeles, California) considered that detection of gastric cancer was best achieved by x-ray examination. It was essential to diagnose the condition early, which could sometimes be done before the stage of symptoms. Routine radiological surveys of the entire population were not practicable, but they were feasible in subjects who were known to be unduly likely to develop gastric cancer. These were patients aged 50 and more with pernicious anaemia, gastric ulcer, gastric symptoms, achlorhydria, or occult blood in the stools. In 3,150 patients with either pernicious anaemia or simple achlorhydria he had found 36 examples of cancer and 80 of gastric polyps, which were known to be pre-malignant lesions. By contrast, not a single example of either cancer or polyp was found in a control group of 1,098 patients with normal gastric acidity.

Dr. I. S. RAVDIN (Philadelphia, Pennsylvania) dealt with the factors affecting the outcome after surgery for gastric cancer. The essential was to diagnose cases while the disease was still limited to the gastric wall. All patients with a gastric ulcer which did not heal in 3-5 weeks with medical treatment should be treated by partial gastrectomy, and it should be appreciated that x-ray evidence of healing could not be taken as absolute evidence that the lesion was a benign one.

Nutrition and the Liver

The generally accepted view that nutritional deficiency is of great importance in causing chronic liver disease received some setbacks from some of the information presented. Dr. J. CAROLI and his colleagues (Paris, France) described the close relationship they had found between the average daily consumption of alcohol and the development of cirrhosis. Below 72 grammes of alcohol a day (equivalent to 1 litre of wine) no evidence of cirrhosis occurred. Above 144 grammes, almost all subjects developed hepatic cirrhosis. In between these two limits about 40% of patients were cirrhotic, and it was in this group alone that protein intake appeared to have any influence on liability to cirrhosis. Dr. CHARLES S. DAVIDSON (Boston, Massachusetts), also dealing with alcoholic cirrhosis, considered that the development of this type of cirrhosis was chiefly due to the replacement of normal components of a good diet by alcohol, but he judged that this explanation did not entirely account for the facts.

Drs. BERNARDO SEPULVEDA and SALVADOR ZUBIRON (Mexico City) described their findings in patients with chronic primary malnutrition in whom the total caloric intake had been less than 50% of that usually recommended for health and with low protein and vitamin components. Fatty infiltration was the only hepatic lesion commonly found and cirrhosis occurred only as a rare event.

A Special Social Occasion

One evening of the congress was designated "Embassy Night," to permit foreign delegates and their ladies to attend the embassies of their respective countries. The British contingent was warmly received by HER MAJESTY'S AMBASSADOR and LADY CACCIA, and it may not be amiss to put on record our thanks for the pleasant hospitality they afforded us.

"IN ARDUIS FIDELIS"

SIR GORDON GORDON-TAYLOR'S ORATION

A fine moment in the celebrations attending the Royal Army Medical Corps's diamond jubilee last week was the commemorative oration* Sir GORDON GORDON-TAYLOR delivered in the Great Hall of B.M.A. House on June 25. It was a noble and moving address, not least remarkable for being given without benefit of a single note, orator was imbued with the spirit of his subject and complete master of his words.

Mr. WELDON WATTS, President of the Association, welcomed the distinguished and representative audience, and introduced the orator. Mr. Watts recalled that officers of the B.M.A. had headed the deputation to Lord Lansdowne in 1898 to urge the formation of the Corps. "The R.A.M.C.," said Mr. Watts, "since its formation it has proceeded from strength to strength."

A Time to Take Stock

"Like Proteus of old, I have assumed many guises," began Sir Gordon Gordon-Taylor. He might even, he said, be

*The oration will be published in full in the *Journal of the Royal Army Medical Corps*.

arraigned for divided Service loyalties. From the well-ironed silk hat and morning coat of the first decade of the century, he had donned the khaki of the Corps, subsequently transferring to the blue and gold of the Senior Service in the second armageddon, and thereafter to the drab and sombre *tenue de ville* of the modern civilian surgeon. "1898-1958: sixty years on!" continued Sir Gordon. "The chariot wheels of time roll relentlessly onward: *omnia fert aetas, animus quoque*—time carries everything away, even the memories. Yet would I dare to challenge the last fragment of this sad Virgilian line. Although we are assured by Sir Thomas Browne that 'diuturnity is a dream and folly of expression,' that is surely but a long-term reflection. Look closer! With each revolution of time's wheels 'who runs may read' on flying felly the impress, perhaps faint, of some event or happening from the past in the life of individual, cohort, corps, nation, or the very world itself. It is fitting that from time to time we should look back and take stock of ourselves: for 'people will not look forward to posterity, who never look backward to their ancestors.'"

It might not to-day be wise to dwell too much on the birth-pangs attending the inauguration of the Corps, the struggle with the War Office and governmental circles. Nevertheless there was one aspect which must be emphasized—the important part played by the British Medical Association, which finally, on January 20, 1898, sent a powerful deputation to wait on Lord Lansdowne, then Secretary of State for War. The deputation was introduced by Dr. Robert Farquharson, himself a former Army medical officer and at that time M.P. for West Aberdeenshire; it included the president-elect of the B.M.A., Sir Thomas Grainger Stewart, who also represented his own University of Edinburgh, and others, as well as the most important officers of the Association. In just two months' time the *British Medical Journal* was able to report "some very satisfactory announcements" from a parliamentary debate. There followed Lord Lansdowne's speech at the mayoral banquet in the City of London on May 4, in which he stated that there would be a new Army Medical Corps and that Queen Victoria had been pleased to signify her intention of bestowing upon it the title "Royal."

Ancestors of the R.A.M.C.

Thirty-six years ago, in his rectorial address to the "red gowns" of St. Andrews University, Sir James Barrie had asked how some old graduate returning to his *alma mater* would spend his time if this were restricted to a single hour, or, better still, with whom would he choose to have a few minutes' conversation. "Many of your Army medical ancestors are far beyond our ken this afternoon," continued Sir Gordon. "John of Arderne, who accompanied Edward III at Crécy in 1346; Thomas Morstede with Henry V at Agincourt in 1415; Gale and Clowes; Woodall and Wiseman." He would like to meet Sir Stuart Threipland, who was Prince Charles's chief medical adviser in "the forty-five," but he would rather talk to Sir John Pringle, one of the founders of modern military medicine. "I should find it difficult to break off conversation with those great surgeons of the Peninsula and Waterloo—Sir James McGrigor, Guthrie, or Hennen." If statuary, obelisks, or eponymous buildings were a talisman to ensure immortality, McGrigor stood secure for all time. A hundred years had passed since his death: sired by an Aberdeen father, he was born at his mother's paternal home in Inverness-shire in 1771. Much of his education took place in Aberdeen, but he also studied medicine in Edinburgh, walking the hundred-odd miles to the Scottish capital and visiting St. Andrews on the way. While deputy inspector of hospitals in the Southern Command, he had to make arrangements for the battered remnants of Sir John Moore's forces from Corunna; finally in January, 1812, at the request of Wellington he arrived in Lisbon to undertake the medical care of the troops. McGrigor wrote of his officers: "Great experience and reflection had at this time created a body of operators never

excelled or before equalled in the British Army." He was Director-General from 1815 until 1851.

Hennen died at a relatively early age at Gibraltar of an epidemic fever he was endeavouring to control. George James Guthrie had always been one of Sir Gordon's heroes. He was posted to the 29th Regiment when only 16 years of age, serving with it in North America and the Peninsula. Later, after Waterloo, he successfully amputated at the hip-joint—on a French soldier. This was only the second occasion on which success had attended a British surgeon performing such an operation, the other being by another Army surgeon, Mr. Brownrigg, in 1812. For 30 years Guthrie lectured and gave demonstrations to officers of the Army, Navy, and East India Company without price, as a mark of the esteem in which he held them. He was president of the College in 1833, 1841, and 1854; and he refused a knighthood—"a great little man."

High up on the façade of the London School of Hygiene and Tropical Medicine were carved in stone the names, among others, of Edmund Alexander Parkes (1819-76), an Army surgeon who founded the science of hygiene; David Bruce and William Leishman, both members of the Corps; and Ronald Ross from an allied service. At another place one might see the names of two others who had worked in the Corps—Sir Almroth Wright and Sir Alexander Fleming.

"If services to humanity are the standard of a man's greatness, Whitby stands high among the great benefactors of mankind." One need only reflect on that great Army Blood Transfusion Organization of the 1939-45 war years, which he inaugurated, developed, administered, and commanded, an organization for which more than three-quarters of a million donations of blood were collected; which not only supplied our own armies but also some of the armies of our allies; which created and trained almost a corps of expert transfusion and resuscitation officers. Since some 10% of all wounded men required transfusion fluids, Sir Lionel's contribution to victory was very considerable.

Many would remember Cuthbert Wallace and what he did to advance the surgery of abdominal wounds of war. He saw the importance of early surgery and used to take up Spencer Wells forceps surreptitiously in his pockets. In Mesopotamia George Grey Turner was consulting surgeon at Amara; one of the greatest surgeons of the century, he was an early worker in thoracic surgery. The two surgeons who contributed most to promoting the surgery of thoracic wounds in the 1914-18 war were George Gask and Pierre Duval, of France. More brilliant but only just spreading his wings for his upward flight in chest surgery was Tudor Edwards. And Sir Gordon mentioned many others by name.

Laurel and Rosemary

"The cavalcade has passed," continued Sir Gordon. "The stage is blacked out. We are translated from the past to the fierce light of the present, with eyes firmly fixed on the future with all its incertitude." Remembrance was the greatest incentive and inspiration that history could offer to those who laboured in similar causes to-day. It was unnecessary to go back to Pericles and the Athenian dead; there were memorials nearer at hand, in the R.A.M.C.'s own historical museum at Crookham. "*In arduis fidelis*"—fidelity, next to courage, was the loveliest virtue which God handed down to his children. "I offer to the Corps laurel for tribute on this its diamond jubilee, and rosemary for remembrance of those who have preceded us on the way," concluded Sir Gordon. "*Surgat gloria usque astra*."

The vote of thanks to Sir Gordon was proposed by the Chairman of Council of the B.M.A., Dr. S. WAND. Sir ALEXANDER DRUMMOND, Director-General, Army Medical Services, then ended the proceedings by reading a message of congratulations to the Corps from Queen Elizabeth the Queen Mother, its Colonel-in-Chief. Before the lecture the R.A.M.C. band was playing in the forecourt of B.M.A. House as the guests assembled.

BRITISH EMPIRE CANCER CAMPAIGN THIRTY-FIFTH ANNUAL REPORT

The British Empire Cancer Campaign held its annual meeting at the House of Lords on July 1, under the chairmanship of the DUKE OF DEVONSHIRE. Last year the Campaign achieved the record income of £762,972, a rise of nearly £200,000 over the previous year. Of this large sum it spent £620,722 on what are termed "the main objects of the Campaign"—for instance, grants to research centres (£403,000) and individuals (£99,000), fellowships (nearly £29,000), and the installation of a theratron at the Westminster Hospital (£60,000); nearly £60,000 on publicity and appeals; and just over £10,000 on management and administration. The Campaign's income was derived as follows: from donations, collections, etc., £532,000; from legacies, £187,000; from interest on investments, about £44,000.

The *Annual Report* this year is issued in three parts: Part I—"The Chairman's Statement and the Accounts" (pp. i-xi); Part II—"The Scientific Report" (pp. xliii-lxiii and 1-528); and Supplement to Part II—Report by Dr. Percy Stocks on "Cancer in North Wales and Liverpool Region" (pp. 1-156). The *Annual Report* may be obtained from the Campaign's Offices, 11, Grosvenor Crescent, Hyde Park Corner, London, S.W.1.

Progress of Research

The scientific volume opens with this cautiously optimistic appraisal of current research:

"In the field of chemical and physical carcinogenesis, it is not perhaps surprising that the already long list of carcinogens continues to expand. What is more important is that this is matched by a gradual increase in our knowledge of the underlying mechanisms of cancer production, and of the essential differences (especially in biochemical and biophysical terms) between cancer cells and normal cells. Of much current interest are reports of differences in the chemical and physical structure of the cell surfaces, and in the resultant biological behaviour. The newer ideas and methods in immunology also continue to be applied to good purpose. These are among the more rational approaches. Yet there are many other avenues of attack, some of them much more empirical, which cannot be neglected. In the field of experimental chemotherapy, some work is of negative value in serving to define the limitations of individual agents. Equally obvious, however, is that the potentialities in this direction have scarcely been revealed, let alone exhausted."

Here it is possible to note only a selection of the researches reported.

Further work has been done on the identification of polycyclic hydrocarbons in cigarette smoke tar, some of which are known to be carcinogenic. On the other hand, experiments in which animals of many different species have inhaled tobacco smoke for long periods have yielded no tumours. Likewise attempts to produce tumours in animals by skin painting or oral administration of carcinogens from cigarette tar have met with little success. In view of the possibility that 3:4-benzpyrene discharged into the air from motors of various kinds is an additional factor in the causation of lung cancer in cigarette smokers, the effect of combinations of this carcinogen and tobacco condensate on the lung cultures is also being studied.

Besides biochemical and enzymological studies of nucleoproteins, much work is being done on the surface properties of normal and tumour cells.

Endocrinological and Immunological Studies

At several centres work has continued on the elucidation of the endocrine changes in breast cancer patients variously treated by oophorectomy, adrenalectomy, and some form of pituitary ablation. Particular attention has been given to determinations of the oestrogens excreted in the urine, though, states the *Report*, there seems to be little correlation between the results of these and the clinical progress of the patients. An extensive survey of a large series of patients who had in the past been treated with oestrogen has shown that only two out of 530 traced subsequently developed carcinoma, one of the uterus, the other of the breast. Of 120 patients with carcinoma of the body of

the uterus, only five were found to have been taking oestrogens for longer than one year some time previously. Other clinical and biochemical studies of the endocrine aspects of breast cancer have included a comparison of the effects of pituitary yttrium implantation with adrenalectomy. Oestrogens continue to be excreted in the urine even where the endocrine ablation is complete.

A judicious, intermittent use of prednisone and prednisolone has been shown to provide a means of controlling adrenal activity in post-pubertal adrenal hyperplasia.

Further studies on cancer immunology are reported. The main lines followed at one centre include the detection of antibodies in tumour-bearing animals and of immunological changes during chemical carcinogenesis. At another centre the immunological structure of normal and carcinogen-treated tissues is being examined to determine whether abnormal tissue antigens are formed during carcinogenesis. Attempts to inhibit carcinogenesis by producing immunological tolerance to cancer tissue formed *in vivo* have been unsuccessful. Studies have also been carried out on the phenomenon of tissue transplantation immunity and on the immunological consequences of inducing tolerance of skin homografts in mice by inoculating them at birth with living adult homologous spleen cells.

Experimental Chemotherapy

A new series of cyto-active amino-acids is being studied, and of special interest is a mannitol-busulphan—the first of a new series of busulphan-like derivatives—of low toxicity yet with powerful tumour-inhibitory properties. In studies of the mechanism of action of alkylating agents, a new lead has arisen from the observation that deoxyguanic acid can be alkylated *in vitro* at the 7-position of the guanine moiety. This and related work is stated to be of great potential interest as suggesting the possible importance of alkylation of the purine moieties of nucleic acid in the production of biological effects.

Twenty-one new nitrogen-mustards have been synthesized, designed to act selectively on tumours by enzymic action at the site or by selective transport.

Clinical Studies

With increasing experience of exfoliative cytology in the diagnosis of malignant disease of the uterus it is being found at most centres that three or four women out of every 1,000 attending gynaecological clinics have unexpected cancer of the cervix, usually carcinoma *in situ*. At one centre, however, the incidence of pelvic malignancy revealed by cytology when no clinical suspicion attaches to either the history or the clinical findings is put as high as 2%.

Two investigations bearing on the surgery of carcinoma of the bronchus are reported, one designed to discover for how long the blood supply of the lungs can be interrupted without permanent loss of lung function, the other to establish the precise routes of direct spread of these tumours. Fourteen pregnant patients treated with radium for cancer of the cervix have been reviewed to determine the influence of pregnancy on the clinical course of the disease after treatment.

The incidence of structural damage in the chromosomes of tumour cells of experimental animals has also been studied, more especially in relation to the influence of oxygen tension on the effectiveness of a given x-ray exposure. An extensive investigation into the important question of the reduction in life span and the acceleration of ageing by ionizing radiation has been started at one centre, and the effects of radiation and radiomimetic chemicals on ageing have been compared at another centre. The effects of radiation on many different aspects of iron metabolism in experimental animals are also being investigated.

Natural Radioactivity

The measurement of the low levels of radioactivity which occur in our natural environment continues to occupy an important place in the study of factors which may influence cancer incidence. On the physical side such measurements

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Dindevan (Evans Medical Supplies Ltd.)—This is phenindione, an anticoagulant which exerts its effect by interfering with the hepatic synthesis of prothrombin. Its chemical formula is related to that of dicoumarol (or bishydroxycoumarin). It is more rapidly absorbed than dicoumarol and exerts its full effect clinically 24 to 36 hours after treatment is started. Its duration of action is shorter, and prothrombin activity returns to normal within 48 to 72 hours after treatment is stopped. In addition its effects on blood coagulation are believed to be more constant, and hence the dose is more uniform. It is supplied in tablets containing 10 mg. and 50 mg. The tablets are given orally, 200 mg. on the first day, followed by 50 mg. twice daily, the exact dose for the individual patient being carefully controlled by daily prothrombin estimations. Treatment is aimed at increasing the blood prothrombin time to two to three times normal. When given for long periods, smaller doses are prescribed and prothrombin estimations are less frequent.

Phenindione is given for the treatment of coronary thrombosis, phlebothrombosis, and pulmonary or peripheral embolism. The use of this or similar anticoagulants has helped to reduce the incidence of serious post-operative thrombo-embolic complications. Its place in the treatment of coronary thrombosis is still a matter of controversy, though clinical evidence is mounting to show that it helps to prevent the spread of thrombosis locally in the coronary vessels and to prevent the development of thrombosis elsewhere, especially in the calf veins with consequent pulmonary emboli. The possibility of serious complications in the form of severe haemorrhage must be set against this, and some clinicians feel that the dangers outweigh the therapeutic advantages. It is generally thought, however, that phenindione is indicated in the more severe cases of coronary thrombosis, though it is doubtful whether it need be given in the milder cases. The drug is contraindicated in severe hepatic or renal disease and also in peptic ulcer or haemorrhagic disease on account of the danger of serious haemorrhage. Vitamin K₁ should always be available to combat the complication of haemorrhage; 10 to 20 mg. intravenously or 20 to 25 mg. orally will reverse its action and produce a rapid fall in prothrombin time in 6 to 8 hours.

N.H.S. basic price: 100 10-mg. tabs., 15s.; 100 50-mg. tabs., 21s. 8d.

Rondase (Evans Medical Supplies Ltd.)—This preparation of the enzyme hyaluronidase is supplied in ampoules containing 1,500 international units in freeze-dried powder. Water or normal saline must be added to it before use. The solution is compatible with most fluids given by subcutaneous injection. In a dose of 1,500 units the drug has no side-effects.

The essential action of rondase, as of other preparations of hyaluronidase, is to aid the dispersal of fluids injected into the tissues. By this means it aids the penetration of local anaesthetics, but at the same time it hastens their absorption and thus tends to increase their toxicity. Hyaluronidase may also be added to solutions used for hypodermoclysis, but the need for this procedure is limited. Hyaluronidase has a reputation for dispersing irritant substances injected accidentally paravenously. Thus it can be employed to diminish the likelihood of local reactions to thiopentone or the contrast media used in radiology when they escape outside a vein.

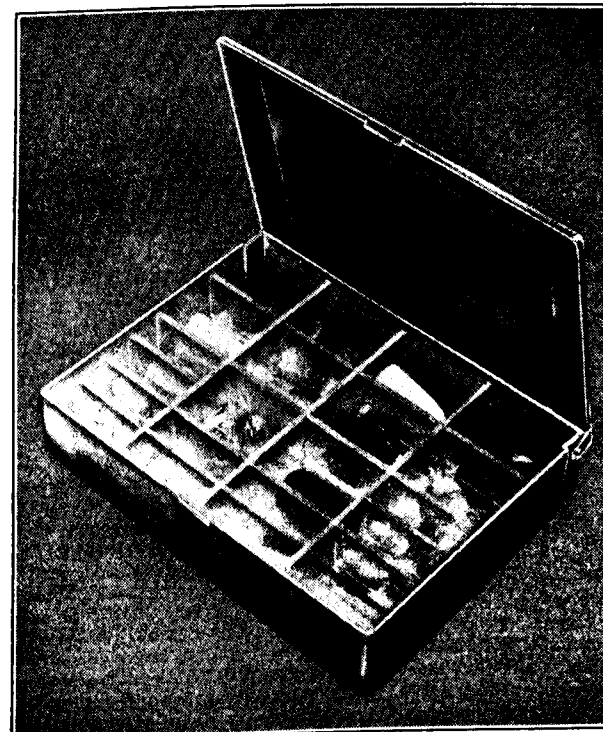
It has been suggested that hyaluronidase may be injected into areas of oedema with a local cause, but this measure, though rational therapeutically, is not firmly established.

N.H.S. basic price: 6 ampoules, 14s.

New Appliances

A PESSARY RECOGNITION BOX

Mr. C. H. DE BOER, assistant gynaecological surgeon, United Liverpool Hospitals, writes: Patients complaining of recurrent vaginal discharge frequently give a history of past treatment by drugs in the form of pessaries. Often an



identification by shape and colour can be made by the patient. Through the courtesy of Messrs. Ward Blenkinsop & Co. I have obtained a demonstration case for the pessaries commonly used in this area and have found it most helpful. By its use the repetition of ineffective treatments can be avoided.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Alcohol and Driving

SIR,—I was interested in the article by Professor John Cohen, Mr. E. J. Dearnaley, and Mr. C. E. M. Hansel, "The Risk Taken in Driving Under the Influence of Alcohol" (*Journal*, June 21, p. 1438). However, I wish to suggest that the authors have drawn a very false conclusion in their penultimate paragraph, when they write "either a large number of people are wrongly convicted by the magistrates or wrongly acquitted by the jury." Electing trial by jury usually involves a counsel's brief and is a costly affair. It would appear fairly logical that people with a good defence should resort to such a tactic and those without a reasonable answer to the charge should content themselves with a magistrates' court, which in the event of conviction tends to be more lenient.—I am, etc.,

Chirk, North Wales.

R. P. W. KUP.

SIR,—The publicity that the article by Professor John Cohen, Mr. E. J. Dearnaley, and Mr. C. E. M. Hansel on "The Risk Taken in Driving Under the Influence of Alcohol" (*Journal*, June 21, p. 1438) has received in the press, and the legal implications of such articles, invites enlargement and comment.

The ability to drive after the consumption of alcohol must be related to the initial level of competence of the driver, and it would be only reasonable to test the offender's ability to drive the vehicle concerned whilst sober before deciding that his incompetence was due to the effects of alcohol. Many of us have been granted licences to drive vehicles whose dimensions may be similar to that of a Manchester Corporation bus after having passed a test on a vehicle three feet (0.9 m.) narrower and a tenth the weight. It would have been interesting to have included a control group of, for example, university staff who hold licences to drive heavy vehicles but who have not actually passed a driving test on such a vehicle and who do not drive one regularly.

The gap through which the drivers who had taken 6 fl. oz. (170 ml.) of whisky could drive was only 0.6 in. (1.5 cm.) less than that through which the control group could drive, a difference of 0.6% of the total width of the gap. This is a figure which would hardly seem significant, even statistically, and the number of drivers who took part in the tests is not stated.

It is a pity that the convivial atmosphere which is said to have been present when the tests were commenced was not extended to those who undertook the test sober, and they were not subsequently invited to take the test after the consumption of alcohol. It is possible, as the method of selection of the controls is not stated, that those who cautiously avoided taking the test after the consumption of alcohol were by nature also the more cautious drivers, so that the results of the experiment might have been reversed if they had been given the alcohol and those who were audacious enough to consume 6 fl. oz. (170 ml.) of whisky before driving a bus had been persuaded to take the test sober. They might then have been able to show off their natural audacity by even greater overestimation of their ability to drive a bus through a narrow opening. It would have been more enlightening if each driver had acted as his own control, and half had been tested before alcohol and the other half had been tested whilst under the influence.—I am, etc.,

Altrincham, Cheshire.

J. F. PATRICK.

Prevention of Lung Cancer

SIR,—The letter from Dr. Lennox Johnston (*Journal*, June 21, p. 1483) raises issues that are even more important than his main theme, serious as the problems of lung cancer and excessive smoking may be. Since I do not

smoke, Dr. Johnston will perhaps exonerate my remarks of the hypocrisy that he associates with those who do.

Dr. Johnston will surely not expect his unrealistic scheme for curing the nation's smoking almost overnight to be taken very seriously. I hope, also, that he does not really mean what he writes about the propriety of deliberately frightening people. There are extremely cogent objections to the practice of frightening children about the effects of fire or anything else. It is essential to protect young children from fire and other dangers by external means over which, like Legge's workmen, they have no control. This must continue until they are mature enough either to assess the dangers realistically for themselves or to be reliably obedient to parents with whom they have a sufficiently trusting relationship (which is the more likely if, *inter alia*, the parents have not deliberately frightened them). Guiding a child into habits of safety, and explaining the reasons for these, is of course quite a different matter from frightening the child (or the smoker) as Dr. Johnston advocates.

Foolhardy behaviour of either children or adults, in common with many other psychological difficulties, is ultimately a result of some kind of fear, and it often appears to be caused by fear of the consequences of the very activity in question. Perhaps, therefore, the resistance of some smokers to repeated warnings is due, not to a hypothetical process of immunization, but to a compulsive need for reassurance that the danger is not after all as serious as the warnings assert. If this be so, a campaign to induce greater fear seems rather futile. The motives of smokers (and also the motives of those who are anxious to prevent smoking) are undoubtedly complex, and clearly the problem can have no such simple solution as that proposed by Dr. Johnston. In general medicine it has long been recognized that rational therapy demands an understanding of underlying processes and is not achieved by merely trying to abolish symptoms. It is also generally agreed that the adequate physical care of children is a much better way to produce healthy adults than trying to correct maldevelopments in later years. Unfortunately there is still considerable resistance against accepting that these principles are just as true for psychological problems—amongst which smoking must surely be considered one of the less important.—I am, etc.,

St. Albans, Herts.

A. C. WOODMANSEY.

Cancer Education

SIR,—The efforts of Mr. Malcolm Donaldson to promote wider dissemination of what we know to be the true picture of cancer have aroused the gratitude and admiration of many of us, so that his letter in the *Journal* of May 31 (p. 1302) deserves support. The reluctance in this country especially to accept information about cancer, or even to acknowledge its very existence, is more reminiscent of the ostrich than of beings endowed with perception and judgment. Surely it is time for the psychologist to enter this field as he has done so effectively in other spheres of public relations where irrational factors seem to be operating.

Many people regard a malignant growth as something with an independent life which is devouring them and which cannot possibly be brought under control, so that a diagnosis of cancer is necessarily a sentence of inevitable mutilation, pain, and eventual destruction. It is no use telling them either collectively or individually that they are wrong and that it is better to diagnose cancer at an early stage when it can be treated with a very good chance of palliation, if not cure, as they simply do not believe it. It is surely significant that in almost any lay discussion about cancer frequent reference is made to the large number of sufferers who die apparently uninfluenced by treatment, while in a similar discussion about, say, hypertension or heart disease reference is rather made to the increasing number of sufferers living happy and useful lives as a result of treatment.

In some countries, such as France, there is wide publicity of the early signs of cancer, coupled with assurances that treatment gives great hope of cure, but there has not been any significant improvement in the overall survival figures after some years of this propaganda. In this country there is the impression, possibly due to the news value of large benefactions and of large and

impressive machinery, that cancer can only be helped at all by treatment in one of the large centres with "something atomic," as a recent patient has put it, so again there is a denial of the confidence placed in the ordinary facilities provided for medical treatment at provincial level. It seems that the word "cancer" conveys much of the despondency, and just as the gradual substitution of "T.B." for "consumption," with its sinister connotation, has accompanied the change in outlook about this disease, so should we hope to find some new general term to cover the neoplastic diseases.

But, until such time as we can fully control new growth, it can be shown that we have much to offer, and that it is just as possible to live with a tumour as with arthritis.—I am, etc.,

Hove.

E. MILLINGTON.

Asphyxia by the Cord

SIR,—I should like to comment on Dr. H. E. Reiss's scholarly and well-documented article on "Foetal Asphyxia Associated with Umbilical Cord Around the Neck" (*Journal*, June 14, p. 1394). I assume that the foetal distress was caused by tension during labour on a relatively short cord and not solely by the number of coils.

At first sight it seems strange that, while cord round the neck is common, foetal distress is rare, but Nature has provided two compensating mechanisms. First, if the length of cord from placenta to neck is very short, the breech presents and will not turn spontaneously. Secondly, Nature provides a push on the fundus by means of the voluntary contractions of the diaphragm and abdominal muscles during the second stage of labour. This helps to relieve tension. It follows that, if the child can survive the squeeze of the uterus, which increases the length of the uterine cavity during the first stage, it ought to be able to survive the push and squeeze of the second stage. Dr. Reiss's case illustrates very clearly that foetal distress appeared during the second stage. When the os is fully dilated it is undoubtedly proper to correct any malposition and deliver with forceps so long as firm fundal pressure is maintained during delivery. Push, and tension is released; pull, and tension is increased. If the cord is intact when the head is delivered, it is always possible to deliver the body by fundal pressure without dividing the cord.

It is a pity that British textbooks accept the findings of Gardiner,¹ as they are demonstrably false. It is untrue to say that a cord of nearly 13 in. (32 cm.) is necessary for spontaneous delivery. Gardiner forgot that the fundus can follow the foetus and be pushed down nearly to the symphysis pubis either by the mother's own efforts or by the obstetrician. Nature provides the human foetus with a very long cord, usually 20 in. (50 cm.) or more, not because it is necessary for delivery—indeed, the longer the cord the more likely it is to become coiled round the foetus and so be relatively short—but because it was necessary for many hundreds of thousands of years for the mother to be able to pick up her child immediately after delivery without tension on the placenta during the hazardous third stage. But that, Sir, is another story.—I am, etc.,

Cambridge.

C. W. WALKER.

REFERENCE

¹ Gardiner, J. P., *Surg. Gynec. Obstet.*, 1922, 34, 252.

SIR,—Cord round the neck is a common condition at birth, and Dr. H. E. Reiss (*Journal*, June 14, p. 1394) rightly points out that it may cause serious foetal asphyxia and even foetal death. Whether or not the foetus shows signs of distress from compression of the umbilical vessels depends, firstly, on the tightness of the cord round the neck, and, secondly, on its thickness. The amount of Wharton's jelly in cords is variable, and, when it is reduced, the umbilical vessels, deprived of its cushioning effect, are more easily compressed.

During an investigation of 100 cases of foetal distress at St. Helier Hospital, Carshalton, several years ago, I attributed 24 of them to cord round the neck. What impressed

me most was that signs of distress appeared late in labour. In 20 cases it occurred in the second stage and in the remaining 4 at three-quarters dilatation. I believe that the reason for this is that the cord is liable to be nipped by the foetal chin during flexion and rotation of the head on the pelvic floor. Since delivery can usually be readily effected when the danger signs appear, the baby is saved in most cases and stillbirths from cord round the neck are relatively rare.—I am, etc.,

Birmingham, 16.

D. B. WHITEHOUSE.

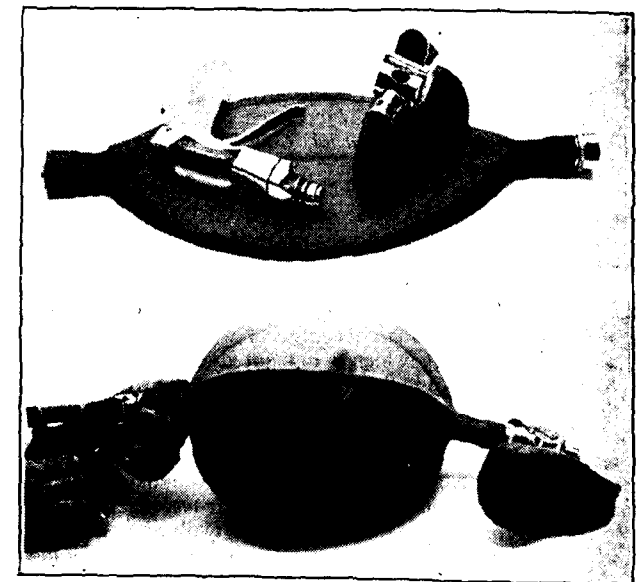
SIR,—I read with interest the article by Dr. H. E. Reiss (*Journal*, June 14, p. 1394), not so much on account of the coiling of the umbilical cord around the foetal neck five times, but because general inhalation anaesthesia was used when it was known foetal distress had been present for some time. It is not surprising there was delay in establishing regular respiration in a baby when, in addition to the distress, a second dose of pethidine, 125 mg., was given two and a half hours before the administration of cyclopropane, gas, oxygen, and ether. Caudal analgesia by the single-dose technique would have been well worth attempting. In the majority of patients it is simple to administer, effective, and always safe to mother and baby. Moreover, it takes little time and one knows well within fifteen minutes if one has been successful. The time to have given it would have been just prior to full dilatation. This would not have delayed, but probably hastened, labour. That the method is a practical one I have proved to myself, and now it is my method of choice in all vertex presentations requiring forceps unless the head is very low, in which case local analgesia is used. In the last 225 cases there have been 25 failures and not all these have failed completely. General inhalation anaesthesia is not only dangerous to the mother but also to the baby, particularly to the latter when there has been evidence of foetal distress.—I am, etc.,

Haywards Heath, Sussex

C. J. FARR.

Out-patient Anaesthesia

SIR,—Professor William W. Mushin and Dr. Peter W. Thompson's favourable report (*Journal*, June 14, p. 1376) on cyclopropane in out-patient anaesthesia may help to persuade manufacturers in this country to make the necessary apparatus. More than two and a half years ago I



Apparatus for administering cyclopropane in dentistry.

developed in conjunction with Sparklets Ltd. the apparatus shown in the photograph; but it was not put into production because the value and safety of this method of anaesthesia did not seem to have gained wide acceptance by

anaesthetists. Cyclopropane continued to be regarded as too powerful and dangerous to be placed in the hands of the "occasional" anaesthetist.

Ever since 1951, when I first described the use in out-patients of 50% cyclopropane given from a six-litre bag,¹ I have urged the safety of the method. The following year I reviewed 1,000 administrations and suggested that it might, with advantage, replace the nitrous oxide method²; and in 1954, the year in which Hingson³ began to use it, I reported nearly 2,000 administrations and repeated my suggestion.⁴ Nevertheless, contrary to the statement of Mushin and Thompson, cyclopropane has never been widely tried in out-patient work. Moreover, apart from Hingson and myself, the few who have made reports have used it in low concentrations which give longer and therefore less satisfactory induction and recovery. None of them suggested its general adoption in place of N₂O; only Hingson supported me in this.

In the apparatus shown here, the Sparklet bulbs, which are sealed together, charge the bag through a non-return valve with 50% cyclopropane, and oxygen and nitrogen in equal parts, after which the gun is detached. The mixture is non-ignitable, but, as with Hingson's mixture, if it is discharged from the bag into a flame the cyclopropane will catch fire, since on leaving the bag the gas becomes diluted with air and enters its ignitable range. Warning should also be given that nitrous oxide and oxygen given nasally to dental patients after induction with the cyclopropane mixture, as Mushin and Thompson recommend, may reintroduce the risk of igniting the patient's breath with sparks from teeth and dental forceps.

A soda-lime canister has not been incorporated in the apparatus, because it was designed for use by "occasional" anaesthetists, whom I recommended not to prolong the administration for more than a minute. This gives satisfactory anaesthesia lasting about a minute and a half, which is sufficient in most of the dental-extraction cases that need general anaesthesia, which number more than 2,000,000 a year in England and Wales. The soda-lime canister in Hingson's apparatus gives it a distinct advantage in other kinds of operation, for which more prolonged administrations may be needed. If either type of apparatus were made available, the method might be given the extended trial I have long thought it deserved.

—I am, etc.,

London, S.E.1.

J. G. BOURNE.

REFERENCES

- 1 Bourne, J. G., *Brit. med. J.*, 1951, 1, 1330.
- 2 — *Lancet*, 1952, 2, 705.
- 3 Hingson, R. A., *J. Amer. med. Ass.*, 1954, 156, 604.
- 4 Bourne, J. G., *Proc. roy. Soc. Med.*, 1954, 47, 416.

Tubeless Gastric Analysis

SIR,—I read with interest the articles on tubeless gastric analysis by Drs. M. A. Denborough and F. P. Retief and Professor L. J. Witte (*Journal*, May 24, p. 1213). During an investigation of 23 cases with "diagnex," using the azure-A method, I had five false negatives. I had no false positives. This is in agreement with all the other workers quoted in the article, who do not find false positives to be a problem. The authors of the article, however, in 36 cases negative to the augmented histamine test screened by azure-A test had two false positives showing an excretion of azure-A greater than 0.6 mg. I wonder was this after cooling—a measure which I did not use or find desirable. Another possibility is that these were true positives and that the test meal was at fault probably owing to passing into the duodenum. In the one positive I had that did not correlate with the test meal, when I repeated the latter, I found that in fact the meal was at fault. I would suggest that apparent false positives should have their test meal repeated.

To overcome the false negatives I evolved a technique which was tried on 27 further patients and the results have now been published.¹ Briefly, the test was carried out as usual and the urine was tested immediately. If it was negative a gastric tube was passed at once and the gastric contents aspirated. The tube was therefore passed about 2½ hours after the granules had been swallowed. The aspirated juice showed one of three things: (1) The gastric contents

were normal in appearance—i.e., the dye had passed through the stomach and it was therefore a true negative. (2) There was a large or small amount of undissolved granules, showing that there was some gastric hold-up with achlorhydria. (3) There was a large amount of partially undissolved granules, this being evidence of gastric hold-up with free hydrochloric acid present.

Using this modification I was able to eliminate the problem of false negatives. It will be evident that in about 70% of cases it is not necessary to pass a gastric tube. Further, an unsuspected delay in gastric emptying may be revealed. I have found the azure-A test, with this modification, to be an excellent one, although it cannot always be strictly called "tubeless."—I am, etc.,

Dublin.

TERENCE CHAPMAN.

REFERENCE

- 1 Chapman, T. T., *J. Irish med. Ass.*, 1958, 42, 124.

Treatment of Leg Ulcers

SIR,—The following quotation from a letter written in 1781 will interest those doctors who have taken part in the correspondence on the treatment of leg ulcers by compression:

Dear Sir, . . . A gentleman whose leg had been ill for several years and had several running sores on it, was advised by an old Clergyman to discard his physicians and surgeons and to follow this simple prescription: "Take a fillet of soft Welsh flannel four inches broad and four yards long, let it be rolled as tight as you can bear it over your leg from the knee to the sole of the foot, and keep it on day and night without any alteration." He wore this for a month and has been perfectly well ever since. If she is not well already, I have little doubt but that the same method would cure Mrs. Brackenbury. I trust that you and she are both pressing on to the mark and strengthening each other's hands in God.

I am, dear sir,

Your affectionate friend and brother,
JOHN WESLEY.

This letter is interesting as showing that wisdom is not confined to us. It was written by the Rev. John Wesley¹ to Robert Carr Brackenbury from Towcester on November 19, 1781.—I am, etc.,

Hong Kong.

D. VAUGHAN REES.

REFERENCE

- 1 *Letters of the Rev. John Wesley*, 1931, vol. 7, p. 90, edited by J. Telford. Standard Edition. Epworth Press, London.

Chain-store Glasses

SIR,—I missed Mr. J. Primrose's letter (*Journal*, April 19, p. 943), but with Mr. A. C. Shuttleworth's (*Journal*, June 14, p. 1419) no medical practitioner, one might think, could disagree. I expressed the same views three years ago (*Journal*, July 23, 1955, p. 267). Yet from time to time I learn from patients that they have been sent by their doctors direct to opticians for examination of their eyes with the object of getting glasses if thought desirable, rather than to medical practitioners at hospitals or in the competent Supplementary Ophthalmic Service provided by the State. (To their honour, I have known opticians to resist the temptation to correct the small errors of refraction which are almost invariably present.) If the Ministry is aware of this undesirable practice, it may feel justified in taking appropriate action, and the profession has partly itself to blame for an unwise decision.

But buying glasses over the counter is another matter. Every day I use professionally a pair—the last survivor of half a dozen pairs, the others being war casualties—of multiple-store glasses bought 25 years ago at a shilling a pair. One more breakage, and, if the Opticians Bill is passed, replacement will cost £1 for the lenses and a considerable sum for the frame. Well, that won't break me financially, but it will be a hardship to many poor people who can see just as well with self-chosen 3s. 6d. spectacles (I think that is now the store price) as with the £2 plus ones. Why, then, interfere with a harmless and necessary trade

which has never been known to damage eyes, and has had the implicit support of such specialists as Sir George Berry and Mr. D. Priestley Smith (*Journal*, August 6, 1955, p. 382). Mr. Shuttleworth does well to appeal for clear thinking and unprejudiced judgment.—I am, etc.,

Portsmouth.

W. S. INMAN.

Case of Exomphalos

SIR,—I feel it is worth while reporting a case of exomphalos which survived operation but died on the twenty-third post-operative day with volvulus of the mid-gut.

H. A., a baby boy, was admitted to the Evangelical Hospital on January 1, 1958, at the age of 1 hour, with a congenital umbilical hernia. The liver and parts of the gut were felt in the hernial sac. The baby weighed 2.375 kg.

The baby was prepared for operation when it was 2 hours old, but it was noticed that the colour of the face, hands, and feet was becoming blue and the operation had to be postponed until the baby recovered good colour. It was taken to the theatre at the age of 5 hours. At operation the contents were found to be the liver, many loops of small intestine, caecum, and appendix, together with a part of the transverse colon. The coverings were intimately adherent to the antero-superior aspect of the liver over more than two-thirds of its extent. These were patiently freed, although I had to leave a good deal of the extra-embryonic coelom adherent to the liver, which had to be returned with it to the abdominal cavity. The gall-bladder was peeping through a circular hole on the anterior surface of the liver; it could not be seen on the inferior surface nor was it adherent to the liver substance; it was covered with peritoneum all round. A Meckel's diverticulum was found lying along the small intestines and stuck to its wall with fine adhesions near the terminal ileum; it was about 2 cm. long and 5 mm. wide.

The defect in the abdominal wall measured 7 by 10 cm. This was too small for the reduction of the liver and I had to enlarge the opening upwards to achieve this stage of the operation. Reduction could not be completed without aspirating most of the gas in the intestines at three different points. The wound was closed satisfactorily with difficulty and the baby was sent to its cot on hourly feeds of 10 ml. glucose-water for six hours and then three-hourly feeds of 30 ml. for the rest of the first 24 hours. It was given its mother's breast next morning. It sucked vigorously and thrived well, gaining weight after an initial loss of 250 g.

On the evening of the twenty-third post-operative day the baby suddenly collapsed and became cold and pale. It was screaming all the time, pulled its knees to its abdomen, and vomited repeatedly. The abdomen was slightly distended at first, but it became excessively so in less than three hours. Its condition deteriorated very quickly and the baby died eight hours after the start of symptoms. No post-mortem examination could be done, and the diagnosis of volvulus of the mid-gut is based on the clinical findings alone.—I am, etc.,

Nablus, Jordan.

E. HANDAL.

Azacyclonol in Schizophrenia

SIR,—The general conclusion of Dr. S. Gray and Dr. A. D. Forrest (*Journal*, February 15, p. 374) that azacyclonol is "unlikely to be a very useful drug in the treatment of chronic schizophrenia" agrees with my own experience with this drug¹ in the dosage employed. I also agree that further trials using higher dosage are indicated. May I, however, question the means by which their conclusions were reached?

In the course of their "controlled trial," 17 out of 40 patients received reserpine, and another 6 chlorpromazine, together with the drug being tested. This means that, in fact, only 17 patients could be expected to demonstrate change attributable to azacyclonol, any alteration in the mental function of the remainder being possibly due to the effect of a combination of drugs. That this point is of importance can be demonstrated by the effects of other drugs given in combination. Examples easily come to mind from clinical experience—e.g., potentiation of barbiturate activity seen commonly with some phenothiazine derivatives.

It would seem appropriate to recommend the greatest caution in interpreting the effects of medication on mental

function. Research design should attempt to eliminate, so far as possible, any artifact. The objections to attempting to reach conclusions about the activity of any drug when it has been administered in conjunction with another also apply to the administration of psychotherapy during a drug trial or indeed to any change, physical or psychological, in the patient's environment.—I am, etc.,

Williamsburg, Va., U.S.A.

BASIL E. ROEBUCK.

REFERENCE

- 1 Peak, E. C., Canestrari, R. E., and Roebuck, B. E., *J. nerv. ment. Dis.*, 1956, 124, 504.

Out-patient Gynaecology

SIR,—Dr. Max B. Clyne (*Journal*, June 7, p. 1353) says, "And yet out of 60 women 42 . . . were referred to the wrong agency . . ."; and earlier, "This is a very serious challenge to us general practitioners." Certainly. Think again. A gynaecological (or any other) department is a consultant department even before it is a specialist treatment department, under the charge of a consultant.

The general practitioner, when in doubt and difficulty, will not institute psychological treatment until he has excluded organic causes for the symptoms. All these 60 women were rightly sent to a consultant, who was able to reply in 42 cases, "There is no gynaecological organic lesion; you may institute your psychological treatment with a clear conscience."—I am, etc.,

Crowthorne, Berks.

H. D. FORBES FRASER.

Induction of Labour

SIR,—As a general practitioner who does a fair amount of midwifery, I was very interested in the paper by Mr. Ian Cope and Mr. Morton Pearson (*Journal*, May 24, p. 1211) and in the letter by Professor G. Gordon Lennan and Mr. E. M. Edwards (*Journal*, June 14, p. 1413). I do not wish to enter into the discussion about the thorny question whether such a high induction rate is justified, especially as you dealt with this problem so excellently in your leading article (*Journal*, May 24, p. 1226). However, I wish to express my surprise that neither of the two reports mentions the possibility of medical induction.

For several years now I have made it my rule to induce labour if the patient goes two weeks beyond her expected date, and earlier if there are signs of toxæmia. Lacking facilities of an operating-theatre, I naturally turned to medical induction, and, since an intravenous drip is also difficult to arrange under domiciliary conditions, I adopted the following method.

1. The patient is given 15 mg. stilboestrol every waking hour. This apparently heroic dosage is surprisingly well tolerated by most patients.

2. If labour has not started after about 48 hours, the patient is given a course of oxytocic injections. She is asked to come to the surgery, and is warned that she may have to stay there for 2½ hours, and that she may have to take a taxi to get home. Oxytocin injections are then given at half-hourly intervals, up to six injections if necessary, starting with 0.3 ml., then 0.4 ml., and then for four times 0.5 ml.

3. If after the sixth injection the patient has only slight and indefinite contractions, she is given six 2 gr. (130 mg.) tablets of quinine sulphate, and asked to take one tablet every half-hour, but to stop it if she starts labour, or if she notices any ill effects like palpitations or deafness or buzzing in her ears.

Unfortunately I am unable to give the exact number of cases in which this method of induction was tried, but I can trace the records of 13 cases, and I remember only three failures. Although I realize that these figures are too small to draw any valid conclusions, they do show that it is worth while to try medical induction before one turns to surgical methods.

The advantage of medical induction becomes obvious if one considers that surgical induction is not without dangers and disadvantages. Cope and Pearson mention the increased caesarean-section rate with its increased morbidity rate, and the psychological shock to the patient. They do not mention the (although rare) cases of ruptured uterus in succeeding pregnancies. They mention that the morbidity rate in

the induced cases could be kept low only by the routine use of antibiotics—with all its well-known disadvantages and dangers. Neither of the two reports mentions whether there was an increased forceps rate with its additional risks (anesthetic) and its psychological shock, and neither of the reports mentions whether owing to the difficulties and complications of dry labour (with or without forceps) there was an increased number of spastic, epileptic, and mentally defective children.

To avoid misunderstanding, I wish to make it clear that I found medical induction ineffective if used to induce labour before term.—I am, etc.,

Leicester.

BELA GALANDAUER.

Food Conversion in Babies

SIR,—Dr. Ian G. Wickes's letter (*Journal*, June 14, p. 1415) makes the suggestion that the ratio weight of food consumed/increase in infant body weight may produce an index figure useful in diagnosing certain diseases of infancy, a high index suggesting poor food utilization.

It seems probable that a group of healthy infants would be found to have widely varying indices and that any given infant would have a variable index from period to period. The range acceptable as indices within normal limits would therefore have to be broad, and the wider the acceptable normal range the less the value of the index as a diagnostic pointer. However, within the range of normal conversion ratios, the difference in index obtained for a number of healthy infants (healthy, that is, on general clinical grounds) might be attributed to a difference in metabolism, providing the broadest of pointers to the future nature of the individual. A high figure clearly suggests that the baby will become active-minded and highly strung rather than placid and easygoing.

If, in this respect, time showed the ratio to be in any sense reliable, it might be of help to those subsequently endeavouring to assess the child's temperament against a background of data supplied and perhaps coloured unduly by parents or others. The ratio would be comparable with an E.S.R. in being free from external influences but in requiring judicious appraisal of its meaning and worth in the individual case.

Such philosophical studies do not of course interest the farmer in studying the meaning of his pig conversion ratios. To him, high ratios mean only more fodder to provide without financial return, but, since high-ratio infants may produce some of the more talented of our species, we need not take the same gloomy view of them.—I am, etc.,

Nottingham.

GORDON CURRIE.

Mortality and Morbidity of Steroid Therapy

SIR,—In a leading article last year¹ you warned us about the mortality and morbidity which follow treatment of arthritis with steroids. Bunim was mentioned as having reported six deaths in 39 patients after prednisone. Of 50 patients of mine who started prednisone treatment more than two years ago,² four have died. Others who have reported fatal arthritic cases are Nelson,³ four; Stolzer *et al.*,⁴ three; Hart *et al.*,⁵ two; Medical Research Council and Nuffield Foundation,⁶ one. Three times as common were non-fatal gastro-intestinal disasters, severe infections, thrombo-embolic episodes, heart failure or arrhythmia, and mental disease.

Previously the mortality and morbidity after cortisone and corticotrophin were equally high. The Americal Rheumatism Association reported 26 deaths in 446 rheumatic patients in one year.⁷ Howell and Ragan⁸ reported 11 deaths in 68 patients; West⁹ 6 deaths in 52 patients, and Savage¹⁰ 6 deaths in 90 patients. The mortality rate for Levin *et al.*¹¹ was five in 50 patients; for Toone and Irby¹² five in 35; for Bunim *et al.*¹³ five in 78; for the Medical Research Council and Nuffield Foundation⁶ 2 deaths in 33 patients in one year. Similar death rates were seen in controlled trials on non-fatal disorders such as skin diseases¹⁴ and asthma.¹⁵ Baldwin *et al.*¹⁶ had 7 deaths in 60 steroid treated asthmatic patients. There is a steadily increasing

roll of death and disease from this therapy, for which I can see no compensating advantage.—I am, etc.,

East Melbourne, Australia.

M. KELLY.

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Full-term Extrauterine Pregnancy

SIR,—Professor Coralie Rendle Short reports a case of a full-term extrauterine pregnancy with a living child, followed two years later by a full-term normal delivery (*Journal*, May 10, p. 1123), and, not having heard of a similar case, she was interested to learn that such a patient could conceive again so easily. The following case provides further evidence that this can happen.

A coloured woman, aged 22, primigravida, was admitted as an emergency to the Provincial Hospital, Port Elizabeth, on April 4, 1951, as a case of "obstructed labour." She was 37 weeks pregnant and had complained of abdominal pains for three days. The pains had increased in severity and she was very distressed on admission. She was small and thin, and her pulse rate was 128 per minute. The abdomen was distended, and the foetus, which was lying obliquely, was easily palpable under the thin abdominal wall. No foetal parts were palpable in the pelvis and the cervix was closed. A provisional diagnosis of an extrauterine pregnancy was made and was confirmed at laparotomy, when a healthy female infant weighing 5 lb. 2 oz. (2.6 kg.) was delivered from the sac. The placenta was firmly attached to the left broad ligament, the small bowel, the mesentery, the transverse colon and mesocolon. The tubes were not identified, as they were obscured by the numerous adhesions. The umbilical cord was cut short and ligated; the sac was closed and the placenta left *in situ*. The mother made a normal recovery and left hospital with the baby on the tenth day.

On August 23, 1953, the patient was again admitted in labour and had a normal vertex delivery of a healthy male infant, weighing 7 lb. 4 oz. (3.6 kg.). The duration of labour was 13 hours. The first child had died at 9 months from bronchopneumonia.

If a patient who has had an extrauterine pregnancy does not return to hospital for her subsequent confinements, the case will almost certainly be lost sight of. I feel sure that somewhere in Africa and Asia there are several of these unrecorded cases which have had subsequent normal deliveries at home.—I am, etc.,

Port Elizabeth,
South Africa.

G. MAIZELS.

Do Sebaceous Cysts Exist?

SIR,—Would Dr. J. L. Edwards (*Journal*, June 21, p. 1480) then leave us with no difference between our old "seb. cysts" and implantation dermoids except that in the latter condition the causative factor is believed known?—I am, etc.,

Leicester.

B. J. FOWLER.

Monkeys for Polio Vaccine

SIR,—I still enjoy a good steak even though I find slaughterhouses revolting. Likewise my whole family have been given poliomyelitis vaccine even though its production depends on the death of many monkeys. However, I could not help feeling that if the word "slave" had been substituted for "monkey" your annotation on monkeys for polio

myelitis vaccine (*Journal*, May 17, p. 1168) might have appeared in a moderately enlightened early nineteenth-century medical journal.

"Slaves are trapped by professional trappers—Some—will have to be destroyed or released because they are unfit for export.—a load of healthy slaves will tolerate a journey of many days, with little or no loss in transit. Indeed the slaves' health may improve on the journey owing to their receiving better food than in the wild state.—The worst of the slaves' hardships occur before they reach the (ship) and this is a matter for the exporting countries to control.—only large operators can supply the slaves in the numbers in which they are required.—the supply might be less liable to interruption from political or religious motives.—The African species are different but would probably serve well enough—"

There seem to be other reasons than mere shortage of supply for hoping that technical methods will be evolved which will obviate the use of monkeys.—I am, etc.,

Fort William, Ontario.

P. C. MACGILLIVRAY.

Medical War Crimes

SIR,—I should like to add to the comments made by Dr. Wilhelmina C. Maguire (*Journal*, June 14, p. 1420). The fact that notorious German doctors, tried, found guilty, and heavily sentenced for crimes of unbelievable horror, are now restored to full rights of medical practice in Germany—their sentences reduced, and discharged because of good behaviour—seems beyond belief.

One overwhelming surprise has been the damage still existing among the victims of these experiments. The wounds and results of operation can heal and stay healed apparently, but psychological trauma remains. To see a victim professionally to-day—15 years after—reduced to tears and trembling by the simplest and kindest examination produces an urge to see simple justice done and their needs given careful and practical consideration. Surely Germany must stand by her promises to the United Nations and fulfil her promise to help and compensate such cases. Some victims have been given compensation on a truly absurd financial basis; many have not even had this.

Surely the revelations of a doctor's wife, who herself was an eye-witness, will stir medical men and women to express in no uncertain terms what we in England feel on this subject. To Mrs. Salvesen,¹ wife of the medical adviser to the Norwegian Royal Household, we owe a debt for her book, *Forgive—But Do Not Forget*, for throwing into the lime-light the misdeeds of the German medical profession in charge of prison camps in Germany.—I am, etc.,

London, N.W.8.

E. T. WRIGHT.

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SIR,—We are asked by Dr. Wilhelmina C. Maguire (*Journal*, June 14, p. 1420) to join her in taking action to prevent war-criminal Dr. Herta Oberheuser from continuing to practise medicine on the grounds of her past behaviour. I wonder if it would not be more adult for Dr. Maguire to present us with the facts as they are now. We might find that this person is now a dedicated practitioner, doing good work. It is possible. If it were so and Dr. Maguire knew it, I wonder if she would be so determined to finish what she wishes to start.—I am, etc.,

Derbyshire.

A. P. TAIT.

Tetanus Immunization

SIR,—It is heartening to read the letter (*Journal*, May 17, p. 1176) from the honorary secretary of the Medical Officers of Schools Association deploring the indiscriminate use of anti-tetanus serum in casualty departments and stressing the desirability of boosting active immunization wherever possible. Your leading article on this subject¹ admirably summarizes the strong grounds on which this plea is made.

One must agree, however, with Mr. Maurice Ellis (*Journal*, May 31, p. 1299) that it is usually extremely difficult to obtain information regarding previous active immunizations. In previous reviews on the matter^{2,3} I have stressed the need for providing the sort of record that Dr. A. H. Morley issues at Mill Hill School (*Journal*, May 31, p. 1299), and Dr. H. J. Parish's authoritative book⁴ makes this necessity quite clear. It has been suggested, so far without avail, that the Medical Directorates of the Armed Services should issue each Service man returning to civilian life with a small card giving a record of his Service immunizations so that the growing pool of actively immunized civilians does not drain away. It would not be impossible to find a space on the National Health Medical Card (Form F.C.4) for this purpose. The Wellcome Foundation have, in fact, issued for some years past a neat and comprehensive record card of protective inoculations, supplied on request, and one would like to see this used in all cases of such prophylaxis.

It is only by means of such a record-card system that the increasing build-up of actively immunized members of the civilian population can be utilized to supersede the less effective and more hazardous method of passive immunization. Dr. Morley's remarks that, in spite of the production by his boys of record-cards, serum has been given to them in casualty departments support my previous contention that the teaching on tetanus immunization in medical schools still leaves very much to be desired.—I am, etc.,

London, S.W.3.

NOEL H. MOYNIHAN.

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Guildford Cathedral

SIR,—May I be allowed very warmly to support the appeal by Dr. J. O. M. Rees and others (*Journal*, June 14, p. 1419) on the matter of a window in the name of the new Guildford Cathedral to be given by the doctors? I hope this appeal will be met with a brisk response. As I am a Guildford diocesan lay reader and an honorary guide the issue is one which is very near to my heart. This beautiful cathedral will be undoubtedly one of the twentieth century's most remarkable buildings. When the Queen saw it a year ago she very aptly described it as being so serene and beautiful.

In connexion with the proposed window I feel it would be a splendid idea if a doctor with an artistic gift could design it. As readers of the *Journal* may know, the nurses' window has been designed by a qualified nurse. It might be possible, as with the nurses' window, to hold a competition for the best design. Medical men have a great variety of hobbies and skills apart from their own vocation.—I am, etc.,

Redhill, Surrey.

J. B. GURNEY SMITH.

Occupational Diseases of Musicians

SIR,—I am at the moment completing a paper on occupational diseases of musicians. There is very little in either medical or musical literature about this, and the material at my disposal has been obtained partly from my own limited clinical experience in this field and from information volunteered by musician friends. I am anxious to obtain further case histories from doctors who have had experience in treating musicians, and would very much appreciate it if any of your readers who are interested would care to share their experiences with me. The source of this information would of course be acknowledged.—I am, etc.,

Ingham Infirmary,
Westoe Road, South Shields.

M. ANDERSON.

Obituary

SIR RUDOLPH HAMPDEN SMITH, Bt., C.B.E.
M.B., B.Ch., F.R.C.S.

Sir Rudolph Hampden Smith, honorary consulting surgeon to the Torbay Hospital, died at Hindhead on June 25, aged 89.

Thomas Rudolph Hampden Smith was born on January 24, 1869, the eldest son of Sir Thomas Smith, first baronet, who was consulting surgeon to St. Bartholomew's Hospital, Surgeon Extraordinary to Queen Victoria, and Honorary Sergeant-surgeon to Edward VII. Rudolph Smith was educated at Winchester, Trinity College, Cambridge, and St. Bartholomew's Hospital, qualifying in 1892 and graduating M.B., Ch.B. two years later. He took the F.R.C.S. in 1895. After holding resident appointments at St. Bartholomew's he became a consulting surgeon at Stockton-on-Tees, where he was on the staff of the local hospital. During these early years he wrote a number of papers on surgical subjects, including one published in this *Journal* on "Chloroform Syncope and Direct Manipulation of the Heart." In 1909 he succeeded his father as second baronet, and a few years later he moved to Torquay, where he was appointed to the consulting staff of several hospitals in the locality. During the first world war he directed a hospital for the wounded and was appointed C.B.E. in 1920.

Sir Rudolph married Ann Ellen Sharp in 1897 and she died in 1928. The heir to the title is his nephew, Mr. Thomas Turner Smith, of New Zealand.

Mr. H. K. GRIFFITH writes: During the first world war Sir Rudolph showed that he was an able organizer as commandant of the Torquay Hospital for the wounded, and in 1922 he was appointed honorary secretary of the committee responsible for building the new Torbay Hospital. In this he spared neither time nor energy in working with his colleagues to produce the best possible hospital for the district. The Torbay area owes him a great debt for the work he did so efficiently. An excellent clinician, he was deservedly popular with his colleagues, whom he was always ready to help in any way. With his patients he was sympathetic and inspired complete confidence. He did not suffer fools gladly, and if a house-surgeon did something foolish he was unlikely ever to repeat it. In committee he was a good chairman, and would enliven the proceedings with an occasional witty remark. Like his father he was an excellent raconteur and after-dinner speaker. Among his professional brethren he set a high ethical standard.

OSCAR PARKES, O.B.E., M.B., Ch.B.

Dr. Oscar Parkes, who practised in London and in Ringwood, Hampshire, died suddenly at his home in Co. Down on June 24, aged 72. A well-known naval historian, he was editor of *Jane's Fighting Ships* from 1918 to 1935.

Oscar Parkes was born at Handsworth, Birmingham, on October 18, 1885, the son of Dr. W. E. Parkes. He was educated at Rydal Mount, Colwyn Bay, Berkhamsted, and Birmingham University, where he graduated M.B., Ch.B. in 1914. He played both rugby football and cricket for his university. After holding resident appointments at the General Hospital, Birmingham, he joined the Royal Navy, and towards the end of the first world war served in the Naval Intelligence Division at the Admiralty. In 1919 he became official naval artist and director of the naval photographic section at the Imperial War Museum. Before he left the Service in 1920 he had already been appointed editor of *Jane's Fighting Ships*, an annual publication founded in 1897. Between the wars he practised in Knightsbridge and was for a time an adviser in neurology to the Ministry of Pensions. He moved to Ringwood in 1943

and continued to practise there, being for a time on the staff of Fordingbridge Hospital. Six months ago he retired from medical practice and went to live in Northern Ireland, having been appointed a director of a publishing company there.

Besides his work as editor of *Jane's Fighting Ships*, Dr. Parkes contributed many articles on naval history and other matters to the *Navy League Magazine* and other journals. He was a very capable marine artist and had exhibited at the Royal Academy. His major work, *British Battleships from 1860 to 1950*, was published at the end of last year.

R. H. L. writes: Oscar Parkes came to Ringwood about 1943, when he took over a small general practice. He had previously been in specialist practice in London, and was always ready to admit that general practice was not his *métier*. He continued to follow his previous work in his general practice, and this consisted of electrical treatment of various kinds, in which he had a fanatical faith. He always strongly resented the fact that the National Health Service did not include payment for such services. He was indeed a real "character" in the true sense of the word, always full of fun, kindness, and energy. But his two chief interests in his leisure hours were his "ships" and his garden. There must be many more capable to tell of his vast knowledge of the Royal Navy, as shown in the fact that for about 17 years he was editor of *Jane's Fighting Ships*. He was a fine artist and very ready to use this gift to entertain others. A founder member of Rotary in Ringwood, he could, with a blackboard and chalk, be always relied on for a most entertaining evening. He retired to Ireland last year when his wife became seriously ill, and she predeceased him by only a very few months. We would like to extend our sympathy to their only child, a daughter, now living in Ireland.

H. M. PEREIRA, L.R.C.P., L.R.C.S.Ed.
L.R.F.P.S., D.P.H.

Dr. H. M. Pereira, formerly smallpox consultant to the Ministry of Health and medical superintendent of the Eastern Hospital, London, died at his home at Bexley, Kent, on June 11. He was 87 years of age.

After qualifying in Scotland in 1895 Henry Manning Pereira held posts in the fever-hospital service in London and then took the certificate of the London School of Tropical Medicine and the D.P.H. of Cambridge University in 1901. Going out to India, he worked first at St. Martha's Hospital, Bangalore, and then became medical officer to tea plantations in Mysore. Coming back to London, he rejoined the fever-hospital service, and after many years in various posts in and around London he was appointed medical superintendent of the Eastern Hospital in 1930.

Dr. J. PICKFORD MARSDEN writes: H. M. Pereira was one of that famous medical team who worked under T. F. Ricketts in the Hospital Ships and River Ambulance Service during the smallpox epidemic of 1900-2. Thereafter he never ceased to practise, and to preach, that great master's teaching on the diagnosis and the hospital management of smallpox. Because of his characteristic modesty, to the medical world at large Pereira was probably the least well known member of that team; but those of us who worked under him learned more about smallpox from him than from any other source. And his value, especially to medical officers of health, as a consultant—a real smallpox expert of the Ricketts school—was, of course, outstanding and almost unique. In addition to his smallpox experience Pereira possessed an exceptional knowledge of diphtheria, enteric fever, and the old type of scarlet fever gained from years of work in the fever hospitals of the Metropolitan Asylums Board; and when the London County Council took over those hospitals in 1930 he was appointed medical superintendent of the Eastern Hospital at Homerton, where he remained until his retirement. Pereira was a most lovable man, supremely happy in his family life. There are many of us who will treasure the memory of his friendship.

EUNICE M. HATCH, M.R.C.S., L.R.C.P.

Dr. Eunice M. Hatch died suddenly at her home at Palmers Green, London, on May 9. She was 64 years of age.

Eunice Mary Hatch was born in Highgate and studied medicine at the London School of Medicine for Women and at St. Mary's Hospital, where she was one of the first women students. Qualifying in 1927, for some years she was in general practice at Ilford, and later became an assistant in a country practice at Lavington, Wilts. In 1940 she returned to London, where she practised in Wood Green until her death. She will be greatly missed by her patients, who appreciated her unfailing kindness and sympathy and her special gift for allaying their anxieties with her humour and cheerfulness. During the second world war Dr. Hatch gave much valuable help to the Red Cross, in addition to bearing the strain of working during the numerous air raids.—G. P. S.

G. J. WILLIAMS, M.D.

Dr. G. J. Williams, who was a general practitioner in London, died peacefully at his home in Paddington, aged 95.

Dr. E. O. LEWIS writes: Much has been written about the "country" doctor, but comparatively little about the "town" and especially the "metropolitan" doctor. Dr. Griffith Jones Williams may be aptly described as a "country" doctor in a metropolis. At all times, and especially when dealing with patients, Dr. Williams had, and induced in others, that feeling of leisure we associate with rural life. His slow, quiet, and dignified entrance to the sick-room gave the patient a sense of calm and assurance. He always gave the impression that he had plenty of time to listen to his patient, and he was most indulgent towards those who were garrulous and hysterical. Dr. Williams's professional approach to his patients was a great contrast to the hustling visit that the overworked general practitioner these days often finds compelled to do.

The family to which Dr. Williams belonged has rendered great services, more particularly in medicine, to Londoners during this last century. His father, Elias Williams, was a chemist in Poultry, E.C., in the middle years of the nineteenth century—a strong personality who was a pioneer in establishing Welsh Presbyterian churches in the metropolis. Three of Elias Williams's sons became doctors and had separate practices in Paddington. Dr. Isaac Williams, the eldest, after about twenty years in practice died in 1896. The second son, Dr. John Cadwaladr Williams, was nearly fifty years in practice before he retired to North Wales, where he died in 1950; his daughter, Dr. Mabel Rolant Thomas, is a dental surgeon in Caernarvon, and his son, Sir John Cecil-Williams, is the honorary secretary of the Honourable Society of Cymmrodorion. Dr. Griffith Williams was the youngest son of Elias Williams, and he spent the whole of his professional life, with the exception of a few years when he was in Kroonstaad and East Rand, in London. His eldest son, Dr. Howell Griffith Williams, was in practice with him for a few years, but died in 1950 when in the prime of life. This is surely a unique record of medical service in one metropolitan area by one family.

Dr. Griffith Williams received his medical training in Edinburgh, where he graduated M.B., C.M. in 1892, and in 1915 he proceeded to the M.D. All-round efficiency and thoroughness were Dr. Williams's chief features as a clinician. Although he was in practice when past his 90th birthday he kept abreast with modern methods of treatment; but he was critical of the indiscriminate empiricism in the use of some of the synthetic proprietary drugs practised by the younger generation of doctors. During the first world war Dr. Williams gave valuable services as a physician at military hospitals; and during the last war he continued with his general practice in Paddington. He was not absent from London a single night during these six

years. The "courteous old doctor" was a familiar figure to the residents and war workers in Paddington, and he was highly respected by them for the great service he rendered in the terrible conditions in London at that period. One night heavy bombs razed to the ground all the houses opposite his surgery and several others on both sides. When the doctor was in one of the top rooms above the surgery an incendiary bomb burst through the ceiling and fell on the bed on which he was resting; he calmly rendered the bomb harmless, removed it to a safe place, and then continued with his rest. Dr. Williams had a most lovable disposition; he was a better saint from his first birth than most Christians are after their "second birth." Even those who lived daily with him never remember Dr. Williams ruffled, annoyed, or irritable. Whilst he had in himself all the resources for contentment, he was very sociable. His geniality, courtesy, and delicate humour made him a most acceptable and congenial member of any home circle, club, or society.

The infirmities of old age which he suffered without complaint compelled Dr. Williams to retire soon after he was 90 years of age. His last years were made as happy and as comfortable as possible by the devoted and excellent nursing care of Mrs. Williams, and the companionship of his only surviving son, Mr. John Trevor Williams. Both have the solace of many happy memories of a most charming personality.

T. R. WILSON, L.R.C.P., L.R.C.S.Ed.
L.R.F.P.S.

Dr. T. R. Wilson, who practised for many years at Wainfleet, Lincs, died at Skegness on June 10.

Thomas Robert Wilson studied medicine at Anderson's and St. Mungo's Colleges, Glasgow, and qualified in 1917. After a period of active service in the R.A.M.C. he settled in practice at Wainfleet and became a well-known figure in the medical life of the district.

R. N. K. writes: Dr. Thomas Robert Wilson came to Wainfleet in 1921, bringing with him a pawky sense of humour which was to be enjoyed by his patients and colleagues. He served this community for 33 years and quickly earned the respect and esteem of its members. A firm favourite with children, there were many now grown up who inquired anxiously for their well-remembered "Dr. Thomas" during his last illness. He had seen service with the R.A.M.C. during the first world war in Egypt and Palestine, and was a member of the British Legion. He was a familiar and popular figure at B.M.A. functions and was chairman of the Holland Division in 1950. It was a bitter blow when the illness which overtook him in his last years of practice curtailed his activities. The many who miss him extend their deepest sympathy to his wife and son.

JOHN LAMBERT, O.B.E., M.D., D.P.H.

Dr. John Lambert, who was medical officer to Wellington College for 27 years, died suddenly at Crowthorne, Berkshire, on June 16. He was 78.

John Lambert was born at Sheffield on January 2, 1880. From the Perse School, Cambridge, he won a scholarship to Downing College, and took first-class honours in the Natural Sciences Tripos. Going on to the London Hospital, he graduated M.B., B.Ch. in 1904, proceeding to the M.D. in 1908 and taking the D.P.H. in 1909. After holding the posts of house-surgeon and house-physician at the London Hospital, he became a clinical assistant at the Hospital for Sick Children, Great Ormond Street, thus stimulating his interest in paediatrics. Thereafter he became senior medical officer to the Brighton education committee, and then, for two years, medical officer to Lancing College. Joining the Royal Navy at the beginning of the first world war, he served mainly in hospital ships, and was appointed O.B.E. in 1919.

Leaving the Navy with the rank of surgeon commander in 1919, he went to Wellington College, where he spent the greater part of his life before retiring in 1946. In his work

there as resident medical officer and as doctor to neighbouring preparatory schools he built up a reputation for accurate diagnosis and sound advice on all matters of school health. He acquired a wide experience of the ailments and epidemics of schoolboys, and, though he wrote little for publication, he kept the most careful records of all medical events at Wellington and his other schools. Though retirement brought him relief from the clinical routine of school doctoring, his interest in all things medical was as lively as ever. He sat on committees—one of them being the Medical Officers of Public Schools Subcommittee of the B.M.A.—and in debate made gently expressed but extremely sane contributions. He was indefatigable in attending medical meetings right up to the time of his death, and was ready to add some well-informed remarks to discussions on almost any medical topic. Before retirement he held office for a time as president of the Medical Officers of Schools Association.

For some boys he stood in a rather special position, since in his early days at Wellington he combined the job of school doctor with that of housemaster in charge of a waiting house. Many generations of Wellingtonians will remember him with affection.

H. R. TIGHE, M.D., F.R.C.S.I., D.P.H.

Dr. H. R. Tighe, a former medical officer of health and school medical officer of Swansea, died suddenly at Morriston Hospital on June 20, after a short illness. He retired in June, 1949, having been in office since 1939, after serving as deputy to the late Dr. Thomas Evans from 1920.

Harman Richard Tighe was a native of Southern Ireland and qualified in 1910, obtaining the F.R.C.S.I. in the following year. In 1914 he took the D.P.H. at Liverpool and held his first public health post as assistant school medical officer in that city. In 1920 he came to Swansea, and 12 years later he took the degree of M.D. at the University of Durham. A man of distinction and of the highest integrity, during the whole of his time in Swansea he was looked upon as an authority on preventive medicine, which he did much to promote. He took an active part in the medical life of Swansea, serving for some years as honorary secretary of the Swansea Division of the B.M.A., and being chairman of the Division from 1936 to 1937. He had also been president of the Welsh Branch of the Society of Medical Officers of Health. Those who served under Dr. Tighe have the happiest memories of his charm and kind personality and mourn his passing. He is survived by his wife, his son, Dr. J. R. Tighe, and two daughters, one of whom is medically qualified.

B. W. ARMSTRONG, O.B.E., M.C., M.B.

The obituary of Dr. B. W. Armstrong was printed in the *Journal* of June 14 (p. 1422).

Dr. P. SZUMOWSKI writes: For 31 years the Royal Sea Bathing Hospital had been Dr. Armstrong's home, his work, his life. Even after his retirement from the post of medical superintendent in 1954 he never completely lost contact with the hospital, continuing to serve as honorary consultant surgeon and president of the League of Friends of the hospital. He told me he was always extremely happy here. Although I knew him only for a short time, I formed the impression that his medical work was for him not merely a profession—it was something much more. He lived for his work and for his personal contact with the sick. He was first of all a friend of his patients. He lived with them through their sufferings, great and small, and he found with them the way to a happy recovery. They always remained his personal friends. No wonder I have seen a patient coming to "her Dr. Armstrong" for routine check-up all the way from New Zealand. Apart from his being one of the leading authorities in his specialty, surgical tuberculosis, Dr. Armstrong had always

been a pioneer and artisan in his work. For him his work was an art and a constructive one. He was a perfectionist in everything he said or did, be it something big and important or some small and seemingly unimportant detail, and this art he taught to his staff and in fact to everybody working in the hospital. Under Dr. Armstrong there prevailed in the hospital the spirit of professional pride and perfection. I am sure that many technical achievements of the highest standard in the treatment and nursing of long-standing surgical tuberculosis illnesses in the Royal Sea Bathing Hospital were entirely due to his inspiration and scrupulous work. The plaster and splint departments are second to none in the country. He certainly made the Royal Sea Bathing Hospital what it has been during the last three decades—well known in this country and abroad. He knew where and how to find the "proper people" for the proper place in the hospital, and during this time he succeeded in forming a team of most devoted and inspired workers in all departments. It was his personality which was the secret of his success and achievement. He was full of charm, deep culture, with wide cosmopolitan interests, and with special consideration for everyone, thereby enabling him to be respected and admired by his staff and his patients. He was the last medical superintendent of the Royal Sea Bathing Hospital, and with his retirement closed a chapter in its history. It was a pity that he had so little time after his retirement, and his activities were further curtailed by a progressively debilitating disease.

LORD WEBB-JOHNSON, G.C.V.O., C.B.E., D.S.O.
Hon.L.L.D., M.B., Ch.B., F.R.C.S.

The memorial service for Lord Webb-Johnson was held at St. Margaret's, Westminster, on June 26. The church was filled by a very large gathering of relatives, private and professional friends, and representatives of the many institutions with which Lord Webb-Johnson was connected. The Queen was represented by Lord Evans. The Rev. C. L. Creswell and Canon Michael Stancliffe conducted the service, and Sir Gordon Gordon-Taylor read a passage from *Proverbs* beginning: "Happy is the man that findeth wisdom, and the man that getteth understanding."

Medico-Legal

AN UNEXPECTED BABY

[FROM AN OBSTETRIC CORRESPONDENT]

On March 17 the Birmingham Coroner's Court investigated an unusual neonatal death (*The Times*, March 18). The mother of the baby said that she did not realize she was pregnant and in labour until after the waters broke. Four years previously she had had a normal pregnancy and labour. In her evidence she stated that she had spent a year in the Far East with her husband prior to sailing for England on May 12, 1957. While abroad she discovered that her husband wanted to marry someone else, but she had shared a bedroom with him shortly before her departure for England. She had no idea that she was pregnant, because she had no symptoms. Her periods had continued regularly and she had felt no movements. On getting up on February 27, 1958 (i.e., 291 days after embarkation), she had started to have some vaginal bleeding which she took for the start of her normal period. Later in the morning she had very severe pain, but still did not realize what was happening and sat on the toilet, where the waters broke. The baby had been born very suddenly while her mother, to whom she had called out, was getting help. She stated, "If I'd realized I was pregnant, I'd have seen my doctor and have prepared for the child—even if I had divorced my husband I'd still have wanted it." The woman's mother, mother-in-law, and next-door neighbour all affirmed that they had not suspected that she was pregnant.

The pathologist who carried out a necropsy on the baby the day after its birth said that the child had been born alive and had breathed. No water was found in the air passages. In his opinion the death of the baby, which weighed 6 lb. 15 oz. (3.3 kg.), was due to shock from immersion in water. He stated that he had known of about half a dozen cases where the mother had not known she was pregnant, including a woman who had previously had 10 children.

The coroner recorded a verdict of death from lack of care and attention at birth.

Comment

One of the most interesting features of this case was the affirmation by a parous woman that she did not know she was pregnant until the baby was actually being born. Most obstetricians of experience have encountered cases where a woman found to be advanced in pregnancy, or even in labour, denies awareness of being pregnant, and sometimes, as in the case cited, there is no history of amenorrhoea. Usually, however, the patient is primigravid and unmarried, and it is tempting therefore to draw an analogy between these cases and those of pseudocyesis. Fried *et al.*¹ remarked that spurious pregnancy commonly followed a situational stress which would best be resolved by the presence of pregnancy. The patient's basic mental conflict made it desirable that she should be pregnant, and therefore she developed all the symptoms and some of the signs of pregnancy, even to the point of her doctor being deceived. Presumably, by a similar mechanism, the symptoms of a true pregnancy might be suppressed or denied conscious recognition because the pregnancy was not in the particular circumstances welcome. But if this can happen it is surprising that pregnancy unsuspected by the mother is not encountered more often.

REFERENCE

1. Fried, P. H., Rakoff, A. E., Schopbach, R. R., and Kaplan, A. J., *J. Amer. med. Ass.*, 1951, 145, 1329.

DROWNED IN NINE INCHES OF WATER

[FROM AN EXPERT IN FORENSIC MEDICINE]

At 2 p.m. on February 1 a boy of nearly 13 finished his midday meal and went out to play. A quarter of an hour later he was found lying face down in a brook in the playing fields behind his home in Sutton Coldfield. The water was nowhere more than 9 in. (23 cm.) deep, and indeed did not cover his head. Artificial respiration was carried out without response until 2.50 p.m., when a doctor arrived and pronounced the boy dead. Post-mortem examination showed no marks of violence, no congenital defects, and no organic disease. The stomach contained a large undigested meal. Petechial haemorrhages were noted upon the heart and lungs—a rather unusual finding in death from drowning—but gravel as well as froth was found in the ballooned lungs, leaving little doubt that the immediate cause of death was, in fact, drowning. A police sergeant is reported to have said that a cigarette was found on the bank of the brook, and that the boy had a packet of the same brand in his pocket.

Another recent fatality from drowning occurred in a pool on Tooting Bec Common. On April 11 at 12.39 p.m. a small boy ran up to the Common keeper and told him that another small boy had fallen into a pool. The keeper ran to the pool and saw the body of a child of 2½ lying on the bottom in 3 to 4 ft. (about 1 metre) of water. The body was recovered, immediate first-aid given, and an ambulance was summoned. The boy reached the casualty department of St. James's Hospital at 12.55 p.m. Here further resuscitative measures were instituted, including cardiac massage, and at 1.25 p.m. the heart began to beat. Spontaneous respirations returned and the child made remarkable progress until at 9 p.m. that evening what were thought to be purposive movements were observed. A tracheotomy was performed but the child died about 20 minutes later. Post-mortem

examination showed partial collapse of the lungs with a great excess of mucus throughout the air passages.

Comment

Theories on the mechanism of death in drowning have been rationalized in the last few years. The work of Swann and Brucer^{1,2} suggests that the interval between immersion and cardiac arrest is almost 3½ minutes in fresh water and 10 minutes in sea water; and, further, that the cause of death in fresh-water drowning is haemodilution and overloading of the heart, while in salt-water drowning fluid is sucked by osmosis from the circulation into the lungs so that acute pulmonary oedema develops.

The two cases noted here present a strange contrast: the elder boy falls into a shallow stream in conditions of apparently minimal danger, while the small boy falls into a pool where every circumstance would seem to be against him—and yet is kept alive for six hours. This contrast makes one wonder whether there was not some extraneous circumstance in the case of the elder boy, one which would not be obvious to the pathologist. Among such could be epilepsy, some form of vagal shock followed by drowning, or the very remote possibility that he had been held under water. There was of course speculation at the inquest and in the press as to why this healthy boy should have drowned in such shallow water, especially as he had ready access to the brook and had often played around and in it. Epilepsy might be an explanation, though there was no history of fits. Nor was there anything in the post-mortem findings to suggest epilepsy—e.g., a bitten tongue or empty bladder—though these findings would not necessarily be present after a fit. A cigarette was picked up near the boy, and smoking one at that early age could undoubtedly cause giddiness and might result in a fall into the brook. But one would have thought that giddiness from smoking or an ordinary faint would have been as effectively relieved by falling into water as by most stimulants.

At the inquest on the younger boy doubts were expressed whether after such a prolonged period of anoxia full cerebral recovery could have been expected. However, the partial recovery in this case does underline the value of modern resuscitative measures, including cardiac massage, in cases of drowning and electrocution.

REFERENCES

1. Swann, H. G., and Brucer, M., *Tex. Rep. Biol. Med.*, 1949, 7, 604.
2. Moore, C., and Veziou, B. L., *ibid.*, 1947, 5, 423.

Medical Notes in Parliament

ANSWERS TO QUESTIONS

Student Grants

Mr. G. LONGDEN (South-west Hertfordshire, Con.) asked the Minister of Education on June 25 whether he would make a further statement about the arrangements for financial awards to university students. Mr. GEOFFREY LLOYD said that with the Secretary of State for Scotland he had decided to set up a committee with the following terms of reference:

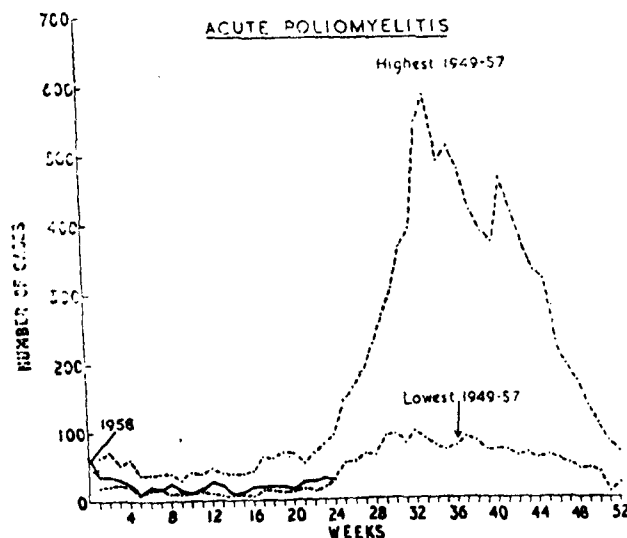
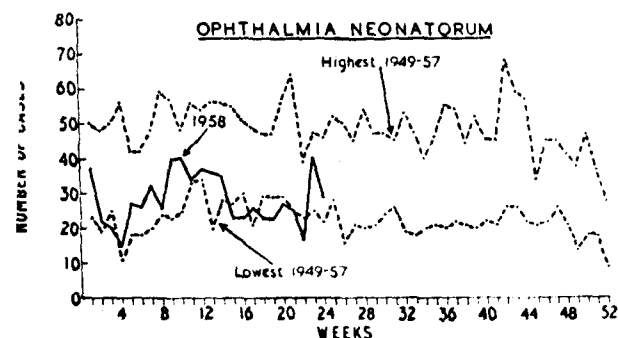
"To consider the present system of awards from public funds to students attending first degree courses at universities and comparable courses at other institutions and to make recommendations."

The committee would therefore consider the kinds of awards to be made from public funds, the method of selecting students for such awards, and the principle of the hardship test required by the law as it now stands. Sir Colin Anderson had accepted the Government's invitation to act as chairman, and the other members of the committee were: Mrs. Gladys Buxton (chairman, Derbyshire County Council), Mrs. Margaret Cooke (Birmingham City councillor), Mr.

The figure consists of two vertically stacked line graphs. Both graphs have 'WEEKS' on the x-axis, ranging from 0 to 52 with major ticks every 4 weeks. The y-axis for both is 'NUMBER OF CASES'.

The top graph is titled 'ENTERIC FEVER'. The y-axis scale ranges from 0 to 140 in increments of 20. It shows two data series: a dashed line representing the period 1949-57 and a solid line representing 1958. The 1949-57 series has several peaks, with the highest reaching approximately 135 cases around week 32. The 1958 series shows a single prominent peak of about 40 cases around week 10. Labels include 'Highest, 1949-57' pointing to the peak at week 32, 'Lowest, 1949-57' pointing to a low point around week 28, and '1958' pointing to the peak at week 10.

The bottom graph is titled 'DYSENTERY'. The y-axis scale ranges from 0 to 2600 in increments of 200. It also shows two data series: a dashed line for 1949-57 and a solid line for 1958. The 1949-57 series shows multiple peaks, with the highest reaching nearly 2400 cases around week 12. The 1958 series shows a steady increase from week 4, peaking at about 1550 cases around week 10, and then fluctuating between 800 and 1100 cases. Labels include 'Highest 1949-57' pointing to the peak at week 12, 'Lowest 1949-57' pointing to a low point around week 20, and '1958' pointing to the peak at week 10.



Week Ending June 21

The largest fluctuations in the notifications of infectious diseases in England and Wales during the week ending June 21 were increases of 514 for measles, from 5,594 to 6,108; 53 for whooping-cough, from 747 to 800; and decreases of 53 for dysentery, from 891 to 838; and 33 for acute pneumonia, from 247 to 214. The largest rises in the notifications of measles were 165 in Lancashire, from 672 to 837 (Liverpool C.B. 237, Blackburn C.B. 214); 112 in Devonshire, from 144 to 256 (Exeter C.B. 129); 84 in Somersetshire, from 121 to 205 (Bath C.B. 145); 66 in Nottinghamshire, from 219 to 285 (Nottingham C.B. 145). The notifications of scarlet fever numbered 657, 9 fewer than in the preceding week, and there were no large fluctuations in the local returns. The largest increase in the incidence of whooping-cough was 20 in Somersetshire, from 8 to 28. For the second consecutive week no case of diphtheria was notified.

The notifications of acute poliomyelitis numbered 36, and these were 2 more for paralytic and 5 more for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 9 (Halifax C.B. 3, Morley M.B. 2) and Lancashire 5.

The areas returning the largest number of cases of dysentery were Yorkshire West Riding 195 (Barnsley C.B. 42, Huddersfield C.B. 27, Sheffield C.B. 26, Leeds C.B. 13, Rotherham C.B. 12, York C.B. 12), Lancashire 154 (Liverpool C.B. 48, Manchester C.B. 16, Rawtenstall M.B. 14, Oldham C.B. 10), London 60 (Islington 11, Stepney 10), Surrey 58 (Banstead U.D. 42, Carshalton U.D. 11), Essex 50 (Walthamstow M.B. 27, Chigwell U.D. 17), Staffordshire 39 (Newcastle-under-Lyme M.B. 25), Durham 35 (Hartlepool M.B. 17), Middlesex 33, Hampshire 26 (Droxford R.D. 17), Yorkshire North Riding 26 (Middlesbrough C.B. 24), Warwickshire 25 (Bedworth U.D. 14), and Cambridgeshire 25 (Cambridge M.B. 25). 75 of the 279 cases of food-poisoning were notified in London (Stepney 57).

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending June 14 (No. 24) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	0	0	1	0		8	2	3	0	2
Dysentery	891	651	184	15	4	457	38	194	6	1
Encephalitis, acute	4	0		0		5	1			
Enteric fever:										
Typhoid	8	0	0	0		7	1	0	0	
Paratyphoid	2	0	3(11)	0	5(11)	1	1	2(11)	0	
Food-poisoning	275	14	351	0		125	25	19	0	
Infective enteritis or diarrhoea under 2 years										
Measles *	5,594	457	133	34	53	21,793	856	214	250	154
Meningococcal infection	15	5	9	2	2	15	1	11	0	
Ophthalmia neonatorum	29	4	1	0		36	3	3	0	
Pneumonia †	247	19	112	3	1	308	27	118	1	2
Poliomyelitis, acute:										
Paralytic	20	2	6	3	4	41	6	2	7	4
Non-paralytic	9	0				42	3			
Puerperal fever ‡	200	22	10	0		185	38	4	0	
Scarlet fever	666	48	70	14	31	547	32	78	24	14
Tuberculosis:										
Respiratory	558	59	111	18	5	469	51	178	19	
Non-respiratory	108	10	14	5		22	1	18	3	
Whooping-cough	747	37	91	10	30	1,371	39	152	6	49

DEATHS	1958					1957				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	0	0		0		0	0		0	
Encephalitis, acute	0	0		0		0	0		0	
Enteric fever	0	0	0	0		0	0		0	
Infective enteritis or diarrhoea under 2 years	4	0	1	0	0	0	1		0	0
Influenza	9	0	0	0	1	0	1		0	0
Measles	1	0	0	0	0	0	0		0	0
Meningococcal infection	0	0				0	0		0	
Pneumonia	328	16	17	6	8	32	12		8	5
Poliomyelitis, acute	1	0		0	0	0	0		0	
Scarlet fever	0	0	0	0	0	0	0		0	
Tuberculosis:										
Respiratory	81	5	2	0	5	2	3		3	
Non-respiratory		1	2	0	0	1	3			
Whooping-cough	0	0	0	0	0	0	0		0	
Deaths 0-1 year	315	36	26	8	10	17	0		0	
Deaths (excluding stillbirths)	8,639	682	523	110	157	11,051	993	247	45	
LIVE BIRTHS	14,662	1,294	971	210	436	14,662	1,294	971	210	436
STILLBIRTHS	324	20	25			26	24			

* Measles not notifiable in Scotland, where return are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Medical News

N.A.P.T. Commonwealth Chest Conference.—The Commonwealth Conference, which incorporates the British Tuberculosis Association's annual conference, opened in London on July 1. The DUCHESS OF KENT, president of the National Association for the Prevention of Tuberculosis, performed the opening ceremony. Besides problems concerned directly with tuberculosis, the Conference's wider interests are shown by the inclusion in its programme of discussions on leprosy and tuberculosis, environmental factors in respiratory disease, the management of the heart in chronic respiratory disease, and the problem of lung cancer. After the four days of scientific sessions, there were tours and visits for the delegates.

Poliomyelitis Centre.—On June 25 the EARL OF LIMERICK, chairman of the Medical Research Council, opened a poliomyelitis research centre at Hendon Isolation Hospital, London, N.W.9. The centre is under the direction of Dr. A. B. KINNIE WILSON, and the Institute of Orthopaedics (London University) will administer it. Dr. Kinnier Wilson is specially interested in artificial respirators and rehabilitation. The centre is the outcome of a recommendation in 1951 by a committee of the Royal College of Physicians of London for a unit to carry out research on the clinical aspects of poliomyelitis, and the proximity of the centre to the Public Health Laboratory Service's virus reference laboratory at Colindale will be useful in investigations of other viral diseases of the central nervous system. The Royal National Orthopaedic Hospital, Stanmore, is assisting in staffing the unit.

Ciba Foundation.—The names of the nine winners of the Foundation's 1958 awards for research relevant to the problems of ageing have now been announced. The two winners of £300 prizes are Dr. R. J. BOUCEK, of Miami, and Dr. D. S. McLAREN, of Mwanza, Tanganyika, the latter for a report entitled "Age and Nutrition in the Aetiology of Cataract." Dr. A. COMFORT (University College, London) is one of the four winners of £200. These awards are being offered for the last time next year, the closing date being January 10, 1959. The Ciba Foundation issued its annual report for 1957 recently. During that year over 800 scientific visitors from 35 countries were provided with rooms. Among its other activities the Foundation held six international conferences, and, as a new venture, five study groups. The conferences were on hormones in the blood, the mechanisms of drug resistance, the mucopolysaccharides, the C.S.F., hormone-producing tumours, and the neurological basis of behaviour. The Foundation's address is 41, Portland Place, London, W.1.

Speeding Medical News.—The Institute for Advancement of Medical Communication, New York, announces its establishment as a non-profit organization to study and develop ways of facilitating the exchange of information between medical scientists, medical educators, and practising physicians. The Institute intends to do this by devising and testing methods of disseminating medical information which promise advantages over those in present use and by serving as an information centre for medical organizations wanting help with communication problems. The Institute will be financed by general and research grants from private foundations and from agencies, private and Federal, which support medical research. The charter members of the Institute's board are Professor CHAUNCEY D. LEAKE, Ph.D., professor of pharmacology, Ohio State University; Professor HOMER W. SMITH, professor of physiology, New York University; Professor IRVING S. WRIGHT, professor of clinical medicine, Cornell University. Dr. RICHARD H. ORR, assistant editor of *Metabolism* and formerly medical director of Messrs. Grune and Stratton, Inc., is executive director. From whom further details may be obtained at the Institute's temporary headquarters, 37, East 67th Street, New York, 21.

F.R.C.S.—The following were successful in the recent examination for the Fellowship of the Royal College of Surgeons of England:

G. B. Northcroft, V. M. Thompson, W. B. Ashby, R. S. Sneath, F. R. Coffin, A. E. Buckle, P. L. C. Diggory, A. Gillespie, F. J. Moynihan, J. M. Powley, W. J. Pryn, D. M. Millar, K. R. S. Pool, R. Y. Calne, A. R. Bearn, R. James, P. S. Boulter, G. Hayes, J. Mutch, I. K. Mikhail, A. K. Chowdhury, W. Lees, K. A. McCluskey, K. A. Menon, J. Y. Fowler-Wright, H. Harrop-Griffiths, N. H. Harris, R. H. Lewis, A. H. Petty, K. Bloor, H. C. Brown, T. I. El-Gailani, J. Magri, G. A. W. Milner (Otolaryngology), R. F. Rohan (Otolaryngology), D. S. Sardana (Otolaryngology), C. B. Walker (Ophthalmology), K. R. Alimchandani, D. S. Dharmage, J. L. A. Dowse, J. G. Gray, G. L. Grigg, A. C. Jain, K. N. Khanna, M. L. Rajakaruna, V. Rasanayakam, G. E. Rousseaux (Otolaryngology), E. J. Williams, J. A. Adams, S. D. Chatterjee (Ophthalmology), M. H. Cox, J. C. M. Currie, E. J. England, A. P. Fuller (Otolaryngology), B. E. Hagan, A. H. T. Hodgkinson, R. A. Howett, I. Kaplan, B. H. Kelham (Otolaryngology), H. M. Learoyd, C. V. Mann, J. A. P. Marston, V. G. Mavalankar, J. Moran, D. C. Patel, G. C. Robin, I. B. Tait, L. J. Walker, J. H. Williams, R. Attard, D. Churchill-Davidson, J. A. Girling, P. B. Humphris, S. R. Mitra, S. K. Nair, B. T. O'Connor, K. C. Perry, W. D. Proudman, G. R. A. Raad (Ophthalmology), M. P. Robinson, J. F. Sander, L. Souvlis, H. H. Srinivasan, P. Virmani, N. K. Yong, L. Das, I. D. A. Johnston, M. Y. D. Koawavwala, M. G. Maguire, B. A. Maurice, D. C. O'Sullivan, C. G. Paul, J. G. Ross, S. B. Singh, J. R. Solomon, D. E. Cam, R. D. P. Craig, A. R. Desai, K. H. Langford, M. B. Menelaus, R. P. Silverton, R. G. Smith, J. L. Dawson, H. F. Jeejeebhoy.

Faculty of Anaesthetists.—Dr. G. S. W. ORGANE, of the Westminster Hospital, has been elected dean, and Professor E. A. PASK, of King's College Medical School, Durham University, vice-dean of the Faculty for the coming year.

British Association of Urological Surgeons.—The 14th annual meeting, held in London from June 19 to 21, under the presidency of Mr. ARTHUR JACOBS, was attended by about 170 members. There was a full scientific programme, the main discussion being on carcinoma of the prostate. The papers will be published in the *British Journal of Urology*. The following were elected officers and members of council for 1958-9:

President, Mr. Arthur Jacobs; immediate past president, Mr. R. H. O. B. Robinson; vice-president, Mr. Hugh Donovan; hon. treasurer, Professor Victor W. Dix; hon. secretary, Mr. J. D. Ferguson; hon. editorial secretary, Mr. N. M. Matheson; members of council, Mr. F. R. Kilpatrick, Mr. W. S. Mack, Mr. T. J. Millin, Mr. R. A. Mogg, Mr. D. S. Poole-Wilson, Mr. N. L. Shepperd, Mr. J. Swinney, Mr. D. Innes Williams, and (ex officio) the president of the Section of Urology of the Royal Society of Medicine and the chairman of the editorial committee of the *British Journal of Urology*.

Liverpool University.—Dr. K. MCCARTHY and Dr. K. R. DUMBELL have been appointed senior lecturers in bacteriology; Dr. J. L. BRAITHWAITE and Dr. E. W. MACMILLAN senior lecturers in anatomy; and Dr. J. GLOVER, Ph.D., and Dr. H. K. KING, Ph.D., senior lecturers in biochemistry. These appointments take effect from next October.

Parapsychiatry and Human Development.—Messrs. S. Karger, of Basle, announce the publication of two new journals. *Confinia Psychiatrica*, whose editors are Drs. H. HEIMANN and T. SPOERRI, of Berne, is intended for papers on borderland subjects to psychiatry—psychology, behaviour research, endocrinology, pharmacology, sociology, medical history, etc. *Vita Humana*, edited by Professor H. THOMAE, of Erlangen, will be concerned with the science of human development and will cover such fields as anthropology, psychology, physiology, paediatrics, geriatrics, social hygiene, etc. Both journals are international in scope and will publish papers in English, French, or German, with summaries in all three languages; both are to appear quarterly, at an annual subscription in each case of 38.50 Swiss francs.

Health Service Supplement.—Next Monday (July 7) *The Times* will contain a 16-page supplement on the

National Health Service. The opening articles will discuss the general practitioner, the consultant service, local authority administration, and the cost of the Service. Other subjects include the future of private practice, hospital insurance, and the pharmaceutical industry.

"Family Doctor."—The July issue includes articles on suicide (Dr. E. H. HARE), Parkinsonism (Dr. DOREEN MOORHOUSE), and weight-lifting and "body-building" (by Mr. I. MACQUEEN, F.R.C.S.), as well as regular features such as "Family Doctor answers," the question-and-answer section for the layman.

COMING EVENTS

British Association of Paediatric Surgeons.—Annual meeting, July 23-25, in London. Details from Mr. R. ZACHARY, hon. secretary of the association, Children's Hospital, Sheffield, 10.

Prophylactic Medicine and Social Hygiene.—World congress at Gmunden, Austria, September 8-13. Details from the general secretariat, 41, Pianistengasse, Vienna, 8.

International Congress of Balneology.—Arranged by the Czechoslovak Society of Physiotherapy, September 8-13 at Marienbad. Details from the secretary of the congress, 5, Reznicka, Prague, 2.

International Collegium for Neuro-Psychopharmacology.—First international symposium, September 9-12, in Rome. Details from Dr. P. B. BRADLEY, Department of Experimental Psychiatry, the Medical School, Birmingham, 15.

International Scientific Film Association.—Twelfth congress in Moscow, September 10-20. Details about the British delegation and entries for the congress may be obtained from the Scientific Film Association, 164, Shaftesbury Avenue, London, W.C.2.

Institute of Medical Laboratory Technology.—Triennial conference, September 13-20 at Bristol University. Further details from the institute, 9, Harley Street, London, W.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Sunday, July 6

UNIVERSITY COLLEGE HOSPITAL, London.—10.15 a.m., clinical demonstration by Dr. H. A. Burt: Backache, its Prevention and Treatment. Open to all general practitioners.

Monday, July 7

LONDON UNIVERSITY.—At Wright-Fleming Institute Lecture Theatre, St. Mary's Hospital Medical School, 5 p.m., special university lecture in medicine by Professor Gerrit Bras (West Indies): Veno-occlusive Disease of the Liver.

Tuesday, July 8

INSTITUTE OF CHILD HEALTH.—5 p.m., Dr. David Gitlin (Harvard Medical School): Plasma Protein Metabolism in the Nephrotic Syndrome.
INSTITUTE OF PSYCHIATRY.—5 p.m., public lecture by Professor George Rosen (Columbia University): Social Stress and Mental Diseases in the 18th, 19th, and 20th Centuries.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Bertram Louis Abrahams Lecture by Sir Lindor Brown, F.R.S.: The Mode of Action of Sympathetic Nerves.

Wednesday, July 9

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. G. Belyavin: Serology of the Influenza Viruses.

Thursday, July 10

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., F. E. Williams Lecture by Professor P. B. Medawar, F.R.S.: The Biology of Ageing.
ROYAL SOCIETY OF HEALTH.—At Town Hall, Lancaster, 10.15 a.m., Dr. R. W. Farquhar: Care of the Aged—Some Socio-medical Problems; Mr. F. Shaw: Public Control of Housing—A Broad Survey.

Friday, July 11

NUTRITION SOCIETY.—At Queen Elizabeth College, Campden Hill Road, London, W.1. Symposium on Applied Nutrition: The Human Factor in Group Feeding. Speakers, Mr. F. Le Gros Clark, Alexis Soyer (1809-1858) Historical Note on His Contributions in Applied Nutrition; Sir Zachary Ope, The Medical Aspect of Soyer's Illness and His Culinary Experiences; Miss B. R. Stanton, The Human Factor in Hospital Feeding; Dr. J. J. O'Dwyer, Some Experiences in Group Nutrition; Brigadier Roscoe, The Problems of Feeding Women in Industry; Miss P. Morkam, The Human Factor in School Dinners; Mrs. D. W. Newman, Appetites in Retirement: The Organized Feeding of Old People.

Saturday, July 12

NORTH OF ENGLAND OTOLARYNGOLOGICAL SOCIETY.—At Royal Manchester Sick Children's Hospital, 2 p.m., meeting.

APPOINTMENTS

CLYNICK, F. E., M.B., Ch.B., F.F.A.R.C.S., D.A., Part-time Consultant Anaesthetist, St. Peter's, St. Paul's, and St. Philip's Hospitals, London.
FLOOD, CHARLES, M.D., M.R.C.O.G., Honorary Assistant Obstetrician and Gynaecologist, Hospital of St. John and St. Elizabeth, 60, Grove End Road, London, N.W.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—Thérèse M. Vanier, M.B., B.Chir., House-physician; K. J. Brown, M.S., F.R.A.C.S., House-surgeon to Orthopaedic and Plastic Departments; P. J. Koblenzer, M.B., B.S., Assistant Medical Registrar; C. G. H. Newman, M.B., B.S., M.R.C.P., D.C.H., House-physician; R. H. R. White, M.B., B.Chir., M.R.C.P., D.C.H., Medical Registrar and Pathologist; Rosalie E. B. Eastwood, M.B., Ch.B., Resident Officer to Department of Neurology and Neurosurgery; Dinah C. M. Henderson, M.B., Ch.B., D.M.R.D., Senior Registrar in Radiology (to be shared with Royal Free Hospital); D. Barltrop, M.B., B.S., and G. W. Hatcher, M.B., B.S., D.Obst.R.C.O.G., House-physicians; J. M. Kingsmill Moore, M.B., B.Ch., and J. Abrahamson, M.B., Ch.B., House-surgeons; D. A. Larnder, M.B., Ch.B., F.R.C.S., and C. J. Stevenson, M.D., M.R.C.P., Senior Registrars to Department of Dermatology; R. M. Innam, B.M., B.Ch., Senior Registrar to Ophthalmic Department; D. G. Mackie, M.B., B.S., Resident Ear, Nose, and Throat Registrar; June E. Brett, M.B., B.Chir., F.F.A.R.C.S., D.A., Junior Anaesthetic Registrar.

LONDON COUNTY COUNCIL.—The following have been appointed whole-time medical officers in the Council's Public Health Department: T. J. Mahon, M.B., B.Ch., L.M., D.P.H., D.C.H., C.P.H., R. W. Watton, M.B., B.S., D.P.H., W. T. Orton, M.B., B.Ch., D.P.H., and M. L. Graeme, M.B., B.Chir., D.P.H.

MANCHESTER REGIONAL HOSPITAL BOARD.—N. S. Gordon, M.D., M.R.C.P., M.R.C.P.Ed., Consultant Neurologist, Booth Hall Hospital, Manchester, Royal Manchester Children's Hospital, with additional duties at David Lewis Epileptic Colony, Cheshire, and in Preston Hospital Centre; E. Sherrah-Davies, M.B., B.Chir., F.R.C.S., D.M.R.T., Consultant Radiotherapist, and K. E. Hainan, M.D., F.R.C., D.M.R.T., Assistant Radiotherapist (S.H.M.O.), Christie Hospital and Holt Radium Institute, Manchester; G. R. Carr, M.D., Ch.M., F.R.C.S., Consultant Surgeon, Stockport and Buxton Group of Hospitals; D. L. Chadwick, M.D., F.R.C.S., D.L.O., Consultant Ear, Nose, and Throat Surgeon, Crumpsall, Ancoats, and Manchester Ear Hospitals.

NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—Ella Preiskel, M.B., B.S., D.M.R.T., Consultant Radiologist, Wilkeson General Hospital; S. A. James, M.R.C.S., L.R.C.P., D.Phys.Med., Assistant Physician in Physical Medicine (S.H.M.O.), West Herts Group; Susan Gordford, M.D., Assistant Pathologist (S.H.M.O.), Clare Hall Hospital; F. J. Fowler, M.B., Ch.B., Senior Administrative Medical Officer, as from August 1, 1958; D. Preiskel, M.D., M.R.C.P., Consultant Physician in Physical Medicine, Acton Hospital; J. L. Anderson, M.B., B.S., C. Robinson, F.R.C.S.Ed., Consultant Orthopaedic Surgeon, and T. Faulkner, F.R.C.S., Consultant Plastic Surgeon, St. Charles' Hospital; O. F. Swann, M.B., B.S., M.R.C.P., D.M.R.D., Consultant Radiologist, West End Hospital for Neurology and Neurosurgery; K. E. Schmidt, M.D., D.P.M., Assistant Psychiatrist (S.H.M.O.), Hill End Hospital; G. Stroh, M.B., B.S., D.P.M., Consultant Psychiatrist in Charge, High Wick, Tyttenhanger, St. Albans; Edwina R. Goodall, M.B., B.S., D.M.R.D., Consultant Radiologist, Ashford and Hounslow Hospitals; J. G. Roberts, M.B., Ch.B., F.R.C.S., Consultant Assistant Neurosurgeon, Central Middlesex Hospital; G. E. Steln, M.B., B.Chir., F.R.C.S., Consultant Ear, Nose, and Throat Surgeon, Acton Hospital; Mary I. Wray, M.B., B.S., D.M.R.D., Consultant Radiologist, Barnet General Hospital; J. R. E. Richardson, M.R.C.S., L.R.C.P., Assistant Pathologist (S.H.M.O.), King Edward Memorial Hospital, Ealing.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—P. F. Boreham, M.Chir., F.R.C.S., Consultant General Surgeon in North Gloucestershire Clinical Area; P. A. Skinner, M.B., B.S., F.F.A.R.C.S., Senior Anaesthetic Registrar at Frenchay Hospital, Bristol; J. L. James, M.B., Ch.B., Medical Registrar in Bath Group of Hospitals; H. A. McClelland, M.B., B.S., D.Obst.R.C.O.G., D.C.H., Medical Registrar at Cheltenham General Hospital.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Champion.—On June 21, 1958, at "Lawnwood," Ventnor, Isle of Wight, to Valerie, wife of Dr. Alan Champion, a daughter—Rosemary Ann Dixey.—On June 22, 1958, at Newmarket General Hospital, to Christie (formerly Humphrey), wife of Dr. John Dixey, of Isicham, Cambs, a son and a daughter.

Harman.—On June 2, 1958, at Grey's Hospital, Pietermaritzburg, South Africa, to Dr. and Mrs. M. J. Harman, twin sons.

Merrileather.—On June 19, 1958, at Lobatuli Hospital, Bechuanaland, to Dr. and Mrs. A. M. Merrileather, a daughter—Winifred Joy.

Reynolds.—On June 25, 1958, at Brighton General Hospital, to Patricia (formerly Aldridge), wife of Patrick C. Reynolds, a daughter—Christine Anne.

DEATHS

Ashton.—On June 10, 1958, Joseph Ashton, M.B., of Colwyn Bay, Denb., formerly of Wandsworth, London, S.W., aged 88.

Bryson.—On June 7, 1958, at St. Leonard-on-Sea, Sussex, Alexander Carruthers Bryson, M.B., B.S., formerly of Shanghai, China.

Cosgrave.—On June 20, 1958, Alexander Kirkpatrick Cosgrave, M.C., V.D., M.B., B.Ch., D.P.H., D.T.M.&H., of Westleigh, Beaconsfield, Bucks, late of Malaya.

Garlick.—On June 6, 1958, at Lucerne, Switzerland, George Herbert Garlick, M.R.C.S., L.R.C.P., of Singapore.

Innes.—On May 27, 1958, at Menton, France, Arthur Innes, M.B., Ch.B., F.R.E.P.S., of Greenways, South Lynn Drive, Eastbourne, Sussex, late of Glasgow.

Melvin.—On June 20, 1958, at Sherwood, Lofthouse, near Wakefield, Yorks, Moray Melvin, M.D., aged 62.

Perreira.—On June 11, 1958, at his home, Bexley, Kent, Henry Manning Perreira, L.R.C.P.&S.Ed., L.R.F.P.S., D.P.H., late of Homerton, London, E., aged 87.

Wilson.—On June 10, 1958, Thomas Robert Wilson, L.R.C.P.&S.Ed., L.R.F.P.S., of Skeaness, Lincs, formerly of Wainfleet, Lincs.

Yates.—On April 17, 1958, Robert Burton Melkie Yates, M.B., Ch.B., of Market Drayton, Salop.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Origin and Spread of Influenza

Q.—Does the natural history of influenza epidemics and pandemics give any indication of their usual place of origin and rate of travel?

A.—The short answer to this question is no. The precise origin of the recent Asian epidemic is unknown, though it is said to have appeared first in a relatively small area of south-west China. The 1949 European epidemic broke out among shepherds in Sardinia. The first cases of the 1918 pandemic are said to have occurred in Army camps in the U.S.A., and the outbreak in Europe occurred after the arrival of American troops in Sardinia. The 1889 pandemic has been traced to north-central Asia. Thus it cannot be said that there is any usual place of origin for influenza epidemics nor that the first sufferers are people with an exceptional susceptibility to the virus. But the age-specific attack rate of the recent epidemic was highest in children. Adults who were in close contact with children probably suffered more severely than those with less intimate contact. This was shown by a change in the age-distribution of deaths as the epidemic progressed. There was a shift in the distribution towards the older age-groups of the population in successive weeks of the epidemic, thus suggesting a gradual involvement of the more resistant members of the population. The rate of travel of the Asian epidemic appears to have been no greater than that of the epidemics of 1890 or 1918. It was noteworthy that local outbreaks followed the arrival of ships rather than aircraft, and this suggests that a sufficient quantum of infection must be imported before spread takes place.

Potassium Bicarbonate and Chlorothiazide

Q.—Is it possible to give potassium bicarbonate instead of potassium chloride to counteract hypokalaemia in chlorothiazide therapy?

A.—One of the practical reasons against giving potassium bicarbonate is that it is not possible to make it into tablets. There is, however, 1 g. of potassium bicarbonate in 14 ml. of mist. pot. cit. et hyoscyami, so it would theoretically be possible to give enough, although this is a most unpleasant mixture to take. The main disadvantage is that it is an alkali. Chlorothiazide acts chiefly on chloride excretion, and therefore potassium chloride might be expected to be beneficial in this respect. Potassium bicarbonate, on the other hand, will enhance the alkalaemia which chlorothiazide tends to produce by virtue of its action as a carbonic-anhydrase inhibitor.

Recurrent Sprains

Q.—What can be done to prevent recurrent sprains of the ankle in a woman which occur on the slightest provocation since an original sprain 25 years ago?

A.—When a woman suffers recurrent sprains of the ankle after an original "sprain" 25 years ago it may well be that the original injury was in fact something more serious than a simple sprain. She may possibly have sustained a complete rupture of the lateral or deltoid ligaments of the ankle. She may even have fractured or avulsed the tip of the medial or lateral malleolus. Such lesions could have been overlooked at the time and the injured ankle treated as an uncomplicated sprain by strapping only.

Often these more serious injuries can be detected with certainty only by radiography with the foot passively held in forced full inversion and eversion. Disruption of the ankle-

joint on its lateral or medial aspect will then be shown by the opening up of the talo-tibio-fibular mortise on the respective side.¹ This kind of lesion usually demands more radical surgical measures than simple strapping support. Failure correctly to diagnose the full extent of the injury and to give proper initial treatment results in a permanently unstable ankle-joint. In view of this possibility in the patient in question, she should be referred to a consultant orthopaedic surgeon for any surgical treatment that might be necessary.

Apart from the more serious causes suggested, recurrent ankle sprains in women are frequently due to a combination of obesity, unsuitable footwear, and weak calf muscles. The treatment of these is diet, low-heeled, lace-up shoes, and supervised ankle exercises in a physiotherapy department.

REFERENCE

¹ Watson-Jones, R., *Fractures and Joint Injuries*, 1955, 4th ed., volume 2, p. 817. Livingstone, Edinburgh.

Nasal Haemolytic Streptococci

Q.—Why is it that when haemolytic streptococci are found in a throat swab they are not usually found in a nasal swab taken at the same time?

A.—The area sampled by an anterior nasal swab is remote from the fauces and has a different flora. The direction of flow of secretion produced by the action of the nasal ciliated epithelium is from before backwards, and this is an obstacle to the migration of throat bacteria even into the posterior part of the nasal cavity.

Haemolytic streptococci are cultivated from throat swabs in patients who have an acute streptococcal tonsillitis or a more diffuse form of angina, or from those who are tonsillar carriers of this organism. Unless there is an accompanying rhinitis, which is sometimes seen in both the acute and the chronic infection, there is no reason why the organism should also be found in the nose.

Infection from Books

Q.—Can library books convey infection? What measures are suitable for disinfecting them?

A.—Pathogenic organisms such as haemolytic streptococci can certainly be recovered from books, but it is difficult to prove that infection has been caused by them. It is highly likely that when the organism is very resistant to light and drying, as in smallpox, books could be dangerously infectious. Infection with various diseases has often occurred when human contact with another case could be excluded. Laundry articles are then the commonest vehicles of infection, but, allowing for the difference in the amount of contact and handling, books could act in the same way. It is important to remember that it is an offence under the Public Health Act to allow a book from a public or circulating library to be used by a person suffering from a notifiable disease: if it has been so used, the local authority must disinfect or destroy the book. Unless the book is valuable, the safest measure is to burn it. For disinfection, books should be exposed in a special chamber to a maximum concentration of formaldehyde for at least 24 hours. The gas has limited powers of penetration, so that the books should be hung on wires in such a way that the pages are kept as open as possible.

Fats and Coronary Disease

Q.—What is the strength of the evidence of a relationship between dietary saturated fatty acids and coronary artery disease?

A.—Epidemiological studies indicate that in countries and communities where the total fat consumption is high the incidence of coronary artery disease is also high. Unfortunately very little is known about the contribution of saturated or of unsaturated fatty acids to the total fat intake in various countries, and so it is impossible at present to relate the incidence of coronary disease to excess or lack of any particular type of fatty acid. Most of us in this country

eat more or less the same amount of fat, but fortunately most of us do not develop myocardial infarction or even advanced coronary atherosclerosis. It is obvious, therefore, that the total intake of fat is only one part of the aetiological picture of coronary disease.

All that can be said at present is that saturated fatty acids elevate the serum cholesterol and that the serum cholesterol is often elevated in patients with coronary disease. These two observations may not be very closely related, and so far there is no evidence that there are more saturated or less unsaturated fatty acids in the serum of patients with coronary disease than in healthy controls. Thus, the evidence for a relationship between saturated fatty acids and coronary artery disease is no more than circumstantial.

Hard Beds for Small Children

Q.—Is a hard bed without pillows satisfactory for small children?

A.—Sleeping on a hard bed without pillows is a perfectly satisfactory orthopaedic state for normal young children. It is important that the bed should not sag in the middle. A bed or mattress may be hard yet still sag because the bedstead springing is of poor design. In this respect a fine wire mesh over vertically placed coiled springs is a better base than a wire mesh with no supporting vertical springs.

On top of a sprung base should be a firm mattress, not a spring interior or foam rubber one. An interior sprung or foam rubber mattress on a sprung base is an unhealthy combination, as it is too soft, sags too easily, and predisposes to low back pain. It can be improved by placing wooden boards or a large sheet of thick plywood between the mattress and the bedstead. A very satisfactory, and inexpensive, bed for two young children is to make wooden bunks in which are placed 4-in.-thick (10-cm.) foam rubber mattresses resting on a plain wooden board base. As there is only board and no springing under the mattresses the latter are compressed evenly by the body weight and do not sag.

Pillows are not essential for normal children provided they sleep well without them. Pillows assume more importance if a child has some deformity like torticollis or scoliosis. For the normal child a single pillow is best. If there is any allergic tendency a pillow filled with soft latex rubber foam (in one piece or foam rubber chips) should be chosen in preference to a feather or kapok pillow.

NOTES AND COMMENTS

Thin and Greasy Hair.—Dr. E. J. MOYNAHAN (London, S.E.1) writes: It is a popular belief, evidently shared by your expert ("Any Questions?" June 7, p. 1365), that massage of the scalp will "delay the progress of hair loss" in a young man with premature baldness. This is a condition which is determined genetically and invariably inherited as a dominant character. The gene responsible for it, like the gene (or genes) which give rise to a number of other traits affecting the skin, such as hirsutism in the female, acne vulgaris, psoriasis, and loss of the so-called juvenile hair-line on the forehead during adolescence, is much more frequent in white populations than in those of other races. There is little evidence which supports the view that any form of treatment, other than castration (which is rather a high price to pay to preserve one's locks), will arrest or slow up the process of hair loss in common baldness, whether premature or not. There is evidence, however, that scalp massage may, in fact, make the baldness worse. It is not surprising that this is so, since it is a common experience to find that many of the follicles which are ultimately destined to lose the power of producing hair first show this by producing thinner and shorter hairs before giving up hair-production altogether. These hairs, which are more fragile than the normal terminal scalp hair, are apt to break off when the scalp is massaged, thus making matters worse for the balding individual. The evidence that any improvement in the local circulation consequent on massage of the scalp will help such an individual to retain his hair is even more slender, and must be regarded as pure speculation for as long as we remain as ignorant as we do of the factors which are responsible

for the progressive atrophy and/or disappearance of the hair follicles. A great deal remains to be done, by way of investigation of the normal cycle of hair growth in the human scalp, before any useful suggestions can be made to help those who are so genetically endowed to postpone or avoid their fate.

OUR EXPERT replies: The fact that premature baldness depends partly upon genetic factors does not in itself mean that it cannot be influenced by treatment. The same argument could apply to psoriasis and acne, which Dr. Moynahan also mentions. The value of massage or of any kind of treatment is extremely difficult to assess in a disorder, such as this, which runs a variable and unpredictable course. It is, however, a widely held belief among doctors as well as the lay public that massage has some beneficial effect in these cases. It is for this reason that I said no more than that it may be possible to delay hair loss. Most patients certainly prefer to do something rather than wait for the inevitable progress of their baldness. The harmful effect of massage on the hair results from friction between the fingers, the hair, and the scalp. This point has been well brought out by the observations of Bowers.¹ Massage with the flat of the hand is recommended as free from this risk.² As Dr. Moynahan points out, a great deal remains to be known about the mechanism of hair growth, but until knowledge is more precise we should not be too ready to condemn empirical treatment.

REFERENCES

- ¹ Bowers, R. E., *Brit. J. Derm.*, 1950, 62, 262.
- ² Sidi, E., and Aron-Brunetière, R., *Précis de Dermatologie Corrective*, 1952. Paris.

Senna and Colic.—Mr. E. W. GODDING (Westminster Laboratories Ltd., London, N.W.1) writes: Your expert ("Any Questions?" May 31, p. 1313), in quoting Professor Duncan's¹ findings of a 17% incidence of griping in puerperal women following relatively large doses of standardized senna, omitted reference to a much more practical aspect of Professor Duncan's data. Thus, in the same article he states: "The fact that a higher proportion of the 'senokot' series had gripes is thought to be due to overdosage, because for the purpose of the trial it was necessary to give the same dose to all patients. Further experience with senokot has shown that an occasional patient experiences severe gripes in spite of smaller dosage, but this has been so infrequent [my italics] that it has not detracted from the advantages of the drug." The clinical reports which have reached us during the past five years leave little doubt as to the correctness of the statement²: "The great advantage of prescribing a standardized preparation of constant laxative action is that, once the dose for each patient is decided, there should be no griping, since this seems to be a symptom of overdosage."

REFERENCES

- ¹ Duncan, A. S., *Brit. med. J.*, 1957, 2, 439.
- ² *Lancet*, 1952, 1, 655.

Correction.—In the answer to the question on diuretics ("Any Questions?" May 31, p. 1313), mercaptopurine was listed as a mercurial diuretic. The name of the drug should have been mercaptopimerin.

Collected Articles from the "British Medical Journal"

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 12 1958

SITTING, STANDING, AND WALKING*

BY

MICHAEL KREMER, M.D., B.Sc., F.R.C.P.

Physician, Department for Nervous Diseases, the Middlesex Hospital, London; Physician, National Hospital, Queen Square, London

In the terms of the original bequest the Oliver Sharpey Lectures are required to have some physiological leaning, and physiology in the widest sense is the basis of medicine. A clinician, particularly a clinical neurologist, is conscious, all the time he is practising his art, that he is using the work of the physiologists and anatomists who preceded him, whether these were labelled as such or were in fact clinicians. There is now perhaps a tendency to swing away from the technique of meticulous clinical observation as a basis for determination of function, whether in the nervous system or elsewhere. Instead there is often the substitution of the results of investigations carried out by technical experts who may see only a part of the patient. The former is said to result only in the description of disease; the latter to fundamental observations on the nature of disease. In spite of this, whatever may be the fate of descriptive neurology, which must surely be the same as that of descriptive clinical medicine of any kind, there is still room for the elucidation of physiological mechanisms by the careful clinical study of disease processes aided, wherever necessary, by planned laboratory investigation. This was true of the past and it is still true to-day. One has only to watch a Symonds, Critchley, or Carmichael at work elucidating a clinical problem and then (perhaps this is what the critics fail to realize) applying these results to the interpretation of normal function and its breakdown to see that the clinical techniques still have much to offer to physiology.

It is with a little hope of following this well-established principle that I am offering the following clinical studies, and as a support for what may appear to be a narrow presentation of a few clinical phenomena as the basis for the analysis of function I will quote Karl Pearson (1911). "To decry specialization in education is to misinterpret the purpose of education. The true aim of the teacher must be to impart an appreciation of method and not a knowledge of facts. This is far more readily achieved by concentrating the student's attention on a small range of phenomena than by leading him in rapid and superficial survey over wide fields of knowledge."

Posture

The apparently simple physiological procedures of adopting and maintaining a posture can be regarded as simple only until an analysis is made of the various mechanisms which must be brought into play to initiate, continue, and close the underlying motor activity. The

*The first of two Oliver Sharpey Lectures delivered before the Royal College of Physicians of London on February 11 and 13, 1958.

first or original action, as every parent knows, is always an uncertain one—needing constant repetition before a pattern is established; beginning as so many learning processes do by a series of attempts which gradually achieve success, until firstly sitting, then standing, and finally walking become fixed patterns which are followed with consummate ease, no longer requiring more conscious thought than is necessary to set the pattern in action. It is a commonplace of daily observation that complicated performances can be carried out while walking. One has only to see a messenger boy walking down the street, biting an apple held in one hand while reading with apparent complete concentration some book held in the other, avoiding oncomers, stepping on or off kerbs without pause, to realize that the youth is walking without the least effort of body or of mind and that all the co-ordination of muscles under sensory guidance is taking place with no apparent correction, intervention, or supervision.

It is not my intention in this lecture to make any analysis of the peripheral or spinal physiological phenomena of posture or of the partial contraction which enables a muscle to remain active indefinitely. This has been so well covered by Sherrington and his followers that it is now standard teaching, though I hope in the next lecture to discuss modifications of these views. What I will attempt is to show, by consideration of some patients with dissolution of powers of sitting and standing, some of the phenomena other than those of spinal cord activity that are necessary to the efficient performances of these motor functions.

Some Elementary Principles

First, however, as many of my patients have suffered brain damage, it is necessary to restate certain elementary principles which are sometimes overlooked in the desire to localize a lesion or, what is so much worse, a "function" of the brain. When a part of the brain is damaged a disorder of function may be produced. What we observe is the result of the rest of the brain making an effort to adjust for the deficiency, with greater or less success. It is never a simple arithmetical state of affairs. The situation is further complicated by the fact that men are not born equal. One brain is better than another in many ways, not the least of which is the power of adjusting for loss of part of the structure. Further, a poor original equipment may appear to suffer out of proportion to the rest. As a simple example one can take the individual who has normally the greatest difficulty in knowing his right from his left—the recruit

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who breaks the drill instructor's heart because he will turn the wrong way as often as not. Let such a person sustain a closed head injury of only moderate severity and as a result lose some brain activity as an overall deficit; then the lowering of his ability to recognize his right from his left will appear now to be great, perhaps even glaringly obvious, and may well give the impression of an apparent focal disorder.

In his most comprehensive account of the parietal lobes, Macdonald Critchley (1953) takes great pains to stress the impossibility of precise anatomical localization of the multitudinous fractions of disordered functions evident in brain damage. He makes clear that it would be wrong to attempt more than the most general distribution of higher functions—perhaps not more than lateralization, perhaps not as much as that in many cases. No one will deny that permanent damage to certain fibre tracts will produce permanent defects of function. Damage to the visual pathway will produce permanent defects in the visual field which are so clear because no adjustment is possible—a final path has been affected. It is true that occasionally the defect is disregarded or filled with images that do not exist, but no adjustment can be made to produce actual vision in the defective part of the field. In higher functions, however, constant and varying adjustments are being made which must account for the fluctuations in the results of examinations from day to day as pointed out by Head and Holmes (1912).

It is true, then, that the study of brain damage gives results which are difficult of interpretation and which may be valueless for anatomical localization. They must, however, be useful for pointing to the functional organization of the individual.

An infant usually sits up at about 6 months old, unless it has profound muscular hypotonia, or disease of the central nervous system, or mental defect, when it may take much longer. When it sits up at first it sways readily, and unless propped it falls in any direction very easily. Once it succeeds in sitting steadily it makes efforts to pull itself up or if held will take its weight on its legs for increasing periods. When it has succeeded in standing it sits down anywhere by letting go and ending sharply in the sitting position. Once it has reached independence in standing, then it gradually tries to achieve a more gentle translation into the sitting position. But when it can get around the room and needs to sit on something, whether a stool or even its pot, one may find in the early stages that it does not manage very easily to seat itself in exactly the position it wants, and has to manoeuvre itself round to get to the desired relationship *vis-à-vis* the outside world.

Trunk Apraxia

A similar situation can be found in the so-called rumpe apraxie or trunk apraxia, first described by Sittig (1929, 1931) in his monograph on apraxia, and further commented upon by Lange (1936). In this condition the sufferer is unable to sit up, lie down, sit down, or roll over on command, though he may do so spontaneously. Only one case is described, though in considerable and most revealing detail; but, as the underlying pathology was a vascular degeneration, there were numerous other defects which complicate and confuse the picture.

Nielsen (1946) briefly describes three cases of trunk apraxia. In the first a man of 40 was unable to rise from his bed or lie down upon it. He raised his arms and legs in the air in an effort to rise, but never succeeded in the attempt. Permission for a necropsy was not obtained.

The second patient could not read but could understand when spoken to. He could not undress himself; he tried to unbutton his clothes, but never succeeded in getting anything done. He acted like a child who had not learned how to do it. When on the examination couch, he turned and rolled like an infant and had to be carefully watched. When asked to sit down he walked across the room to the chair as though uncertain whether he was acting properly. When he finally reached the chair he turned round and regarded it from all angles. He tried to get himself into the chair but bent his knees while facing it. When this was not successful he turned half-way round, decided that was wrong, turned all the way round to the proper position, bent his knees a little—again decided that was wrong, and never succeeded in sitting down. At necropsy a diffuse glioma was found almost filling the left hemisphere, stretching from the tip of the frontal horn of the lateral ventricle to the occipital pole. It is remarkable that his defects were so few.

The third patient had difficulty in sitting up or lying down, yet he had no paralysis. He could not slide down the bed, but raised his pelvis in all sorts of clumsy ways, and finally put it down where it had started from. Necropsy was not performed, but the patient was regarded as suffering from diffuse cerebrovascular degeneration.

I have quoted almost all the details given in Nielsen's book. They are relatively few, but do indicate a difficulty with orientation of the body. Unfortunately it is all too clear that these patients had massive cerebral disease with great dysfunction of many parts of the brain, and it is impossible to use this sort of material to analyse the nature of the particular disturbances I wish to discuss.

To get a clearer view of the disorder I will describe two patients who showed this difficulty but who recovered, who were able to talk about their disorders, and whose general intellectual level was high. They were the best sort of subjects to help in working out the disorder, and, though it will be seen that this was not the only defect from which they suffered as a result of brain damage, it dominated the situation.

Case 1

A tank commander aged 28, while fighting in the battle of El Alamein, was struck in the back of the head by a shell fragment. He sustained a penetrating wound of the occiput from which brain was protruding when he was first seen. The first notes available to me were made 18 hours after the wounding, at a field surgical unit. Here he was found to be responding to questions but confused. His only complaint was of blindness. The evidence given for confusion was that when asked to move his right or left leg he moved either arm indifferently and insisted that he was moving his legs. A primary operation was performed with removal of some bone fragments and necrotic brain, and he was evacuated to the head centre, where I saw him 60 hours after wounding. He was then moderately confused, and his amnesia, both retrograde and post-traumatic, could not yet be estimated. He could now see, though he was very hazy in the lower half of each visual field. The only other abnormality was that he would not or could not move the correct limb on command, and this was out of proportion to the degree of confusion. X-ray examination of the skull showed a midline high occipital bone defect a little more to the left than right with radiating fissures and in-driven bone fragments to a depth of 4 cm. Two weeks later a small abscess was evacuated through the wound, after which he progressed uneventfully, and a month later his wound was soundly healed. He was rational and his amnesia was now clearly about half an hour retrograde and 18 days post-traumatic. There were, however, numerous islands in these 18 days. It is interesting, and perhaps of a patient's amnesia, that late in this intelligent young man gave his own views on the estimated time of loss of memory. He said that, lying in bed in hospital with few visitors, one day is so like another it may be quite impossible to be

certain when consecutive memory begins. In his case he marked it by the ward sister appearing one day wearing a Flanders poppy on her uniform as something different that he could hang on to in his mind.

Once he emerged from his confusion he showed a difficulty with visual imagery or visual recall. He would picture a uniform and try to attach the rank badges without finding the proper place for them. As he said himself a little later, "I knew I had two pips, but I couldn't see where I could wear them—wherever I pictured them seemed odd and absurd. It all came back to me quite suddenly, and I felt how stupid I had been ever to be uncertain." By the end of that first month his visual fields had improved and he then had only a homonymous defect of the right inferior quadrants which did not approach the fixation point nearer than 10 degrees. This remained as a permanent defect.

He was then allowed up and at once became aware of a queer inability to place himself correctly when getting into bed or trying to sit down. On his second day up he went into the lavatory and found he could not work out which way he must face in order to end up in the conventional position. He began by bending his knees and found them on the seat. He knew this was wrong, but no matter what he did he could not combine a knees bend with his posterior to the seat. This went on until he anchored himself by placing his hands on one of the side walls and keeping them there while bending the knees. This enabled him to sit sideways, which was a satisfactory compromise to begin with, though he soon shuffled round to the front. As this happened on several days he could not dismiss it, and tentatively mentioned it during a ward visit. Like so many patients with these bizarre disorders he was afraid that it meant insanity. When reassured he talked freely about this and applied himself to overcoming the defect. He soon worked out a technique of holding on to the lavatory door handle, instead of the side wall, before bending his knees.

At this time careful testing showed no visual agnosia, no visual disorientation; he could read, though he might miss a line now and again. He had no difficulty with his own right and left nor any finger agnosia, but he could be confused about the examiner's right and left by rotating through 180 degrees.

Two months after the wounding he discussed his difficulty in getting into bed. If he was sitting on the side of the bed and was told to get in, as often as not he would end up with his feet on the pillows and his head at the foot. He would get out to rectify this and often repeat the error. The same thing would happen if he told himself to get into bed, whereas if while undressing he started talking to another patient, then he would get into bed without thinking about it and find himself the right way up. He noticed that the action was also much easier if he was thinking with concentration about something such as the next day's activities. One day I asked him to get into bed to be examined; he was obviously in great difficulty, and helped himself by head and tongue movements such as may be seen in a child trying to solve a difficult problem. When asked what the difficulty was he said, "Once I take my eyes off the bed I'm lost, because I can't picture myself and the bed at the same time." It was certainly true that if he faced the bed and climbed in he achieved the correct ending more often than when sitting on the side. No defect of visual imagery for pictures, objects, or topography could be found at this time.

The following episode disturbed him greatly because it illustrated his difficulty in bodily orientation.

Because of the scar on his occiput he had become sensitive about the appearance of the back of his head. In places where he took off his hat he liked to sit with his back to the wall. In a favourite restaurant frequented by his regiment there were only round tables with as many as a dozen chairs. He could never decide which chair to

sit on in order to have the back of his head towards the wall. As a rule he gave up trying to work this out, but sat on any chair and moved round until he got into the right place.

Another interesting defect this patient showed was a difficulty in rapid visual interpretation. He had no visual agnosia as ordinarily interested, but in the cinema he found that he could follow only slowly paced action. Any rapidly changing scene or much activity on the screen was completely beyond him. After a short time he would abandon the effort of following visually and hope the accompanying sound would keep him in touch until he could once more see what was happening. Like other patients with this disorder he preferred the theatre, where as a rule most of the action is static, to the cinema.

This patient was seen again a year later and improvement had continued. The visual fields were unchanged. Now he could usually put himself into a desired chair, though on important occasions, or where fear of failure or ridicule was present, he would resort to trial and error. He had no trouble with lavatory seats, though occasionally his knees would begin to bend too soon, but this he could control. He could now manage the cinema. He had no apraxia, constructional or otherwise, and no defect of the body scheme as applied to himself or the examiner. Formal intelligence testing gave an I.Q. of 120 on the Wechsler battery of tests.

Case 2

A sergeant was struck on the head by a shell fragment during the invasion of Europe. He sustained a penetrating wound of the skull a little posterior to the vertex from which brain protruded. He had a retrograde amnesia of a few seconds and a post-traumatic amnesia of an hour or two. He was at once aware of a loss of power in both lower limbs, because when stood up by a stretcher-bearer he at once fell to the ground. He was seen by a neurologist 36 hours after his wounding, when he had a partial right homonymous hemianopia with some diminution in power and sensation in both legs. It was then noted that he had a curious difficulty with the initiation of movements of the legs, though power was reasonable once the movement was under way. Unfortunately no pre-operative x-ray films exist, but an operation note is available. A bone defect was present just anterior to the apex of the lambdoid suture extending 2-3 cm. to the left of the midline and just to the right of it. The superior wall of the sagittal sinus was missing for 2.5 cm. under the bone defect, and bleeding could be stopped only by a large muscle graft. The dura was tense on the left side of the sinus, and from below it some subdural clot and lacerated brain was removed, leaving a cavity just to the left of the falx and extending down for about 3 cm.

He recovered quickly and was transferred to the Hospital for Head Injuries at Oxford four days after being wounded. On arrival he was alert and rational but noticed difficulty in judging distances, in that he would put things down short of his locker. He complained also that he didn't know where his legs were in bed or how to start them moving. Either or neither might move, and he could not be certain what would happen.

At this time he showed a right homonymous inferior quadrantanopia to 10 degrees short of the fixation point. The upper limbs were normal, but the lower limbs showed a moderate increase of tone with marked weakness of dorsi and plantar flexion of the feet and toes, more so on the right; the ankle-jerks were exaggerated, ankle clonus was well sustained, and the plantar responses were extensor. Sensation was normal except over the feet. Here he had a gross loss of all forms of sensation, both cutaneous and kinaesthetic, over the toes and almost to the ankle-joint. He had no dysphasia or visual agnosia. He had a confusion between right and left in himself and the examiner. He had no finger agnosia so long as lateralization was not required, and could copy finger postures, though he produced a mirror image of the examiner's fingers. He could sit up on

command, but on being asked to roll over he had difficulty, and, after trying and failing, wanted to know whether he had to roll to the right or left. Whatever the reply, or if told it didn't matter, he still couldn't manage until given a shove, when he continued quite smoothly.

He improved steadily and was allowed up some three weeks after the wounding. The visual field defect had cleared, but he still had marked sensory loss in the feet. He then noticed, as did the first patient, difficulty in getting into bed—ending up across the bed or with feet on the pillow. He also said, "The more trouble I take the worse I seem to be." In spite of saying this he attributed his trouble to absentmindedness. As a further example of "absentmindedness" he said that the first time he went to the up-patients' dining-hall he stood with a plate in each hand and his knife and fork and spoon in his pocket. He had no idea what to do next, whether to put a plate down or to get the cutlery out of his pocket first. This inability to carry out a complicated movement pattern persisted for another two weeks, yet from the first he had no evidence of dyspraxia in carrying out simple actions or pretending so to do.

From the time he was allowed out of bed he had difficulty in sitting in a chair. If he started facing the chair then he would turn a complete circle and end up facing the chair. If he turned only 180 degrees, he usually sat down by the side of the chair and landed on the floor. This difficulty persisted for six weeks longer than any of the other difficulties and awkwardness. He was quite certain it had nothing to do with the loss of sensation in his feet, because he said, "It isn't the numbness; that only affects me in the dark, and it's quite a different feeling." At a later stage he said, "My legs are queer creatures and I am often confused about them. I've mixed them up with someone else's. I sat in front of another patient to help him off with his boots, and it wasn't until I had unlaced and almost got one off that I realized I was handling one of my own." I must emphasize that at this time he had no defect of his visual field and that the sensory defects had receded and were confined to the toes and distal parts of the feet, but here they were dense.

This man was intelligent, giving an I.Q. of 130 on the Wechsler series. He had some memory disturbance in that he could not remember more than 50% of the details of a short story. He did poorly with Koh's block patterns and also in visualizing tests. For instance, he gave 16 and 8 respectively for the number of corners and surfaces of a cube. This was not due to any impairment of reasoning, as he did well in the standard tests for abstract thinking. Six months later his body orientation was normal, while the sensory defects in the feet were unchanged.

Comment on Cases 1 and 2

Both these patients showed a disorder of movement which can be summed up as an inability to achieve a desired relationship between the body and the external world. This was most dramatically shown when they tried to sit down, but it is also clear in other actions. These movements were at their worst when commanded voluntarily, at their best when automatic. In this they resemble the classical case of Hughlings Jackson's (1931-2) of apraxia of the tongue and lips in which it was impossible to protrude the tongue on command but where it went out quite smoothly and dexterously to lick a crumb off the lips. It is clear, therefore, that, whatever the disorder, it is not one which has disorganized completely the orientation of the body, but one in which the voluntary drive has been blocked so far as this function is concerned.

Sittig (1931), in the analysis of his own case, felt that it was usually associated with apraxia for other parts of the body and that the order of development of the apraxia was face, upper limbs, lower limbs, and trunk. This he advanced as an example of Hughlings Jackson's (1931-2) law that the more highly differentiated functions show the first

evidence of dissolution in a large or general cerebral lesion. Sittig regards all forms of apraxia as really being bilateral, but that the hemiplegic weakness usually present covers up one side of the apraxia. In his view apraxia is primarily a disorder of movement and actually a form of paralysis. This he calls a paralysis of "higher potentiality."

A superficial view of the two cases here presented might class them as examples of ideational apraxia. This would mean that the disorder was due to a faulty conception of the movement as a whole; but this must be incorrect, for even the brief analysis here given makes it obvious that we are dealing with perceptual as well as movement disturbances.

"Body Image"

It is usual to attempt to explain these orientation defects in terms of disturbances of the body image, or schema, and this view has so many implications for my argument that I would like briefly to outline the major points of the hypothesis and its development. The term "body image," or schema, was introduced as such by Head (1920), though some of his views had been foreshadowed by Bouier, about 20 years earlier. This development was probably due to the failure in Head's (1920) view of the theories on sensation and its relation to motor activity propounded by Munk (1890). The latter argued that the parietal lobe is directly concerned with appreciation of touch, pressure, temperature, and muscle sensation. Apart from muscle sense, these sensations can be reactivated centrally in the form of images, and though muscle sense could not be revived by imagination it could in spite of this combine with the contact or pressure images. These provide definite and distinct images of the actual position of the parts of the body and of their changes, and served as the initiator of movements. By extirpation experiments he produced a mosaic of function, each fragment having sharply defined capabilities.

I cannot go further into this view, which was severely dealt with by Head both directly and by implication. Head suggested that three schemas existed. The first is a visual model and the second a surface or tactile model on which localization took place. Both of these can readily be brought into awareness. The third is a postural model, usually not part of our awareness or conscious introspection, the means of ascertaining the position of the body or of movement of its parts. Which of these body images or schemas, if they exist, is the most important is still being argued. Head is clearly in favour of the postural model, whereas Lhermitte (1939) and Schilder (1935) favour the visual model.

Head says: "The image, whether it be visual or motor, is not the fundamental standard against which all postural changes are measured. Every recognizable change enters into consciousness charged with its relation to something that has gone before, just as in the taximeter the distance or time is presented to us already transformed into shillings and pence. So the final product of the test for the appreciation of posture or passive movement rises into consciousness as a measured postural change. For this combined standard against which all subsequent changes of posture are measured before they enter consciousness we propose the word schema. By means of perpetual alterations in position we are always building up a postural model of ourselves which constantly changes. Every new posture or movement is recorded on this plastic schema, and the activity of the cortex brings every fresh group of sensations evoked by altered posture into relation with it. Immediate postural recognition follows as soon as the relation is complete."

It is clear that this must be (if we may continue the same terminology for a time) a dynamic model, for no single element in the past is sufficient as the basis of the recognition of posture. The standard must be a continuously variable one involving all that has gone before.

It is by means of this mechanism that we are able to make the adjustments of position that enable one movement to follow smoothly on another. It is difficult, however, if we follow this view in its entirety, to see how the breakdown

of the schema can result in the breakdown of the long-standing well-reinforced fully established patterns such as sitting in a desired place.

Lhermitte (1939) sees these orientation difficulties as "a change in spatial thought, particularly in the representation of external space, the objects in it, the relations of the body to external space, and the individual's concept of his physical personality."

This is, of course, expressing the results in the most general terms of the breakdown of the whole orientation mechanism, but the mechanism itself remains obscure.

To elucidate this a little further I should like to describe some further cases which, while not directly related to the mechanics of sitting, may help to clarify this obscure problem.

Case 3

A driver was wounded in March, 1945, sustaining a penetration in the right occipital region. He was operated upon within 12 hours, and a track went forward to the falx, which was bruised but not torn. Debridement was carried out to 6 cm., but a later x-ray film showed that a small piece of metal had entered the posterior end of the frontal lobe. Two days later it was noted that the left limb movements, particularly of the arm and hand, were slow and clumsy, and that he often used the right limbs instead. I first saw him on the fifth day, and then he had signs of damage to the supranuclear pathway of the oculomotor nerves, particularly no visual field defect. There was no loss of power in the limbs, but he never used the left arm if he could avoid it. A week later he was still reluctant to use the left arm, but it was possible to demonstrate that he had no difficulty with recognition of right or left, nor was there any sensory defect at all.

Three weeks later power was full in formal testing, yet there was falling away of the outstretched arm and hand. There was no ideational apraxia, because he could comb his hair, salute, and lather his face with his left hand. There was no finger agnosia. Yet when asked to find his nose with the left hand he groped for it. He could not put the left arm into the same position as the right arm with his eyes shut. With eyes open he had less difficulty, but he had to make constant visual references to the position of the two limbs. Three weeks later he could imitate right-arm postures with the left even with his eyes shut, but he still groped for his nose and chin. Particularly impressive was the test for visual disorientation. In either visual field he could locate an object with his right hand with the greatest precision even though his eye remained fixed on the centre of the field. With the left hand, however, under the same conditions, he was inaccurate by many inches until the object was close to the fixation point. He eventually made an almost complete recovery.

Comment on Case 3

In this patient we see that, during the acute phase of his injury before adjustment had set in, he was unable to maintain so simple a posture as the outstretched arm; yet his postural sense as ordinarily estimated by tiny movements of fingers, his tactile sense tested in every way, and his visual functions were all normal. With more complicated postures where movement must be imitated or initiated, the disorder becomes even more obvious. This shows that there is a dissociation between sense of passive movement and sense of position in space, that it is possible to have damage to one function without damage to the other. Head, in his studies of sensation, recognized that these could be distinguished, but believed it to be unlikely that anything more than minor differences in degree of disturbance could occur. That this is not so is shown not only by this patient but also by a similar case described by Lhermitte and Trelles (1933) of a man of 68 who also could not copy the position of one limb with that of the other in spite of apparently intact sensorium. We must accept, therefore, that more than

an intact sense of passive movement or position as ordinarily determined is necessary to achieve and maintain a posture. Can we find an example in which the converse is present—that is, an ability to maintain position when the sense of passive movement is absent?

Head says categorically that in order to maintain so simple a position as that of the outstretched hand and fingers one must be aware of the position of the hand in space either by kinaesthetic sensation or by vision, and in the absence of these the digits and then the hand would droop by gravity and remain uncorrected. This is standard teaching now, and we have all used the test to show the sensory defect. I have no doubt that this is true for the peripheral sensory pathways and their continuation up to the cortex, and even here it is usually true—but not invariably so.

Case 4

A Commando officer was struck on the head by the butt of a tommy-gun during a raid on the coast of France. He was rendered unconscious, and during this time he was captured. He had a post-traumatic amnesia of 14 days and on recovery he was hemiplegic on the right and aphasic. He gradually recovered power and speech, but after a few months he developed Jacksonian epilepsy. I saw him just over a year later, when he was repatriated. He then had a mild spastic hemiparesis on the right. He moved hand and fingers clumsily. He had a mild increase of tone with increased deep reflexes and an extensor plantar response on the right. Sensory testing showed a minor loss to pinprick and cotton-wool touch over the right digits extending into the palm. All appreciation of passive movement was lost in the fingers and thumb. Movement but not direction could be perceived at the wrist and direction could be perceived at between 20 and 30 degrees at the elbow. Two-point discrimination was lost over the fingers but localization was fair. Stereognosis was absent. In the toes there was no appreciation of movement, but direction could be felt only at the knee. In spite of this gross postural loss this man could maintain his hand and fingers outstretched without any droop. I may say that this surprised me to such an extent that only after I had tried this out on several different days using blindfolds did I dare show the phenomenon to colleagues.

Comment on Case 4

If we accept this as a valid case then it is clear that the maintenance of position without use of the eyes and without the conscious appreciation of sense of position is possible. A very similar case is described by Head, and therefore we must abandon his own postulate that one must always be aware of the position of a limb to maintain that position.

This case, and also Case 3, lead me to the same conclusion, though from opposite directions—that the ability to achieve and maintain a posture is not dependent only on that part of the postural mechanism which can enter our awareness. There must be another mechanism, outside our awareness, which plays an important part, and this mechanism must receive activation in some way from the periphery. It may explain the pseudo-athetotic movements in those patients with severe tabes or sensory polyneuritis which persist even with the eyes open. There may be also in the failure of this mechanism the explanation for those tabetics who cannot be trained by re-education to use their eyes to walk with some ease. But this may be dependent on intelligence rather than anything else.

The part played by different regions of the brain in these phenomena is still very uncertain, and for reasons already given it would be difficult to attempt any formal localization and probably valueless, certainly leading to false conclusions. It is useful, however, to add some negative evidence about localization.

Phantom limbs in amputees are an example of retention within memory of previous experience—a limb continues its existence within the mind where no limb is present. It

is generally accepted that if kinaesthetic sensation is lost owing to a parietal lobe lesion, then this phantom limb will disappear. Such a case is quoted by Head (1920), and I will describe another in the second lecture, though for a different purpose. On the other hand, phantom limbs can exist without loss of the limb if the sensory pathway from the limb is destroyed. Cases of this sort have been described at every level of the sensory pathway. Whether such a phantom would disappear in a parietal lesion is probable, but I am not familiar with any such case in the literature. The suggestion, however, that such phantom limbs disappear because the post-central region is no longer functioning is rendered invalid by the evidence of the "third phantom." Such cases have been briefly mentioned by Macdonald Critchley (1953), and I would like to offer another such.

Case 5

A young man received a left parietal wound which resulted in a right hemiplegia with complete loss of postural sensation in the right limbs. After recovery from the initial dysphasia he felt that the paralysed hand was making piano-playing movements (he was a pianist), and only by looking at it could he convince himself that it was lying immobile across his chest or under his bedclothes. When sitting up in a chair and wanting to reach a glass of water or to turn a door-knob he often apparently put out his paralysed arm, and the feeling of movement was complete until nothing happened and he looked down at the limb with the immediate disappearance of the phantom. The tendency to try to use the paralysed limb was increased because he was definitely dyspraxic with the good left arm. He could never work out why he couldn't do things with the left hand such as use a comb, blow a kiss, or use a pair of scissors. He always tried to excuse the failure by saying it was because he was very right-handed and this was the cause of the clumsy left hand. He also said that if he shut his eyes he could easily feel his right arm doing all the things at which the left was bad. He never said I can see the right arm doing all these things. With the partial recovery of postural sensation the phantom third limb disappeared permanently.

Comment.—Cases such as this would suggest that a parietal lobe lesion causing the disappearance of a phantom limb is massive and includes more than the post-central cortex and subcortex. It would suggest that the mechanism for the third phantom, the maintenance of posture, and the orientation of the body not only can take place outside consciousness but can remain efficient even when the conscious appreciation of movement is lost; further, that orientation of the body as a whole when sitting or standing can fail even though normal sensation is present.

Mechanism of Body Image

The concept of the body schema as put forward by Head indicates that it is conveniently on the edge of consciousness—usually outside it, but capable of being drawn into it and thus reaching our awareness. This use of words is unfortunate, for it creates a curiously solid picture of a body-image mechanism which may, even on this hypothesis, have a definite localization. Perhaps such a view is superficially useful to explain how one loses awareness of parts of the body in terms of disappearance or damage to the body image. Yet this concretization cannot but impede progress in determining the real mechanism.

From his studies of memory and its breakdown, Ritchie Russell (1957) suggests that the memory of movement patterns is due to constant activity within the cerebrum of neuronal circuits. These are established by constant repetition and reinforced by activity. With non-physical memory, reinforcement can take place even during sleep, indicating that a voluntary drive need play no part. The circuits producing postural tone control must be widespread, including cerebellum and brain stem, and must be capable of modification by the afferent information the body can

provide. It is clear from our personal experience that this mechanism exists outside our awareness once the neuronal circuits have been well established, but it must never be accepted as fixed but rather as a dynamic state. This is capable of constant change, as will be shown in the next lecture for the much simpler spinal circuits.

If the body-image mechanism is considered as a series of neuronal circuits, then at points where these circuits are narrowly confined, as in the reticular substance in the brain stem, physical change will produce the widest alterations in the pre-existing state of the individual. This may account for the ascendancy the brain stem has acquired in the neurophysiology of to-day.

This concept of neuronal circuits which are constantly active makes the difficulties of anatomical localization clear and must mean the abandoning of mosaics of function in the hemispheres. It will account also for the widespread area in which lesions may occur with the production of similar alteration in function.

The body image therefore must be regarded as a series of long-standing well-established neuronal circuits or loops which are constantly reinforced because the circuit is self-propagating. Superimposed are the modifying influences produced by streams of afferent impulses from eyes, muscles, and joints. Spreading from this are the impulses which will affect posture and movement, both of which will be considered in more detail in the second lecture.

[The second lecture, with a list of references, will appear in our next issue.]

SEROLOGICAL RESPONSE OF INFANTS TO POLIOMYELITIS VACCINE

BY

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It is now recognized that satisfactory serological response to poliomyelitis vaccine occurs in children after the age of 1 year (Medical Research Council, 1957), but as yet little is known of the response of infants to this vaccine. However, as it has been shown that even newborn infants can be adequately immunized against tuberculosis (Gaisford and Griffiths, 1951), diphtheria (Butler, Barr, and Glenny, 1954), and—with a suitable triple antigen—diphtheria, pertussis, and tetanus together (Feldman, 1954), it seemed logical to try to ascertain how early in infancy immunization against poliomyelitis could be successfully undertaken. This was the purpose of the study here described.

An additional reason for this investigation was the incidence of precipitated paralytic poliomyelitis after the injection of diphtheria and other prophylactic antigens, particularly when combined (Medical Research Council, 1956), because it was felt that if successful immunization against poliomyelitis were possible in early infancy this could precede all the other protective inoculations and might thereby eliminate the risk of provoked paralysis.

In this study, 88 mothers and their infants have been investigated in respect of the relationship between maternal serum and umbilical cord levels of polio-

myelitis neutralizing antibodies, the rate of loss of maternally transmitted antibodies in the infants, and the response of the infants immunized at different ages with poliomyelitis vaccine.

Procedures

Immunization.—The 88 infants were divided into three groups, A, B, and C, containing 34, 29, and 25 subjects respectively. The first dose of 1 ml. of vaccine was given to the infants in group A when they were 1 week old, to those in group B when they were 6 weeks, and to those in group C at 10 weeks. The second dose, also of 1 ml., was given to all the infants four weeks after their first dose. The injections were given intramuscularly into the left and right buttock alternately. Two batches of Glaxo vaccine were used, Nos. 7 and 10, and each was distributed equally throughout the three groups. These batches had been used in other field studies with older age groups and been shown to have satisfactory antigenic activity (Medical Research Council, 1958).

Collection of Sera.—Serum was collected from the cord blood of all the infants and from the mothers within three days of delivery. Pre-immunization samples of sera were taken from the infants in groups B and C on the day the first dose of vaccine was given; in the case of group A the cord serum served as the pre-immunization sample. Post-immunization sera were taken from all infants between 14 and 21 days after the second dose of vaccine.

Titration of Sera.—The sera were titrated for poliomyelitis neutralizing antibodies to each of the three virus types by the method previously described (Biological Standards Control Laboratory, 1957) which has been shown to give reproducible results (Perkins, Sousa, and Tobin, 1958). Fourfold serial dilutions of sera were made and the test dose of virus consisted of approximately 100 TCID₅₀. Each serum-dilution/virus mixture was inoculated into two monkey-kidney-cell culture tubes.

The sera from the mother, umbilical cord, and infant were titrated strictly in parallel in the same test in order that a valid comparison of antibody levels could be made. All titres are given as the dilution of serum in the serum-virus mixture before the addition to cell cultures.

Antibody Levels in Mothers, and Umbilical Cord Blood

Table I gives the distribution of antibodies in the cord sera of the 88 infants. A relatively large number (55) had antibodies to all three types and only four were "triple negative," having no antibodies to any of the types. There

TABLE I.—Distribution of Poliomyelitis Antibodies in the Cord Sera of 88 Infants

No. of Sera	No. of Sera with Antibodies to:			
	No Type	One Type Only	Two Types Only	Three Types
88	4 (5%)	9 (10%)	20 (23%)	55 (62%)

was considerable variation in the antibody levels, which ranged from less than 8 to 16,000 for types 1 and 2 and from less than 8 to 4,000 for type 3. The numbers of infants with no detectable antibody to one particular type were similar, being 21 for type 1, 19 for type 2, and 17 for type 3.

A comparison of the antibody levels of the cord sera with those of the mothers' sera is given for each subject in Fig. 1. With all three types the titres of the cord and mothers' sera were similar—in a high proportion the titres were the same—and where differences occurred they were mostly either twofold or fourfold, although in the case of two subjects the

difference was as great as 32-fold. The geometric mean titres of the cord sera and mothers' sera were also similar for all three types.

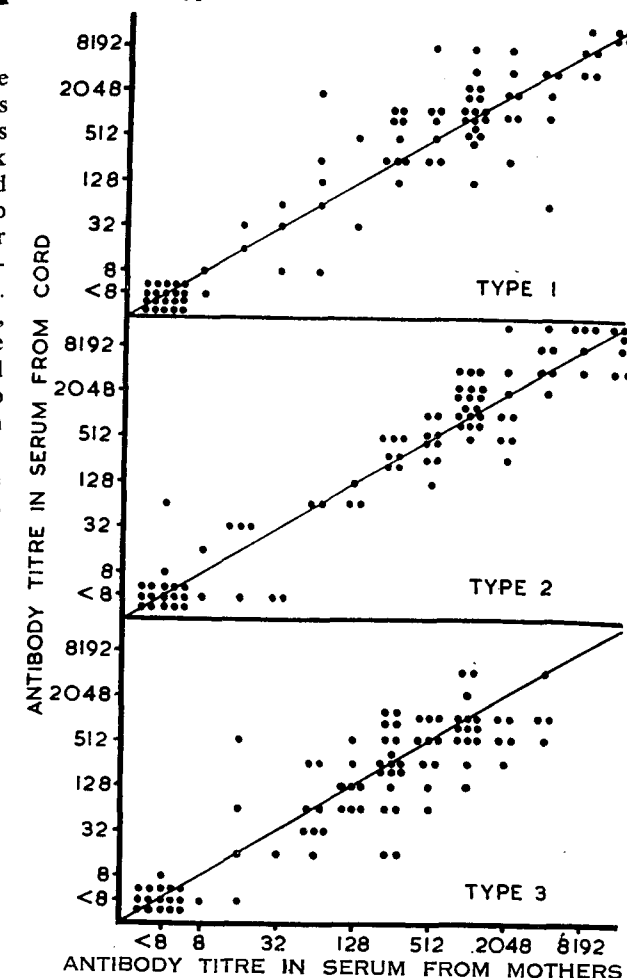


FIG. 1.—Poliomyelitis neutralizing antibody levels in mothers' and cord sera.

Loss of Maternal Antibodies in Infants

The loss of maternal antibodies in the 6-weeks-old and the 10-weeks-old infants is shown in Table II, where, for each type, the mean titres of the sera obtained at the time

TABLE II.—Loss of Maternal Antibody in Infants at 6 and 10 Weeks

Age of Group (Weeks)	No. of Sera	Virus Type	Geometric Mean Antibody Titre of Sera of		Loss of Antibody
			Cord	Infant	
6	29	1	125	42	66%
		2	271	73	73%
		3	62	21	66%
10	25	1	411	37	91%
		2	667	52	87%
		3	271	25	89%

of giving the first dose of vaccine are compared with those of the cord sera. In each age group the loss of maternal antibodies was similar for each type, being approximately 70% in the 6-weeks-old and 90% in the 10-weeks-old infants. Such a decline would suggest that the maternal antibody level was halved every 21 days.

Effects of Maternal Antibody on the Response to Immunization

The antibody response to immunization of the 1-, 6-, and 10-weeks-old infants is shown for each type in Fig. 2, which gives the titres both before and after immunization for each infant. Considering all three groups together, it is seen that

only a small proportion of infants responded to the vaccine; 12.5% responded to type 1, 47% to type 2, and 36% to type 3. It is also evident from Fig. 2 that, for each type, the lower the maternal antibody level the greater the proportion

TABLE III.—Response to Immunization of Infants with no Maternal Antibody at the Time of Giving the First Dose

Virus Type	No. with No Maternal Antibody before Immunization	No. Responding	Geometric Mean Titre of Sera after Immunization
1	24	6 (25%)	3
2	22	21 (95%)	329
3	20	15 (75%)	47

TABLE IV.—Proportion of Infants (a) With Maternal Antibody Titres of 64 or Less at the Time of Immunization, and (b) Responding to Immunization

Virus Type	Age of Group (Weeks)	Total No. of Infants	No. with Antibody Titres of 64 or Less	No. Responding to Immunization
1	1	34	8 (23%)	1 (3%)
	6	29	14 (48%)	3 (10%)
	10	25	19 (76%)	7 (28%)
2	1	32	10 (31%)	11 (35%)
	6	28	13 (47%)	14 (50%)
	10	25	20 (80%)	15 (60%)
3	1	34	15 (44%)	5 (15%)
	6	29	22 (76%)	14 (48%)
	10	25	20 (80%)	13 (52%)

of infants who responded. The effect of maternal antibody, however, differed with the three types. With type 1 no infant with a maternal antibody titre of greater than 16 responded, whereas a response was given by 10 out of the 32 who had titres of 16 or less. With type 2 no infant with a titre of greater than 512 responded, but a response was

TABLE V.—Effect of Age on Response to Vaccine

Virus Type	Age of Group (Weeks)	No. of Infants with Antibody Titre of 16 or Less	No. of Infants Responding to Immunization
1	1	5	1 (20%)
	6	11	3 (27%)
	10	16	7 (44%)
2	1	8	8 (100%)
	6	6	6 (100%)
	10	12	11 (92%)
3	1	9	5 (56%)
	6	11	9 (82%)
	10	12	9 (75%)

obtained in one infant with a titre of 512, in three with titres of 256, and in 36 of the 45 with titres of 128 or less. With type 3 no infant with a titre of greater than 64 responded, but 32 of the 58 responded when the titre was 64 or less.

The results clearly indicate that, with the vaccines used, the type 2 antigen was the most effective in overcoming the inhibiting effect of the homologous maternal antibody, that the type 3 was not quite so effective, and that the type 1 was the least effective. The relative activities of the three antigens are also shown in Table III, which gives the responses obtained in those infants who had no detectable homologous maternal antibody at the time of inoculation. It is evident that the type 2 antigen was the most active, that the type 3 was less active, and that the type 1 was poor. A similar result was also reflected in the responses obtained with the four triple-negative infants. Although the number was small, it is of interest to note that all four responded to type 2, two to type 3, and one to type 1.

Antibody Response in Relation to Age

When the results in the three different age groups are considered separately it is seen that for all three virus types the older the infant the greater the number with lower maternal antibody levels at the time of vaccination. This increase is evident from the analysis in Table IV, which gives for each type and for each group the proportion of infants with maternal antibody titres of 64 or less. It is also seen from Table IV that as the proportion of infants with low maternal antibody levels increased there was a corresponding increase in the proportion responding to immunization. However, the increase in the proportion of those responding was not entirely due to the decline in maternal antibody but appeared to be dependent, to a small extent, on the age of the infant. This is

evident from Table V, where the results are given for those infants with maternal antibody levels of 16 or less—levels which produced little or no interference with antibody response. Although the numbers are small, it appears that, in the case of types 1 and 3, the older the infant the better the response to vaccination, although in the older groups there was still a high proportion who did not respond, especially to type 1. With type 2, however, the age of the infant had no effect on the response, because in all groups all the infants except one responded well to this type.

Discussion

The chief points which emerge from this study are that the titres of maternal and cord blood neutralizing antibodies are strikingly similar for all three virus types; that the loss of placentally transmitted antibodies in the infant is of the same order for all three types, the level being halved approximately every 21 days; that the response of the infants to the vaccine varies with the level of transmitted antibodies, which interfere with the response to the homologous type; that this inhibiting effect is most easily overcome by the type 2 antigen; and that the age of the infant also plays a part in determining the ability to respond to types 1 and 3.

It is clear, therefore, that the earliest age at which infants can be successfully immunized against poliomyelitis depends on a number of different factors, but if, for practical purposes, it is assumed that the majority of infants are born with antibody levels of the order of those observed in the present investigation, it is unlikely that these will have disappeared, or fallen to non-inhibitory levels, until the infants are between 6 and 9 months old. This unfortunately precludes the use of poliomyelitis immunization as the first protection to be offered routinely to infants and leaves the problem of overcoming the risk of provoked paralysis still unsolved.

Early protection against pertussis is particularly desirable and can most conveniently and efficiently be combined with diphtheria and tetanus prophylaxis. To be effective in earliest infancy, this demands an alum-containing antigen (Feldman, 1957), which experience has shown to be the most dangerous in producing provoked paralysis. Some method must therefore be evolved whereby this triple antigen may be given with safety. One solution would be to boost the levels of placentally transmitted poliomyelitis antibodies by immunizing all pregnant women. This would ensure that the infant would have sufficiently high titres against poliomyelitis to last at least for the first four months of life and—under cover of this protection—immunization could be started as soon as possible after birth with three doses of triple antigen and thereafter followed with poliomyelitis vaccine. A study of such a procedure is already in progress, and will be the subject of a further communication.

Considered solely from the point of view of the protection of infants against poliomyelitis, the earliest age for successful immunization is still undetermined; for, although our evidence suggests that all infants would respond adequately to type 2 by the age of 6 to 9 months, it is not yet known whether this would hold true for type 3 and, more particularly, for type 1. This is at present being investigated, as also is the effect of a third inoculation given a month after the primary course, the usual practice for diphtheria, pertussis, and tetanus prophylaxis. It is possible that those infants who have shown no obvious response to their two primary injections of poliomyelitis vaccine may nevertheless have developed a sufficient degree of basal immunity to enable them to respond to the third injection.

Summary

The levels of poliomyelitis neutralizing antibodies in sera from the mother and from the umbilical cord are similar. The loss of maternal antibody in the infant is similar for all three types, the level being halved approximately every 21 days.

The response of infants to poliomyelitis vaccine depends partly on the age of the infant, but chiefly on the level of maternal antibodies, which inhibit the response to the homologous type. This inhibiting effect is overcome most easily by the type 2 antigen, not quite so easily by the type 3, and hardly at all by the type 1.

In order to avoid the inhibiting effect of the placentally transmitted antibody, immunization should at present be delayed until six to nine months after birth, although even at this age it is not yet known whether the responses to types 1 and 3 will be adequate. Studies are proceeding to determine the earliest age at which the response to all types will prove satisfactory.

Investigations are also in progress of alternative methods of immunization in early infancy.

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ORAL TREATMENT OF DIABETES TRIAL OF PHENETHYLDIGUANIDE (D.B.I.)

BY

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In the treatment of diabetes insulin is irreplaceable: no satisfactory substitute has yet been discovered. However, the need for parenteral administration of insulin has stimulated the search for substances which will lower the blood sugar when given by mouth. Recently, certain sulphonylureas (notably carbutamide and tolbutamide) have been shown to do this. Unfortunately, sulphonylureas are effective only in mild diabetes, and this is in accord with the experimental finding that some functioning pancreatic islet tissue is necessary for them to exert full action (Levine, 1958).

Ungar *et al.* (1957) have investigated a series of compounds of different structure belonging to the diguanide group, and found that one of them, phenethyldiguanide, or N-beta-phenethylformamidinyl iminourea (D.B.I.), was able to produce hypoglycaemia even in eviscerated or alloxan-diabetic animals. Later workers have confirmed that this substance can lower the blood sugar in the absence of insulin (Nielsen *et al.*, 1958). Clinical trials of D.B.I. have been carried out by Pomeranze

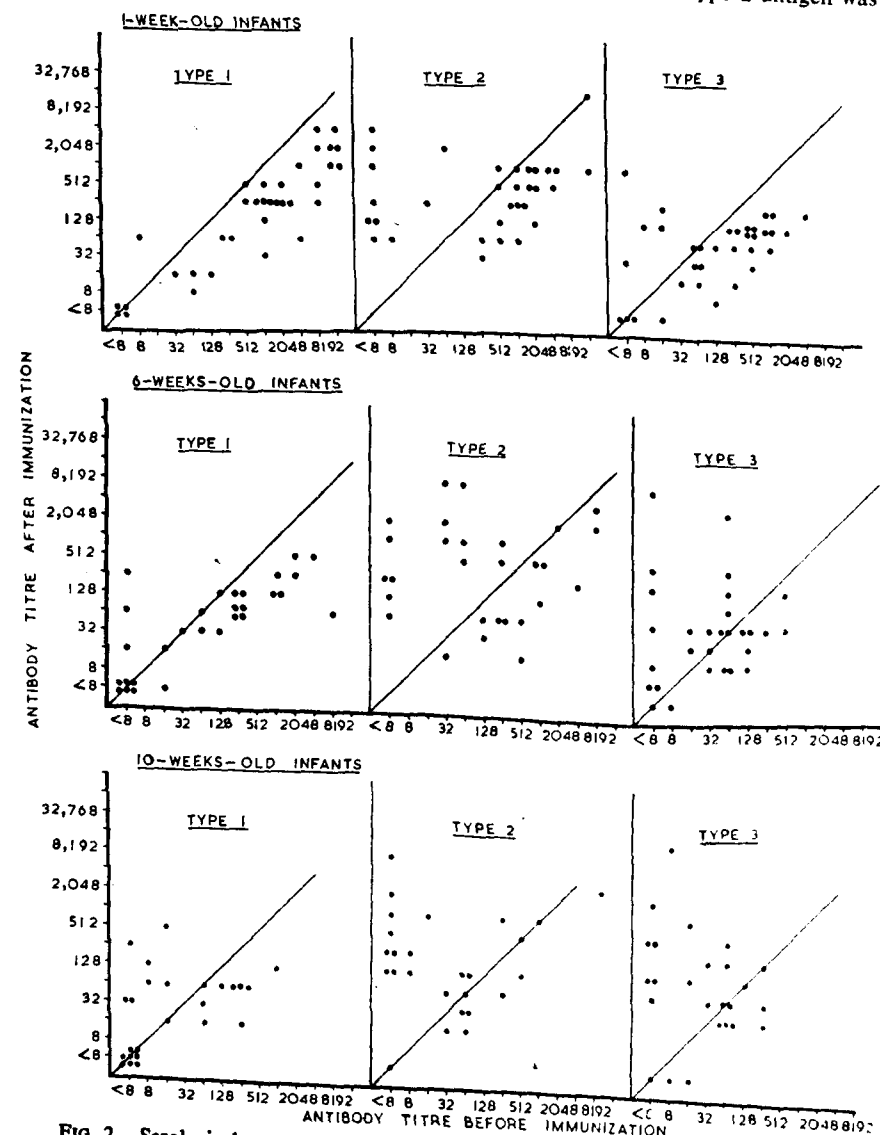


Fig. 2.—Serological response of 1-, 6-, and 10-week-old infants to poliomyelitis vaccine.

(1957), and the results were held to be promising enough to warrant further investigation.

This paper records an attempt to assess the effectiveness of D.B.I. as a hypoglycaemic agent in diabetes of all grades of severity, to gauge its side-effects, and to compare its mode of action with that of insulin and tolbutamide.

Material and Methods

Forty diabetic patients were admitted to the ward for treatment with D.B.I. Their ages ranged from 18 to 78 years, average 57. The weights of 36 of them lay in the 5 to 95 centile range (Kemsley, 1952). Two males and two females were heavier than 95% of their peers. Fourteen of the diabetics were newly diagnosed and had received no treatment; one was relapsing on dietary control, never having had insulin; and the remaining 25 had all at some time had insulin, in varying amounts, for periods ranging from 3 months to 21 years. Diabetics of all degrees of severity were included; five of them developed thirst, poly-

uria, and acidosis if insulin was withheld for more than 24 hours. Where feasible, the patients were managed for a week by dietary control alone before D.B.I. was administered. This enabled the exclusion from the trial of the mildest diabetics who became normoglycaemic after simple food restriction, and permitted estimation of control figures for the blood and urine sugar contents. The calorie value of the diets was arrived at by consideration of the patients' age, height, weight, sex, and activity, and was kept constant through the trial. Patients were also weighed before and during treatment with D.B.I.

On the first day of treatment 150 mg. of D.B.I. was given by mouth half an hour before breakfast, while on the second and subsequent days 50 mg. of D.B.I. was given orally three times daily before the main meals. The full course of treatment with D.B.I. lasted for six weeks. The total 24-hour urine output of glucose (method of Benedict (King, 1951)) was measured daily and venous blood sugars (method of Hagedorn and Jensen (1923)) were estimated each day at 12 noon before lunch. In addition, on the day before D.B.I. was given and on the first day of treatment with D.B.I. blood samples were taken at two-hourly intervals: at 6 a.m., 8 a.m., 10 a.m., 12 noon, 2 p.m., and 4 p.m. These samples were analysed for sugar, plasma inorganic phosphorus (method of Fiske and Subbarow, 1925), and plasma amino-acid nitrogen—method of Folin as modified by Danielson (1933) and Frame *et al.* (1943). From all patients, before and during treatment with D.B.I., blood was also collected for a haemoglobin estimation, for white cell count and blood-film examination, and for liver-function tests.

Results

Effect of Single Dose of 150 mg. of D.B.I. on Blood Sugar.—Fig. 1 shows the mean percentage falls in the blood sugars produced by a single 150-mg. dose in 24 diabetic patients, some of whom showed no hypoglycaemic response to D.B.I. The individual blood-sugar values on the first day of treatment are expressed as a percentage of the value obtained at the same time on the previous day. A hypoglycaemic response to D.B.I. begins to be apparent in four hours, is maximal at six hours, and ceases to be noticeable ten hours after the administration of D.B.I.

Effect of Protracted Treatment on Noon Blood Sugars.—Fig. 2 shows the percentage fall in blood sugars produced by several days' administration of D.B.I., 50 mg. t.d.s. For each patient the mean pre-treatment noon blood sugar was calculated, and each value before and after treatment was expressed as a percentage of this. There was no significant change in the blood sugars during the period of dietary restriction alone. Administration of D.B.I. led to a progressive fall in the mean blood sugars, the lowest level being attained by the sixth day of treatment. Two-hourly serial blood sugars measured a week after treatment in a few diabetic patients were all lower than those observed on the first day of treatment.

Effect of D.B.I. on Glycosuria.—The urinary output of sugar reflected the blood-sugar levels and there was no evidence of an altered renal threshold.

Effect of D.B.I. on Ketosis.—The five patients whose life depended on insulin developed ketosis very rapidly when the insulin was discontinued. Administration of D.B.I. in these cases produced a small fall in the blood sugar, but the ketosis increased in severity. Of the remaining 35 cases, only occasional positive "acetests" were recorded before treatment. After D.B.I. was given, 11 of the 35 cases showed intermittent acetoneuria, of greater frequency and concentration than before treatment, although normoglycaemia and aglycosuria had been produced. The acetoneuria was

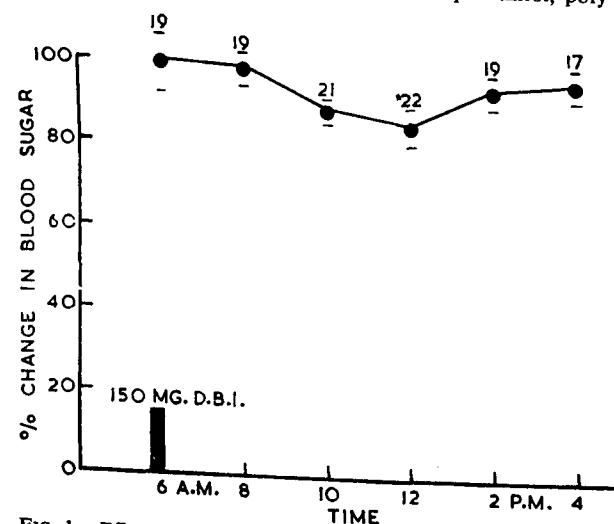


Fig. 1.—Effect of a single dose of D.B.I. on the blood-sugar level of 24 diabetics. Blood-sugar levels are expressed as a percentage of the value obtained at the same time the previous day. Each point on the graph is the mean of the figures obtained from the number of diabetics shown above each point. The horizontal lines bracketing each point represent the standard error of each mean.

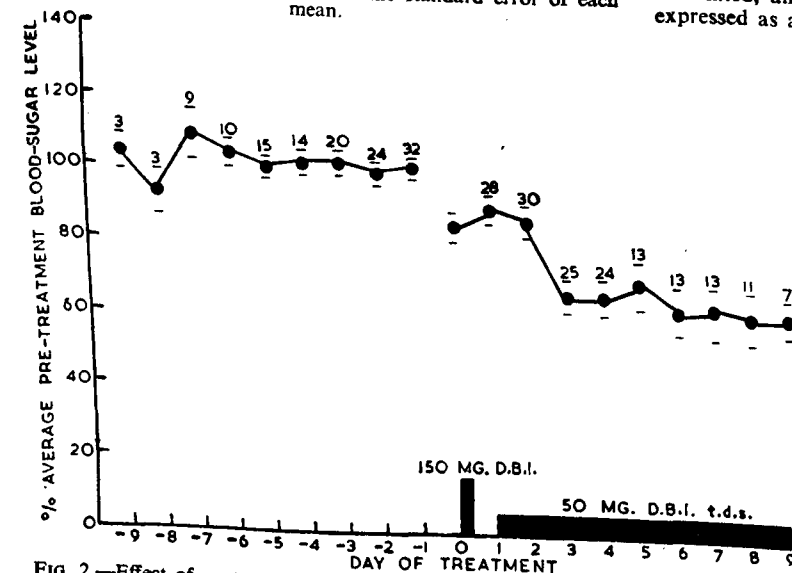


Fig. 2.—Effect of protracted treatment with D.B.I. on noon blood-sugar levels. Blood-sugar levels are expressed as a percentage of the average pre-treatment level for each case. Each point is the mean value obtained from the number of diabetics shown above each point. Horizontal lines bracketing each point represent the standard error of each mean.

not due to starvation, as these patients had eaten well throughout. Acetonuria also developed in most patients who became nauseated, or who vomited while receiving D.B.I. In one case the paradoxical coexistence of ketonuria and aglycosuria was particularly marked.

An underweight male diabetic, aged 51, newly diagnosed, presented with thirst and polyuria. Heavy glycosuria and acetoneuria were observed. The initial noon blood sugar was 391 mg./100 ml. D.B.I. was given after two days' observation, and the noon blood sugars fell to 80 mg./100 ml. after a week's treatment. Although no sugar was passed in the urine, the daily output of acetone exceeded 1 g. and the blood acetone was 10 mg./100 ml. The D.B.I. was discontinued, with immediate reappearance of glycosuria. After two days without the drug, acetone disappeared from the urine, although the sugar content exceeded 2%, and the blood sugar rose to 300 mg./100 ml. D.B.I. was again given and the blood sugar fell again to normal levels. Glycosuria disappeared, but acetone bodies reappeared in the urine, the acetone being positive at a dilution of 1:32. It was thought unwise to continue with D.B.I., and insulin was given. Although the blood-sugar levels were normal, two days elapsed before the ketonuria was eliminated. The patient, although making no spontaneous complaint while receiving D.B.I., immediately commented on a sense of improved health when insulin was given.

Effect of D.B.I. on Plasma Inorganic Phosphorus and Amino-acid Nitrogen.—Although 150 mg. of D.B.I. administered on the first day of treatment produced some reduction in the blood sugar in all the 11 patients studied, there was no increase in the postprandial fall of serum inorganic phosphorus (5.4% at 10 a.m. compared with 10% on the previous day at the same time). Similarly, no effect of D.B.I. on the plasma amino-acid nitrogen could be demonstrated.

Relation of Severity of Diabetes to Response to D.B.I.—Five patients had a severe, brittle type of diabetes and required more than 30 units of insulin daily. D.B.I. was substituted for insulin in dosage varying from 150 to 250 mg. per 24 hours, but failed to prevent severe ketosis, hyperglycaemia, thirst, and polyuria. Insulin had to be reintroduced in these cases. The remainder of the patients had a mild or moderately severe diabetes, and most of them showed a fall in the blood sugar in response to D.B.I. In 18 cases the noon blood sugar was reduced to below 180 mg./100 ml., and in seven of these to below 140 mg./100 ml.

Relation of Response to Duration of Diabetes.—Of the 14 newly diagnosed diabetics, 12 showed a good hypoglycaemic response to D.B.I., and five of these did not relapse when the D.B.I. was withdrawn. Of the cases with diabetes of long standing, 17 showed some hypoglycaemic response, but none could subsequently be managed by diet alone. The impression was obtained that the drug was more effective in cases of diabetes of recent onset.

Pejorative Effects of D.B.I.—No fewer than 26 out of the 40 patients developed gastro-intestinal disturbances while on the drug. Nausea, anorexia, abdominal discomfort, vomiting, and diarrhoea were variable in severity, but in most cases were persistent enough to necessitate cessation of treatment with the drug. Symptoms usually appeared three or four days after the beginning of therapy and were not related to hypoglycaemia. Discontinuation of the drug caused the symptoms to abate, usually within two or three days.

Effect of D.B.I. Compared with that of Tolbutamide.—In two patients in this series in whom tolbutamide had previously been employed with unsatisfactory fall in the blood sugar, D.B.I. was effective in lowering the blood sugar. Unfortunately, in each case nausea and vomiting precluded continuous use of D.B.I. In three other patients in whom D.B.I. had produced normoglycaemia and in whom treatment with the drug was stopped because of nausea and vomiting, tolbutamide was introduced, but was much slower and less effective in reducing blood sugar.

Clinical Effects.—It was originally intended to administer D.B.I. for six weeks in all cases. In 25 out of the 40 patients this was not possible because of unpleasant side-effects or because an adequate fall of blood sugar had not been obtained. 20 of these cases now receiving insulin and five

tolbutamide. Of the remaining 15, six are still receiving D.B.I. (50 mg. t.d.s.) and are satisfactorily controlled. When the drug was discontinued in the rest after six weeks' treatment, in four the diabetes relapsed, necessitating treatment with insulin in two and with tolbutamide in two. In five dietary control seemed adequate to control the diabetes. Where D.B.I. was effective in lowering the blood sugar without causing gastro-intestinal symptoms, adequate relief of diabetic symptoms such as thirst or polyuria was afforded. Of the 15 patients who received a prolonged course of D.B.I., five complained of a sensation of lassitude and epigastric fullness after meals. One patient to whom a second course of D.B.I. was given after relapse of her diabetes mentioned that she felt much better "in herself" while receiving the tablets.

No skin rashes, blood dyscrasia, or toxic effects on the liver were observed in this series.

Discussion

D.B.I. has been demonstrated to be an effective hypoglycaemic agent in mild and moderate diabetes. At a dosage of 50 mg. three times a day it has been shown to reduce the blood sugar to normal levels, in some cases even in the presence of ketonuria and in some patients who have failed to respond to tolbutamide. Unfortunately, its administration was accompanied by gastro-intestinal disorders in no less than two-thirds of the diabetics in whom it was used. Nausea, abdominal discomfort, vomiting, and diarrhoea were severe enough to necessitate withdrawal of the drug in these patients. Symptoms usually quickly subsided on cessation of treatment, but vomiting is a particularly unwelcome symptom in diabetics. No toxic effects were observed in the blood or in the liver of patients so far treated, but the period of observation has not extended for more than a few months. While this paper was in preparation, Williams *et al.* (1958) recorded their experiences with the drug. They found a similar proportion of gastro-intestinal disturbances in patients on diguanides, but observed no permanent ill effect of any type. Pomeranze (1957) has stated that labile diabetics can be better controlled with supplementary use of the drug, but we have not investigated this aspect of its use.

Experimental evidence (Williams *et al.*, 1957) suggests that the drug has two main modes of action; firstly, it decreases the output of glucose from the liver by depressing gluconeogenesis, and, secondly, it increases glucose utilization by the tissues. Lundbæk *et al.* (1958) have also shown that D.B.I. has a strong effect on the uptake of glucose by the tissues. As, however, the amount of glycogen in muscle was decreased by D.B.I. (Williams *et al.*, 1957; Rafalsen, 1958) the effect of D.B.I. on the carbohydrate metabolism of muscle differs from that of insulin, and Williams *et al.* (1957) have suggested that the increased glucose uptake is due to increased anaerobic glycolysis. Our results support the view that D.B.I. does not act like insulin. In contrast to insulin, D.B.I. was quite unable to relieve acidosis in severe diabetics, and normoglycaemia could be attained in only about a third of diabetics to whom the drug was given.

Further, the appearance of ketone bodies *pari passu* with the development of normoglycaemia in certain cases makes it likely that carbohydrate oxidation is not completely rectified even when the drug has returned the blood sugar level to normal. The lack of a fall in a plasma inorganic phosphate may be due to the milder effect of D.B.I. on glucose uptake. Lotspeich (1949) found that insulin promoted the synthesis of proteins from amino-acids. The resultant lowering of the plasma amino-acid nitrogen could be seen in normal individuals (Luck *et al.*, 1928) as well as in diabetic patients. The lack of effect of D.B.I. on the amino-acid nitrogen levels in the present trial indicates again that D.B.I. does not act like insulin. On the other hand, the impression was obtained that D.B.I. was more potent as a hypoglycaemic agent than the sulphonylureas. As with tolbutamide, however, several days of treatment must elapse before maximal effect is demonstrated, and

D.B.I., like the sulphonylureas, proves more effective in patients whose diabetes is of short duration.

The ultimate value of maintaining normoglycaemia in diabetics by substances whose mode of action differs from that of insulin remains undecided. There is evidence that hyperglycaemia *per se* is harmful if allowed to persist and can be responsible for the degenerative changes that occur in diabetics (Duncan *et al.*, 1958). The search for an effective non-toxic hypoglycaemic agent is justifiable on these grounds. D.B.I., although its range of action is probably wider than that of tolbutamide, is unsuitable for general use because of the high incidence of unwanted side-effects.

Summary

A new oral hypoglycaemic substance, phenethyl-diguamide (D.B.I.), was administered to 40 diabetic patients, of all grades of severity.

A significant fall of blood sugar occurred in about two-thirds of cases.

Ketosis was not rectified, and occasionally developed, in patients on D.B.I.

In five cases in which tolbutamide proved ineffective, D.B.I. produced a fall in blood sugar.

Ill effects (usually nausea, vomiting, or diarrhoea) appeared in 25 of the 40 cases, precluding the general use of D.B.I. in diabetes.

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The annual meeting of the Medical Sickness Annuity and Life Assurance Society, Ltd., was held in London on June 24, under the chairmanship of Mr. R. J. McNEILL LOVE, F.R.C.S. There had been an unprecedented increase in both sickness and life business, he said, arising from the excellent results of the 1956 valuation and the reduction in premiums for sickness and accident insurance. The sickness insurance fund now stood at over £2,700,000, the annual premium income exceeding £360,000, while the life assurance and annuity fund exceeded £5m., with a premium income of over £500,000. The net new life business at practically £2½m. was nearly 40% better than the previous year. New business under the scheme to cover the risk of death under the Medical Sickness Finance Corporation's hire purchase agreements amounted to £661,000. This subsidiary, which financed the hire purchase of cars and medical and dental equipment, charged rates little more than half those current among the ordinary finance companies. The society had formed a new subsidiary company, the Permanent Sickness Insurance Co., Ltd., whose non-cancellable sickness and accident policies would be issued to those in other than the medical and dental professions and, it was hoped, also to nurses, physiotherapists, and others in the ancillary medical services.

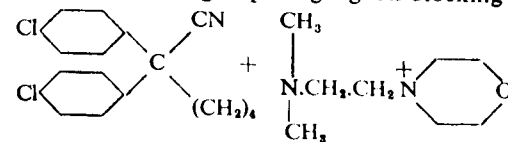
A NEW ORALLY EFFECTIVE LONG-ACTING GANGLION-BLOCKING AGENT FOR HYPERTENSION (189c56)

BY

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The substance 189c56, as can be seen from the formula, is a derivative of the group of ganglion-blocking sub-



stances originally described by Adamson, Billingham, Green, and Locket (1956). Careful and prolonged clinico-pharmacological investigation of these agents over a period of years has shown that systematic variations in certain chemical groupings could produce corresponding systematic and progressive alterations in pharmacological properties (Locket, 1956b; Green, 1956; Billingham, 1956). 189c56 is one of the compounds developed as a result of this investigation. Chemically it is related to pentacynium methylsulphate ("presidal"), a ganglion-blocking agent used in the treatment of hypertension (Locket, 1956a; McKendrick and Jones, 1958).

Clinico-pharmacological Studies of 189c56

Compared with pentacynium methylsulphate, about twice the dose of the active cation of 189c56 by subcutaneous or intravenous injection produced the same fall in blood pressure. Initial studies demonstrated that 189c56 produced hydrodynamic changes and effects on renal function comparable to those of pentacynium.

It was possible to identify 189c56 in human urine many days after the last therapeutic dose had been injected. For this identification special biological techniques using mice were developed (A. F. Green and N. B. Ward, 1957, personal communication). Prolonged excretion could mean prolonged action with appropriate dosage, and this might be of great advantage because of longer control of the hypertension.

The hypotensive effect of 189c56 begins about two minutes after intravenous injection, but may require up to three hours before reaching its lowest level. The subcutaneous dose is two to four times larger than that necessary to produce a comparable fall in blood pressure by intravenous injection. A local reaction due to the cation may occur at the site of the subcutaneous injection, and this may be immediately apparent. The fall in blood pressure begins half an hour after subcutaneous injection, but on occasion this interval may be two hours.

Administration by Mouth

The observations of the action of the drug by mouth extend over a period of more than a year and are based on many more patients than the few "long-term" cases here reported. The small supply of drug necessitated as wide a coverage as was practicable, on a short-term basis, of severely ill hypertensive patients.

The clinical results are better than with any other member of this series so far used therapeutically, and in many ways better than those obtained in comparative trials with the other ganglion-blocking agents available for clinical use by oral administration (see Cases 2, 4, 5, 7, and 9). Within the dose range of 200* to 1,250 mg. daily by

*All dosages in this communication refer to the salt bis-methylsulphate trihydrate unless specifically stated otherwise.

mouth of the salt 189c56 bis-methylsulphate trihydrate—that is, within the range of 114 to 713 mg. of active cation—given as a single dose, we are able with ease to produce prolonged and marked hypotension in every patient. The hypotension usually begins about 25 to 45 minutes (range 20 to 150 minutes) after the oral dose, reaches its maximal effect on an average about 4 hours (range 1½ to 8 hours) later, and lasts from 10 to 40 hours for a single dose.

Our current procedure is as follows. In any individual patient we start with a small oral dose, usually 200 mg. This is increased by 50 mg. each day until an appreciable hypotensive effect is obtained. This dose is then given daily. In a few days the patient becomes accommodated to the hypotension and it is now less marked. The dose is then increased by 25–50 mg. every few days. During these initial stages it will be necessary to stop on occasion in order to give the patient time to adjust, before proceeding to the desired degree and duration of hypotension. The degree and duration of hypotension achieved show little daily variation once a satisfactory drug level is obtained. After several weeks of daily administration of this constant dose it may occasionally be necessary to reduce it because of increased severity and duration of the fall in blood pressure. We presume this is because of a cumulative effect, as anticipated in our earlier studies.

The daily oral hypotensive dose most suitable for any individual patient is highly critical. Where the maintenance dose lies in the range 300 to 1,250 mg. a reduction of 25 to 50 mg. cuts the clinical effect quite appreciably, and an increase of 25 to 50 mg. converts a moderately severe hypotensive effect into a marked and prolonged hypotension.

Side-effects

Dryness of the mouth is noticeable with the larger doses, as with all other commercially available ganglion-blocking agents. Gastric emptying is hardly affected.

Disturbance of bowel motility is of little importance in this small series. As a rule, passage through the small intestine does not appear to be delayed, but when delay does occur it seems to be due to slowing down in the passage of gut content through the colon. Constipation is seldom complained of, and our information on this disturbance is elicited in most cases by leading questions. When present it is controlled by any mild aperient. Ileus does not occur.

No disturbance of bladder function occurred, nor was it complained of by any patient; yet with mecamlamine and little effective hypotension two of our small "long-term" group (Cases 5 and 9) developed severe retention of urine.

Disturbance of the vision occurs, as with other ganglion-blocking agents. This visual disturbance is in many cases of little significance, and the patient rapidly adjusts to it. On other occasions the use of 0.25–0.5% pilocarpine or physostigmine eye-drops will control the visual disturbance for several hours.

Effect of Renal Damage on Clinical Response

Using this drug, given only by mouth, we are able to control hypertension in malignant hypertensive patients. The severity of the hypertension at all ages, as judged purely by the height of the diastolic pressure, did not affect dosage in the small but severe group reported in this paper. We find that the larger doses, both per kilogram of body weight and per patient, are required by the younger patients. The presence of renal insufficiency may necessitate larger doses. Four patients in this group showed evidence of renal insufficiency, and in two cases this was severe. One patient (Case 2), who when first seen had a very considerable degree of renal impairment, showed a marked improvement in his condition, and his renal function as shown by renal-function tests rapidly improved. He has returned to work. The second patient (Case 9), though his blood pressure was adequately controlled and the retinal changes regressed, died of uraemia. Of the other two cases (Nos. 8 and 10) with

moderate impairment of renal function at the onset, one (Case 8) has shown a progressive deterioration in renal function in spite of an initial marked improvement in general condition and regression of ocular changes, and the other (Case 10) has improved, the blood urea falling steadily from 80 to less than 30 mg. per 100 ml.

It is a curious observation that with an effective reduction in blood pressure these cases and others have shown a reversal of retinal changes to normal, alterations in the electrocardiogram to a more normal picture, reduction in heart size, and amelioration of many disturbing symptoms (paroxysmal nocturnal dyspnoea and angina of effort); and these improvements seem to occur independently of and without necessarily any improvement in renal function. Nevertheless adequate control by the same drugs of the most severe hypertension, which, when treatment begins, is without apparent renal damage, is not followed by the occurrence of renal damage or progressive renal functional impairment.

Effect of Diet on Severity and Duration of Hypotension

No significant effect was elicited upon the duration of action of the orally administered drug, the size of dose, the time of onset of symptoms, or the hypotension, by a very considerable variation in the constitution of the diet. It was found, however, that to produce any specific length of effect the dose of drug necessary in any patient is smaller when given by mouth before breakfast than when given at night before going to bed, even if followed by a meal. For most patients giving the drug before breakfast is the recommended procedure. In some cases, by giving the drug at night and following it with a meal, it is possible to obtain prolonged hypotension, with the maximum hypotensive action whilst the patient is in bed. The less-disturbing later hypotensive effect (amplified by posture and activity) is present when the patient is up and about the next day. In other cases, and particularly when large doses are necessary, a more satisfactory scheme seems to be to give a large dose at night and a small "topping up" dose before breakfast.

Effect of Posture and Activity

Physical activity, when any degree of drug effect is demonstrable, is found to produce a fall in blood pressure. Posture has an appreciable hypotensive effect, the erect position invariably producing a far greater fall in blood pressure than the supine. The drug 189c56, however, produces an easily demonstrable hypotension in the patient reclining in bed during the first 5 to 10 hours of its action.

Action in Combination with Other Drugs

In view of the statement that chlorothiazide will augment the hypotensive effect of many hypotensive agents (including mecamlamine, pentolinium tartrate, chlorisondamine chloride, and reserpine) (Freis and Wilson, 1957; Hollander and Wilkins, 1957; Tapia *et al.*, 1957), some of our patients were given chlorothiazide additionally. We were unable in this brief trial to demonstrate any significant hypotensive action attributable to the combined use of chlorothiazide and 189c56 which in any way differed in intensity or duration from that given by the same dose of 189c56 without chlorothiazide. Nevertheless chlorothiazide produced its diuresis when the blood pressure had fallen in response to administration of 189c56.

After the initial pharmacological investigations all our patients given 189c56 for long-term control of their hypertension receive in addition 2 mg. of "rauwilloid" (a preparation of total active rauwolfia alkaloids) nightly.

Case 1

A girl aged 18½ (weight, 50 kg.) had malignant hypertension. She was a known hypertensive of nine months' duration when she first came under our care more than a year ago. There were visual disturbances, recurrent severe headaches, and vomiting. Nephrectomy for a unilateral

fibrotic kidney had no effect on her blood pressure. Her mother died of malignant hypertension, aged 52.

On examination her B.P. was 260+/170-180; blood urea 30 mg. per 100 ml.; renal function normal; urine normal; fundi—papilloedema, numerous haemorrhages, some very large, hard and soft exudates; x-ray examination of chest showed moderate cardiomegaly; E.C.G.—left axis deviation and left ventricular strain patterns.

Treatment with daily subcutaneous injections of 189c56 resulted in a complete relief of symptoms and a return of her fundi to normal. One year ago she was transferred to oral 189c56. Originally she required 1,250 mg. daily; but later was adequately controlled by 750 mg. nightly—this produced hypotension for 16+ hours. She has been back at work for six months and is more comfortably controlled by 650 mg. at night and 150 mg. before breakfast. In addition she receives 2 mg. of rauwiloid nightly. Chlorothiazide, 1 g. daily for four days each week, had no effect on hypotensive response. No gastro-intestinal disturbance. Some dryness of mouth and occasional blurring of vision. Postural symptoms not incapacitating.

Case 2

A youth of 17½ (weight, 60 kg.) had malignant hypertension superimposed on a long-standing renal lesion. He attended the medical out-patient department for six years with albuminuria and low clearance, but no hypertension until 1½ years ago, when his B.P. was 160/100. He was admitted to hospital in September, 1957, with a six-weeks history of vomiting and incapacitating headache.

Examination showed B.P. 260+/170, blood urea 180 mg. per 100 ml., albuminuria, bilateral papilloedema with exudates and haemorrhages.

Treatment was started with oral 189c56. The result was dramatic. 800 mg. daily before breakfast produced hypotension lasting 20+ hours. Headaches and vomiting ceased, papilloedema receded, and blood urea fell steadily to 40 mg. per 100 ml. Albuminuria diminished but persisted. In this patient the later trial of mecamlamine, 15 mg. daily before breakfast, produced little effect on blood pressure, which after three hours was 240/150, but vomiting, constipation, abdominal discomfort, and malaise were present; 17.5 mg. of mecamlamine produced moderate hypotension lasting six to eight hours, persistent vomiting, severe abdominal pain, ileus, and intractable constipation. With oral 189c56 this lad was able to return to work as a hospital orderly, but when put on to mecamlamine he became so ill that he was unable to work. No constipation with 189c56. The pre-breakfast dose was changed to 1,200 mg. at night with nearly as good a hypotensive effect (16+ hours), but more comfortable control is given by 1,000 mg. at night (9 p.m.) and 300 mg. before breakfast. He also receives rauwiloid, 2 mg. nightly. Chlorothiazide, 1 g. for four days each week, had no detectable effect on the hypotension.

Case 3

A man aged 56 (weight, 80 kg.) had severe essential hypertension with gross arteriosclerosis.

Examination revealed long-standing hypertension and marked vascular arteriosclerosis. Hemiplegia from stroke 14 months ago; gross retinal arteriosclerotic changes; no papilloedema. Uncontrolled B.P. 260-290/150-170; 450 mg. 189c56 daily before breakfast produced hypotension to 147-170/70-95 for 8-16 hours. No undue side-effects, according to this patient.

Case 4

A man aged 62 (weight, 64 kg.), with severe hypertension with papilloedema and gross arteriosclerosis, was admitted to hospital 10 months ago after a stroke; B.P. 260+/150; gross vascular arteriosclerosis; papilloedema, haemorrhages, and exudates. B.P. below 150/100 for 14 hours on 450 mg. 189c56; objectively, physical condition remained unchanged and in general poor; fundi now showed no papilloedema, only occasional haemorrhages and hard exudates; on

mecamlamine 10 mg. twice daily deteriorating mentally and physically, with aphasia and constipation, but no demonstrable effect on blood pressure. All hypotensive treatment with ganglion-blocking agents stopped; rauwiloid, 2 mg. nightly, continued—present condition unchanged. B.P. fairly static at 220/110.

Case 5

A man aged 61 (weight, 72.5 kg.), with severe hypertension and papilloedema, was admitted to hospital with hemiplegia and aphasia of recent onset and rapidly improving.

Examination showed B.P. 300/170; fundi, papilloedema, occasional exudates, and haemorrhages. 500 mg. 189c56—hypotension 14+ hours—upset by dryness of mouth and postural vertigo. Nevertheless incapacitated by giddiness when not receiving treatment. Mecamlamine, 17.5 mg. before breakfast, produced slight temporary hypotension and marked constipation, dryness of mouth, and visual disturbance. Mecamlamine, 20 mg., caused retention of urine, nocturnal frequency, strangury, constipation, though the blood pressure was as high as ever 4½ hours after this drug. Chlorothiazide, 1 g. daily for four days each week, did not augment hypotensive effect of 189c56. Not keen on taking any ganglion blocker in spite of knowing consequences of untreated hypertension.

Case 6

A man aged 61 (weight, 63 kg.), with severe hypertension and papilloedema, was admitted to hospital after mild cerebral catastrophe (cerebral thrombosis) with practically complete recovery. Fundi—papilloedema, exudates, and haemorrhages; B.P. 240/160. 500 mg. 189c56 gave 15+ hours of hypotension. Postural vertigo a nuisance; dryness of mouth slight. B.P. 4½ hours after 10 mg. of mecamlamine 270/140. Increased to 12.5 mg. with no appreciable hypotensive effect beyond constipation. Accepts treatment under duress. Has been under treatment for eight months.

Case 7

A man aged 63 (weight, 81 kg.) had essential hypertension with recurrent left ventricular failure. He was a known hypertensive of more than 20 years' duration, cardiomegaly and gross E.C.G. changes (left bundle-branch block). Recurrent attacks of left ventricular failure. B.P. 240/140; B.P. controlled for 12+ hours below 150-170/90-110 by 350 mg. of 189c56 daily and rauwiloid, 2 mg. at night. Chlorothiazide, 0.5 g. daily for four days each week, did not apparently augment hypotensive effect of 189c56, but produced an appreciable diuresis. He has been under treatment for six months.

Case 8

A woman aged 42 (weight, 56 kg.), with malignant hypertension, had a history of medical attention for preceding two years for severe recurrent headaches, vomiting, anorexia, vertigo, and gross emotional disturbance. Two weeks before admission she developed haematuria and was referred to the genito-urinary surgeon, who referred her to us.

On examination she was well covered; B.P. 260+/180; blood urea 55-60 mg. per 100 ml.; urine—much albumin, occasional R.B.C.s and granular casts; I.V.P. normal; cystoscopy normal; E.C.G.—L.A.D. and L.V. strain patterns; x-ray chest—L.V.++; fundi—papilloedema and numerous exudates and haemorrhages; profound emotional disturbance.

She was controlled satisfactorily on 500 mg. before breakfast, which gives hypotension below 150-160/100 for 18+ hours, and 2 mg. of rauwiloid at night. In hospital felt well, no headaches, no vomiting, bowels regular, slight dryness of mouth, good appetite, slept well, fundi practically normal, but blood urea remained up (last figure 72 mg. per 100 ml., and serum creatinine 3 mg. per 100 ml.). Said she felt better than she had felt for many years. Urine still contained 0.1% protein and some R.B.C. Under treatment for three months. Discharged home to attend out-patient departments. She took drug erratically—said it was because

she felt giddy. Emotional symptoms and vomiting recurred (? due to reappearance of hypertension). Stopped taking tablets. Vomiting and hypertension persisted. Readmitted with hypertension uncontrolled; blood urea, 220 mg. per 100 ml.; oliguria and albuminuria; papilloedema; and B.P. 240+/160 mm. Hg.

Case 9

A man aged 47 (weight, 75 kg.), with malignant hypertension, was a known hypertensive under care of a London teaching hospital for two years, first being treated with oral pentolinium and reserpine with no effective hypertensive control; was then transferred to mecamlamine and reserpine. Admitted to us as an emergency whilst receiving treatment with mecamlamine 10 mg. four times a day. Mecamlamine dose had apparently been halved some few months earlier owing to intolerable and incapacitating side-effects. History of recurrent episodes of severe dyspnoea for at least preceding nine weeks. Constant "asthma" for past nine days. Bowels not open. Continuous nocturnal and diurnal frequency of many months' duration.

Examination on admission: B.P. 300+/195; pulmonary oedema; fundi—gross papilloedema, numerous exudates, and haemorrhages; E.C.G.—L.A.D. and L.V. strain patterns; chest x-ray examination showed gross left ventricular enlargement, pulmonary oedema patterns; blood urea 180 mg. per 100 ml. Urine—albumin and R.B.C.

Given subcutaneous pentacynium methylsulphate, 10 mg. thrice daily for 24 hours, and then oral 189c56. Controlled with 800 mg. daily. Blood pressure below 160/100 for 16-22+ hours daily on this dose, with rauwiloid 2 mg. nightly. Chlorothiazide, 1 g. daily for four days each week, produced initial diuresis, but no apparent effect on degree or duration of hypotension. On admission he was found to have marked retention of urine. After catheterization on admission, and again in 12 hours, retention of urine cleared, and whilst having 189c56 with marked hypotension no residual urine could be demonstrated, and strangury and frequency did not occur. Bowels, previously intractably constive, opened regularly. Retention of urine due to mecamlamine. Renal insufficiency persisted, and renal function continued to deteriorate in spite of a vast improvement in his mental and physical condition, a controlled low B.P., absence of pulmonary oedema, and no retention of urine. He developed pericarditis and died two months after admission.

Necropsy: Cardiomegaly and pericarditis. No other macroscopic changes. Histology of kidneys showed evidence of malignant hypertensive changes, healed, much fine fibrosis in parenchyma, and a large renal cyst.

Case 10

A man aged 55 (weight, 74 kg.) had malignant hypertension and recurrent attacks of left ventricular failure. He had a four-months history of increasing dyspnoea and recurrent paroxysmal nocturnal dyspnoea.

Examination showed: B.P. 260+/150-170; fundi—occasional exudates and haemorrhages, early papilloedema; urine—albuminuria; blood urea, 82 mg. per 100 ml.; cardiomegaly; E.C.G.—L.A.D. and L.V. strain patterns. Adequately controlled by 600 mg. of 189c56 orally before breakfast; B.P. below 140/95 for 16+ hours. Steady improvement: no constipation; no dyspnoea. Blood urea falling over period of six weeks—last figures less than 30 mg. per 100 ml. At home, well controlled and feeling fit on 600 mg. of 189c56 before breakfast.

Case 11

A man aged 43 (weight, 83.5 kg.), with malignant hypertension, was a known malignant hypertensive of five years' duration, controlled on injections of pentacynium and daily rauwiloid. Now adequately controlled on 500 mg. of 189c56 daily before breakfast and rauwiloid 2 mg. nightly. Without treatment, B.P. 240-260/150-160; with treatment, B.P. below 150/100 for 20+ hours.

Conclusion

In patients with very severe hypertension, compared with all other ganglion-blocking (or presumed ganglion-blocking) agents commercially available for oral use, at comparable levels of induced hypotension, 189c56 has a longer duration of action, a far greater hypotensive action on the supine blood-pressure level, much less effect on the intestinal motility, and no effect on bladder function. It is our impression, too, that the general discomfort associated with the induced hypotension is less disabling than that associated with similar falls of blood pressure caused by these other ganglion-blocking agents.

Two features of the action of 189c56 which seem worthy of comment are: (1) A constant daily effect with predictable results is achieved with oral dosage, though the effective dose by mouth is far higher than either the effective intravenous or subcutaneous dose. (2) The separation in some degree of hypotensive action from effects on gastro-intestinal motility. The evidence suggests that the small intestine and bladder effects are due to high local luminal concentration of active ganglion-blocking agent (Locket, 1951), also with mecamlamine a direct effect on smooth muscle (Bennett, Tyler, and Zaimis, 1957). Salivary gland and visual effects appear to be due to systemic blood levels and not dependent upon high concentration of drug in the gut. However, ganglion-blocking hypotension too is related to blood levels of active drug. If the drug is given by mouth in an inactive or less active form, activated during or after absorption, we could avoid appreciable gut effect (but not eye or salivary gland effect). Similarly, prolonged excretion at low concentration, excretion of inactivated drug, or destruction of drug in the body would avoid any effects on bladder and ureteral motility. This mechanism might explain the demonstrable absence of ileus and retention of urine after the use of ganglion-blocking drugs by injection. It could also explain the minimal gut effects and the absence of bladder effects with oral 189c56.

Our clinical experience with the drug 189c56 in the treatment of hypertension extends to more than 18 months. During the past year we have used it only by mouth.

Owing to our very limited initial supply we have had to restrict its long-term use to a small group of the most severe hypertensives. We have no reliable experience of the extent of its long-term value in the less severe cases.

Summary

The valuable features of 189c56 would seem to be: (1) It is invariably effective when given by mouth. (2) When given daily, before breakfast and followed by this meal, it consistently produces the expected degree of hypotension. (3) Duration of action is such that single daily dose control of hypertension in some patients becomes possible for the first time. (4) Dosage is highly critical. A small alteration in the controlling dose of the order of 5-12% causes a marked effect on the extent and duration of the hypotension. (5) Constipation is absent or minimal, even with large doses. Ileus does not occur. (6) Disturbances of bladder-emptying do not occur.

Brief case reports are given and may help to amplify some of these points.

I am grateful to Burroughs Wellcome and Co. (Wellcome Foundation Ltd.) for a continuous supply of the hypotensive agents in this group. I wish to thank Dr. F. Prescott, Dr. P. O. Jones, Mr. J. W. Billingham, Mr. A. F. Green, of the Wellcome Research Laboratories, for their unstinted help and advice, and Mr. D. Stevenson, of the Wellcome Chemical Works, for his help with the pharmaceutical preparation of 189c56. I am grateful to Riker Laboratories Ltd., Mr. J. Lumley, and Mr. R. W. Richards for a continuous supply of the "alseroxylon" preparation of rauwiloid known as "rauwiloid." I am also grateful for the help of my housemen and registrars over a

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EFFECTS OF PENTACYNIIUM METHYL-SULPHATE ON RENAL CIRCULATION IN HYPERTENSION

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One of the disadvantages of some of the ganglion-blocking drugs used in the treatment of hypertension is the fall in renal blood flow that follows their systemic administration. Reports of the new ganglion-blocking drug pentacynium methylsulphate (139c55; "presidal") claim (Locket, 1956) that it is not associated with gross changes in renal blood flow or glomerular filtration rate and produces a prolonged fall in blood pressure with few side-effects. We have therefore studied the effect of pentacynium on the renal circulation in a number of patients with hypertension.

Present Investigation

Nine patients (seven women and two men), whose ages ranged between 50 and 70 years, were studied (Table I). The minimum basal blood-pressure reading was 230/130, and all showed clinical and electrocardiographic evidence of left ventricular hypertrophy. Cases 6 and 7 had been in heart failure some months previously but had responded

TABLE I

Case No.	Age and Sex	Basal B.P.	Retinopathy Grade	Left Ventricular Hypertrophy	Blood Urea mg./100 ml.	Previous Therapy
1	50 F	250/160	I	+	41	Pentolinium
2	51 F	260/160	I	+	42	Hexamethonium bromide
3	58 F	270/150	III	+	55	Nil
4	51 M	230/130	II	+	180	Hexamethonium bromide
5	52 M	240/130	I	+	62	Pentolinium
6	52 F	260/140	III	+ with heart failure	31	Hexamethonium bromide
7	70 F	300/140	II	+ with heart failure	35	" "
8	51 F	260/150	IV	+	200	Nil
9	53 F	250/140	III	+	49	Hexamethonium bromide, pentolinium, and mecamylamine

to digitalis and diuretics and were free of this complication at the time of study. Hypertensive retinopathy of varying degree was present in all cases; six showed retinal haemorrhages, and exudates and papilloedema were present in Case 8. In six cases there was a trace of albumin in the urine, but with the exception of Case 8 there were no red cells or casts in the urinary deposits. The blood urea, in the absence of vomiting and heart failure, was above 40 mg. per 100 ml. in seven subjects. Seven patients had been treated for between 6 and 18 months with either pentolinium tartrate or hexamethonium bromide in combination with one of the reserpine alkaloids. Treatment was stopped because with the increasing dosage necessary to control blood pressure side-effects became intolerable. Case 8 presented with malignant hypertension and Case 3 had not been previously treated.

Methods

Each subject lay at rest in bed with the head raised to 30 degrees. Renal blood flow and glomerular filtration rate were measured by a technique previously described (Smith *et al.*, 1938) and inulin and para-aminobiphenyl acid (P.A.H.) were estimated, using a method as reported by Dick and Davies (1949). Mean blood pressure was calculated as the diastolic plus one-third of the pulse pressure.

Renal-clearance periods lasted 20 minutes. Each value for effective renal blood flow (E.R.B.F.) and glomerular filtration rate (G.F.R.) in Table II is the average of two consecutive measurements. Following the drug two clearance periods were estimated during the period of falling blood pressure. Two further estimations were carried out in six subjects when their blood pressure had remained at or near normal levels for an average of 30 minutes. Percentage changes of blood pressure E.R.B.F. and G.F.R. in Table II are related in all cases to control values. Blood pressures were recorded every two minutes during the study and then six-hourly for 24 hours in both lying and standing positions. Pentacynium was given subcutaneously; Cases 8 and 9 received 12.5 mg. and the remainder 25 mg.

Results

Blood Pressure.—A fall in blood pressure occurred in all subjects between 9 and 20 minutes after the drug. In six the figure was approximately 120/80 by 30 minutes. The diastolic pressure fell to 100 mm. Hg in Cases 1 and 9 by 50 minutes, while Case 4 showed little change in blood pressures at this stage. The average reduction in mean blood pressure for the whole group was 49% at 50 minutes. Diastolic blood-pressure readings in all patients had reached levels below 100 mm. Hg by 120 minutes and remained so for a further 16 to 24 hours.

E.R.B.F.—A mean reduction in E.R.B.F. of 53% occurred by 50 minutes, and the individual changes were closely related in time and magnitude to the alteration in blood pressure. Subsequent clearance values obtained between 30 and 110 minutes in Cases 2, 5, 6, 7, 8, and 9 reveal a mean percentage increase in E.R.B.F. of 28 above mean control value. This figure is largely accounted for by a rise in renal blood flow to above control levels in Cases 8 and 9. The remaining four cases show a rising E.R.B.F., but individually these were still well below control values.

G.F.R.—Changes in G.F.R. showed a similar trend to those of E.R.B.F. but were proportionately greater in amount, producing a fall in the filtration fraction. The reduction in G.F.R. occurred *pari passu* with the fall in blood pressure. Case 4 showed little initial change in blood pressure and a correspondingly small alteration in G.F.R. The initial mean reduction in G.F.R. for the nine patients occurred between 10 and 30 minutes, and was approximately 71%. Subsequent values for G.F.R. obtained between 30 and 110 minutes in six subjects reveal a mean rise of 9%. As with E.R.B.F., this striking rise in G.F.R. for the group is produced largely by the increase in Cases 8 and 9 to above control values. Cases 2, 5, 6, and 7

reveal a rising G.F.R. between 30 and 80 minutes, but individual levels are still well below control values.

Side-effects.—Bradycardia and dryness of the mouth occurred in all subjects by 15 minutes. Three complained of blurred vision; six developed nausea, and three of these vomited at 30 minutes. Moderate to marked drowsiness was a prominent feature in all nine subjects, occurring approximately 20 minutes following the drug.

Discussion

The changes in renal haemodynamics following pentacynium are similar in nature to those observed with other ganglion-blocking drugs. Pentamethonium iodide is associated with a reduction in E.R.B.F. and G.F.R. in hypertensive subjects when the blood pressure fall is minimal (Mackinnon, 1952), but observations of changes occurring up to 110 minutes after the drug are not available in all reports. Case selection introduces the difficulty of comparing results in this type of study.

The doses of pentacynium given were on average higher than those subsequently necessary to control blood pressure in the same group of patients, and this fact, with the high incidence of impaired renal function, may explain the degree of reduction in E.R.B.F. and G.F.R. observed. Following the initial fall, E.R.B.F. and G.F.R. had risen in Cases 2, 5, 6, and 7 to approximately 50% of their control values by 30 to 110 minutes. Data for Case 8 with malignant hypertension and Case 9 at 60 minutes showed that E.R.B.F. and G.F.R. had risen above their control values. Mackinnon reported a rise in renal blood flow, following an initial fall, in a patient with malignant hypertension given a small dose of pentamethonium iodide; the blood pressure at this stage had not reached normal levels.

These observations lend support to the view that the changes in E.R.B.F. are to some extent independent of changes in blood pressure. A rise in renal blood flow with fall in blood pressure has been observed following hydralazine hydrochloride ("apresoline"). However, use of this compound produces a high incidence of toxic effects, and no advantage appears to be gained by its combination with other hypotensive drugs. The increase in renal blood flow which immediately follows hydralazine hydrochloride may be due to renal vasodilatation; a similar mechanism may account for the unexpected rise in E.R.B.F. and G.F.R. in Cases 8 and 9. However, a partial redistribution of blood volume has been demonstrated following some of the ganglion-blocking drugs, and experimental evidence supports the view that this factor may produce the initial fall in renal blood flow (Combes *et al.*, 1957). It is possible that later changes are due to compensatory mechanisms dependent on vascular tone, so that E.R.B.F. is restored to its original level in spite of a persisting reduction in blood pressure.

We cannot state precisely when E.R.B.F. had returned to control level in all our subjects, but the rapid rise observed indicates that it probably had done so within three to four hours of giving a therapeutic dose of pentacynium. The effective blood-pressure reduction with a single daily dose of pentacynium is an advantage compared with other systemically given ganglion-blocking drugs, where presumably repeated injection is followed on each occasion by a fall in both G.F.R. and E.R.B.F. There is little evidence that prolonged administration of these compounds produces renal damage *per se* or hastens that already present. A blood urea of 60 mg. per 100 ml. has been quoted (Harington, 1956) as the upper limit desirable when using the more powerful hypotensive drugs. In this respect Cases 8 and 9 are worthy of further comment.

TABLE II.—Details of Cases

Case No.	Time (mins.)	Dose (mg.)	B.P.	Mean B.P. (mm. Hg.)	B.P. % Change from Control	G.F.R. (ml./min.)	G.F.R. % Change from Control	*E.R.P.F. (ml./min.)	E.R.B.F. (ml./min.)	E.R.B.F. % Change from Control	
1	0	25	260/150	187	-39.5	105	-84.3	210	412	-22.3	
	50		140/100	113		27		163	320		
2	0	25	250/100	183	-46.9 -49.1	75	-77.3 -34.6	169	291	-76.3 -14.4	
	30		130/80	97		17		40	69		
	50		120/80	93		39		157	249		
3	0	25	260/140	180	-46	175	-66.8	650	1,180	-67.3	
	40		110/90	97		58		212	386		
4	0	25	240/150	180	-74.4	27	-51.8	68	115	+3.4	
	50		180/130	46		13		70	119		
5	0	25	250/150	183	-49.1 -57.9	120	-90.8 -88.3	212	451	-81.2 -64.5	
	30		140/70	93		11		40	85		
	80		110/60	77		14		75	159		
6	0	25	240/140	173	-47.9 -52.1	35	-74.3 -60	123	222	-72.5 -43.6	
	30		110/80	90		9		33	61		
	70		110/70	83		14		70	125		
7	0	25	260/150	186	-51.6 -55.3	110	-83.6 -65.4	400	701	-72.5 -64.7	
	10		110/80	90		28		110	193		
	30		110/70	83		38		141	247		
8	0	12.5	230/130	163	-40.4 -38.0	1.8	-27.7 +177.7	4.9	7	-18.6 +265.7	
	30		130/80	97		1.3		4.0	5.7		
	110		140/80	100		5		17.9	25.6		
9	0	12.5	260/150	187	-35.8 -42.7	105	-81.9 +14.2	242	493	-74.3 +91.4	
	50		160/100	120		19		62	126.6		
	70		140/90	107		120		462	944		
% changes immediately following drug					-49%	Mean change		-71.2%	Mean change		-53.5%
Calculated from later clearance periods up to 110 mins. in six subjects					-49%	Mean =		+9.4%	Mean =		+28.3%

* Effective renal plasma flow.

Case 8.—This patient was suffering from malignant hypertension. The initial blood urea was 200 mg. per 100 ml. Following 12.5 mg. of pentacynium the patient complained of drowsiness and a dry mouth. Thirty minutes later she became unconscious, with a systolic pressure of 95 mm. Hg. Elevation of the foot of the bed raised the blood pressure to 130/95. Over the next 12 hours, with a constant pressure reading, consciousness returned. At the end of 18 hours after the injection the blood pressure had reached 250/140. Subsequent doses of 1.25 mg. of pentacynium subcutaneously reduced the B.P. to 140/110. The blood urea, however, rose to 419 mg. per 100 ml. and the patient died in coma three weeks later. Permission for necropsy was not obtained.

Case 9.—This patient, who had severe essential hypertension, cardiac enlargement, and a left-sided hemiplegia, had received a low-protein and low-salt diet for 18 months before admission. His blood pressure had not been controlled by large doses of parenteral pentolinium or mecamylamine by mouth. The initial blood urea was 180 mg. per 100 ml. A satisfactory fall in blood pressure occurred initially with 25 mg. of pentacynium subcutaneously, and normal blood pressure was later achieved with 6.25 mg. subcutaneously each morning. The patient's general condition improved over the next two weeks, and before discharge his blood urea was 80 mg. per 100 ml. He had not experienced any side-effects, and was back at light work.

The incidence of side-effects in our series appears high, and may be partially explained by the dose of drug used and the incidence of renal damage. Nausea and vomiting were probably aggravated by the water drunk in an attempt to maintain urinary flow. The fall in urine flow was marked in all instances and water intoxication might be precipitated under these circumstances.

Drowsiness occurred in all nine subjects, and does not seem to have been commented on previously. It appeared earlier than the maximum fall in blood pressure. This effect, which was not associated with hypotension, has not been recorded with other ganglion-blocking drugs, and may be due to a central action, possibly on the hypothalamus.

Eight patients of this series have been followed up for six months after the study. Blood pressures were still well controlled with 6.25-12.5 mg. of pentacynium once daily, combined with a reserpine preparation three times a day.

Summary

The effect of pentacynium methylsulphate (presidal) on the renal circulation in nine subjects with hypertension has been studied.

A fall in blood pressure to normal levels occurred in all subjects and persisted for at least 16 hours.

Reduction in E.R.B.F. and G.F.R. occurred initially in all subjects by 30 minutes. In four subjects the mean E.R.B.F. and G.F.R. had risen to 50% of the mean control value by 60 to 110 minutes. In two subjects with severe renal damage the values for E.R.B.F. and G.F.R. had risen to greater than their control values by 110 minutes.

The significance of these findings is discussed, and it is noted that satisfactory control of blood pressure may be obtained with a single daily injection of pentacynium.

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FOLIC-ACID STUDIES IN MEGALOBlastic ANAEMIA DUE TO PRIMIDONE

BY

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It is well known that a megaloblastic anaemia may develop in patients being treated with barbiturate-like anticonvulsants such as phenytoin sodium (Badenoch, 1954; Hawkins and Meynell, 1954), primidone (Fuld and Moorhouse, 1956), and, very occasionally, other barbiturates (Hobson, Selwyn, and Mollin, 1956). The cause of the anaemia is uncertain. The patients resemble patients with folic-acid deficiency in that their serum vitamin B₁₂ concentrations are normal, and they fail to respond, or they respond suboptimally, to treatment with vitamin B₁₂, while responding excellently to treatment with folic acid. However, as there is no evidence of malabsorption of folic acid in these patients it has been generally assumed that the drugs act by interfering with the metabolism of folic acid. In this paper we report studies made on the utilization of folic acid in a patient who developed severe megaloblastic anaemia while receiving primidone ("mysoline").

Case Report

An Anglo-Indian woman aged 44 was admitted to Hammersmith Hospital on May 28, 1957, under the care of Dr. J. G. Scadding. She had lived in India until August, 1956, when she was brought to England. She had a bilateral hemiplegia, probably due to a birth injury, and at 13 years of age began to have major and minor epileptic fits. She was looked after at home, and until two years before admission had been given bromides and various barbiturates for her fits. Two years before admission treatment with primidone (1 to 2 g. daily) was started and treatment with other barbiturates was stopped. Until six months before admission she was reasonably well and took a well-balanced diet. Shortly after arriving in England she became lethargic, lost interest in her surroundings and refused food, and from this time until the time of admission she ate only tea, bread, biscuits, Horlicks' milk, and an occasional banana. She became progressively weaker and paler, had episodes of diarrhoea, and shortly before admission became incontinent of urine and faeces.

Examination.—The patient was a well-nourished Anglo-Indian, crying out incomprehensibly but able to respond to simple commands. Her mucous membranes were very pale, but there were no skin lesions, purpura, or haemorrhages, and her gums were normal. The lymph nodes were not enlarged and the spleen was not palpable. Her temperature was 97° F. (36.1° C.), she was slightly dyspnoeic, the jugular venous pressure was 10 cm. above the sternal angle, but there was no oedema. Her pulse rate was 120 a minute and blood pressure 110/30. Her heart was not grossly enlarged, but there was a soft apical systolic murmur. Signs of a bilateral hemiplegia were present, more marked on the left than on the right side. There were scars around the left eye, and the left retina appeared disorganized.

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Investigations.—A blood count showed red cells, 600,000/c.mm.; Hb, 2.9 g./100 ml.; P.C.V., 9%; reticulocytes, 3.9%; M.C.V., 150 cubic microns; M.C.H.C., 32%; leucocytes, 4,500/c.mm. (neutrophils 68%, lymphocytes 27%, monocytes 4%); platelets, 95,000/c.mm. A stained film revealed macrocytosis, poikilocytosis, anisocytosis, with occasional polychromatic megaloblasts and myelocytes. A sternal-marrow biopsy showed severe megaloblastic change. The serum vitamin-B₁₂ level measured by the *Euglena* assay, was 190 µg./ml. (normal range, 100 to 900 µg./ml., Mollin and Ross, 1954). The serum protein was 6.6 g./100 ml. (albumin 3.6 g., globulin 3 g.), serum bilirubin 0.6 mg./100 ml., and urea 28 mg./100 ml. The fractional test meal showed the presence of free acid in the gastric

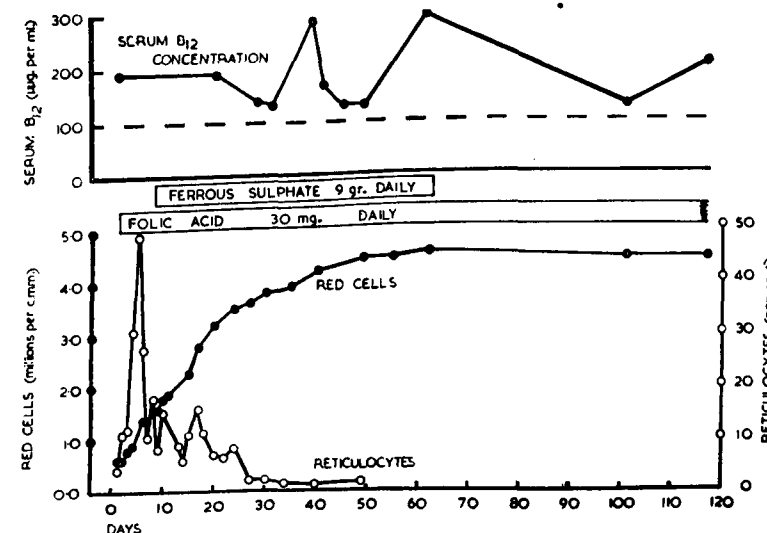


FIG. 1.—Haematological response to treatment.

juice; and the absorption of radioactive vitamin B₁₂, measured by the hepatic uptake method of Glass (1954), was normal, an estimated 0.4 µg. being absorbed from a 1-µg. dose of ⁵⁷Co-vitamin B₁₂. A three-day fat balance was normal, the patient excreting 4.3 g. daily while on a 50-g. fat diet. Fat absorption, using ¹³¹I-labelled fat, was studied by Dr. K. Ibbertson; the blood level of iodine in the patient was similar to that found in normal subjects. Vitamin-A absorption was also normal, the blood level rising from 38 to 584 I.U. after a dose of 300,000 units. A glucose-tolerance test and a barium-meal examination revealed nothing abnormal. The urine contained numerous pus cells, and culture gave a heavy growth of *Escherichia coli*.

Course and Treatment

Haematological Response.—The haematological response to treatment is shown in Fig. 1. On the day of admission and on the following day 0.69 mg. of folic acid was injected intravenously. Then 15 mg. of folic acid was given twice daily, by intramuscular injection during the first week, and daily, by intramuscular injection subsequently by mouth. A third intravenous injection of 0.69 mg. of folic acid was given on the ninth day. A single dose of ascorbic acid (500 mg.) was given on the second day. Treatment with primidone was continued until the third day.

There was a reticulocyte response with a peak of 49% on the fifth day. The red-cell count rose rapidly, but evidence of iron deficiency appeared at the end of the first week with a fall in the M.C.H.C. to 24%. Ferrous sulphate, 3 gr. (0.2 g.), was given three times a day. Seven weeks after admission the blood count was: red cells, 4,600,000/c.mm.; Hb, 14.4 g./100 ml.; P.C.V., 44%; M.C.H.C., 33%.

Other Treatment.—On the fourth day after admission she developed a temperature of 101° F. (38.3° C.), which was due to a urinary infection. She was then given sulpha-

furazole ("gantrisin"), 2 g. at the start of treatment and 1 g. three times a day for 10 days. With this treatment her fever subsided and her urine became sterile. Phenobarbitone, ½ gr. (32 mg.) three times a day, was also given, and on this regime her fits appeared to be well controlled.

Folic-acid Studies

The absorption of folic acid was studied by measuring the changes in the concentrations of folic acid in the serum after an oral dose of 3 mg. (Chanarin *et al.*, 1958a).

The utilization of folic acid was assessed by measuring the rate of disappearance from the blood of a small dose of folic acid given by intravenous injection (Chanarin *et al.*, 1958b). The dose used for this test was 15 µg. per kg. body weight.

Folic acid in serum was estimated by microbiological assay, using *Streptococcus faecalis* R as the test organism, as described by Tepy and Elvehjem (1945), Jukes (1955), and Chanarin *et al.* (1958a).

Absorption.—The peak serum folic-acid level in the patient after the oral dose was normal (73 µg./ml.) (Fig. 2). The peak serum folic-acid concentrations in 55 normal subjects ranged from 40 to more than 140 µg./ml. The results of three normal subjects and three patients with treated folic-acid deficiency associated with idiopathic steatorrhoea are included in Fig. 2 for comparison.

Utilization.—The rate of clearance of folic acid from the plasma was studied after an intravenous dose of 15 µg./kg. body weight (0.69 mg.): (1) before treatment was started, while the patient was still receiving primidone; (2) on the following day, when treatment with primidone had been stopped and after the patient had received a large dose of ascorbic acid; and (3) on the ninth day, after the patient had received large doses of folic acid. Fig. 3 shows that the clearance of folic acid in all three tests was similar to the clearance found in normal subjects and unlike the very rapid clearance found in patients with a megaloblastic anaemia due to folic-acid deficiency.

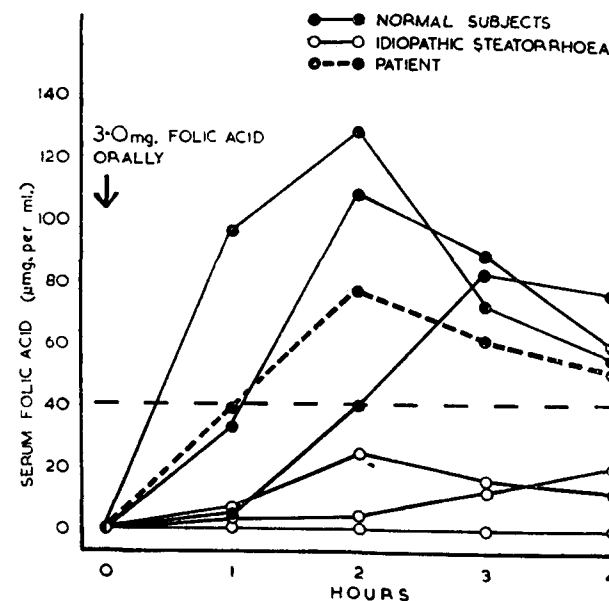


FIG. 2.—Changes in serum folic-acid concentration after a single oral dose of 3 mg. in three normal control subjects, three patients with idiopathic steatorrhoea, and the patient. Interrupted horizontal line denotes lowest peak level (40 µg. per ml.) of folic acid found in 55 control subjects.

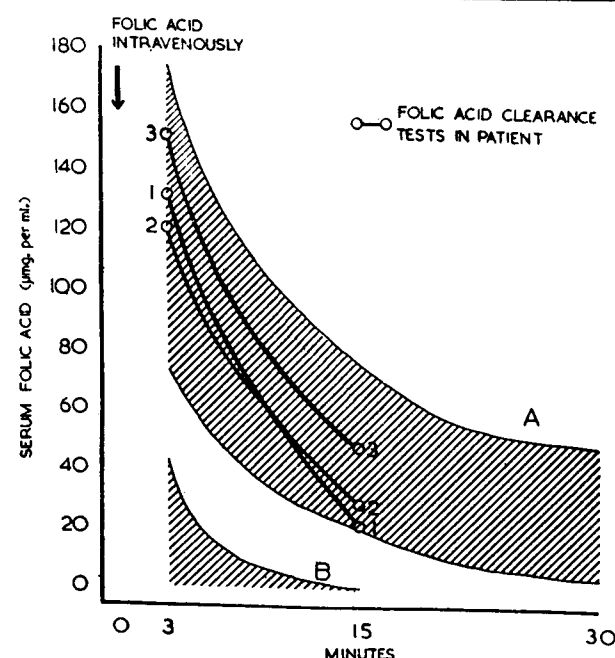


FIG. 3.—Rate of clearance from plasma of an intravenous dose of folic acid: in the patient 1—1=before withdrawal of primidone; 2—2=after a large dose of ascorbic acid; 3—3=after treatment with folic acid. A, In 35 control subjects. B, In 11 patients with megaloblastic anaemia due to folic-acid deficiency.

Discussion

The megaloblastic anaemia in this patient appeared to be due to the anticonvulsant drug primidone. She was not suffering from a gastro-intestinal malabsorption syndrome, for she absorbed vitamin B₁₂, folic acid, fat, vitamin A, and glucose normally. Although her diet was probably defective in vitamin B₁₂, there was no evidence of vitamin-B₁₂ deficiency and her serum vitamin-B₁₂ concentration was normal.

The megaloblastic anaemia in these patients resembles that seen in pregnancy and in certain patients with intestinal malabsorption syndrome who develop uncomplicated folic-acid deficiency. The serum vitamin-B₁₂ concentration in each of these three groups of patients is usually normal and the patients respond optimally only when they are treated with folic acid. In a general sense, therefore, patients developing a megaloblastic anaemia on treatment with anticonvulsants may be considered to be suffering from "folic-acid deficiency." Our results, however, suggest that the pathogenesis of the "folic-acid deficiency" in these patients is different from that in the pregnant patients and in the patients with folic-acid deficiency associated with intestinal malabsorption syndrome. These latter patients clear a small intravenous dose of the vitamin from their plasma very rapidly (Chanarin *et al.*, 1958b), and this has been interpreted as indicating true folic-acid deficiency with depleted tissue stores. In this patient, however, the rate of clearance of intravenously injected folic acid was normal. Hence it seems that there was no tissue deficiency of folic acid in this patient. The anaemia is thus probably not due to deficiency of folic acid but to interference by the anticonvulsant drug with the action of available folic acid in cellular metabolism. That tissue stores of folic acid are present in these patients is supported by the observation that the withdrawal of primidone will itself bring about relief of the anaemia (Christenson *et al.*, 1957).

The development of megaloblastic anaemia in patients receiving anticonvulsants is analogous to the megaloblastic change which develops in patients with leukaemia who are treated with 6-mercaptopurine or with various folic-acid antagonists. As one would expect, the folic-acid clearance in patients with leukaemia who develop such megaloblastic change remains unaltered (Chanarin *et al.*, 1958c).

The action of folic acid in producing a response in patients with megaloblastic anaemia associated with anticonvulsants is also presumably analogous to the action of folic or folinic acid in reversing the megaloblastic change in patients being treated with folic-acid antagonists, and similar to the action of *para*-aminobenzoic acid in overcoming sulphonamide inhibition in micro-organisms.

Although these observations provide a satisfactory explanation for the action of the anticonvulsant drugs, they do not explain why relatively few patients develop frank megaloblastic anaemia. The observations of Hawkins and Meynell (1957) suggest that about one-third of patients receiving anticonvulsants develop a macrocytosis which responds to folic acid. The effectiveness of these drugs in converting these minimal haematological changes into frank megaloblastic anaemia must depend on other factors such as associated vitamin-B₁₂ deficiency (Kidd and Mollin, 1957), associated ascorbic-acid deficiency (Gydell, 1957; Kidd and Mollin, 1957), and probably the dietary intake of folic acid.

Summary

Folic-acid studies were carried out on a patient who developed a severe megaloblastic anaemia while being treated with the anticonvulsant drug primidone.

The absorption of folic acid was found to be normal.

However, by contrast with megaloblastic anaemia due to folic-acid deficiency the tissue stores of folic acid were normal.

It is concluded that the anaemia was not due to folic-acid deficiency but to interference with the tissue metabolism of folic acid.

We thank Dr. J. G. Scadding for permission to carry out these studies on his patient; Professor J. V. Dacie for his interest and advice; Dr. K. Ibbertson for carrying out an ¹⁵I-labelled fat-absorption test; and Miss B. B. Anderson for help with folic-acid assays.

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Speaking at the opening of the Commonwealth Chest Conference in London on July 10, the MINISTER OF HEALTH, Mr. Derek Walker-Smith, said that the advances of recent years had brought total eradication of tuberculosis increasingly within the range of possibility. During the ten years since the start of the National Health Service, new cases of tuberculosis had fallen in England and Wales by 38% and deaths by 78%. This striking decline had brought both social and economic benefit, reflected not only in enhanced well-being of individuals but also in freeing hospital resources for the treatment of other ills. In tuberculosis more than in most diseases, continued the Minister, Government action could claim a good deal of credit. As Sir William Osler had said, tuberculosis was a social disease with medical aspects. The recent history of tuberculosis in this country illustrated the value of preventive measures. In England and Wales 27 million x-ray examinations had been carried out since the introduction of M.M.R. in 1943; and in recent years over 20% of all cases of tuberculosis had been detected by this means. Since 1949 over a million people had received B.C.G. vaccination.

TREATMENT OF BOILS WITH ERYTHROMYCIN AND WITH ANTIBIOTIC E 129

BY

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WITH THE TECHNICAL ASSISTANCE OF

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The well-known propensity of strains of *Staphylococcus aureus* to develop resistance to the effects of bactericidal and bacteriostatic drugs has been a major factor in the search for newer antibiotics. E 129, one of the most recently produced of these, has already been described and tested in the laboratory (Garrod and Waterworth, 1956). The present study records the results of a clinical investigation of this alternative therapeutic agent. Its purpose was to compare the efficacy of E 129 in the treatment of a relatively "standard" clinical infection—a furuncle—with that of an established antistaphylococcal antibiotic, erythromycin, to which E 129 is related. In addition to judging therapeutic effect by clinical criteria, laboratory studies were carried out to determine the effect on the staphylococcus itself, and in particular on its sensitivity to each of the antibiotics used in treatment.

Methods

Patients were a consecutive series, 210 in all, who attended the out-patient department of St. Bartholomew's Hospital for the treatment of boils. The period of study occupied the year from February, 1957, to February, 1958. No patients under 16 were treated in this series, largely because of the difficulty presented for children by the ingestion of the large quantity of E 129 tablets (12 daily) during their treatment. The ages ranged from 16 to 67 years, with a mean of 27. There was a slight preponderance of males—3:2.

Several criteria were used to decide whether the patient was suitable for inclusion in this series: (1) the lesion must have been fresh, (2) no treatment of the patient with antibiotics in the preceding six months, and (3) no secondary space infections (such as may be seen on the hand).

Classification of Boils.—(1) Localized infection of diameter under 1 cm., and with no surrounding reaction. (2) Localized infection, larger than above, with minimal adjacent reaction. (Neither of these two groups had any systemic symptoms or signs.) (3) Local infection of diameter over 2.5 cm., with marked surrounding cellulitis, moderate regional lymphadenopathy, some tissue destruction, occasional mild fever. (4) Large area of local infection, with marked peripheral cellulitis, regional lymphadenopathy, and systemic signs—for example, fever, fatigue. The first part of the study included patients with boils of all four types, but the main series included boils of the last-named two groups only.

Therapy.—All patients received local applications of mercury perchloride, 0.1% aqueous solution. In approximate consecutive rotation, therapy was conducted in successive patients with (a) local application alone; (b) erythromycin patients with (a) local application alone; (c) E 129, 250 mg. four times daily per os for seven days; (d) E 129, 750 mg. four times daily per os for seven days. The larger dose of E 129 was decided on for three reasons: as obtainable at the time of the investigation, this substance included about one-half of the activity of the latter against *Staph. aureus*. Eleven patients on placebo therapy whose condition was deteriorating rapidly were removed from the series and given treatment as indicated.

Observations.—Swabs were taken from the boil of each patient before the beginning of therapy, and on the second, fourth, and seventh days of treatment. Further cultures were taken until the area healed. In addition a clinical assessment of each case was made on the above days until healing was complete. Further examinations were made in the third and sixth weeks after therapy.

Results

General Observations

In the treatment of boils categorized as 1 and 2 no substantial difference was noted in the results obtained with either placebo or antibiotic routines. This prompted us, therefore, to limit our further patients to those who had boils of group 3 or 4—a total of 165 patients.

A comparison of results obtained in the treatment of boils of less than four days' duration with those of longer than four days demonstrated that the latter tended to be of greater severity (22% in contrast to 12% classed as group 4), with a prolonged healing-time (30% required over two weeks), and a higher incidence both of necessary surgical drainage (22% in contrast to 9%) and of fresh outbreaks (40% in contrast to 17%). Cultures became negative over a slightly longer period.

A consideration of the mean duration of boils prior to treatment in each of the three therapeutic groups showed these values to be almost the same. Hence for the purposes of the remainder of the results the boils of varying duration are discussed together.

Comparison of the Results of Placebo and Antibiotic Therapy

The results are stated in the Table. The evolution of the boil process continued in 42% of the placebo-treated group for over four days, in contrast to the course in patients of the antibiotic group, in which only 2% were observed to progress after therapy was started. In 24% of the former group the boil was not controlled even after one week.

Comparison of the Results of the Treatment of Boils Using Placebo, Erythromycin, and E 129

	Form of Therapy Employed		
	Placebo	Erythromycin	E 129
No. of cases	55	55	55
Duration of boil (average in days)	4 (3-10)	4.2 (2-7)	4 (2-7)
Progression of boil during therapy:			
1-2 days	10 (18%)	26 (47%)	31 (56%)
3-4 "	23 (42%)	27 (50%)	23 (42%)
5-7 "	10 (18%)	2 (4%)	1 (2%)
8-21 "	12 (22%)	0	0
Duration of healing:			
4-7 days	5 (9%)	16 (29%)	24 (44%)
8-14 "	27 (50%)	29 (53%)	29 (53%)
15-21 "	9 (16%)	8 (14%)	1 (2%)
22-28 "	9 (16%)	2 (4%)	1 (2%)
29-42 "	5 (9%)	0	0
Degree of final tissue damage:			
Grade 1	10 (18%)	39 (71%)	45 (82%)
" 2	18 (32%)	13 (23%)	10 (18%)
" 3	27 (50%)	3 (6%)	0
Last positive culture:			
Within 4 days	20 (36%)	26 (47%)	29 (53%)
5-7 days	21 (36%)	16 (29%)	18 (32%)
8-14 "	10 (18%)	7 (12%)	6 (11%)
15-21 "	2 (4%)	1 (2%)	1 (2%)
Over 21 days	2 (4%)	0	0
New lesions during therapy	14 (25%)	5 (9%)	5 (9%)
" after "	5 (9%)	8 (14%)	5 (9%)
Drainage required	11 (20%)	8 (14%)	3 (6%)

Healing-time was less than a week in only 9% of the placebo group, while 25% required over three weeks for healing.

Of those having no antibiotic therapy, 50% suffered marked local necrosis, with subsequent scarring after the infection; in contrast to this only a small number of antibiotic-treated patients showed this complication.

Eventual surgical drainage of the boil area was required in 20% of the first group, while an even greater number (34%) developed fresh lesions within the observation period of six weeks. It is interesting that antibiotic therapy in the other group did not appear to influence the tendency of some patients to recurrent furunculosis.

Various systemic complications were observed in the placebo-treated group; these included fever in 36% of cases, usually lasting about three days.

Although most of the untreated boils showed only a slightly slower rate of disappearance of positive cultures, 8% of the tests still yielded a positive result even after 14 days.

Clinical Comparison of the Results of Treatment with Erythromycin and E 129

Both antibiotics showed approximately the same ability to arrest the progress of the boil—about 50% controlled within two days, and only 2% uncontrolled after four days. The development of the boil appeared to be halted slightly more rapidly with E 129.

The boils treated with E 129 healed more rapidly than those given erythromycin; 44% healed within the first week, in contrast to only 29% of those in the latter group. It can be shown, using the χ^2 test for a trend (Armitage, 1955), that the difference in rates of healing is statistically significant at the 5% level ($\chi^2=5.7$; $0.01 < P < 0.05$).

Tissue damage was not marked in either of the two groups—over 80% of the E 129 group and 72% of the erythromycin group could be placed in stage I, although three patients in the latter group did show sufficient damage to be classified as grade 3.

Surgical drainage was necessary in slightly more (8) of the erythromycin group, while the incidence of fresh lesions was about equal.

Diarrhoea associated with the presence of *Candida* in the stools followed erythromycin therapy in four patients. No such complication was observed with E 129.

Bacteriological Findings

Coagulase-positive staphylococci were found in the initial culture from 159 of the 165 patients: the few negative cultures are attributable to the fact that the lesion was sometimes still closed when the first swab was taken. Although 37 (23.3%) of these strains were resistant to penicillin and 3 (1.1%) to tetracycline, they were uniformly sensitive to both erythromycin and E 129, the respective minimum inhibitory concentrations almost invariably found, using the method of Garrod and Waterworth (1956), being 0.12 and 0.25 $\mu\text{g./ml.}$: no strain differed from this figure by more than one (doubled) dilution.

Negative cultures were obtained after about the same time in both groups—within four days in 47% of the erythromycin group and 53% of the E 129 group. All strains of coagulase-positive staphylococci recovered from the original boil after the seven-days period of treatment (8 in the erythromycin group and 7 in the E 129), and those from fresh lesions developing during or after treatment (13 and 10 respectively) were retested and found to have undergone no change in sensitivity to either antibiotic.

Discussion

The apparent lack of effect that antibiotics had on less severe boils is in keeping with our knowledge of the adequacy of the body's natural defences against such infections. In the treatment of more severe infections it is clear that the use of antibiotics promotes more rapid recovery with fewer sequelae such as post-necrotic scarring, although the better results appear to depend not so much on the rapid elimination of the infecting organisms as on limitation of their destructive activity.

By each of the criteria used the effect of E 129 was slightly superior to that of erythromycin, and by one of these—the rate of healing—the difference has a statistical significance. Against this advantage has to be set the fact that a larger dose of E 129 was given. Reasons for adopt-

ing this dose have been stated, and, allowing for the impurity of the E 129 and its less complete absorption, the effective doses of the two antibiotics must have been approximately equivalent. It would be unwise, however, to base any final conclusion about the relative merits of these two antibiotics on these findings.

It was thought possible that a difference between them might be found in another direction. Staphylococci acquire resistance to erythromycin rather readily and to E 129 less so (Garrod and Waterworth, 1956). It has been a common practice to restrict the use of erythromycin severely for fear of breeding resistant strains, and it would not have been surprising if in some of these patients with persisting or recurrent infections increased resistance to the antibiotic had been found. In fact, no instance of increased bacterial resistance to either antibiotic was seen in the whole series. Whether this is to be credited to strict limitation of the treatment to seven days, or whether the nature of the lesion is unfavourable to change in bacterial resistance, is uncertain. It is nevertheless encouraging to know that this form of staphylococcal infection can be treated in this way apparently without serious risk of producing such a change.

Summary

Patients with severe boils were treated with erythromycin (1 g. daily) and E 129 (3 g. daily) each for one week, or by the local application of mercury perchloride only. There were 55 patients in each group.

As judged by each of four criteria, patients in both antibiotic-treated groups recovered more rapidly and more satisfactorily than the controls. Slight differences between the treated groups were in favour of E 129.

All strains of staphylococci found in these patients were normally sensitive to both antibiotics, and none cultivated again after seven days' treatment had acquired resistance to either of them.

The advice of Dr. R. M. B. MacKenna and Professor L. P. Garrod on the clinical and bacteriological aspects respectively of this work is gratefully acknowledged. Mr. M. P. Curwen kindly made the statistical calculation referred to in "Results." Antibiotic E 129 was kindly supplied by Glaxo Laboratories Limited.

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EFFECT OF ABDOMINAL OPERATIONS ON TOTAL LUNG CAPACITY AND ITS SUBDIVISIONS

BY

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Although serious pulmonary complications of an inflammatory nature are becoming less frequent after abdominal operations, atelectasis and bronchitis still occur. One of the main factors is the interference with the mechanical efficiency of the lungs. The effect of laparotomy on vital capacity has been extensively studied (Churchill and McNeil, 1927; Powers, 1928; Overholt, 1930; Anscombe, 1957) and reductions of up to 80% of the pre-operative figure may occur after an upper abdominal operation.

Other effects on pulmonary function have not been examined in such detail. Beecher (1933) measured the

total lung capacity and its subdivisions in 35 patients before and after abdominal operations. He found that reductions occurred in the total lung capacity and functional residual capacity. As the decreases in the vital capacity may be due to the effect of the operative trauma on the efficiency of the respiratory musculature, he argued that the total lung capacity and vital capacity readings were not indications of the "real state" of the lungs. The functional residual capacity, which did not depend on the voluntary efforts of the patient, was a better guide, and Beecher found that this was reduced to 20%.

More accurate methods are now available for the measurement of the gas volume of the lungs, and it was thought that a further investigation would be of interest. In this series a modification (Buxton and D'Silva, 1956) was used of the helium dilution described by Bates and Christie (1950).

Procedure

A total of 26 male patients comprising three groups was investigated, the same procedure being adopted in each group. Group I consisted of 10 patients admitted to medical and surgical wards, none of whom suffered from conditions likely to affect the respiratory system in any way or who underwent any operation during the period of study. The selection of those patients depended upon their availability for the investigation, and they serve as a control group. Group II consisted of 13 patients upon whom abdominal operations were performed. The operations consisted of seven inguinal herniorrhaphies and six upper abdominal operations (five partial gastrectomies and one cholecystectomy). Group III contained three patients only, and in each case an operation of similar severity was performed upon an extremity.

Two measurements were made on each patient. In groups II and III the first measurement was made within the 24 hours preceding the operation, the second within the first 48 hours post-operatively, depending upon the general condition and availability for study of the patient. In the control group two measurements were made within a period of 48 hours. The surgical patients were ambulant before operation, and then confined to bed in the period between the two measurements. As it has been shown that recumbency reduces the residual capacity (Whitfield, Waterhouse, and Arnott, 1950) the same regime was followed so far as was possible in the control group, and all measurements were made with the patients in this position.

The patients were brought by wheel-chair or in their beds to the apparatus, which was housed in an adjacent side ward. They then assumed the recumbent position, and after a brief explanation the mouth-piece was inserted and the nose clipped. The patient then breathed oxygen for 10 minutes in order to replace the nitrogen of the functional residual capacity. This period also allowed the state of the pulmonary circulation to become stabilized. At the end of a normal expiration the patient was admitted to the circuit, which contained pure oxygen and about 10% helium. The fall in helium concentration was followed on a katharometer until no further change was apparent.

Finally, two measurements of the vital capacity were made, and the results calculated and corrected to 37° C. at saturated water-vapour pressure. Assessment of the findings was made by use of the analysis of variance, or Student's *t* test.

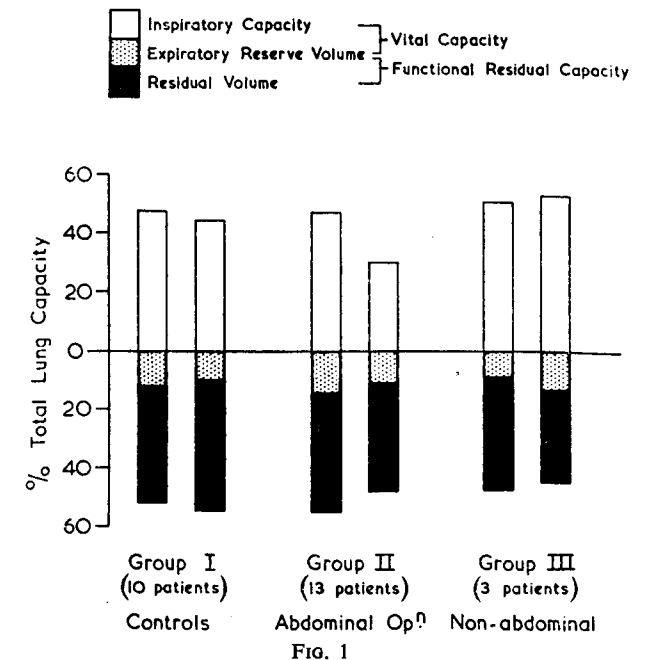
Results

The first or pre-operative examination values for groups I and II were studied. The difference between the means of the subdivisions of the total lung capacity was not significant, but the total lung capacity showed a significant difference ($P=0.02$) (columns a and c, Table I). The changes in the three groups are shown in Fig. 1.

TABLE I.—Total Lung Capacity and its Subdivisions (in litres) in Control Group and Patients with an Abdominal Incision

	Group I (Control)			Group II (Abdominal)			
	a	b	Dif.	c	d	Dif.	
Functional residual capacity	3.3	3.4	0.1	3.8	3.2	0.6	0.05 > P > 0.02
Inspiratory capacity	2.9	3.0	0.1	3.2	2.3	0.9	P > 0.01
Expiratory reserve volume	0.8	0.7	0.1	0.9	0.6	0.3	0.05 > P > 0.02
Vital capacity	3.7	3.8	0.1	4.1	2.9	1.2	P > 0.001
Residual capacity	2.5	2.7	0.2	2.9	2.6	0.3	0.2 > P > 0.1
Total lung capacity	6.2	6.4	0.2	7.1	5.5	1.6	P > 0.001
Residual capacity $\times$ 100	40	41	1	42	48	6	0.3 > P > 0.2
Total lung capacity	40	41	1	42	48	6	

a and b represent the observed values in Group I at the first and second measurements, while c and d were the figures noted before and after operation in group II.



It was found (Table I) that a small difference occurred between the first and second measurements in group I, depending on the reproducibility of the method, but that the corresponding pre-operative and post-operative figures in group II were grossly different. When these changes were investigated further, significant reductions were found to have occurred after laparotomy in the functional residual capacity, inspiratory capacity, expiratory reserve volume, vital capacity, and total lung capacity. This reduction was mainly due to a decrease in the vital capacity, although the functional residual capacity was reduced to a less extent.

The post-operative results in the three patients of group III showed no significant change compared with the pre-operative measurements (Table II). This is in accordance

TABLE II.—Total Lung Capacity and its Subdivisions (in litres) in Control Group and Patients with an Operation on an Extremity

	Group I			Group III			
	a	b	Dif.	e	f	Dif.	
Functional residual capacity	3.3	3.4	0.1	3.2	3.0	0.2	0.9 > P > 0.8
Inspiratory capacity	2.9	3.0	0.1	3.2	3.4	0.2	P > 0.9
Expiratory reserve volume	0.8	0.7	0.1	0.8	0.8	0.0	P > 0.9
Vital capacity	3.7	3.8	0.1	4.0	4.2	0.2	P > 0.9
Residual capacity	2.5	2.7	0.2	2.4	2.2	0.2	0.9 > P > 0.8
Total lung capacity	6.2	6.4	0.2	6.4	6.3	0.1	0.9 > P > 0.8
Residual capacity $\times$ 100	40	41	1	37	35	2	P > 0.9
Total lung capacity	40	41	1	37	35	2	

a and b were the observed values in group I at the first and second measurements, and e and f were the figures noted before and after operation in group III.

with previous findings (Anscombe, 1957) that operation upon the extremities did not significantly affect the mechanical function of the lungs.

TABLE III.—Total Lung Capacity and its Subdivisions (in Litres) in Patients with Upper and Lower Abdominal Operations

	Upper Abdominal			Lower Abdominal			
	c'	d'	Dif.	c'	d'	Dif.	
Functional residual capacity	4.0	3.2	0.8	3.5	3.2	0.3	0.4 > P > 0.3
Inspiratory capacity	3.3	1.7	1.6	3.2	2.9	0.3	0.1 > P > 0.5
Expiratory reserve volume	1.1	0.6	0.5	0.8	0.6	0.2	0.02 > P > 0.01
Vital capacity	4.4	2.4	2.0	4.0	3.6	0.4	0.05 > P > 0.02
Residual capacity	2.9	2.6	0.3	2.7	2.6	0.1	0.8 > P > 0.7
Total lung capacity	7.3	4.9	2.4	6.7	6.1	0.6	0.05 > P > 0.02
Residual capacity × 100 Total lung capacity	39	53	14	42	43	1	0.1 > P > 0.05

c' and c" were pre-operative measurements and d' and d" were post-operative values.

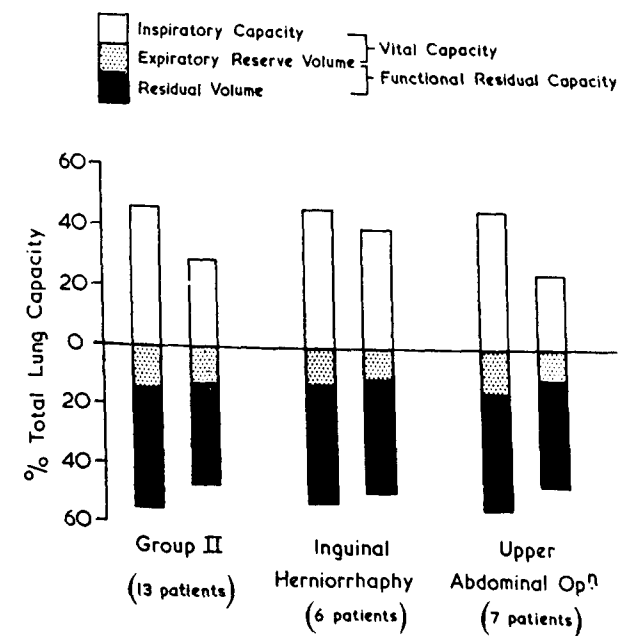


FIG. 2

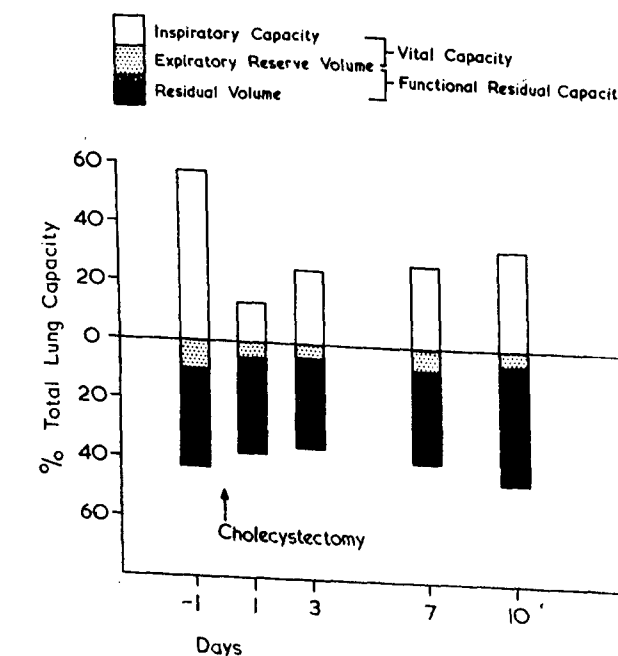


FIG. 3

By subdividing group II into those patients with inguinal herniorrhaphies and those with upper abdominal operations, the effect of the site of operation on these changes was studied (Table III and Fig. 2). The difference between the observations in these groups was significant only for the vital capacity ($0.05 > P > 0.02$) and the total lung capacity ($0.05 > P > 0.02$). This finding emphasizes further the importance of the decrease in vital capacity in reducing the total lung capacity and also stresses the fact that upper abdominal procedures cause a greater reduction than those of the lower abdomen. The findings in the subject who underwent cholecystectomy are illustrated in Fig. 3.

Discussion

A significant reduction in total lung capacity after laparotomy could be due to closure of part of the bronchial tree, to interference with the normal function of the muscles of respiration, or to a combination of these factors.

The bronchial tree may become obstructed actively by bronchospasm or passively by blockage with mucus or inflammatory exudate. The upper abdominal cases in group II showed an average reduction in total lung capacity of 2.4 litres. Passive obstruction of the air passages leading to atelectasis of this degree should be demonstrable on clinical and radiological examination, but there was no evidence to support this. In the present study, 0.25 g. of aminophylline was given intravenously to two patients before and after partial gastrectomy. No significant change was noticed pre-operatively or post-operatively in the total lung capacity and its subdivisions. It is likely that if any bronchospasm had been present after operation the exhibition of a bronchodilator would have caused some increase in at least one component of the total lung capacity.

Electromyographic studies (Campbell, 1952) have shown that the muscles of the anterior abdominal wall play no part in quiet breathing when the subject is lying supine. They do assist in the terminal portion of forced expiration, and their contraction is a limiting factor in maximal voluntary inspiration. We have confirmed with records from the rectus abdominis that no activity occurs during respiration at rest. But if the subject adopts a sitting posture or is inclined on a bed in such a way that his abdominal musculature is participating in maintaining his posture, then the recti will be involved more in expiration than in inspiration. Where respiration is forced against resistance then all the abdominal muscles are used in both phases of breathing. After laparotomy the potentials recorded were reduced, and this finding was more marked in those patients recovering from an upper abdominal operation.

Dysfunction of the muscles of the anterior abdominal wall may occur after operation as a reflex secondary to peritoneal inflammation or may be due to the local trauma of an incision. When the results obtained from patients after an abdominal operation (group II) are examined, reductions are seen to have occurred in both the inspiratory and the expiratory components. Impairment of the muscular power available to complete forced expiration will reduce the expiratory reserve volume. But the reduction in the vital capacity (mean 1.2 litres) was due mainly to a reduction of the inspiratory capacity (mean 0.9 litres). This is presumably due to the abnormal contraction of the abdominal muscles acting as a limit to the depth of maximum inspiration.

Those patients who had emphysema presented figures which followed the same general pattern as those not so affected, but the mean reduction in five emphysematous cases as compared with five without chest disease was 0.88 and 1.6 litres for the vital capacity, 0.5 and 1.3 litres for the inspiratory capacity, and 0.8 litre in both sets for the functional residual capacity.

Thus it appears that an abdominal operation, especially one in the upper abdomen, is followed by a reduction in the subdivisions of the lung volume, and that similar changes occur post-operatively in subjects with evidence of pre-existing lung disease. This effect occurring in a patient

whose lung function is already impaired is more likely to cause respiratory insufficiency in the immediate post-operative period. It is suggested that any such patient should have the pulmonary function assessed before operation so that measures may be taken to combat any post-operative anoxia which may arise.

Summary

Measurements of the total lung capacity and its subdivisions were made on 26 male patients.

Significant reductions occurred in the total lung capacity, inspiratory capacity, expiratory reserve volume, vital capacity, and functional residual capacity after abdominal operations, and these changes were more marked after those on the upper abdomen.

Possible causes of these changes are briefly considered.

We thank Professor J. L. D'Silva for much helpful advice and criticism, and the surgical staff of the London Hospital for permission to study their patients. Figs. 1-3 are from *The Pulmonary Complications of Abdominal Surgery* by one of us (A. R. A.), and are printed by permission of Lloyd-Luke, London. This work was done during the tenure of one of us (R. St. J. B.) of a postgraduate Research Fellowship.

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OPEN HEALING OF TUBERCULOUS CAVITIES

RESULTS IN 40 PATIENTS TREATED CONSERVATIVELY

BY

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With the development of rational chemotherapy the phenomenon of open-cavity healing in pulmonary tuberculosis is becoming increasingly evident. From the extensive literature on the subject a few observations are summarized.

Auerbach and Small (1957) state: "For practical purposes it is the opinion of the writers that those cases should be accepted as open healing in which the lumen of the cavity is free of necrotic contents, the inner aspect contains no pyogenic membrane or necrotic lining, and the cavity wall contains no necrotic foci." The same writers comment that, although open healed cavities often appear cystic, the radiological appearances are deceptive in that a thin-walled cavity may present evidence of active disease and a thick-walled cavity may be healed. They believe that open-cavity healing is less common than might be supposed and point out that, despite the absence of tubercle bacilli from the sputum for many months, a resected cavity may show the

presence of a necrotic lining. They admit, however, the increasing frequency of open healing after long-term chemotherapy and suggest that where the sputum has been negative for tubercle bacilli for more than seven months four out of five cyst-like cavities prove to be instances of open healing. In their experience isoniazid has not significantly increased the incidence of healing.

Corpe and Stergus (1957), on the other hand, believe that isoniazid is of great importance in this connexion. In their cases open healing was observed to occur most often when a triple-drug regime of streptomycin, P.A.S., and isoniazid had been used. They are not sanguine about the conservative management of such cavities, and state: "The possibilities of rupture, suppuration, haemorrhage, and reactivation of tuberculosis are well recognized. Accordingly, it is believed that when these openly healed or healing cavities are unilateral, or bilateral, they should be excised if the patient is otherwise fit for surgery." A similar opinion has been expressed by Chenebault (1954). Caffey (1950) explains the pathogenesis of pulmonary cysts during respiratory infections. Such cysts may develop during the course of treatment and may be indistinguishable radiologically from thin-walled cavities. Auerbach (1955) states: "After chemotherapy such healed cavities may be mistaken for lung cysts or emphysematous blebs. It is believed that such areas may be accepted as open healed cavities if they occupy the site of a cavity visualized in the roentgenograms, if bronchi communicate with them and if they do not surround an inspissated cavity or radial scar."

Most papers on the subject are concerned with the pathological findings in resection specimens. Little is known of the fate of patients who continue to receive drug therapy alone without resection therapy after they have achieved presumptive open healing of tuberculous cavities. Douglas and Horne (1956) have reported on six such patients. Corpe and Stergus (1957) indicate that they are in the process of making such a study. Raleigh and his co-workers (Raleigh 1957; Bell, Decker, and Raleigh, 1957) have reported unfavourably on the conservative treatment of patients in this category.

This paper records our own experience with indefinitely prolonged chemotherapy in 40 cases of advanced pulmonary tuberculosis with persistent cavitation. The cases recorded are the most grossly diseased of a large series of patients treated by prolonged chemotherapy in this unit over the past five years. They have been observed for periods ranging from one and a half to five years. The distribution of the patients is shown in Table I. Twenty-nine patients have been observed for more than two years and 17 for more than three years.

TABLE I.—Distribution of 40 Cases Observed for One and a Half to Five Years

	Period of Observation in Years				
	>5	4-5	3-4	2-3	1-2
No. of patients starting treatment	2	4	11	12	11
Total No. of patients under observation	2	6	17	29	40

Methods and Materials

By virtue of age, advanced disease, or poor respiratory function 37 of the patients were judged unsuitable for surgical treatment. A further three refused surgery. All were sputum-positive at the beginning of the study, the finding of a positive culture for *Mycobacterium tuberculosis* being considered obligatory to their inclusion in the

series. Thirty-five had received no previous treatment and five had had previous chemotherapy with drug combinations considered unlikely to produce drug-resistant organisms. In every case the organisms were fully sensitive to streptomycin, P.A.S., and isoniazid, as judged by the standard M.R.C. techniques. Cavitation, the total diameter of which was not less than 5 cm., was present in every case.

All were treated in hospital for periods ranging between 4 and 35 months, the average duration of stay being 14 months.

Thirty-two of the patients received a triple-drug regimen for at least the first year of treatment—streptomycin (usually streptoduoicin), 1 g. daily, intramuscularly with P.A.S. (sodium salt), 10 g. daily, and isoniazid, 0.2 g. daily, by mouth in two divided doses. Triple-drug therapy was thereafter continued until resumption of employment or other circumstances made it difficult to arrange the administration of streptomycin. Eight patients received varying drug combinations for reasons stated in Table II. Particular care was taken to "sell" long-term chemotherapy to each patient. At each visit to the chest clinic patients were questioned in detail about the drugs they were taking;

TABLE II.—Cases Receiving Drug Combinations Other than SPH for a Minimum Period of One Year

Case No.	Drugs Employed	Reason
13	S ₂ H	Unable to tolerate P.A.S.
36	SH 12/12→S ₂ H	
21	SH	Allergic to P.A.S.
20	SPH 6/12→SH	
28	SPH 8/12→10 PH	Partial nerve deafness
7	S ₂ H 24/12→10 PH	Failure to receive standard combination was oversight
15	SP 12/12→SH 1/12→10 PH	
16	SH 13/12→10 PH	

SPH=Streptomycin 1 g., P.A.S. 10 g., isoniazid 0.2 g. daily.
S₂PH=Streptomycin 1 g. thrice weekly, with P.A.S. 10 g. daily, and isoniazid 0.2 g. daily.
SH=Streptomycin 1 g. daily with isoniazid 0.2 g. daily.
S₂H=Streptomycin 1 g. thrice weekly with isoniazid 0.2 g. daily.
10 PH=P.A.S. 10 g. daily, isoniazid 0.2 g. daily.

they were invited to discuss any difficulties they might have with chemotherapy, and were repeatedly encouraged and advised about the security afforded by careful adherence to the prescribed regimen. All of the patients, except one, continue to take antituberculosis drugs. This individual (Case 4) passed to the care of another physician, who stopped the drugs after 30 months' continuous chemotherapy. In hospital chest x-ray films were taken every six weeks; out-patients were x-rayed at intervals of not more than three months. Tomograms were taken roughly at the end of each year of treatment. (In any instance where the persistence of cavitation was uncertain, tomograms have been taken during the past two months. In this connexion it should be recorded that there were originally 60 patients in the series, of whom 20 were discarded because of failure to demonstrate beyond any doubt the persistence of cavitation. No patient was withdrawn from the series for any other reason.)

The sputum of in-patients was examined each month by smear and culture, and sensitivity tests were carried out on all positive cultures. For out-patients the sputum was similarly examined on three consecutive days each three months. At the end of each year of treatment all antituberculous drugs were withheld for a period of four weeks. During the fourth week daily specimens of sputum, or a series of laryngeal swabs, were obtained.

Results

A detailed list of patients is given in Table III. All showed marked clinical and radiological improvement, which usually continued into the second or third year of treatment. Tomograms taken during the second and third years of treatment showed marked resolution of disease: in all instances the appearances did not suggest the persistence of large residual necrotic foci. Multiple cavities persisted in 28 patients; the remainder had solitary residual cavities. Twenty-five patients had thin-walled cyst-like

TABLE III.—Summary of Cases

Case No.	Date of Beginning of Treatment	Chemotherapy		Time Taken in Months for Sputum Conversion	Residual Cavitation		Total Diameter (cm.)
		SPH	Other Combinations		Site	Radiological Appearance	
1	17/11/52	16/12	→S ₂ PH 3/12→S ₂ H 18/12→10 PH	6	L.U.L. (S)	Cystic	2.5
2	15/1/53	15/12	→S ₂ PH 14/12→10 PH	15	R.U.L.; L.U.L.	R.U.L., multiple thick-walled cavities; L.U.L., cystic	25
3	19/6/53	12/12	→S ₂ PH 12/12→10 PH	9	R.U.L.; L.U.L.	Cystic	5
4	20/7/53	12/12	→10 PH 18/12*	4	R.U.L.; R.L.L.	"	7
5	3/9/53	18/12	→SH 9/12→10 PH	5	R.L.L. (S)	"	5
6	24/2/54	12/12	→S ₂ PH	7	R.U.L.	Thick-walled	8
7	7/7/54	Nil	S ₂ H 24/12→10 PH	3	R.U.L.; R.L.L.	Cystic	8
8	8/7/54	12/12	→10 PH	1	R.U.L. (S)	Thick-walled	2.5
9	11/9/54	19/12	→10 PH	2	R.U.L.	Cystic	12
10	6/10/54	12/12	→S ₂ PH	1	R.U.L.; L.U.L.	R.U.L., thick-walled; L.U.L., cystic	15
11	18/10/54	24/12	→10 PH	4	R.U.L.; L.U.L.	Thick-walled	2
12	27/10/54	12/12	→S ₂ PH 6/12→10 PH	2	R.U.L. (S)	"	3
13	1/11/54	Nil	S ₂ H	1	R.U.L. (S)	"	6
14	1/11/54	12/12	→10 PH	2	R.U.L. (S)	"	5
15	1/11/54	Nil	SP 12/12→SH 1/12→10 PH	1	R.U.L.; L.U.L.	"	3
16	1/11/54	Nil	SH 13/12→10 PH	1	R.U.L. (S)	Cystic	6
17	15/1/55	27/12	→10 PH	2	R.U.L.; L.U.L.	"	5
18	30/3/55	32/12†	→10 PH	1	R.U.L. (S)	"	3
19	26/4/55	12/12	→10 PH	1	R.U.L.; L.U.L.; L.L.L.	"	4
20	1/6/55	6/12	→SH	1	R.U.L.; L.U.L.	Thick-walled	18
21	1/7/55	Nil	SH	1	R.U.L. (S)	"	14
22	3/7/55	18/12	→10 PH	4	L.U.L. (S)	Cystic	4
23	3/7/55	29/12†	→10 PH	1	L.U.L. (S)	Thick-walled	7
24	5/7/55	14/12	→S ₂ PH	4	L.U.L. (S)	Cystic	6
25	16/7/55	17/12	→10 PH	1	R.U.L.	Thick-walled	7
26	27/7/55	29/12†	→S ₂ PH	1	R.U.L. (S)	"	8
27	3/9/55	21/12	→S ₂ PH	1	R.U.L.	"	6
28	1/10/55	8/12	→10 PH	1	R.U.L.; L.U.L.	Cystic	12
29	2/10/55	17/12	→10 PH	1	R.U.L.; R.L.L.; L.U.L.	R.U.L. and R.L.L. thick-walled; L.U.L. cystic	10
30	16/1/56	12/12	→10 PH	4	R.U.L.; R.L.L.; L.U.L.	Cystic	25
31	16/3/56	12/12	→10 PH	2	R.U.L.; R.L.L.	"	8
32	20/4/56	15/12	→10 PH	1	R.U.L.; L.U.L.	"	8
33	23/4/56	13/12	→S ₂ PH	2	R.U.L.; L.U.L.	"	6
34	1/5/56	15/12	→S ₂ PH	1	L.U.L.	"	2
35	7/5/56	12/12	→S ₂ PH	3	R.U.L.; L.U.L.	"	7
36	1/5/56	Nil	SH 12/12→S ₂ H	1	L.U.L.	Thick-walled	4
37	6/6/56	30/12†	→S ₂ PH	1	R.U.L.; L.U.L.	Cystic	6
38	6/9/56	27/12†	→S ₂ PH	1	R.U.L.; L.U.L.	"	6
39	1/10/56	12/12	→S ₂ PH	2	R.U.L.	"	12
40	3/10/56	14/12†	→S ₂ PH	6	R.U.L.; L.U.L.	"	3

* = Chemotherapy discontinued. † = Daily SPH continued. (S) = Single cavity present.
S₂PH = Streptomycin 1 g. twice weekly, with P.A.S. 10 g. daily, and isoniazid 0.2 g. daily.

cavities; in 12 the residual cavities were apparently thick-walled; and in 3 both varieties persisted.

The rate of sputum conversion is indicated in Table IV. In most instances this was rapid, 37 patients becoming sputum-negative within six months. Of the remainder, two

TABLE IV.—Rate of Sputum Conversion

Months of observation:	0	1	2	3	4	5	6	7	9	15
No. sputum-positive	40	20	13	11	6	5	3	2	1	0
% sputum-positive	100	50	32.5	27.5	15	12.5	7.5	5	2.5	0
No. sputum-negative	0	20	27	29	34	35	37	38	39	40
% sputum-negative	0	50	66.5	72.5	85	87.5	92.5	95	97.5	100

Average time for sputum conversion, 2.7 months.

became negative during the seventh and ninth months respectively. The last patient remained intermittently positive for 15 months. In this patient (Case 2) the last positive culture was obtained two months after the start of treatment. During the ensuing 13 months the sputum was positive on direct smear on four occasions, but no growth was obtained on culture. One patient (Case 9) produced a solitary positive sputum culture during the third year of observation. The organisms cultured were fully sensitive to streptomycin and P.A.S. and partially resistant to isoniazid. Eight subsequent examinations were negative. The remaining 39 cases remained consistently sputum-negative after conversion.

Apart from the instances listed in Table II, prolonged chemotherapy presented few problems. Two patients became allergic to streptomycin, the first (Case 30) after one year's treatment and the second (Case 11) after two years' continuous therapy. Table V shows that the majority were fit enough to return to work. With two exceptions the patients remained well during the period of observation. During the fourth month of treatment Case 29 developed

TABLE V.—Indicating Number of Patients at Work and Incidence of Late Complications

Years of observation:	<1	1-2	2-3	3-4	4-5	5-6
Total No. of patients	40	40	29	17	6	2
No. at work	2	8	24	14	4	2
Complications	1*	Nil	Nil	Nil	1†	1†

* Case 29. † Case 2.

multiple tension cysts, which subsided spontaneously (Figs. 1, 2, and 3). During the fourth year of treatment Case 2 developed repeated episodes of secondary infection in a cavitated right upper lobe. (This patient has deteriorated both clinically and radiologically, and has developed hypertrophic osteoarthropathy. Right upper lobe resection is being arranged.)

Discussion

The results of treatment in this incomplete investigation, although inconclusive, are none the less gratifying. They do not support Raleigh's (1957) adverse findings: this, however, is not surprising, as his patients received insufficient chemotherapy for his observations to be valid. It is clear that with adequate chemotherapy even the most



FIG. 2.—Case 29. Radiograph, showing multiple tension cysts, taken at four months of treatment.



FIG. 1.—Case 29. Radiograph taken before treatment.

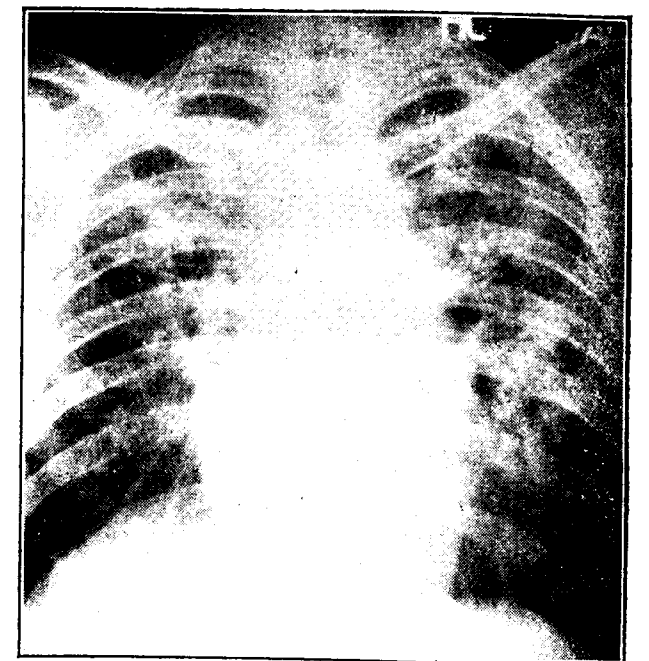


FIG. 3.—Case 29. Radiograph showing spontaneous subsidence of cysts.

extensive disease can be controlled and rendered non-infectious. The findings support the claim of Corpe and Stergus (1957) that a triple-drug regimen of streptomycin, P.A.S., and isoniazid is the most effective drug combination in present use. There is as yet no statistical proof of this contention, but it is perhaps significant that the results obtained in the present series, using daily streptomycin, P.A.S., and isoniazid, are superior to those reported where only two drugs were used in combination. This aspect will be discussed in a subsequent communication. The fact that little difficulty was encountered with long-term chemotherapy is probably due to a number of factors. Firstly, the patients were well indoctrinated while in hospital. Secondly, they have remained under the care of the same medical attendants throughout their treatment. Thirdly, throughout their treatment the patients have been constantly reminded of the necessity to take the drugs prescribed. Lastly, but by no means least, general practitioners have co-operated admirably in the supervision of chemotherapy.

Two striking features in the patients observed have been the rapid disappearance of tubercle bacilli from the sputum and the degree of resolution of pulmonary disease as judged radiologically by the apparent absence of large residual necrotic foci. The findings suggest that, where prompt sputum conversion is associated with considerable resolution of disease with apparent absence of large residual necrotic foci, the persistence of pulmonary cavitation need not present an indication for surgical treatment provided adequate chemotherapy has been employed from the beginning of treatment, accompanied by careful bacteriological control.

How long should chemotherapy be maintained? This problem remains unsolved. The available evidence suggests that two years is the minimum effective period. Our experience of chemotherapy is of not less than three years' duration. In view of the advanced disease of the cases in this series it has been decided to administer drugs for a minimum period of five years. Since secondary infection occurring in only one patient is the only serious complication that has been encountered here, the reported hazards in persistent cavitation of rupture, suppuration, haemorrhage, and reactivation of tuberculosis must be accepted with some reserve. At the same time it must be stressed that the patients have been followed up for only a short period. There is plenty of time for the development of late complications.

Summary

The phenomenon of open healing of tuberculous pulmonary cavities is briefly described.

A study is presented of 40 patients with advanced pulmonary tuberculosis treated by means of prolonged chemotherapy who remained sputum-negative despite the persistence of cavitation. The patients were followed up for periods ranging from one and a half to five years.

Success of the treatment is attributed to the use of a triple-drug regimen of daily streptomycin, P.A.S., and isoniazid. In certain cases the persistence of pulmonary cavitation need not necessitate surgical treatment.

Secondary infection in a cavitated lobe in one patient was the only late complication observed.

We are grateful to Dr. K. V. Lodge, and to her staff in the department of pathology at Baguley Hospital, for carrying out the bacteriological investigations of the patients in this series.

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DISTURBED CHRONIC PSYCHOTIC PATIENTS: PILOT TRIAL OF "STELAZINE"

BY

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In the search for a more efficacious drug with which to treat long-stay psychotic patients in hospital, "stelazine" (SKK5019; trifluoroperazine) was given a trial. In the U.S.A. it had been described as having nine times the potency of chlorpromazine in blocking conditioned response. Its specificity was also stated to be greater than that of chlorpromazine. Jaundice had not been seen, but extrapyramidal signs and symptoms as in Parkinsonism had been described. Other side-effects noted included rashes, dizziness, drowsiness, lactation, lacrimation, and, on occasion, anxiety.

Method

Twenty-five female chronic psychotic patients who were extremely disturbed in behaviour unless treated with tranquillizing drugs or E.C.T. were chosen. All except three voluntary patients were detained under certificate. The duration of illness ranged from 5 to 31 years, and the average length of stay in hospital was 13 years. Twenty-three were chronic schizophrenics, of whom eight had been leucotomized, and two were oligophrenics with psychosis. In the past, 10 had had deep I.S.T. and 24 E.C.T. more recently.

All other treatment was suspended during the trial. The dosage of stelazine was built up gradually over a period of two weeks to 30 mg. daily, and in one case to 40 mg. and in another to 45 mg. daily. Treatment lasted four weeks, and the dosage was reduced gradually in discontinuing the drug.

Benzhexol hydrochloride, 6-8 mg. daily, was used to counteract side-effects.

Side-effects (see Table).—These were pronounced and consisted chiefly of the Parkinsonian syndrome. Only seven patients did not seem to suffer from this, but one of them complained of feeling unsteady. Benzhexol was effective in decreasing the salivation but had little effect on tremor. On one occasion a patient had a pyrexia of 101° F. (38.3° C.) which persisted at 99° F. (37.2° C.) for several days until the dose was reduced. Twelve patients needed to be nursed in bed and five required feeding and full nursing attention. These patients were a constant source of worry to the nursing staff in preventing them falling out of bed or otherwise hurting themselves by their restlessness. After discontinuance of the drug these effects were apparent for more than a week, although subsiding gradually.

	Side-effects	No. of Patients
Masklike facies	..	6
Tremor	..	12
Salivation	..	7
Rigidity	..	7
Flushing	..	3
Pallor	..	2
Restlessness	..	13
Nursed in bed	..	12
Needed feeding and full nursing attention	..	5

Loss of weight was noted in 18 cases. One patient had lost 14 lb. (6.4 kg.) (as she was obese, this was acceptable) and two patients lost 7 lb. (3.2 kg.). Seven patients had gained moderately.

The changes in behaviour were: very slightly improved, 6; no change, 10; worse, 6; and much worse, 3.

The improvement that occurred in six cases was marred by side-effects in all but two. The little progress made could have been obtained by other means without such untoward

effects. Two patients were reported as being more coherent in asking for their needs. On investigation it was found that they felt so ill that they clamoured for the doctor and, although previously mute, asked to have the bedclothes removed: it is doubtful whether this can be looked upon as real improvement.

The nine patients who were worse required so much attention that the routine of the ward was disorganized. One became so violent that she needed to be secluded. One of the oligophrenics began to bite and fight. She had a tendency to behaviour of this type but had been controlled on chlorpromazine. The other oligophrenic was extremely nervy and agitated. Two patients were too restless to work, another became depressed, and one was continually stripping herself and her bed. Others were restless and shouting, and one threw the chairs she dusted about and broke them.

Those who showed no marked change were worried in three cases by the side-effects.

Summary and Conclusions

A short pilot trial of the drug stelazine was undertaken with 25 chronic psychotic patients. Marked side-effects, chiefly of the Parkinson type, were apparent. To these benzhexol hydrochloride gave partial relief.

With the dosage used, the side-effects of stelazine were so marked and unpleasant that it is doubtful whether the drug would be acceptable for routine use. In some cases the adverse effect on behaviour has been such that its reliability is in question. Higher dosage is unlikely to be helpful in view of the side-effects already encountered. In view of the lag of time between stopping the drug and the subsidence of side-effects, it would appear that the drug is cumulative in the body. The amount of improvement in a few cases was not sufficient to encourage further use of the drug.

I thank Messrs. Smith Kline and French Ltd. for the supply of stelazine; Dr. I. Atkin, physician-superintendent of Park Prewett Hospital, for his encouragement and advice; and the nursing staff of C ward for unfailing help in this work.

PROGNOSIS OF CEREBRAL EMBOLISM IN RHEUMATIC HEART DISEASE

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Cerebral embolism is a well-recognized complication of rheumatic heart disease. Wood (1954) reported an incidence of 13% of systemic embolism in 300 cases of mitral stenosis, and the site of the embolism was cerebral in three-quarters of these. Of 150 patients undergoing mitral valvotomy (Sellors *et al.*, 1953), five suffered a cerebral embolism; two died within 12 hours, two remained permanently hemiplegic, and one recovered.

Brain (1955) considered that cerebral embolism, as such, was rarely a fatal condition unless the embolus lodged in the internal carotid artery. Harris and Levine (1941), however, reported that one-third of 72 patients with mitral stenosis complicated by cerebral embolism died within a few days or weeks of the latter. Daley *et al.* (1951) found that 49% of 130 patients with rheu-

matic heart disease suffered from cerebral embolism. They concluded that the mortality of this complication was high, and that the residual disability was often severe and crippling in those who survived.

Present Investigation

The present investigation is concerned with the prognosis of cerebral embolism in rheumatic heart disease, and is based on records of patients under the care of members of the consultant staff of Westminster Hospital.

Of a total of 172 patients with rheumatic heart disease, 34 (20%) have been accepted as having shown evidence of cerebral embolism or having a convincing history of this complication. One of these embolic cases has eluded follow-up, and the detailed analysis is of the remaining 33 patients, in whom 39 embolic episodes were recorded.

Of these 33 cases, 28 had dominant mitral stenosis, 1 dominant mitral incompetence, and 4 an admixture of stenosis and incompetence. Aortic valve disease occurred in 8 cases. At the time of the first embolus atrial fibrillation was present in 29 cases, the remaining 4 being in normal rhythm. There were 27 females and 6 males, with ages ranging from 18 to 66 years, average 42.3 years. No attempt has been made to assess the relationship between mitral valvotomy and cerebral embolism. For completeness, however, it is recorded that only three embolic episodes occurred after valvotomy—two immediately and one six hours later. These survived and were followed up for seven months, nine months, and four and a quarter years. Eleven cases coming to valvotomy had had previous cerebral emboli, but none of these had subsequent embolic episodes.

The details of the analysis are as follows:

Main disabilities resulting from 39 embolic episodes: hemiparesis: mild 8 (4 right, 4 left), moderate 16 (11 right, 5 left), severe 10 (3 right, 7 left); aphasia accompanied right hemiparesis in 14, and left hemiparesis in 3. Atypical episodes: (1) dysarthria with euphoria, (2) brief unconscious attack followed by numbness of left arm, (3) transient dysphasia, (4) nominal aphasia, (5) faintness. In addition, hemi-anaesthesia was noted in two cases and hemianopsia in one.

The probable site of embolism in 34 episodes was left hemisphere in 18 and right hemisphere in 16.

The degree of recovery in 39 episodes was: full or almost full in 26, moderate in 6, and slight or nil in 2; and 5 patients died within one month (1 was a case of malignant melanoma).

The time interval to the commencement of recovery in 22 episodes ranged from 0 to 21 days, average 5.5 days. Six further cases were noted to begin recovery within "a few" days or weeks.

The time interval to maximum recovery in 23 episodes was: up to 1 week in 8, 1-6 weeks in 6, 6-12 weeks in 2, 3-6 months in 2, 6 months to 1 year in 4, and 1-2 years in 1; the average was 130 days.

The duration of the follow-up from the first embolic episode is shown in the Table.

Duration of Follow-up in 33 Cases from First Embolic Episode

Time:	Up to 2 w.	2 w. to 3 m.	3 m. to 1 yr.	1-2 Yr.	2-3 Yr.	3-4 Yr.	4-5 Yr.	5-6 Yr.	6-7 Yr.	7-8 Yr.	8-9 Yr.	9-10 Yr.	10-11 Yr.	11-12 Yr.	17 Yr.
Total No. ...	4	1	6	4	3	4	3	1	2	1	0	2	0	1	1
No. followed to death	4	1	1	1	1	1	0	0	0	0	0	0	0	0	0

Average duration of follow-up, 3.8 years.

Discussion

In this series of 172 cases of rheumatic heart disease cerebral embolism complications occurred in 34, the right and left cerebral hemispheres being involved with almost equal frequency. Hemiparesis was the major resultant disability, being severe in 10 episodes, moderate in 16, and mild in 6. Aphasia accompanied right hemiparesis in 14 episodes and left hemiparesis in 3.

Recovery was full, or almost so, in 26 of 39 episodes (67%), moderate in 6, and slight or nil in 2 patients followed up for 10 and 12 years respectively. Four patients died within two weeks of a single embolism. One patient who had made a complete recovery from two previous embolic episodes occurring within a short time died nearly two years later, within a month of her third embolism, and had also malignant melanomatosis. Four other cases followed to their death survived nearly four years, two and a half years, eight months, and three months respectively after their embolus. Clinical recovery commonly began immediately after the embolism, or could be delayed for as long as three weeks. On the average improvement began by the end of the first week.

Maximum recovery was achieved by some patients within hours or days, but progressive improvement was observed to occur in individual cases for a year or more. In the average case maximum recovery was reached after a period of four months. Although no cases of associated epilepsy such as those described by Baker and Finnegan (1957) occurred in this series, they might occur if observation were continued over a longer period.

Summary

Cerebral embolism occurred in 34 out of 172 patients (20%) with rheumatic heart disease.

Thirty-three cases are analysed, with the following results: (1) less than one-fifth died within three months; (2) two-thirds of the patients made a virtually full clinical recovery; (3) the average time to the beginning of recovery was one week, and to maximum recovery four months.

The hopeful outlook for patients with this complication of rheumatic heart disease as regards neurological recovery is stressed.

We thank Sir Clement Price Thomas and Dr. C. J. Gavey for their encouragement and criticism of this investigation, and the members of the staff of Westminster Hospital whose cases we have studied.

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Medical Memorandum

Acute Haemolysis Following P.A.S.

A woman aged 24 was admitted to the National Iranian Oil Company Hospital, Abadan, on October 6, 1957. For the previous five months she had been an in-patient in an isolation hospital on account of sputum-positive bilateral pulmonary tuberculosis. There was infiltration in the right upper zone and the left upper and middle zones. On the left side there was also marked fibrosis, and several large cavities could be seen. During the five months of treatment the sputum had remained positive, acid-fast bacilli being found on August 11 and October 3. The haemoglobin on August 11 was 14.6 g./100 ml. (95%).

Treatment had consisted of streptomycin and isoniazid only, but on the morning of October 4 she had been given 6 g. of P.A.S. in solution by mouth. An hour or two later she felt weak, experienced epigastric pain, and vomited. She had a sense of suffocation and was restless. No further P.A.S. was given. Her condition remained about the same for the next 24 hours, and on the morning of October 6 she again vomited and noticed that her urine was reddish in colour.

On admission to the general hospital she was restless, was sweating profusely, and was so weak that she was unable to sit up in bed. Her temperature was 99.6° F. (37.5° C.), pulse 100 a minute and weak, and B.P. 70/0. She was extremely pale and there was marked icterus of the skin and conjunctivae. The liver and spleen were not palpable, but the uterus was enlarged to the size of a 20-weeks pregnancy. The urine was reddish in colour and contained a large amount of albumin, many casts, and a few pus cells and red cells. The test for occult blood was strongly positive, but no bile could be detected. The haemoglobin was 3.7 g./100 ml. (24%), colour index 0.8, and W.B.C. 22,000/c.mm.; the bleeding, clotting, and prothrombin times were normal. There were 6 normoblasts per 100 leucocytes and the blood group was O.

She was immediately transfused with 2 pints (1,140 ml.) of group O blood. The next day the urine contained a large quantity of albumin, red cells, and pus cells, and on October 8 the haemoglobin was 5.3 g./100 ml. (34%), while the urine was free of albumin. The jaundice faded rapidly, and on October 10, four days after admission, the serum bilirubin was 0.3 mg./100 ml. On October 12 the haemoglobin was 6.3 g./100 ml. (40%) and reticulocytes 4%.

"Imferon," 100 mg. by intramuscular injection daily, was started on October 14, and during the next five weeks the haemoglobin rose to 11 g./100 ml. (70%), her general condition improved greatly, she gained 6 lb. (2.7 kg.) in weight, and she felt foetal movements for the first time. From admission until this time no chemotherapy had been given at all.

In view of the fact that the sputum had remained positive for acid-fast bacilli during the whole of the treatment with streptomycin and isoniazid, it was thought desirable to give her P.A.S., and it was decided to attempt to desensitize her. This was started on November 16 with 1/100 g. by mouth. Thereafter the daily single dose was doubled and the haemoglobin estimation carried out each day. After eight days the dose was 1 g., and during the following six days this was raised to 3 g. six-hourly, during which time the haemoglobin rose to 12 g./100 ml. (76%). At the beginning of the course of P.A.S. the sputum was still positive for acid-fast bacilli.

COMMENT

It would appear that an acute haemolysis began an hour or two after a single dose of 6 g. of P.A.S. given orally for the first time. This was so severe that it reduced the haemoglobin to 3.7 g./100 ml. (24%) during the next 48 hours. The fact that the serum bilirubin was normal four days later suggests that the haemolysis stopped as abruptly as it had begun. Immediate treatment with 2 pints (1,140 ml.) of blood followed by imferon, 100 mg. daily, raised the haemoglobin to 12 g./100 ml. (76%) over the next six weeks, during which time there was no evidence of further haemolysis. By starting with a very small dose of P.A.S. it was possible to raise this to 12 g. a day without any ill effects.

It remains to be seen whether P.A.S. will be any more effective than streptomycin and isoniazid in rendering the sputum negative for acid-fast bacilli. It is interesting that the foetus survived the period of extremely low haemoglobin level.

I thank Dr. M. Rouhani, principal medical officer, N.I.O.C., Abadan, for permission to publish this report.

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At the leprosy research centre attached to the Vellore Christian Medical College and Hospital in South India, a team of workers is engaged in the rehabilitation of those cured of leprosy. Their most striking success has been in the reconstructive surgery of claw hands. Mr. PAUL BRAND, F.R.C.S., director of orthopaedics to the Mission to Lepers, described this work at a recent meeting in London of the Friends of Vellore.

Reviews

SIR CHARLES BELL

Sir Charles Bell: His Life and Times. By Sir Gordon Gordon-Taylor, K.B.E., C.B., F.R.C.S., and E. W. Walls, M.D., Ch.B., B.Sc., F.R.S.(Ed.) (Pp. 288+xi; illustrated. 42s.) Edinburgh and London: E. and S. Livingstone Ltd. 1958.

Jeffery, in writing to Horner in 1804, commented: "All the world migrates towards London." He was referring to Charles Bell, who was then moving from Edinburgh to London, where, after much hard work and worry, he won great fame but only a moderate fortune. It is altogether fitting that the life of Charles Bell should be written by an equally famous migrant from the North—Sir Gordon Gordon-Taylor—who himself came to London almost exactly a century later and became, and still is, the beloved surgical doyen of the metropolis. Sir Gordon has been fortunate in obtaining the collaboration of his colleague—Professor E. W. Walls—to assist in the task, which must indeed have been a labour of love. They have written a delightful story of Bell's hard struggle in London, his final success, and his late return to his native Edinburgh. In addition they have painted a wonderful picture of the contemporary life in the London of that period. We get interesting glimpses of the origins of London University and of Middlesex Hospital Medical School; we are told the story of the Great Windmill Street School of Anatomy; and we are taken to the field of Waterloo, whither Bell went to assist in the treatment of the wounded after the battle. There is also a long and equitable discussion of the controversy between Bell and Magendie as to the relative parts they took in the discovery of the functions of the nerve roots. Then comes an appendix of 100 pages in which 21 different subjects are considered. This section is full of fascination from both the historical and the clinical points of view.

Every surgeon will find this book interesting, and all faithful alumni of Middlesex Hospital Medical School will surely hasten to possess a copy of this beautifully produced and well-illustrated record of one of its most famous teachers.

ZACHARY COPE.

CEREBRAL PALSY

Cerebral Palsy in Childhood (the Aetiology and Clinical Assessment with Particular Reference to the Findings in Bristol). By Grace E. Woods, M.D., D.P.H., D.C.H. Foreword by Peter Henderson, M.D., D.P.H. (Pp. 154+xi; illustrated. 27s. 6d.) Bristol: John Wright and Sons Ltd. 1957.

The increased interest in cerebral palsy is indicated by several new publications, now joined by the elaboration of an M.D. thesis by Dr. Grace E. Woods entitled *Cerebral Palsy in Childhood*. It is based largely upon a survey in Bristol of 301 children, conducted through the medium of a special assessment clinic set up to deal primarily with the educational placement of children of school age or approaching it. After a chapter on the history of the group of clinical syndromes now called cerebral palsy, and an account of the clinical examination, the book goes on to discuss incidence in general and, in more detail, seven selected types. The relation of abnormalities at birth is summed up in a short chapter, and shows that, broadly speaking, less than 50% of the affected children were born after a normal than 50% of the affected children were born after a normal full-time birth following sensory defects and epileptiform disturbances, and a valuable concluding chapter on the assessment of educability. The nature of the survey mainly excluded the pre-school child, so that the important aspect of early diagnosis and "treatment" does not receive attention. This book is packed with facts and will no doubt be freely used by workers in other centres. Dr. Peter Henderson, of the Ministry of Education, contributes a foreword.

ALAN MONCRIEFF.

ADVANCES IN GASTRO-ENTEROLOGY

Modern Trends in Gastro-enterology. Second series. Edited by F. Avery Jones, M.D., F.R.C.P. (Pp. 416+xx; illustrated. 78s. 6d.) London: Butterworth and Co. (Publishers), Ltd. 1958.

The second volume of this series, the first of which appeared in 1952, has been written by a group of contributors chosen with discrimination by the editor, Dr. F. Avery Jones. He has combed not only Britain but Australia, South Africa, America, and Scandinavia for talent. As Professor Illingworth points out in a foreword, the contributors comprise physicians, surgeons, anatomists, radiologists, pathologists, and biochemists, all making their contribution to a common pool of knowledge. Though we may sometimes deplore the fragmentation of medicine into various rather watertight compartments, we should note, on the other hand, that the old rigid divisions between what is purely medical and what surgical are vanishing; and the close co-operation of a variety of specialists in pulmonary disease, neurology, cardiology, endocrinology, and gastro-enterology has come to stay. It may well be that the separation of patients into medical and surgical wards is becoming an anachronism.

This volume does not attempt to be a comprehensive treatise on gastro-enterology, but rather concentrates on those aspects of the subject in which advance is taking place. It is apparent that remarkable progress is being made in a variety of directions: improved methods of determining gastric secretion; new devices for recording pressure changes in and the motility of the alimentary tract; the gluten-free diet in the treatment of coeliac disease; the clinical and biochemical aspects of carcinoid tumours; the importance of the blind-loop syndrome in the production of steatorrhoea and anaemia; the metabolic effects of massive resection of the small intestine; the factors concerned in hepatic coma; the modern methods of investigating the biliary tract and pancreatic function. These and many other advances are clearly described and critically reviewed. The volume is beautifully printed on fine paper and admirably illustrated. This is a very good book indeed, and, as gastro-enterology remains—perhaps more than other specialties—a part of general medicine and surgery, it is bound to have a wide appeal.

D. M. DUNLOP.

SOFT TISSUES

Textbook of Orthopaedic Medicine. Volume I—Diagnosis of Soft Tissue Lesions. By James Cyriax, M.D., M.R.C.P. (Pp. 711+xiv; illustrated. 45s.) Third edition. London: Cassell and Co. Ltd. 1957.

At some time during life most of us suffer from one or more episodes of pain and stiffness in the limbs and trunk. Fortunately most of these episodes are of short duration and little significance, and only a minority represent the onset of serious and crippling disease. Dr. Cyriax has developed a useful system of accurate anatomical diagnosis of the source of pain, based upon clinical examination of the moving parts. He then proceeds to deduce pathological changes from clinical observations, and bases prognosis and treatment upon these deductions. At this stage much of the material in this book becomes highly speculative, since the author often ignores the pathological changes that have actually been observed in morbid anatomical studies; because of this he probably introduces more fallacies than he claims to dispel. Much of the treatment proposed seems of unproven value, since most of the complaints he is dealing with are naturally of short duration, and some measures he advocates, such as manipulation of the cervical spine for pain and stiffness, seem unnecessarily dangerous. In this the author shows a disregard for the dangers of spinal-cord lesions which have been so clearly demonstrated in recent neurological work and morbid anatomical studies of the cervical spine. The best that can be said of the book is that, like the curate's egg, it may be good in parts; but the danger is that the reader without special knowledge will be unable to tell which these are.

J. H. KELLGREN.

ORTHOPAEDIC SURGERY OF CHILDREN

Orthopaedic Surgery in Infancy and Childhood. By Albert Barnett Ferguson, jun., B.A., M.D. (Pp. 508+xii; illustrated. £6.) Baltimore: Williams and Wilkins. London: Baillière, Tindall and Cox Ltd. 1957.

The editor and five contributors have included in one volume most of the subject-matter of orthopaedic surgery required in childhood. The acute phase of fractures is omitted, but a number of complications are mentioned. Reference is made to the observations and writings of British surgeons. There is a regional arrangement of the greater part of the text, but some studies, such as plastic surgery of the hand, are not in sequence. Affections of special tissues, such as bone and muscle, are collected in separate chapters. There is an up-to-date and clear description of the clinical and therapeutic features of most congenital and acquired conditions of childhood. Information on tuberculosis of the knee, hip, and spine will be found. The conception of metabolic disease is overshadowed by regional conditions, so that there is little evidence of the importance of studying a child's general health when spine, knees, or feet are brought to the doctor's notice by the parent. However, the description of each condition is exactly what the general practitioner or aspiring graduate requires, and it is noticeable that the more recently recognized lesions appear to be regarded as of somewhat greater importance than well-established syndromes, such as birth palsy.

The chapter on affections of bone, which is lavishly illustrated, will attract the reader's attention in that the defective formation of bone from cartilage is a feature; and Robert Klein writes well on rickets and scurvy. Recommendations for treatment of congenital dislocation of the hip are made according to the child's age. The article on scoliosis is of some length and amply illustrated. The surgery of cerebral palsy, poliomyelitis, and progressive muscular atrophy is described. Readers may consider that the reproductions of a number of radiographs are insufficiently clear to exemplify the author's text. The book has a place in any surgical library, but it should be appreciated that it is not a complete textbook of orthopaedic surgery of children.

ST. J. D. BUXTON.

CARE OF CHRONICS IN U.S.A.

Chronic Illness in the United States. Volume II: Care of the Long-term Patient. By the Commission on Chronic Illness. (Pp. 606+xv. 68s.) Cambridge, Mass.: For Commonwealth Fund by Harvard University Press. London: Oxford University Press. 1956.

American hospitals and institutions for the care of the "chronic sick" were improvised to meet the needs of widely separated communities with differing conceptions of social responsibility. It is not surprising, therefore, that this encyclopaedic survey by the Commission on Chronic Illness paints a picture of chaotic confusion and disparity of standards like that of the Nuffield Hospital Surveys in this country a few years ago. By 1954 most of the American hospitals for chronic sickness, mental disease, and tuberculosis were already the responsibility of the State, but the patients in acute general and special hospitals controlled by "non-government" authorities outnumbered those in similar government institutions more than three times. The American Commission recognizes that care of the chronically ill is inseparable from general medical care in acute hospitals, and recommends that much more should be done for the patient in his own home than has been attempted hitherto; it suggests that "the most desirable approach to providing hospital care to long-term patients is through . . . co-ordination of the services of general hospitals both private and public" and reform of out-patient practice. But the co-ordination of hospitals under different authorities has always been difficult—at all events in England—and it will not be achieved in America merely by saying that it ought to be. This report lacks precision; nowhere is there any

exact analysis of hospital patients in a single region in terms of their medical, nursing, and social needs such as that which enabled Professor T. McKeown recently to formulate a plan for an integrated hospital community which might be applied on an experimental basis without great difficulty. On finance the conclusion is that "there is no alternative to the basic proposition that society as a whole through taxation must meet the deficit" until the time when plans and programmes of insurance are adequate. An unexpected tribute to the Welfare State.

A. P. THOMSON.

REACTION TO STRESS

Mastery of Stress. By Daniel H. Funkenstein, M.D., Stanley H. King, Ph.D., and Margaret E. Drolette, M.P.H. (Pp. 329+xv. 48s.) Cambridge: Harvard University Press. London: Oxford University Press. 1957.

In this book are described the results of experiments conducted on a group of Harvard students who were all subjected to artificial stress-inducing situations. A large battery of physiological and psychological tests were given so as to examine the acute immediate emergency responses produced, and to test the ability of each person to master, or his liability to succumb to, the stresses imposed over a longer period of time. The book will be useful for those interested in stress research because of the detailed description of the methodology used. It is harder going for the ordinary reader unacquainted with, and perhaps uninterested in, the numerous physiological and psychological tests that were employed.

Interesting conclusions were arrived at. The authors found that the initial types of reactions to stress were generally constitutionally predetermined. However, whether the subject was able to master stresses or succumbed to them often appeared less related to constitution and more to early upbringing and previous life experience and training. But I believe that if something like somatotyping had also been attempted it would have been shown that the power to persist with and to master difficulties also has a strong constitutional component. The absence of any detailed study of bodybuild and somatypes seems a possible weakness in this particular investigation.

WILLIAM SARGANT.

CLINICAL CHEMISTRY

Chemical Methods in Clinical Medicine: Their Application and Interpretation with Techniques of Simple Tests. By G. A. Harrison, B.A., M.D., B.Ch.(Cantab.), M.R.C.S., L.R.C.P., F.R.I.C. Fourth edition. (Pp. 667+xi; illustrated. 65s.) London: J. and A. Churchill Ltd. 1957.

The fourth edition of Harrison, 27 years after the first, illustrates the advantages and difficulties of the one-man book in modern medicine. It attempts to survey apparatus, techniques, and interpretations throughout the field of chemical pathology, and, although much is gained from the unified approach of a single author, and from the stimulating outlook of this particular author, one senses that the task is becoming so burdensome that no one person can keep a book up to date in the whole of these subjects. For instance, 10 pages are spent on faecal fat without a mention of the daily output; the section on gastric analysis includes outdated procedures such as the Ewald and Boas meals; and the chapter on indicanuria might well be omitted. The section on acidosis repeatedly emphasizes that it is not equivalent to diabetic ketosis—a notion which is not likely to need stressing nowadays. The author omits determination of steroids because he regards it as useless. However, new sections on flame photometry, paper chromatography, paper electrophoresis, and photoelectric colorimetry are clear and concise, and these, combined with the fundamental reliability of most of the book, make it a worth-while addition to the library of clinical chemical laboratories.

R. R. MCSWINEY.

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COMFORT IN THE SURGICAL WARD

Although E. Ries¹ advocated early ambulation after operation in 1899, it did not become established practice in Britain until many years had passed. Eventually, advances in anaesthesia and surgical management contributed so much to the well-being of patients that many are now fit enough to get out of bed within 48 hours of operation. The increased mobility of the patient and the quick and uncomplicated recovery after operation have made fresh problems—for the hospital staff an increased turnover of patients, for the patient the difficulty of finding somewhere to sit comfortably in the ward. Approximately three-quarters of the patients in a surgical ward are ambulant, and yet very few hospitals have a recreation- or day-room attached to the surgical wards. The result is that patients are left all too often to stagnate by the ward fireplace or on a chair by their bedside. Controlled series^{2,3} have shown the advantages of early ambulation without increasing the risk of wound dehiscence or incisional hernia. Pulmonary complications and atelectasis in particular are much less common. Normally the vital capacity on the first day after operation is reduced to 70-80% with an upper abdominal incision and by 30-40% with a lower abdominal incision.⁴ Afterwards recovery is progressive, so that full function is present about ten days later. D. J. Leithauser⁵ showed that with early ambulation not only was the initial reduction less but the rate of recovery was greater, so that in some patients vital capacity returned to normal within seven days: this, he suggested, might be due to the effect of gravity on the abdominal viscera, allowing an increased excursion of the diaphragm.

Lying in bed after operation also carries the risk of deep vein thrombosis, with the possible dislodgement of emboli. Early ambulation should in theory reduce these dangers, but the incidence of pulmonary embol-

ism is if anything increasing,⁶ and J. B. Blodgett and E. J. Beattie² found deep vein thrombosis more common in the ambulant group of their controlled series. Deep vein thrombosis is due to a combination of factors of which the most important are local anoxia of the vessel wall, venous stagnation, and changes in the constituents of the blood. The injurious effect of the first two of these factors is at its maximum during the operation, and on the return to the ward before recovery of consciousness, so that by the time the patient becomes ambulant thrombosis may quite probably have already begun. The increased movement later can prevent further venous stagnation and extension of the clot, especially since the plasma fibrinogen rises in the first few days and the increase in the number of platelets does not reach a maximum until about the sixth day. The time of the greatest risk of pulmonary embolism is the eighth to twelfth day, when the clot has extended to the larger veins and the flow of blood is sufficient to separate it from the vein wall or the entrance to a tributary. One result of the rapid recovery of surgical patients is that this period of risk now comes after discharge from hospital, when the patient may be under the care of the general practitioner.

The principal beneficial effect of early ambulation is psychological. Once any initial apprehension has been overcome and the patient is up and about he no longer feels an invalid, and the ordeal of the operation is a thing of the past. As the more serious causes of discomfort after operation disappear, the seemingly trivial causes assume a major importance to the patient. One of these is the assumption of a comfortable posture. An ideal posture must not only reduce pain to a minimum but also it must not increase the risk of any complication. In a letter to this *Journal* H. L. Marriott⁷ has recently suggested from personal experience that for parts of the first few days after operation the patient might be much more comfortable sitting in a chair and leaning well forward on to a pillow on a low table. There is much physiological evidence to support this. Electromyographic studies⁸ have shown that the abdominal muscles play no part in normal quiet breathing, but their contraction is a limiting factor in forced inspiration. Elsewhere in this *Journal* Mr. A. R. Anscombe and Dr. R. St. J. Buxton suggest that this effect may be responsible for most of the reduction in the total capacity of the lungs that occurs after operation. If this hypothesis is correct, the posture suggested by Marriott, by relaxing the anterior abdominal wall, will facilitate breathing. In addition, the vertical distance needed to expel viscid pellets of sputum is decreased, coughing is made easier, and the risk of pulmonary complications is reduced. One possible disadvantage

¹ Ries, E., *J. Amer. med. Ass.*, 1899, 33, 454.
² Blodgett, J. B., and Beattie, E. J., *Surg. Gynec. Obstet.*, 1946, 82, 485.
³ Blodgett, J. B., and Beattie, E. J., *ibid.*, 1947, 85, 294.
⁴ Cornell, N. W., and Lin, D. T. W., *ibid.*, 1947, 85, 294.
⁵ Anscombe, A. R., *Pulmonary Complication of Abdominal Surgery*, 1957, London.
⁶ Leithauser, D. J., *Arch. Surg. (Chicago)*, 1943, 47, 203.
⁷ McCarthy, H. H., *Organ, C. H., and Giles, W., ibid.*, 1957, 75, 493.
⁸ Marriott, H. L., *Brit. med. J.*, 1958, 1, 215.
⁹ Campbell, E. J. M., *J. Physiol.*, 1952, 117, 222.

of this position may be that the flexion of hips and knees may obstruct the return of blood from the legs and increase the risk of thrombosis. Even so, there is much evidence in its favour, and looking round a surgical ward one can see patients trying to adopt it with inadequate facilities.

RADIATION AND CHILDHOOD MALIGNANCIES

Two years ago Dr. Alice Stewart and her colleagues made a comparison between the mothers of children who had died of malignant disease and the mothers of children who had not, and they found that a greater proportion of mothers in the first group had been x-rayed during their pregnancy.¹ At that time the investigation was still incomplete, but the authors put forward evidence to show that the association held only for x rays of the mother's abdomen and that there was no association with irradiation before or after the relevant pregnancy. It seemed likely, therefore, that the association was real. Quantitatively the results suggested that about 8% of all deaths due to leukaemia or other forms of malignant disease in children under 10 years of age might be attributed to x-ray examination of the mother's abdomen during pregnancy and that about 1 in every 1,000 of such examinations might be responsible for the death of a child from malignant disease. Other investigations reported at about the same time showed a high incidence of cancer of the thyroid and of leukaemia among children who had received moderate doses of irradiation in infancy for enlargement of the thymus,^{2,3} and that the incidence of leukaemia among patients who had been irradiated for ankylosing spondylitis might be directly proportional to the dose.⁴ If, therefore, the tissues of the foetus were regarded as particularly radio-sensitive, it was not unreasonable to believe that even the very small doses given in the course of a pelvimetric examination (of the order of 1 to 5 rads) might be carcinogenic.

This conclusion was not an easy one to accept. Experimental evidence of a carcinogenic effect had never been obtained at such low doses, and many cases of radiation-induced cancer in man appeared to develop against a background of widespread tissue damage. The possibility had therefore to be considered that the method of investigation might have biased the results of Dr. Stewart and her colleagues or that some other factor had been overlooked which both caused malignant disease in the child and

increased the risk of irradiation for the mother. The full results of the Oxford inquiry—published in this *Journal* last month⁵—have therefore been awaited with special interest. Altogether, information was collected from the mothers of 1,299 children who died from malignant disease before reaching 10 years of age during the period 1953-5. Information obtained from the same number of mothers of living children was used for purposes of comparison. The results accord well with those already published. The frequency with which the mother's abdomen was x-rayed during the relevant pregnancy was 1.9 times as great for the children who died of malignant disease as for the living children. The figures lead to almost identical estimates of the risk—that is, about 8 in every 10,000 prenatal abdominal x-ray examinations lead to death of the infant from malignant disease before the age of 10 years, and about 6.5% of all deaths from malignant disease in this age group may be attributed to prenatal irradiation. The specificity of the association is, however, less close than appeared from the preliminary data, for the mothers of the dead children also reported an excess of abdominal x-ray examinations before marriage (1.69:1) and a slight excess (1.16:1) of other types of x-ray examination. It is possible that the first of these two results indicates an effect of irradiation on the mother's gonads, but the numbers of women involved were very small (44 to 26), and it is not unreasonable to regard the difference as a chance finding. The excess of other types of irradiation occurred more or less equally at all periods of the mother's life, and it thus seems to point to relative under-reporting on the part of the control mothers. If this were so, the control mothers might also have under-reported previous abdominal x-ray examination, and the estimates given for the risks of abdominal x rays would have been exaggerated by about 20%. But confidence in the interpretation which has been given to the results is strengthened by the finding that the excess exposure to x rays among the mothers of the dead children was greater when it was known that four or more films had been taken than when fewer films had been used, and it was greater when the mothers had been x-rayed during the first five months of their pregnancy than when the examination had been made later. Here again the numbers were small in both groups, and there was no regular relationship between the risk and either the number of films or the period of gestation.

A particularly interesting aspect of the investigation is that the excess of irradiation appeared among the mothers of 6 out of the 8 groups of malignant disease studied—the greatest proportion of irradiated mothers being recorded for the children who had

died of malignant tumours of the suprarenals and of a heterogeneous group of other tumours, including retinoblastomas and teratomas. The differences recorded between the different types of tumour were, however, not very great, and they could reasonably be attributed to chance. The simplest conclusion seems therefore to be that, if x-ray examination of the mother's abdomen does in fact carry a risk of inducing malignancy, the risk applies more or less equally to all those tissues which can be subject to malignant change in childhood—and certainly not only to the bone marrow or reticulo-endothelial system.

Dr. Stewart and her colleagues also studied many other aspects of the mother's and the child's environment and the details of their heredity. In the main the facts elicited were closely similar in both the malignant and the control series, and the few points of difference that did emerge did not seem to be of much significance.

In an investigation of this type it is never easy to be certain of the meaning of the results. Dr. Stewart and her colleagues have quite rightly asked themselves whether their results can have been due to an unequal recording of the data in the study and the control series, to an unequal reporting of events by the mothers concerned, or to an unrepresentative selection of patients for examination, and against all these possibilities they provide good arguments. It is, however, difficult to exclude the possibility that the mothers of the dead children, by virtue of their bereavement, may have searched their memories more effectively than have the mothers of the living children and so reported some events more accurately. There is some evidence that this may be true—for example, a small excess was found in the study series for a number of factors which it is difficult to envisage as causes of malignant disease. Such an excess was, however, not constant for all factors, and it would be necessary to postulate that the more efficient (or more exaggerated) recall of past events applied only to certain items; it would, in particular, be necessary to postulate that the effect was greater for abdominal irradiation during pregnancy than for any other of the items studied. Unlikely though this may seem, some scientists would regard it as not more unlikely than that such small doses of radiation should be capable of causing so many different types of cancer. It is therefore important to test the hypothesis by obtaining data directly from medical sources and so excluding any bias which might be introduced through the almost inescapable tricks of memory. That this has already been done by Dr. J. C. S. Paterson in the U.S.A. must carry great weight in favour of the conclusions originally reached by Dr. Stewart

and her colleagues. As yet Dr. Paterson has reported only in a personal communication to Dr. Stewart, and the publication of his full data will be awaited with great interest.

The importance of this work is perhaps less related to the immediate prevention of disease than to the central problem of carcinogenesis. The mortality which may be attributed to the effects of antenatal irradiation forms only a small proportion of the recent increase in the incidence of deaths from malignant disease in childhood. The smallness of the risk must mean that the dangers of not making a radiological examination will often outweigh the attendant risk of malignancy. In practice, therefore, the total number of pelvimetric examinations may not be greatly reduced, though greater care will certainly be taken to ensure that the dose of radiation given is kept to the minimum. If, however, it is accepted that doses which may amount to only a fraction of a rad are carcinogenic, it is difficult to conceive of any mechanism which could produce the result other than that of a change in the genetic structure of the cell, comparable to a genetic mutation.

THE CIRCULATION IN CIRRHOSIS

Some patients with portal cirrhosis have the clinical signs of a hyperdynamic circulation: warm skin, a bounding pulse with an increase in pulse pressure, a forceful cardiac impulse, and often a systolic ejection murmur. Recent studies^{1,2} have shown that the cardiac output is increased and that peripheral vascular resistance falls, the latter implying peripheral vasodilatation. In general the changes occur in patients who have extensive portacaval anastomoses, but they do not bear any constant relation to the presence of spider naevi or palmar erythema. It is significant that in extrahepatic portal hypertension, where shunts are equally prominent but the liver is normal, the cardiac output is normal. This implies that some degree of liver damage plays a part in the circulatory changes, a view that is supported by the presence of a similar hyperdynamic state in a proportion of patients with severe hepatitis. Levels of serum albumin tend to be lower in the hyperdynamic group, but this may be merely the result of haemodilution, since the plasma volume is known to be increased. The latter finding also cannot be explained solely by the presence of portacaval anastomoses as was originally suggested,³ since the blood volume is

¹ Kowalski, H. J., and Abelman, W. H., *J. clin. Invest.*, 1953, **32**, 1025.

² Murray, J. F., Dawson, A. M., and Sherlock, S., *Amer. J. Med.*, 1958, **24**, 358.

³ Perera, G. A., *Ann. intern. Med.*, 1946, **24**, 643.

⁴ Shorr, E., Zweifach, B. W., Furchgott, R. F., and Baez, S., *Circulation*, 1951, **3**, 42.

⁵ Snell, A. M., *Ann. intern. Med.*, 1935, **9**, 690.

⁶ Rydell, R., and Hoffbauer, F. W., *Amer. J. Med.*, 1956, **21**, 450.

⁷ Calabresi, P., and Abelman, W. H., *J. clin. Invest.*, 1957, **36**, 1257.

normal in patients with extrahepatic obstruction. Comparable circulatory changes are seen in association with anaemia and vitamin-B₁₂ deficiency, both of which may occur in portal cirrhosis, but neither of these factors provides an adequate explanation, and it is tempting to postulate a general vasodilator substance of the type described by E. Shorr and his colleagues.⁴

There is, however, an interesting alternative which might possibly account for the circulatory changes. Some years ago⁵ it was observed that the arterial blood was not fully saturated with oxygen in patients with portal cirrhosis. This suggests that venous blood is being shunted into the arterial system, and indeed a few cases of juvenile cirrhosis have been recorded in which cyanosis and clubbing were so marked as to suggest a diagnosis of congenital heart disease. Extensive pulmonary arteriovenous anastomoses have been detected in a recent case.⁶ Though admittedly rare, this finding may be of some significance in view of a comparable phenomenon in some adults with severe portal hypertension.

Post-mortem injection studies⁷ have shown that communications exist between the portal and pulmonary venous systems via the azygos and bronchial veins. Normally the pressures in both systems are similar, but with portal hypertension it would be theoretically possible for blood to flow from the portal vein into the pulmonary veins, thus causing a slight reduction in arterial oxygen saturation. Similarly reduction in the reverse direction might explain the occasional finding of oesophageal varices in patients with heart failure. Prominence of the azygos vein has been reported as a radiological sign both in heart failure and in portal hypertension. Whether such arteriovenous communications bear any relation to the circulatory changes in cirrhosis remains to be seen. That there may be a link between the pulmonary and portal circulations will come as no surprise to those who have noticed certain similarities in some of the clinical features of cardio-pulmonary and hepatic disease.

FARMER'S LUNG

Pneumoconiosis following exposure to mineral dusts has long been recognized as a serious occupational hazard, but, except in the cotton industry, the importance of vegetable dusts has been less fully appreciated. Farmer's lung is an acute respiratory illness which may follow exposure to a wide variety of vegetable dusts, particularly those encountered when handling mouldy hay, grain, or silage. Most of the British cases have been reported from western country districts,¹⁻⁷ where a wet summer may result in crops of poor quality being stored, often in ill-ventilated, closed barns. When the hay is forked out

to feed cattle, the barn swept out, or the grain threshed, clouds of white, irritant dust, laden with fungus spores, fill the barn, and if inhaled by a previously sensitized farm worker may cause an alarming lung reaction.

After a few minor episodes of breathlessness the established picture is one of severe dyspnoea immediately after exposure, increasing over the next few days and frequently resulting in complete incapacity. There may be rigors at the onset; fever, sweating, a dry, irritant cough, and loss of weight complete the picture. On examination the main findings are cyanosis, with moist sounds throughout the lung fields. Pleurisy is rare, there is no bronchospasm, and haemoptysis does not occur.⁸ Over a period of three to six weeks gradual spontaneous improvement occurs, but breathlessness on exertion may persist for months, and, in a few cases, permanent disability may result. Despite recovery, re-exposure may lead to recurrence, and after repeated episodes there may be progressive limitation of exertion, pulmonary fibrosis, and eventually right-sided heart failure.⁸ The economic significance of the disease is stressed by R. C. Frank,⁸ and seven of his 27 cases had to give up farming entirely because of their illness.

Laboratory findings help little in establishing a diagnosis. Occasional polycythaemia, leucocytosis, and elevation of the erythrocyte sedimentation rate have been reported. Sputum culture may yield a growth of fungi comparable with the flora of the barn dust, and monilia may also be found.⁹ Skin tests for fungi, monilia, and histoplasma have no proved diagnostic value.¹⁰ Radiological changes at the onset may be minimal, but in the established case there is a ground-glass opacity extending to the periphery of the lung fields, fading to a granular mottling in the areas of least involvement. The granularity has been described as a "sandstorm," the densities being a millimetre or less in diameter. E. Tornell⁹ and Frank⁸ noted a similarity to sarcoid, but hilar adenopathy is absent in farmer's lung. Clearing is gradual, and though after a single attack radiography shows a return to normal appearance progressive pulmonary fibrosis and emphysema may be seen after continued exposure.

The effect of treatment is difficult to assess in any disease with a natural tendency to remission. Iodides have been recommended in the acute attack by R. Fawcitt^{2,3} and Frank,⁸ but T. C. Studdert⁵ found them of no value. Antihistamines, antibiotics, and cortisone have been tried, with equivocal results. Any patient with serious symptoms should avoid re-exposure to dust.

The pathogenesis of farmer's lung is not yet clear. It was first described in 1932 by J. M. Campbell¹ as

- ¹ Campbell, J. M., *Brit. med. J.*, 1932, 2, 1143.
- ² Fawcitt, R., *Brit. J. Radiol.*, 1936, 9, 172.
- ³ ———, *Amer. J. Roentgenol.*, 1938, 39, 19.
- ⁴ Fuller, C. J., *Thorax*, 1953, 8, 59.
- ⁵ Studdert, T. C., *Brit. med. J.*, 1953, 1, 1305.
- ⁶ Joyce, J. C., and Kneafsey, D. J., *J. Irish med. Ass.*, 1955, 37, 313.
- ⁷ Williams, D. I., and Mulhall, P. P., *Brit. med. J.*, 1956, 2, 1216.
- ⁸ Frank, R. C., *Amer. J. Roentgenol.*, 1958, 79, 189.
- ⁹ Tornell, E., *Acta med. scand.*, 1946, 128, 191.
- ¹⁰ Duncan, J. T., *Brit. med. J.*, 1945, 2, 715.
- ¹¹ Zettergren, L., *Uppsala Läk.-Fören. Förh.*, 1950, 55, 257.
- ¹² Towey, J. W., Sweany, H. C., and Huron, W. H., *J. Amer. med. Ass.*, 1932, 99, 453.
- ¹³ Sodeman, W. A., *Dis. Chest*, 1949, 15, 162.
- ¹⁴ Caminita, B. H., Baum, W. F., Neal, P. A., and Schneider, R., *Publ. Hlth Bull. (Wash.)*, 1947, No. 297.

"acute symptoms following work with hay" in Westmorland. Fawcitt,^{2,3} reporting several cases from Cumberland, believed that the condition was a true fungus infection and used the term "broncho-mycosis feniseiorum" to describe it. Tornell,⁹ describing an apparently identical condition in Sweden under the name of "thresher's lung," regarded it as a form of pulmonary moniliasis. J. T. Duncan¹⁰ first noted the clinical similarity to byssinosis, pointed out that the finding of fungus spores in the sputum meant only recent exposure to mouldy dust, and considered that the lung lesion was an irritation by fine vegetable dust. Studdert⁵ and C. J. Fuller,⁴ from Cumberland and Devonshire, independently reached the same conclusion that the probable cause was a sensitization reaction in the lung tissues to the actual fungus spores, and Fuller⁴ drew attention to the experimental work of L. Zettergren,¹¹ who produced granulomata in rabbits' lungs following inhalation of both sterile and monilia-contaminated barn dust. These lesions bear at least a superficial resemblance to sarcoid granulomata, and Frank,⁸ carrying out a lung biopsy on one of his cases, found non-caseating granulomata of sarcoid type. He also reported similar findings from a rather doubtful fatal case of many years' duration, complicated by nephritis and uraemia.

Lung changes apparently identical to farmer's lung occur in maple-bark strippers when the cork layer of the tree is infected with *Coniosporium corticale*,¹² in workers handling mouldy sugar-cane pulp (bagassosis),¹³ and in the cotton industry when mildewed yarn is used (weaver's cough).¹⁴ It seems reasonable to postulate that in all of these conditions there is a comparable sensitization reaction, possibly of sarcoid type, in the lung tissues, but further work is needed to clarify the picture.

EPIDEMIOLOGY OF CANCER

For over 30 years Dr. Percy Stocks has been working on the epidemiology of cancer. In 1924 he showed that in Switzerland death rates due to stomach cancer were highest in those cantons where there was most goitre,¹ and now he has published, in the form of a special supplement to the Annual Report of the British Empire Cancer Campaign, the fruits of his labour in North Wales and Liverpool.² His earlier interest has been maintained in his study of a possible relation between stomach cancer and soil content. Within the well-known "pocket" of high incidence of this disease in North Wales there is some evidence of an association between mortality from stomach cancer and the amount of organic carbon in the soil, but as this does not apply in other parts of the survey area it is clearly not the only causative factor. Another characteristic which appears to be related to stomach cancer is the frequency of eating fried foods, but since North Wales is not peculiar in that respect it does not account for the excess in that area. However, in spite of his return to this theme no one could accuse Dr. Stocks of having a one-track mind. His survey covers the incidence of cancer of all sites, and he has studied factors as diverse as diet, water supply, method of cooking, place of work, and

method of travelling there, "race" (Welsh, Irish, or Jewish), smoking, snuff-taking, use of a petrol lighter, age at marriage and parity, and history of previous infections and vaccination. He claims to have shown, for instance, that Welsh blood is not associated with a higher incidence of cancer of any site; that among light smokers beer-drinking is associated with a higher incidence of cancer of all sites except the stomach; that in Cheshire and Merseyside frequent milk-drinking is associated with a reduction in lung cancer no matter what the beer-drinking or smoking habits have been; that pipe-smoking, which hardly affects the incidence of lung cancer, is in some districts associated positively with cancer of the larynx, oesophagus, and intestines; that cancer of the cervix uteri is associated with early marriage, parity being a relevant factor only when marriage is late, and that death rates are high in seaports and textile towns. He found no association between cancer of any site and the use of oil lamps or petrol lighters, or with a history of streptococcal infection or vaccination.

Dr. Stocks's findings on smoking and lung cancer are in general agreement with those of other workers. Only 40 of the 2,101 men aged 35 to 74 who died of lung cancer had not smoked at all, against 188 expected from a control group: 593 had smoked more than 150 cigarettes a week compared with 325 expected. There appears to be an urban factor adding a constant risk which is independent of the number of cigarettes smoked up to about 200 a week, and Dr. Stocks suggests that this might indicate a saturation point for the combined action of smoking and urban carcinogens, or that only a proportion of heavy smokers are liable to cancer, and at this level most of the "susceptibles" have become affected. The report provides more detailed information on the distribution of polycyclic hydrocarbons and certain trace elements in the air of both urban and rural areas than has hitherto been available, but so far it has not been possible to incriminate any particular substance as contributing to the urban factor in lung cancer.

Some may ask whether, with such a multiplicity of factors being investigated simultaneously, apparently "significant" results are not bound to emerge. D. D. Reid in his recent Milroy lecture³ quoted Sir William Gull as saying that the only way to extract the truth in such matters was "to put a definite question, and, that being settled, follow it up by another and so on in series. Nature must at last be driven into a corner and be obliged to say 'Yes' or 'No.'" There is great strength in this argument, and perhaps most epidemiological research should follow such rigorous lines. But there is surely an important place for such all-embracing studies as Dr. Stocks's: they are in the nature of reconnaissances, exploring avenues which would be by-passed by the main strategical attack. In unskilled hands such inquiries may prove misleading; unless electronic equipment is available to analyse all the possible correlations (and there may be a profitable field of inquiry here in the future) it must be a matter of personal judgment

¹ Stocks, P., *Biometrika*, 1924, 16, 364.

² ———, "Cancer Incidence in North Wales and Liverpool Region in Relation to Habits and Environment," *A.R. Brit. Emp. Cancer Campgn.*, 1957, 35, Suppl. to Part II.

³ Reid, D. D., *Lancet*, 1958, 1, 1289.

how to analyse and interpret the data: statistical theory gives little guidance. For many years to come research workers, before embarking on an investigation to test, for example, whether tea-drinking causes cancer of the stomach, will look up the book "to see what Stocks found," and will have ample cause to be grateful for the painstaking way he has prepared the ground.

ANTIBIOTIC TREATMENT OF BOILS

Although antibiotics are much used for lesser forms of sepsis, actual proof of their efficacy is not easily obtained. It should be obtainable by the study of a constant type of lesion if enough cases treated in different ways were closely observed. Such study is that described by Dr. Allene Scott on p. 83. The boils treated were graded in four degrees of severity, and the first conclusion, reached comparatively early in the investigation, was that antibiotic treatment did not affect the course of boils in the two minor grades. Thereafter the study was restricted to the two major grades, and 165 such cases were allotted randomly to three groups, treated respectively with erythromycin, antibiotic E 129, and no antibiotic. Effects were judged by the time taken to arrest the progress of the lesion, time of healing, time of disappearance of the staphylococcus from the lesion, the degree of final tissue damage, and by the frequency of development of fresh lesions during treatment. On all these counts it is quite clear that treatment with either antibiotic gave better results than those in the control group. On the other hand, there is no evidence of any diminished liability to develop further boils after one episode is over. What little difference there was between the efficacy of the two antibiotics was in favour of E 129, but for several reasons, including its impurity and less complete absorption, this was given in larger doses. E 129 is an antibiotic still undergoing clinical trial to determine its degree of usefulness: according to L. P. Garrod and Pamela M. Waterworth¹ it is related, although not closely, to erythromycin, and differs from erythromycin in that staphylococci acquire resistance to it more slowly.

It was one object of this study to determine whether a course of treatment limited to seven days was one during which any bacterial resistance might appear. All the strains of staphylococci were initially sensitive to both antibiotics to a very constant degree, although 23% were resistant to penicillin and a few also to tetracycline: all those re-isolated during or after treatment were retested and none were found to have become more resistant. There were 16 re-isolations from patients treated with erythromycin after 5 to 7 days' treatment, and 7 more during the succeeding week: the numbers from cases treated with E 129 were similar. These are not large numbers, but they do at least show that after seven days' treatment of this type of lesion the development of bacterial resistance must be exceptional. It is well recognized that staphylococci can develop resistance to erythromycin during treatment and that the rate of increase in resistance can be fairly rapid, and because of this the use of erythromycin was much restricted

during a period of several years when it appeared to be the last resort for the treatment of otherwise antibiotic-resistant infections. With the advent of such newer antibiotics as novobiocin and vancomycin it no longer occupies this position of doubtful privilege, and can consequently be used more freely. The findings in the present study, in so far as they exemplify a situation in which apparently resistance to erythromycin is not acquired, suggest that we might with advantage know more about the circumstances in which it is. Is the determining factor the nature of the lesion, dosage, or duration of treatment, or a property in the staphylococcus itself? The scattered records of individual patients in whom this change has occurred may not answer this question, but there must be an answer, and further study directed to this end might provide it.

BEAT KNEE

In the first schedule of the National Insurance (Industrial Injuries) (Prescribed Diseases) Regulations, 1948, beat knee is described as "a subcutaneous cellulitis or acute bursitis arising at or about the knee." If beat knee is a term commonly associated with coal-mining it is not a surgical entity by this definition. It does nothing more than cover a list of conditions not necessarily related except in so far as they affect those whose occupation demands the kneeling position. A recent study of 899 cases, encountered within a period of eighteen months in the North Derbyshire coalfields, focuses attention on the importance of the problem in the mining industry.¹ It is perhaps not surprising to learn that among the miners these affections are most common in coal-face workers and are related to the height of the seam in which they work. The possible influence of environment is shown by the wide variation in incidence between collieries. In some, 13.25 per 1,000 are affected; in others, it is as high as 195.4 per 1,000 men who work underground. But if heat, hygiene, and height of seam are factors, hardness of the surface knelt upon is not. Prepatellar bursitis is the traditional disease of housemaids. Even carpet-layers suffer from it. Therein lies the explanation of the failure of protective pads in prevention. It is not pressure which is the cause of bursitis. It is constant friction between skin and the front of the knee. Some miners aver that the knee-pads in current use aggravate rather than alleviate by harbouring fragments of coal between pad and skin. Early treatment can reduce the loss of working time.² It is no paradox that pressure should have been found so valuable: simple elastic compression was always more effective than irritation in the treatment of effusions in superficial joints or bursae. Ablution and antibiotics look after the infection. The disabling scars of incisions used to drain a cellulitis should be relics of the past. Housemaid's knee disappeared with housemaids. The advent of housewife's knee was saved by the vacuum cleaner. The incidence of beat knee in coal-miners can be reduced. But the problem will remain just so long as men are required to work on their knees to get coal.

¹ Watkins, J. T., Hunt, T. A., Fernandez, R. H. P., and Edmonds, O. P., *Brit. J. Industr. Med.*, 1958, 15, 105.
² Fernandez, R. H. P., *ibid.*, 1958, 15, 110.

MEDICAL ELECTRONICS

[FROM A SPECIAL CORRESPONDENT]

A conference on medical electronics, instigated by Dr. V. K. ZWORYKIN, of the Rockefeller Medical Electronics Center, was held in Paris from June 26 to 28, under the aegis of the Council of International Organizations of the Medical Sciences and the Rockefeller Institute for Medical Research, New York. The President was Professor FESSARD, professor of electroneurophysiology at the Collège de France, Paris.

Dr. Zworykin, himself a pioneer of modern television, the electron microscope, the image converter, the ultra-violet television colour translating microscope, and the "radio-pill" which signals pressure or pH changes from the intestines, contends that medicine is not taking full advantage of the electronic aids now available. He believes that the new developments in this field could be used more effectively than they are to assist both research and clinical practice. The conference was attended by 60 delegates from nine countries. The British contingent of nine observers was assembled by a combined medical and engineering committee* of the Institution of Electrical Engineers.

Cinédensigraphie

The conference gave no support to the view that America has a monopoly in this field. Of the 34 papers from different parts of the world many were of considerable interest. Dr. M. MARCHAL and his colleagues from the Hôpital St. Antoine, Paris, surprised everyone with his "Cinédensigraphie." This depends on the fact that the periphery of organs such as the lungs or liver varies in opacity to x rays with each respiratory and cardiac cycle. These variations are recorded from a small röntgen dosimeter placed behind the patient, and the recordings provide information of air entry and vascular mobility which is of value in locating the boundaries of neoplastic changes and chronic diseases. Dr. Marchal and his colleagues have used this technique for the differential diagnosis of primary and secondary neoplasms of the lung, chronic bronchitis and emphysema, thrombosis, and tricuspid valve disorders.

From the United States, Dr. STUART MACKAY, of California, described the use of a pressure-sensitive paint for manometers for internal use. The paint's electrical resistance varies with the pressure to which it is exposed. Dr. ZWORYKIN gave further technical information of his U.V. colour-translating microscope.† From the British side, Dr. P. BAUWENS discussed advances in electrodiagnosis, Dr. R. E. GEORGE transistor techniques for electromyography, and Dr. B. SHACKEL the measurement of ocular co-ordination. Dr. C. N. SMYTH described the ultra-sound telescope with which he hopes eventually to visualize the foetus *in utero* and the heart valves in action.

Electronic Computers in Medicine

Dr. CARL BERKLEY (Rockefeller Institute) and M. LE GUENEDAL (France) introduced what was perhaps the most popular subject—namely, the use of electronic computers in medical research and practice. The computer with its punch-card, magnetic tape, or photographic store of coded information can classify and select medical literature automatically. Once a machine is allocated to this purpose and the systematically fed with classified abstracts of papers, the preparation of bibliographies of single subjects or combinations of subjects or details of their content is an effortless process. What can be done for a library can also be done for patients' records, and later case histories can be added to former records and the changes tabulated.

*The Committee on Radiological and Electromedical Apparatus.
†See *Science*, 1957, 126, 805.

Dr. Berkley's computer has been programmed for the diagnosis of haematological diseases. The machine considers some 50 diagnoses. Coded information, received, for example, by telephone, of a patient's symptoms, signs, and laboratory findings is passed to the computer. A few moments later a typed form lists the changes in the patient's state since the last entry, gives the differential diagnosis, and enumerates the tests necessary to make the diagnosis definite. Any excess information is recorded in case a multiple diagnosis is necessary. It is only one step further for the computer to define the best treatment (from its own previous experience?) and provide a list of suitable diagnostic laboratories and, if desired, the name of a specialist. One major snag, of course, is that the data fed to the machine must be accurate, and the human factor here is bound to impose limitations on the practical usefulness of such expensive clinical aids.

There was also some informal discussion on the possibilities of what is known as paramagnetic nuclear resonance in biological analysis and even treatment. This technique depends on the response of different molecules to specific electrical frequencies, so that it is possible to impart a rotatory movement to only one specific type of molecule in a tissue. This opens up prospects of perhaps using the method at the cellular level to detect the presence of particular molecules, or even by taking advantage of the heat generated by their rotation to disrupt their biological attachments.

Future Plans

The conference showed that many medical research workers who devote their time to circuit research and the design of instruments are often just repeating work already done in industry or struggling with problems that a trained electrical engineer could do speedily. To remedy this state of affairs those present at the conference formed themselves into an interim committee and interim executive council with four objectives: (1) To encourage the formation of national committees representative, if practicable, of their learned societies; (2) to arrange a further international conference to be held in Paris next June; (3) to assist in the preparation of an international bibliography of medical electronics as already started by the Rockefeller Institute; and (4) to draft a constitution for an international body. The interim executive officers are: President, Dr. V. K. Zworykin (U.S.A.); vice-presidents, Dr. M. Marchal (France) and Dr. C. N. Smyth (Britain); treasurer, Dr. B. Shackel (Britain); secretaries, M. C. Berkley (U.S.A.) and Dr. A. Rémond (France); advisers, Professor Sakamoto (Japan), Professor O. Wyss (Switzerland), and Dr. Bekkering (Holland).

New Appliances

SIMPLE DEVICE FOR LOCATION OF PERFORATING VEINS

Mr. D. W. BRACEY, surgeon, Memorial Hospital, Peterborough, writes: The material of the simple device for the location of perforating veins in the treatment of varicose veins consists of (a) a flat rubber tourniquet 1½ in. (3.8 cm.) wide; and (b) two rubber rings of sponge rubber covered with latex; the small ring has an inside diameter of 2½ in. (7 cm.) and an outside diameter of 5 in. (12.5 cm.); the measurements of the larger ring are 3½ and 5½ in. (8.2 and 14.6 cm.) (Fig. 1). The small ring is used for the leg between the ankle and knee, and may, in a thin patient, serve for the thigh. The larger ring is used above the knee in obese patients.

The small ring is rolled over the foot to just above the ankle (Fig. 2). The rubber tourniquet is then applied just

¹ Garrod, L. P., and Waterworth, Pamela M., *Brit. med. J.*, 1956, 2, 61.

below the ring and so adjusted by means of its hook and eyelets as to exert sufficient pressure to stop the venous flow coming upwards in the superficial veins. With the patient standing on a stool, the ring is rolled up the leg to the knee, emptying the superficial veins as it moves up. As soon as it passes a perforating vein the blood will be seen to enter the superficial vein, especially if the patient is asked to work his foot up and down. The exit site of the perforating vein or veins is then marked with an inverted T.

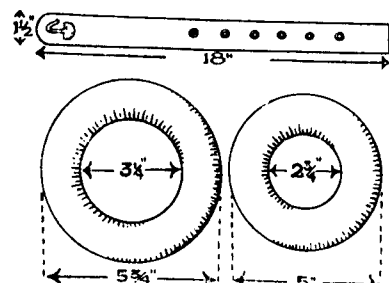


FIG. 1

The horizontal portion of the T marking the site of entry of the perforating vein into the superficial vein. When all the perforating vein exits have been marked the tourniquet is then moved up to the knee just below the new position of the ring. The ring (or the large one if the thigh is obese) is then rolled upwards over the thigh towards the groin and the marking repeated (Fig. 3).

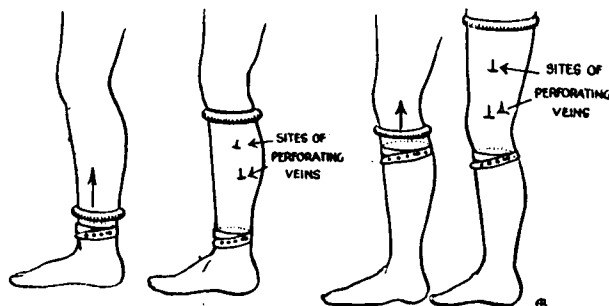


FIG. 2

FIG. 3

The importance of the perforating veins of the leg in varicose veins and ulcers has been stressed by Cockett (1956), and for the past year, in 103 cases, a method of closing these incompetent veins at their exit has been successfully accomplished by a perivenous injection of sclerosing solution (15% phenol in arachis oil 1-3 ml.) at the point where the vein perforates the fascia covering the muscles.

The injection is carried out with a 5-ml. syringe and a No. 1 serum needle, entering the skin at the top of the vertical limb of the inverted T marking. The needle is inserted obliquely downwards for about 1-1 1/2 in. (2.5-3.8 cm.) until its point is felt to penetrate the deep fascia at one side of the perforating vein, and one-half of the total quantity of the solution is injected. The needle is then withdrawn slightly and placed in a similar position on the other side of the perforator and the rest of the solution injected. Accidental penetration of the vein does no harm.

The patient is seen again after a minimum period of six weeks, when the superficial veins will be found to be much less prominent and the symptoms abated. If thought necessary the superficial veins can be sclerosed by an intravenous injection of ethanolamine (1-4 ml.). Examination of the sites of the perivenous injections will reveal a small area of thickening. All the injections, whether perivenous or intravenous, are carried out with the patient lying on a couch.

The initial procedure of examination and injection occupies between 5 and 10 minutes, depending on the number of perforating veins found. The method of perivenous injection is painless and free from complications.

The material used to locate perforating veins has been made for me by Charles S. Bullen, 93, Mount Pleasant, Liverpool, 3.

REFERENCE
Cockett, F. B. (1956). *Brit. med. J.* 2, 1200.

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Neo-Rybax (Rybar Laboratories Ltd.).—This is an antispasmodic inhalant which contains papaverine 0.2% and atropine methonitrate 0.1%, ethyl *p*-aminobenzoate (benzocaine) 0.2%, pituitary (posterior lobe) extract and pituitary (anterior lobe) extract, of each 0.2%, and adrenaline 0.4% in an unspecified detergent base.

Papaverine and atropine methonitrate are both alkaloids having a relaxing effect on smooth muscle, but how far they are effective on bronchial muscle by inhalation is doubtful. Benzocaine is a local anaesthetic. Pituitary posterior lobe extract has some vasoconstricting action, but its effectiveness by local application is doubtful. The purpose of the pituitary anterior lobe extract is not clear. The active ingredient of this inhalant is the adrenaline. Some asthmatic patients claim greater relief from inhalants containing a variety of agents whose pharmacological action is obscure, though their essential ingredient is adrenaline or an adrenaline analogue.

N.H.S. basic price: 1/2 fl. oz. (15 ml.), 4s.

Neo-Eudrine (John Wyeth and Brother Ltd.).—This is a solution for local application to the nasal mucosa, designed to relieve nasal congestion by shrinking swollen mucosa. It contains mephentermine sulphate 5 mg., neomycin base 3 mg., and cetrimide 0.25 mg. in each ml.

Mephentermine is a vasoconstrictor having a relatively sustained action. Neomycin is an antibiotic which has a wide antibacterial activity. It is not suitable for parenteral administration, and may therefore be used more freely for local application than those antibiotics which may need to be given to combat systemic infections, since the effects of sensitization to it are not so disastrous; and in any case it is said to be less apt to cause sensitization on local application. Cetrimide is a cationic detergent, and is presumably included both for its action as a wetting agent, encouraging spreading of the compound across the mucosa, and also because it has a mild antiseptic effect.

There are certain circumstances in which temporary shrinkage of a congested nasal mucosa is of value—for example, in the presence of an acute nasal sinusitis—but the use of compounds of this sort in more chronic conditions is rarely advisable.

N.H.S. basic price: 15 ml., 4s. 4d.

Rhinocort (Ward, Cassenne, Ltd.).—This preparation is intended for local application to the nasal mucosa for the relief of mucosal swelling due to inflammatory and allergic conditions. It contains phenylephrine hydrochloride 0.12%, ephedrine hydrochloride 0.5%, prednisolone 0.01%, and neomycin sulphate 0.06% in an aqueous vehicle. The phenylephrine and ephedrine have a local vasoconstricting action. Prednisolone is included for its anti-inflammatory and anti-allergic effects; and neomycin is an antibiotic agent which, since it cannot be used parenterally, it is permissible to use by local application.

This preparation includes vasoconstrictors, a corticosteroid, and an antibiotic. If a precise diagnosis has been made, occasions on which all these drugs are required would probably be rare. In hay-fever and vasomotor rhinitis, the vasoconstrictors and the prednisolone have a useful symptomatic effect, but an antibiotic is unnecessary. In acute infections it is doubtful whether the local use of prednisolone is advisable. These powerful agents are probably best prescribed individually rather than in a compound of this sort.

N.H.S. basic price: 15 ml., 9s.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Heat Illness

SIR,—Your annotation on "Heat Illness" (*Journal*, June 28, p. 1351), in which you discuss the article "A Classification of Heat Illness" (p. 1533), draws attention to the difficulty of distinguishing between "heat stroke" and "heat hyperpyrexia" as described in the latter article. It may reasonably be assumed that, in a tropical climate, "heat hyperpyrexia" as described in the appendix to this article will become "heat stroke" unless quickly treated, but for this very reason no one would be willing to withhold treatment to observe this transition. I have seen it happen under circumstances where no treatment at all could be given, and the progression "heat hyperpyrexia"—"heat stroke"—death was rapid. Observation of a graded series from "heat hyperpyrexia" through "heat stroke" to death is not often possible at one and the same time when comparisons can be made, but such an opportunity occurred in the Middle East Force during the recent war. I saw all these cases and agree that if distinction between "heat hyperpyrexia" and "heat stroke" is at all possible the former diagnosis will have become the latter in a brief spell in the absence of treatment.

The inclusion of convulsions as a manifestation of "heat stroke" is interesting and, no doubt, correct. If "heat stroke" and "heat hyperpyrexia" are lumped together, my experience produced no example of this until some hours after treatment by cooling had been carried out. At this stage, and when they were quietly resting but still comatose, I provoked a bad epileptic fit in two adjacent patients by applying the gentle stimulus in each case of feeling the radial pulse. These are the only cases of convulsions I have seen associated with heat stroke.—I am, etc.,

London, W.1.

J. C. HAWKSLEY.

REFERENCE

¹ Croom, J. H., *J. roy. Army med. Cps.* 1944, 83, 288.

Delay in Treating Cancer

SIR,—Thoracic surgeons often deplore the stage at which patients with bronchial carcinoma reach them. My experience with my latest such patient may be of interest, as it occurred in London, where teaching hospitals abound. I would stress that this particular case is an exceptional one in that the delay in obtaining admission to hospital was unusual, and the delay was at variance with my usual experience of the particular hospital concerned as well as with others which deal with my patients. For convenience I list the stages of the man's illness in days.

Day 1.—Male aged 57 with no significant previous illnesses complains of cough which provokes pain in the right chest and of small haemoptyses, both for 48 hours. He is pyrexial and there is an obvious right lower lobe pneumonia. Suspecting that this might mask a carcinoma I had a miniature skiagram done at a chest clinic, E.S.R. 105 mm./hour.

Day 3.—Miniature skiagram report: "Round opacity right costophrenic angle."

Day 5.—Large skiagram report: "Pneumonitis."

Day 13.—E.S.R. 200 mm./hour, in spite of antibiotics. Chest clinic reports there is a strong suspicion of bronchial carcinoma.

Day 20.—Thoracic unit report "X-rays suggest carcinoma of bronchus. I think it is worth while getting him into hospital for investigation."

Day 24.—Admitted.

Day 28.—Bronchoscopy report. "A carcinoma is just visible in the posterior basal segment on the right. Histology showed a squamous carcinoma. There was no evidence of glands although x-rays suggest their presence. His name has been put on the waiting-list for admission for thoracotomy."

Day 29.—Discharged.

Day 44.—Not yet admitted for thoracotomy. I telephoned to expedite admission.

Day 50.—7 lb. (3.2 kg.) weight lost since Day 1.

Day 64.—I telephoned again to ask for early admission. Acute tonsillitis developed, again of possible sinister significance. Appropriate treatment begun.

Day 74.—Patient complained of hoarseness. I found his right vocal cord immobile. I telephoned the hospital again and was told that the patient would be admitted "probably in 10 to 14 days' time."

I submit, Sir, that this man, although we shall never know at what stage of his illness he was when I first saw him, needed admission more urgently after the first ten days of his illness than, for example, almost any patient with acute appendicitis, which can be, and is, treated conservatively. In appendicitis admission can be arranged within minutes and operation within the hour. Is my sense of perspective about the urgency of treatment for bronchial carcinoma wrong, or is it that we just do not have enough thoracic units and people trained to work in them? The man whose case I have described was eventually admitted on the 89th day of his illness, and at thoracotomy on the 101st day of the illness "a firm mass 3 inches (7.6 cm.) in diameter was palpable in the lower lobe with a mass of growth at the hilum which had infiltrated the pulmonary artery. There was also peribronchial growth within half an inch (1.25 cm.) of the carina."

In view of the possibility of this patient being identified, I beg to sign myself

London.

GENERAL PRACTITIONER.

Mercurial Diuretics and Nephrosis

SIR,—We have read with interest the articles of Dr. Margaret Riddle and her colleagues and of Dr. J. Burston and his colleagues (*Journal*, May 31, pp. 1274 and 1277) and the letter from Dr. J. F. Goodwin (*Journal*, June 14, p. 1413) in which the onset of marked proteinuria in patients in congestive cardiac failure is discussed. There was no mention, however, of one possible factor—potassium depletion—which we feel may be of significance in these patients. This is known to cause disturbances of renal function with proteinuria¹ and to be associated with histologically demonstrable changes in tubular structure.² Moreover, most patients in congestive cardiac failure have some degree of potassium depletion, which may be gross.^{3,4} The occurrence of a normal serum level of potassium in the patient reported by Dr. Burston *et al.* does not exclude the possibility of depletion.⁵ Neither Dr. Riddle *et al.* nor Dr. Burston *et al.* say whether supplements of potassium were given, nor does Dr. Goodwin, although we understand that in Dr. Goodwin's patients potassium supplements were given during the period when recovery from the nephrotic syndrome occurred despite the continued use of mercurial diuretics.

Whilst not wishing to deny that mercurial diuretics may occasion the onset of the nephrotic syndrome, we would emphasize that potassium depletion also may cause proteinuria, and also we would stress the importance of ensuring an adequate potassium intake during congestive cardiac failure.—We are, etc.,

W. T. COOKE.

C. T. G. FLEAR.

Birmingham.

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- ² ———, *New Engl. J. Med.*, 1956, 255, 195.
- ³ Squires, R. D., Crosley, A. P., and Elkinton, J. R., *Circulation*, 1951, 4, 868.
- ⁴ Flear, C. T. G., Cawley, R., Quinton, A., and Cooke, W. T., *Clin. Sci.*, 1958, 17, 81.
- ⁵ ———, Cooke, W. T., and Quinton, A., *Lancet*, 1957, 1, 458.

Sequelae of Cardiac Arrest

SIR,—In their article describing a case of recovery from neurological sequelae after cardiac arrest (*Journal*, June 28, p. 1521), Dr. D. W. Blair and his colleagues give an excellent description of cerebral oedema following anoxia due to cardiac arrest. I venture to suggest that, if the patient had

been treated for cerebral oedema on the lines suggested by Raison¹ or Argent and Cope,² recovery might have been much quicker.

It is not possible to comment on the cause of cardiac arrest in this case, as there are insufficient details given of the anaesthetic technique and drugs used.—I am, etc.,

Birmingham, 29.

G. A. RAWLINS.

REFERENCES

- 1 Raison, J. C. A., *Lancet*, 1957, 2, 984.
- 2 Argent, D. E., and Cope, D. H. P., *Brit. med. J.*, 1956, 1, 593.

Alcohol and Driving

SIR,—I have read with interest the "Drunk-in-Charge" articles in the *Journal* of June 21 (pp. 1438 and 1442). I assume that Colonel T. E. St. Johnston's figures, quoted in Appendix 2 of the paper by Professor John Cohen and his colleagues (p. 1438), apply to the county of Lancashire, because the local police surgeons are convinced that figures for the Preston Quarter Sessions are more striking still. It is currently believed that on an average 8 out of 10 of the persons electing to go for trial to Preston Sessions are not convicted.

Some will claim that this is a strong argument in favour of the jury system, others that there is no greater indictment against it. I am sure that police surgeons are just a bit tired of the baiting and badgering that goes on at Sessions in an attempt by the defence to establish a case, especially when no doctor is called for the defence. Doing one's best for one's clients seems to involve a clash between what is legal and what is justice, and the barrister most likely to impress the jury stands a very good chance of winning his case—but is that really justice?

I had a case a few years ago on which a Preston jury could not agree; it was reheard at Liverpool with the same evidence, and ended in a verdict of guilty and a sentence of five months' imprisonment—so strongly did the judge feel about it. Did the Liverpool jury show more acumen? Were they less impressed by the same barrister who appeared at Preston? Did the change of judge make any difference? No doubt many other factors could be considered as well. I believe that juries are chosen far too easily, and I would favour a jury of magistrates, who have far more experience than other persons. It is an obvious commentary on these cases that many are advised to go to Sessions for trial because, with juries composed as they are, they have a far better chance of escaping conviction. When will it be realized by juries that no doctor in his senses is going to appear at Sessions unless he is absolutely convinced of the justice of his case? And when will it be realized that of the persons examined at police stations approximately 40–50% are not sent for trial at all?—I am, etc.,

Preston.

W. A. SIMPSON.

Do Sebaceous Cysts Exist?

SIR,—My former teacher, Dr. J. L. Edwards, is right to draw attention to the rarity of sebaceous cysts (*Journal*, June 21, p. 1480). As a surgeon I seldom, if ever, see one, but the common epidermoid cyst is still described as sebaceous by most medical men, and even by the recently qualified. Yet in 1897 S. G. Shattock¹ gave a true description of their nature, and, if I rightly recall, he described the cyst as lined with an extension of the general epidermis. Besides, the cyst usually arises in a hair follicle and not in a sebaceous gland.—I am, etc.,

Doncaster.

DAVID AIKEN.

REFERENCE

- 1 Shattock, S. G., *Trans. path. Soc. Lond.*, 1897, 48, 254.

SIR,—No doubt Dr. J. L. Edwards (*Journal*, June 21, p. 1480) is right when he says that most of the cysts clinically diagnosed as "sebaceous" are in fact of epidermoid structure microscopically, but one often receives such cysts which have a distinctly, and often repulsively, strong sebaceous odour. Yet the lining is stratified squamous epithelium

without appendages and the contents are shed keratin. May it not be that they originate as sebaceous cysts and undergo squamous changes later?—I am, etc.,

Chertsey, Surrey.

C. F. ROSS.

Suffocation in Infancy

SIR,—My newspaper recently reported the case of a baby of 5 months being smothered within the normal environment of a playpen whilst her mother was answering the telephone. One wonders how often very young children are accidentally killed by mechanical occlusion of the respiratory apparatus. The discovery that tracheo-bronchitis accounts for a number of deaths formerly considered to be due to smothering may have attracted attention away from the purely mechanical hazards which still exist.

Some months ago my partner was called to see the cyanosed body of an 18-months-old baby that had just been found dead in its pram. There was a pressure mark on the neck. Apparently this was caused when the baby got its head trapped between the end of the pram and one of the lifting floor-panels which this vigorous and healthy infant had managed to lift on its hinge. This picture, of course, suggested that death was due to prolonged moderate strangulation, but the pathologist, being unable to demonstrate any of the classical signs of asphyxia at post-mortem examination, told the coroner that in his opinion death was due to vagal inhibition of the heart caused by pressure on the nerve.

About three months ago I myself, as coroner, came across a case of smothering that was confirmed by post-mortem examination, though terminal inhalation of vomit appeared to have completed the asphyxia. This was a very healthy and normal infant 3½ months old that had been fed as usual and then for the first time put down to sleep on its belly in an otherwise normal night routine including a very reasonable and practical cradle arrangement. The mother, wife of a professional man, was rearing her first infant with meticulous care and largely according to instructions in the *Sunday Express Baby Book*. She had deliberately put the baby down on its belly with the face turned to one side as illustrated in this book and recommended by it for babies who had attained the age of 2 months and were able to raise their heads from this position unaided. This unlucky infant apparently survived the experiment for only half an hour, during which time it was heard to be crying as the mother was led to expect from the description given in the *Baby Book*. It was not until she went to feed it about eight hours later that she discovered that death and not sleep had put an end to its crying. The book had advised that the experiment should be commenced when baby was very sleepy and had just been fed, and it would appear that both these conditions were factors contributing to the fatal outcome. On the whole I would agree with the opinion of the doctor who gave evidence in this case: that infants should not be compelled to adopt attitudes that they do not select naturally; though it must be conceded that in many countries it is customary to put babies down on their abdomens from birth.

My latest case of this sort occurred only a month ago; the victim was the 5-weeks-old son of an American serviceman: in the opinion of the doctor reporting the case and of the pathologist who performed post-mortem examination, the baby died of asphyxia shortly after being placed face downwards and left for the night. This infant had been healthy apart from a discharging navel; and, like most American babies, was accustomed to the prone position. However, it may be significant that the post-mortem lividity of the face was interrupted by white pressure areas on the nose and around the mouth, and that the air passages in this case, as in the previous one, were full of what the pathologist reported as "terminal vomit."

These tragedies are appalling even to those who come across them merely in a professional capacity. They suggest that there may be here a category of infant mortality which would merit a little investigation with publicity.—I am, etc.,

Eye, Suffolk.

J. SHACKLETON BAILEY.

Aortic Thrombosis

SIR,—I read with great interest the article by Dr. F. Starer and Dr. D. Sutton (*Journal*, May 31, p. 1255). Under aetiology mention is made of one case with fused kidneys who also had retinitis pigmentosa. The Grönblad-Strandberg syndrome¹ consists of typical pseudoxanthomatous

skin lesions associated with angioid streaks of the retina, which on occasion can prove difficult to distinguish from the changes of retinitis pigmentosa.

Sheie and Freeman² showed that angioid streaks of the retina could be associated with peripheral vascular disease, and others have reported angioid streaks in association with hypertension, cardiac arrhythmias, and bleeding from the gut and even from the uterus. Finnerud and Nomland³ have precisely shown the skin lesion of the Grönblad-Strandberg syndrome to be heavily impregnated with calcium phosphate. Sheie and Freeman found findings in the skin are those of swelling and fragmentation of the elastic elements. The degenerate fibres may occur in coils, and the presence of occasional giant cells has been noted. I¹ described a case of this syndrome in which radiology revealed calcification in the line of the femoral arteries, although there was no history of intermittent claudication, hypertension, or angina pectoris and no signs of inadequacy of the peripheral circulation.

The Grönblad-Strandberg syndrome is thought to be due to a generalized degenerative process of the elastic tissue of the body, and it would be of interest to know if any of the cases of Drs. Starer and Sutton showed evidence of pseudoxanthomatosis or angioid streaks of the retina, and also to know the histology of the involved aortic segments in their cases of aortic thrombosis, with especial reference to the elastic elements. An interesting speculation is the possibility of a generalized degenerative process of elastic tissues, as in the described syndrome, leading to fracture of the intima, atheromatous changes, and finally thrombosis in the aorta or other vessels. Although not dangerous to life, the prognosis in cases of the Grönblad-Strandberg syndrome is poor as regards visual acuity, blindness often being an end result.—I am, etc.,

ROBERT BRUCE.

Co. Durham.

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- 1 Grönblad, E., *Acta ophthalm. (Kbh.)*, 1929, 7, 329.
- 2 Strandberg, J., *Verh. derm. Ges.*, 1929, 13, 3.
- 3 Sheie, H. G., and Freeman, N. E., *Arch. Ophthalm. (Chicago)*, 1946, 35, 241.
- 4 Finnerud, C. W., and Nomland, R., *Arch. Derm. Syph. (Chicago)*, 1937, 35, 653.
- 5 Bruce, R., *Med. ill. (Lond.)*, 1956, 10, 394.

Tropical Hazards of Pentachlorophenol

SIR,—The article by Dr. J. A. Menon on tropical hazards associated with the use of pentachlorophenol (*Journal*, May 17, p. 1156) was of considerable interest to me, as the sodium salt ("santobrite") has been in daily use in our sawmills both here and in Nigeria for the past 10 years.

Our local conditions are very similar to those in Sarawak. The climate is practically the same, and our employees also mostly have mixed worm infestations. Their general standard of physique is definitely better than that of the Dyak. The sawmills in each country are the same in design and each has two dip-tanks. In the one, sodium pentachlorophenol is used in a solution of 1.34% concentration, and in the other the concentration is 3.5%. The increased strength in the latter tank is due to the fact that, being in the boxwood mill, the boxwood is stacked whilst wet and the boxwood mill, the manufacturing process. These two is not seasoned in the manufacturing process. The concentrations remain constant throughout the year, as opposed to the practice described by Dr. Menon. The lumber is mechanically handled both in and out of the tanks and the solution is sprayed on to it by a series of multiple jets. Employees handling lumber after it has passed through the tanks wear protective rubber gloves, are provided with a barrier cream, and have washing facilities within a few yards of the tank site. There is no rotation of employees in this job and no dietary supplement is given.

There has been no case of an illness arising in any of these employees attributable to sodium pentachlorophenol since we started using this compound. In the boxwood mill the dip-tank, which has the higher concentration of 3.5% in the solution, there is also ethyl mercuric phosphate in a concentration of 0.1%. Though this is a well-known toxic compound (Agriculture, Poisonous Substances, Organo-

Mercury Compounds, Order, 1956), again we have had no cases of an attributable illness arising out of its use.

I would like to thank the General Manager for permission to publish this letter.

—I am, etc.,

G. M. SHAW,

Medical Officer,

Samreboi, Ghana.

African Timber & Plywood (Ghana) Ltd.

Intravenous Pethidine

SIR,—Mr. C. E. P. Markby's interesting article (*Journal*, June 14, p. 1397) on the use of intravenous pethidine in conscious patients brings to mind a personal experience which may in a small way illustrate further some of his observations, though applicable to another age group and occurring under different conditions. While serving in the British Commonwealth General Hospital in Kure, Japan, during the last eighteen months of the Korean campaign, I had an opportunity of trying intravenous pethidine in doses of up to 300 mg. in some hundred or so cases of burns suffered by men of the Commonwealth Division in Korea.

The burns were caused mainly by space-heaters exploding in a confined space. The heaters, fired by oil and water, were re-introduced into service in the autumn of 1952 to help to protect troops against frost-bite, which had the previous winter taken its own toll. It may well be argued that the cure in this instance was more deadly than the disease. The patients arrived in Japan by air convoy, having previously received first-aid treatment and bandaging for their burns in either a U.S. or Norwegian Mobile Army Surgical Hospital (M.A.S.H.).

As the "exposure" method of treatment was current, the problem was to find a pain-free method of removing the dried and sticking dressings, cleansing the burnt areas, and excising eschars and dead skin without increasing the nursing problems or interfering with the surgical management of battle and other casualties which formed the bulk of the evacuation convoys. Without doubt, after a trial with intravenous procaine, inhalational analgesia, and inhalational anaesthesia, the most satisfactory answer was intravenous pethidine, and it became standard practice to use an average of 200 mg. per patient, injected in 50 mg. doses over a period of a few minutes. It was thus possible to produce safe and almost ideal operating conditions for the British, Australian, and Canadian surgeons working on the four tables available. At the same time the willing co-operation of, and adequate analgesia for, the patients were obtained.

Respiratory depression was not a problem. Any slight slowing in respiratory rate was more than compensated for by an increase in depth. A further advantage in these cases was the relative ease with which transfusions could be set up owing to the vasodilatation provided by the pethidine.

—I am, etc.,

Worthing, Sussex.

P. J. C. BURTON.

Dysgerminoma in Pregnancy

SIR,—It may be of interest to report the following case, a dysgerminoma complicating pregnancy.

A primigravida, aged 18, was admitted on April 10, 1958. She gave a history of intermittent colicky lower abdominal pain for one month, with a brown vaginal discharge for 24 hours. The last menstrual period had commenced four months previously, on January 7. The menstrual cycle was regular, 5–6/28 days. On examination, the uterus was found to be enlarged to the size of a 14-week pregnancy. The cervix was normal and the os was closed. A mobile, firm swelling above and to the right of the uterus, the size of a foetal head, was noted. A diagnosis of threatened abortion with an ovarian cyst complicating pregnancy was made. The pain was thought to be due to partial torsion of the pedicle. The pain and bleeding subsided with rest in bed, and she was discharged a week after admission to return for removal of the cyst one month later.

On readmission the ovarian swelling was thought to have increased in size. At laparotomy a solid ovarian tumour was found on the right side. The pedicle was twisted through 180°. The left tube and ovary, and the uterus, were normal for the duration of pregnancy. There was no evidence of metastases in the abdominal lymph nodes or on the peritoneum. The ovarian tumour and the right tube were removed. The patient made an uneventful recovery. The pathological report on the specimen was: "The tumour consists of an irregularly shaped, white soft

mass, measuring 20 by 20 cm. The cut surface showed it to consist of soft white tissue. Several areas of haemorrhage were seen. Section showed a dysgerminoma; the capsule appears to be intact in the sections examined, but histologically this tumour is certainly malignant." To date the pregnancy is progressing normally.

I should like to thank Mr. D. Jefferiss for permission to record this case.

—I am, etc.,

Exeter.

JILL M. EVANS.

Oesophageal Atresia

SIR.—The article by Mr. C. Parrish and Mr. C. F. A. Cummings on oesophageal atresia (*Journal*, May 17, p. 1140) and the correspondence arising from it (*Journal*, May 31, p. 1297, and June 14, p. 1414) have been of great interest. My own experience of 16 cases has been very similar to that of the authors and most of the correspondents; i.e., an overall recovery figure of a little more than 50%, which would have been better but for associated abnormalities. There are some points of technique and management which have arisen in my experience and which may be of interest.

In general I agree with Miss Isabella Forshall and Mr. P. P. Rickham (*Journal*, June 14, p. 1414) that operative detail is of little importance compared to post-operative management, but there are two points which arise at the time of operation which have a great bearing on the survival prospects. The first of these is that these infants are often found to be reluctant to regain consciousness, and poor breathers, at the end of operation. This may wrongly be attributed to shock or to overdosage with anaesthetic agents; in fact it is due to a hypothermic state, and we have recorded temperatures as low as 88° F. (31.1° C.). This is not entirely due to exposure during operation, because a low temperature is also found pre-operatively; this seems due to the general exposure which the infants suffer during radiographic screening, the setting up of intravenous drips, transfers from one ward to another, or from one hospital to another, etc. This hypothermy is of little significance, and responds readily to simple warming in an incubator; it is important only in that it must be recognized.

A second point is that survival depends to some extent on the size of the fistula; usually this is a pin-point, and, if so, successful operation may be carried out several days after birth; but sometimes the fistulous orifice is the full diameter of the oesophagus, allowing free reflux of gastric contents and bile, which set up a far deadlier pneumonitis than does inhaled milk. Two such cases have come my way. Both succumbed from pneumonia, though operated upon within 24 and 36 hours, respectively. A narrow lower oesophageal segment may be a disadvantage to the surgeon, but it confers some protection on the patient. There is invariably a great disparity in size between the thick upper segment and the tenuous lower oesophageal segments. This can be overcome by not using for the anastomosis the ½-in. (6.4 mm.) of lower oesophagus which entered the trachea. Mr. R. H. R. Belsey has maintained (unpublished) that this small length derives its blood supply from the trachea, and is avascular when detached from it; this may well be true, but it seems to me that it is also fibrotic and the lumen cannot be dilated easily; a little lower down, however, the oesophagus, though very thin, dilates easily, and the disparity in size to the upper segment can be reduced to a useful extent by gentle dilatation prior to anastomosis.

In the post-operative management, for fear of damage to the suture line, I have avoided an indwelling tube, and have relied upon intravenous fluids for a few days before breast-feeding is recommended; but, since the advent of the very fine, soft polythene tubing, these objections have been overcome. But whether intravenous or tube feeding is used, there is no doubt that it should be in the hands of paediatricians especially skilled in this work. I have been fortunate that Dr. H. V. Finlay has always been readily available to undertake the all-important post-operative management of my cases.—I am, etc.,

London, W.1.

KENNETH S. MULLARD.

Unusual Case of Herpes Zoster

SIR.—A case of herpes zoster is reported on account of an unusual feature—namely, the association of a relatively very small area of sacral herpes with a large area of petechial rash extending from the groin to the ankle on the same side as the herpes.

On February 4, 1958, a garage mechanic aged 41 complained of pain in the sacral region just to the right of the midline where, in the second lumbar and perhaps third sacral dermatomes, was a single patch of zoster vesicles of about 4 sq. in. (26 sq. cm.). The pain radiated to the thigh. Two days later the herpetic area was no larger but pain was much worse, and by February 10 it made the patient stay in bed. There was still no extension of the herpes, which had become haemorrhagic, but the buttock, thigh, and leg now showed a petechial rash (flat, discrete, bluish macules 1-2 mm. across) which did not blanch on pressure. On the external aspect of the buttock and thigh the petechiae were in the second lumbar dermatome, but not lower than about 3 in. (7.5 cm.) below the great trochanter. On the inner aspect of the



limb (see photograph) they extended from the groin to just above the internal malleolus, in the third sacral and second, third, and fourth lumbar dermatomes. No petechiae were seen over the rest of the body. Blood taken on February 11 showed: Hb 105%; W.B.C. 5,300, neutrophils 55%, lymphocytes 42%, monocytes 2%, eosinophils 1% (Dorset County Laboratory).

On February 13 the petechiae had begun to fade. Pain in the thigh and calf still prevented walking. By February 18 the petechiae had become invisible while the patient stayed in bed, but became obvious whenever he had been up for 10 minutes. On February 20 the sacral patch of herpes, still its original size, was red and scaly. The pain, still disturbing sleep, seemed to be in the femur and tibia; by the 25th it was spasmodic, and pruritus was a new and troublesome symptom. Rubbing or scratching served only to aggravate the pain. The petechiae were still to be seen whenever the patient had been up for 10 minutes, and blanching on pressure. The area of sacral herpes was now a pigmented scar. On March 1 the petechial rash had considerably faded, and the patient, now in less pain, returned to work. By March 6 the petechiae were scarcely visible. Not one of them had become vesicular.

—We are, etc.,

P. R. BOUCHER.

MARGARET J. TURPIN.

Winfrith, Dorset.

Prevention of Lung Cancer

SIR.—The letter from Dr. Lennox Johnston, president of the National Society of Non-smokers (*Journal*, June 21, p. 1483), provokes me to say something on this subject. Dr. Lennox Johnston castigates the Medical Research Council for not having made any recommendations for preventing lung cancer by stopping people smoking. This side of the problem was not theirs to deal with, so far as I know.

Without denying some, but only some, causal connexion between smoking and lung cancer, it must be evident to anyone who has studied the many observations and letters of independent thinkers on this subject of smoking and lung cancer that the case against cigarettes has been very much overstated, and when one does that one spoils one's case.

No amount of frightening talks or warnings will stop the habit unless one can offer a reliable and easy cure. We can take our experience of drinking as a guide—and would one totally absolve alcohol as a contributory cause? What we need now is research to find a cure for those who wish to give up smoking. So far, we doctors have very little to offer, and to ask people to exercise will power is futile.

There is much more in the air we breathe all day and night in a city like London than thirty or more cigarettes a day. Has not industrial expansion, multiplication of laundry and other chimneys, etc., gone on *vis-à-vis* smoking? Coal smoke with sulphur dioxide and benzpyrene and paraffins in automobile exhausts and half-burnt crude oil in a diesel engine are not to be ignored. We cannot ask the Chancellor to surrender his handsome revenue until we can completely eliminate the undeniable influence of all these other factors.

—I am, etc.,

B. J. BOUCHÉ.

London, S.W.19.

Acepromazine in Schizophrenia

SIR.—We were interested to read Drs. Jessie F. Collard and R. Maggs's account of their assessment of the value of acepromazine maleate ("notensil") in schizophrenia (*Journal*, June 21, p. 1452). The nurses' reactions to drug trials which they report have been noted previously.¹

If any trials of this sort are to be used we suggest: (1) The nursing staff can be told that two forms of a new drug are being tried out. This ensures that the curiosity of the nursing staff as to which is the dummy tablet is not aroused. (2) The active and inactive tablets must be identical in respect of taste, smell, colour, shape, size, and texture if the results of the trial are to be considered definitive. An elementary precaution in all drug trials is therefore to assess the similarity of the tablets before the trial is carried out. (3) Assessments of patients should be based on objective rather than subjective evidence. Statistical evaluation of subjective opinions, particularly when the active preparation has observable side-effects, is of doubtful value.

Finally, we were a little disappointed to see such elaborate statistics reported without a simple statement of the average ratings obtained by each group before and after treatment. Our rating scale² can be used to describe schizophrenic patients in objective terms, and to match the treatment and control groups in order to increase experimental precision.—We are, etc.,

Sutton, Surrey.

A. A. BAKER.

J. G. THORPE.

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2. — *J. ment. Sci.*, 1956, 102, 838.

Littre's Hernia

SIR.—The excellent article on Littre's hernia by Mr. B. R. Meyerowitz (*Journal*, May 17, p. 1154) prompts me to send you the following report on a case of strangulated Littre's hernia, and also further statistics in connexion with the incidence of Littre's hernia.

A man aged 73 was admitted to the Manor House Hospital, Golders Green, on March 3, 1958, by ambulance from his home 35 miles away. He had noticed a lump in the right groin for a week and had several attacks of nausea but had not vomited. During the course of his journey by ambulance he had vomited three times, and on admission was suffering from abdominal distension. A diagnosis of strangulated right femoral hernia was made, and he was submitted to operation, the approach being made by a radical incision dividing the inguinal ligament transversally. The abdomen was opened above the constriction. The gangrenous covering of the hernia was incised, and it was noted that the Meckel's diverticulum was dragging on and it was noted that a part of the wall of the intestine into the small intestine, pulling a part of the wall of the small bowel was almost the hernial sac so that the lumen of the small bowel was almost occluded. The diverticulum was freed and excised. The gangrenous covering and the hernial sac were also excised, and a repair of the inguinal ligament was carried out. He made an uneventful recovery and was discharged fit and well on April 2.

Pathological examination revealed the following: *Specimen*.—A plum-coloured diverticulum, 3.5 cm. long by 2 cm. broad. The wall was swollen by oedema and the inner lining was somewhat roughened. There was no macroscopic evidence of ectopic tissue. *Histology*.—Early strangulation of Meckel's diverticulum. The diverticulum was lined by small-intestine mucosa. There were no ectopic tissues.

In a series of 5,325 operations for inguinal herniae and 210 operations for femoral herniae, personally performed at the Manor House Hospital, all in male patients, there was no case in which a Meckel's diverticulum was found in the hernial sac.—I am, etc.,

London, N.W.11.

J. W. NICOLSON.

"Nacton" in Elderly Patients

SIR.—The articles by Drs. A. H. Douthwaite, J. N. Hunt, and I. Macdonald (*Journal*, August 3, 1957, p. 275) and by Drs. A. H. Douthwaite and J. N. Hunt (*Journal*, May 3, p. 1030) on the use of 1-methyl-2-pyrrolidyl methyl benzilate methyl methosulphate ("nacton") have doubtless established the value of this drug in the management of peptic ulcer and hyperchlorhydric dyspepsia. Recent clinical observations at the Walnut Tree Hospital suggest, however, that it may have other important, entirely different and equally significant effects which deserve to be observed.

I recently gave nacton to a small series of 20 elderly patients suffering from emotional disharmony of the kind that follows atherosclerotic cerebral episodes or is associated with anxiety states. These apathetic, largely unmanageable people who either do not respond or become worse when receiving drugs usually described as "tranquillizers" were given nacton in varying dosage from 4-30 mg. daily. In 70% of these patients the drug was observed to have a noticeably beneficial action: the apathetic patient became alert, more interested in his surroundings, the appetite was improved, and the management of the patient consequently facilitated. In 50% of cases restlessness and confusion were controlled, although this effect diminished after a week's administration of the drug. When placebo tablets were substituted for the active drug the beneficial results described above were not obtained. Moreover, in the dosage given, which is well below the therapeutic maximum, no significant side-effects of any kind were observed and no drowsiness was induced.

The cases observed in this series were under the care of Dr. H. Bathurst Norman, who has kindly given me permission to publish these preliminary observations.

—I am, etc.,

Sudbury, Suffolk.

A. E. GIBBS.

Induction of Labour

SIR.—I was interested in the results of surgical induction of labour reported by Professor G. Gordon Lennon and Mr. E. M. Edwards (*Journal*, June 14, p. 1413). They induced labour at the 38th week of pregnancy in all cases of pre-eclamptic toxæmia and essential hypertension not requiring intervention before that time. Under our care there has been a similar group of cases, to which were added a few with a history of previous toxæmia. Treatment consisted of diet, rest, in some rauwolfia drugs, and, if necessary, admission to hospital, especially about the 28th week, in patients with a rising blood pressure or an initial severe hypertension.

Our series consisted of 950 patients, of whom the large majority went into spontaneous labour at term. The induction rate by rupture of the membranes was 7.3% and in approximately the same percentage medical induction was used. There were 11 stillbirths and 7 neonatal deaths, an uncorrected perinatal mortality of 18.9 per 1,000. Maceration prevented an accurate estimation of foetal abnormalities, but three deaths were due to haemolytic disease.

In attempting to improve our mortality figures, one of our big problems has been the prevention of foetal maceration. Of 11 stillbirths in our series, 7 were macerated, 6 before the 38th week of pregnancy. As regards the neonatal deaths, these have been greatly lessened by more exacting antenatal care, which reduces the need for interference and secures a healthier and more mature baby.—I am, etc.,

London, W.1.

D. J. MACRAE.

Medical War Crimes

SIR,—I would like to add my voice to those of your other correspondents (see *Journal*, June 28, p. 1546) who deplore that Dr. Herta Oberheuser should be allowed to resume practice after such flagrant betrayal of the spirit of the Hippocratic Oath, and agree that an official protest should be made on behalf of British doctors. The German medical fraternity should know exactly what we feel about it. There must be hundreds of doctors, if not thousands, at home and abroad who feel strongly about this, but just have not the time to sit down and write to tell you so.—I am, etc.,

Eldoret, Kenya.

H. LIVINGSTONE PEAKE.

SIR,—Dr. A. P. Tait's suggestion (*Journal*, July 5, p. 51) that Dr. Herta Oberheuser might now be a "dedicated practitioner, doing good work," is staggering in its naïveté. Does he not realize that the very idea is an insult to her countless victims?

This war-criminal, found guilty of crimes against humanity so dreadful that the mind boggles at the thought, has forfeited all right to be accepted by civilized people. I came into contact with many of the victims of these monsters in Belsen towards the end of the war, and the experience was shattering. It might perhaps be more adult of Dr. Tait if he spared a thought for these people rather than for their torturers.—I am, etc.,

London, N.2.

S. BENNETT.

Malignant Exophthalmos

SIR,—Mr. Lionel M. Green (*Journal*, June 21, p. 1479) does not say what treatment had been used before acetazolamide gave such an excellent result. We have had very good results from irradiation in such cases, avoiding the need for orbital decompression.—I am, etc.,

Broadstairs.

R. A. D. CRAWFORD.

Dummy Tablets

SIR,—The suggestion of Dr. E. C. Atkinson (*Journal*, June 21, p. 1478) that the *British National Formulary* should contain control tablets of inert substances rather flatters the *Formulary* by suggesting it does not do so now. I would hardly consider soda mint or calcium lactate tablets likely to produce striking pharmacological results.

If one is trying to find the remedy most likely to help a patient there seems no point in wasting time on dummy tablets. Ascorbic acid or strong vitamin B compound tablets would help a proportion of one's cases in some surprising ways. For instance, one patient demanding sleeping-tablets claimed that three vitamin B compound tablets per day kept her doped all day and asleep all night. On the other hand, if the doctor is doing pharmacological research on new treatments, it would seem logical to compare them with those previously in use and abstain from adopting them unless clearly superior.

Incidentally, giving inert tablets to cure inertia smacks of homeopathy.—I am, etc.,

Shipley.

H. S. RUSSELL.

Diagnosis of Premature Rupture of Membranes

SIR,—A symptom I have often encountered in antenatal work, particularly in general practice, is the complaint in the later months of pregnancy of loss of fluid from the genital region. Sometimes this is caused by premature rupture of the membranes, and treatment consisting of hospitalization, complete rest, and the administration of prophylactic antibiotics should be instituted as soon as possible. On the other hand, I find that this symptom is more often due to incontinence of urine.

A useful aid to diagnosis, which I have used with success over the last two years, is that of administering a dye which is rapidly excreted in the urine. "Pyridium" marketed as

a urinary analgesic contains an orange dye and is a suitable oral preparation. On being confronted with such a patient, I send her home to bed and tell her to wear a sanitary pad. Two tablets of pyridium are then given by mouth. Some three hours later a urine-soaked pad will be stained bright orange, whereas one soaked with liquor amnii will not be discoloured.

I have been assured by the manufacturers of this preparation that there is no evidence whatever that pyridium appears in sufficient concentration to produce such a colour change in the liquor. I consider that this is an important test, enabling a general practitioner to quickly diagnose premature rupture of the membranes and thus help to reduce the high neonatal mortality rate associated with prematurity.—I am, etc.,

Leamington Spa.

JOHN R. LAMB.

Management of Tetanus

SIR,—May I add a comment to my letter on the management of tetanus in the *Journal* of June 7 (p. 1354), which also contained a report (p. 1350) of a recent discussion of the subject at the Royal Society of Medicine? In the report of this discussion there was no allusion to the treatment of the wound, yet here there are differences of opinion. In accordance with one view, on the appearance of tetanic symptoms the wound should be excised in order to diminish the absorption of toxin. No evidence has hitherto been adduced to support this view; on the other hand, interference with the wound may be followed by an exacerbation, sometimes fatal. This appears to apply particularly to extensive wounds; in small superficial wounds the danger seems less, and in selected instances amputation may bring rapid improvement. With regard to non-interference with the wound, in several recent records of recovery from tetanus no local surgical treatment had been given. Looking back at my war cases of 1916 (see my earlier letter), severe tetanic symptoms subsided under A.T.S., sloughs and missiles being left undisturbed.

In the attempt to reduce the high mortality of tetanus, more information is needed. In the discussion at the R.S.M. Dr. A. Crampton Smith is reported as describing seven very severe cases of tetanus with three deaths. In these and similar cases details of the treatment of the wound would be of great value.—I am, etc.,

Sheffield, 10.

R. G. ABERCROMBIE.

POINTS FROM LETTERS

The Fear of Death

Dr. S. G. PAPADOPOULOS (Nicosia, Cyprus) writes: I was interested to read the report of Dr. Eliot Slater's lecture "The Biologist and the Fear of Death" (*Journal*, April 12, p. 885). This reminded me of the often repeated statement by the late Lord Horder that in striving to keep alive people who are dying and beyond any human aid, one does not prolong life, one prolongs death. Some years ago we brought back a patient suffering from advanced leukaemia to a fairly good state of health with deep x-ray therapy. This lasted for two to three months, when suddenly one day after a severe headache he became unconscious and was taken back to the clinic for further treatment. The patient, a young man of 35 of some considerable social and financial status, came from abroad and his mother was staying with him. Lord Horder explained to her the hopelessness of the case and asked her whether we should leave him to die in peace or revive him for a short time with further treatment. It was then that he said, "My dear, we are not going to prolong his life by doing this, but we will prolong his death." She, however, expressed the wish that she would like to speak to her son again and also ask him about his last wishes on various family matters. With further treatment he came round and was able to have a few hours tête-à-tête with his mother. Soon afterwards he fell into a deep coma, one could feel that nothing further could be done, and he was left in peace.

Asphyxia by the Cord

Lines 18-20 of Dr. C. W. Walker's letter (*Journal*, July 5, p. 47) should have read: "Dr. Reiss's case illustrates very clearly that foetal distress appeared during the first stage" (not "second stage").

Obituary

MORAY MELVIN, M.D.

Dr. Moray Melvin, one of the best-known medical practitioners in the West Riding, died at his home at Lofthouse, near Wakefield, on June 20. He was 62.

Moray Melvin was born at Fraserburgh, Aberdeenshire, on March 14, 1896. He had a distinguished career as a student at Edinburgh University, winning the two Cunningham medals in anatomy and graduating M.B., Ch.B., with honours, in 1918. He proceeded to the M.D. in 1933. Immediately after graduating he joined the Army and as a captain in the R.A.M.C. served with the British Expeditionary Force in the North Russian campaign. At the end of hostilities he returned to his university for a time as demonstrator in anatomy. But there was not enough scope for his agile, questing mind, so he forsook the scalpel for the hurly-burly of general practice. Seldom has a man been better equipped for the job, for in addition to his undoubted ability as a doctor he had the human touch. For nearly forty years in the Rothwell and Lofthouse districts of the West Riding he dedicated himself to the care of his patients and quickly built up a large practice. His capabilities were also rewarded when he was appointed medical superintendent of St. George's Hospital, Rothwell, and medical officer of the Yorkshire Copper Works. He was also joint secretary of the Leeds Advisory Council on occupational health and lecturer to disablement resettlement officers. Not content to be simply the family doctor in a mining practice, he was keen to do something for the profession as a whole, and this he achieved by his devoted services to the Yorkshire Branch and Leeds Division of the B.M.A. He was chairman of the latter in the last year of his life. Enthusiastic in his support of the National Health Service, after its inauguration he became vice-chairman of the Wakefield "A" group hospital management committee and chairman of its general purposes committee. A member of the West Riding local medical committee, he was chairman of the local obstetric committee and of the liaison committee of the West Riding health and general practitioners committees. A fluent and cultured speaker, he was president of the Leeds Medico-Chirurgical Society in 1950-1. His death at the height of his powers will be much regretted. The manner of his going was something to marvel at, for he fought a losing battle with unflinching courage. His knowledge of medicine had made him brutally aware for some three years that his days were numbered, but despite cruel disabilities he spent them selflessly visiting the sick in the home, the hospital, and the workshop right to the very end. For him there could be no more fitting epitaph than the words with which the Vicar of Leeds closed his address at the funeral service: "Moray Melvin, beloved physician."

Dr. Melvin is survived by his wife, who is a West Riding J.P., and two married daughters.

CHARLES MARKUS, M.D., M.R.C.S., L.R.C.P.

Dr. Charles Markus, consulting ophthalmic surgeon to the German Hospital, Dalston, died suddenly on July 27, aged 83 years.

Dr. HUGO RAST writes: After studying medicine in Munich, Strasbourg, and Freiburg, Charles Markus graduated in 1898 with the degree of M.D. (Freiburg). He was subsequently first assistant at the ophthalmological clinics of the university hospital at Göttingen and Halle a/S. Leaving this post to settle permanently in London, he passed the conjoint examination in 1903. Later he joined the staff of the German Hospital, first as assistant, then as full ophthalmic surgeon. He retired during the second world war. Markus was a man of the kindest disposition—modest,

loyal, upright, and unselfish to a degree, ever ready to help without considering the remuneration. Although of rather a retiring nature, he was a fellow of the Royal Society of Medicine and a member of the Ophthalmological Society of the United Kingdom, taking a keen interest in the work of both bodies, and he was a member of the B.M.A. for 53 years. In his spare time Markus was an ardent reader of philosophical literature. We have lost in him a kind and likable colleague, a philanthropist in the true sense of the word.

Dr. F. PARKES WEBER writes: Markus's name was especially associated with the so-called Markus's or Adie's ocular syndrome, which at one time could easily be confused with a well-known pupillary phenomenon of tabes dorsalis. There can be no doubt, however, that this peculiar form of "myotonic pupil" associated with absent tendon reflexes was first described by Dr. Markus (*Trans. ophthalm. Soc. U.K.*, 1906, 26, 50). Adie made the subject widely known by his excellent paper on the possible confusion of the syndrome with tabes dorsalis. It was my privilege to be able to demonstrate Markus's original patient at a meeting of the Clinical Section of the Royal Society of Medicine in March, 1933, 27½ years after Markus's original description ("More Forgotten Nosographs," *Med. Press*, 1957, 237, 266).

G. H. GARLICK, M.R.C.S., L.R.C.P., D.M.R.E.

Dr. G. H. Garlick, medical director of the Singapore Antituberculosis Association, died while on leave at Lucerne, Switzerland, on June 6.

George Herbert Garlick was born in London in 1886, the son of Dr. George Garlick. From Epsom College he entered St. Mary's Hospital Medical School, and qualified in 1912. After holding the appointments of house-physician, resident anaesthetist, and house-surgeon at St. Mary's Hospital, and assistant medical superintendent of Highgate Infirmary, he went to Malaya in 1914 as medical officer to a tin-mining company at Trengganu. Three years later he became a medical officer to the Johore Government, and as assistant to the principal medical officer in Johore Bahru he was actively engaged in hospital and public health work in the State, as well as with the medical supervision of the gaol. At that time there were only two other medical officers in Johore State. In 1930 he was appointed principal medical officer, a position which he held until his retirement in 1942. Radiology became one of his special interests, and he took the Cambridge D.M.R.E. in 1927.

N. C. S. G. writes: During his service in Johore Dr. G. H. Garlick proved himself to be an able, energetic, and progressive medical administrator. He was responsible for much rural public health work, the establishing of a modern nurses' training school, and the building of a first-class modern hospital with many unique features. In recognition of his valuable services he was accorded the title of Dato—an honour given by the Sultan of Johore. During the second world war he joined the British Army as a radiologist, and was a prisoner of war in Changi Gaol. Serving with the British Military Administration after the war, he re-established civil radiology at Kandang Kerbau Hospital, and after a period as medical officer in charge of officials he became assistant radiologist at the General Hospital, Singapore. In 1948 he was appointed radiologist and medical director of the Singapore Antituberculosis Association and continued in this dual capacity until 1955, when the appointment of a radiologist enabled him to devote his whole time to his greatly increased responsibilities as medical director, work which he carried out with ability, enthusiasm, and far-sightedness. The growth of S.A.T.A.'s clinic, the steady expansion of its services, and the efficiency of its organization have been contributed to by many, but it was Dr. Garlick's vision, tenacity of purpose, unremitting toil, and human interest which built up in Singapore an institution worthy of the cause it serves. The clinic and its

services stand as a permanent memorial to his unselfish and humanitarian work. Those who had the privilege of working with him learned to know him as a man of thoughtful consideration, singleness of purpose, and unselfish endeavour; a man who acted and spoke, even at cost to himself, for what he believed to be right and in the best interests of the cause to which he devoted himself wholeheartedly.

H. E. HARGREAVES, M.R.C.S., L.R.C.P.
D.T.M.&H., D.O.M.S.

Dr. H. E. Hargreaves, who was a medical missionary in Persia for a quarter of a century, died suddenly on June 4. He was 60 years of age.

Henry Ellison Hargreaves was born at Bath in March, 1898, and was educated at the Stanborough Park Missionary Training College, Watford, where his studies were interrupted by service in the first world war. After demobilization he became a medical student at Charing Cross Hospital, qualifying in 1924. He then held the appointments of house-surgeon at Huntingdon County Hospital and resident medical officer at the Royal Victoria and West Hants Hospital, Bournemouth. In 1925 he went out to Persia as a medical missionary under the Seventh-Day Adventist Mission Board. The prevalence of eye diseases in that country stimulated his interest in ophthalmology, and while on periods of leave he studied the subject at Moorfields, obtaining the Diploma of Ophthalmic Medicine and Surgery of the English Royal Colleges in 1936. Earlier, in 1929, he took the D.T.M.&H. at the London School of Hygiene and Tropical Medicine. After 25 years in Isfahan, Sultanabad, Tabriz, and Tehran, he accepted an invitation to serve as medical secretary of the Australasian Mission Board of Seventh-Day Adventists, and in that capacity supervised the medical work of the denomination, especially in the islands of the South Seas. In 1953 he joined the Commonwealth Repatriation Department in Sydney, in his chosen field of eye specialist, and held the position until the time of his sudden death from a coronary occlusion. He was much beloved by all those who knew him in Persia, England, Australia, and the South Seas. Unfailingly cheerful, he brought his strong Christian faith into all that he undertook. He leaves a widow, a son, and three daughters.

OLOF HULT, M.D.

Professor Olof Hult, the Swedish medical historian, died recently at Stockholm. He was 89 years of age.

Olof Torgny Hult, the son of a schoolmaster, was born in Stockholm on December 2, 1868, and educated there and at Upsala. He qualified in medicine in 1899, proceeding to the M.D. in 1914. He was in practice from 1901, specializing in gastroenterology. Appointed medical adviser to the Swedish Navy, he was personal physician to the Crown Prince, afterwards King Gustav V. Hult held teaching posts at the Karolinska Institutet in epidemiology (1916) and history of medicine (1924) and was given the rank of professor in the latter subject in 1934. In later life Hult devoted more and more of his time to the medical history of Sweden, being a pioneer in this field. He wrote accounts of the historical aspects of relapsing fever, plague, leprosy, scarlet fever, and other infectious diseases occurring in Sweden, and also contributed many biographies of Swedish physicians of the past. He was chairman of the medical history section of the Swedish Medical Society and a staunch supporter of the International Society for the History of Medicine. He married in 1902 Gertrud Rinman.

HELEN ASHTON, M.B., B.S.

Dr. Helen R. Ashton (Mrs. Arthur Jordan) died at her home near Lechlade on June 27, aged 66. She retired from the practice of medicine many years ago, but as a novelist she was known to many under her maiden name of Helen Ashton.

Helen Rosaline Ashton was born on October 18, 1891, the daughter of Arthur J. Ashton, K.C., Recorder of Manchester, and sister of Sir Leigh Ashton, formerly director of the Victoria and Albert Museum. After working as a V.A.D. in the first world war she decided to study medicine, qualifying from the London Hospital in 1921. In the following year she graduated M.B., B.S. at London University. Not long after she had completed resident hospital appointments at the Evelina Hospital for Children she married Mr. Arthur Jordan and gave up medicine. She continued, however, to write novels, and in 1930, with the publication of *Doctor Serocold*, she had her first major success. *Yeoman's Hospital* (1944) was later made into a film under the title of *White Corridors*. Besides novels Miss Ashton wrote a number of books about literary figures of the past, including William and Dorothy Wordsworth, Henry Vaughan, and Jane Austen. In many of her books she used her medical knowledge to advantage, though never displaying it obtrusively.

J. F. COATES, M.D., M.R.C.P.

The obituary of Dr. J. F. Coates was printed in the *Journal* of June 14 (p. 1424).

R. S. H. writes: The passing of Jack Coates exemplifies again the fallacy that "we are none of us indispensable." Jack Coates is irreplaceable. His characteristics were many. He was widely and deeply read, but his erudition was informed throughout with what can only be described as "lovingkindness." He was loved and trusted by his patients, by his colleagues, and by his staff. His enthusiasm was a very real thing, and more than one of us benefited by it continuously. He had wisdom and humility. We shall mourn him for a long time. Our sympathy for his widow is deep and lasting, but we should like to share, if we might, in the pride that she must feel for him.

Medico-Legal

"FAIR COMMENT"

[FROM OUR LEGAL CORRESPONDENT]

It is a function of the law of libel in England to hold the balance between the right of the individual to the protection of his reputation, and the interest of the community as a whole in the free propagation of news and opinion. This is fulfilled in part by the defence known as "fair comment," available to anyone against whom an action for libel is brought. The underlying principle is that the individual has to surrender part of his right where the circumstances of the publication complained of are such that the good of the community requires freedom to publish, if necessary at the expense of the individual's reputation. The interest of the community may require the individual to make such a surrender where the publication is made with no improper motive.

Price of being a Public Figure

Where libellous words are published in the form of comment upon facts which are truly stated and which are of public interest, those responsible for the publication have a good defence provided that the comment is fair and is made without malice. Part of the price which a man must pay for becoming a public figure is that he submits himself to criticism which may lower his reputation in the eyes of right-thinking people, and will have no redress provided it is fair, is made without malice, and is made upon facts truly stated. This defence of fair comment is of course a great help to the freedom of the press, though it is equally available to individuals and gives the press no higher or different protection than is enjoyed by anyone else.

A good example of its operation was given in the action recently brought (*The Times*, June 10 and 11) by Lord

Silkin against Beaverbrook Newspapers Ltd. and the editor of the *Sunday Express*. The *Sunday Express* had published a paragraph entitled "Sugar for Silkin," which criticized him by contrasting his speeches in the House of Lords against arming the Germans with the fact that he was chairman of the English company which distributed the Heinkel bubble car which was selling very well in England during the petrol shortage following upon the Suez crisis.

In his summing-up to the jury Mr. Justice Diplock said that after hearing the evidence they might think that it was not seriously contended that any of the facts in the article were misstated. A good deal was heard nowadays about the intrusion of the press into private life, but Lord Silkin the public man and his attitude towards Germany and the Germans was a matter of public interest on which the newspaper was entitled to comment. As to what was "fair," the limits were quite rightly very wide. People were entitled to hold and express strong views, which members of the jury might think to be exaggerated, obstinate, or prejudiced. The basis provided that those views were honestly held. The basis of our public life was that the crank, the enthusiast, could say what he wanted just as much as the reasonable man or woman. The true test was, was the opinion one honestly held by the writer? In a matter of this kind, relating to views held about Germany and the Germans, the jury ought to be extremely liberal because it was a matter on which men's minds were moved and they entertained very, very strong feelings. If they used strong language every allowance should be made for it.

The jury found in favour of the defendants, and judgment was entered for them accordingly with costs.

SUFFOCATION IN INFANCY

[FROM A PAEDIATRIC CORRESPONDENT]

Elsewhere in this issue (p. 104) a correspondent draws attention to those sudden asphyxial deaths in infancy which from time to time are the subject of coroners' inquiries.

To find a baby dead in its cot, without any previous hint of illness, must be one of the most shocking experiences a parent can undergo. In addition the publicity given to such cases, and the old tales of asphyxia from overlying and from soft pillows, add greatly to the anxiety of many mothers, especially with their first child.

True Cause of Death

How common are these cases? In his *Statistical Review*¹ the Registrar-General records that in 1956 in England and Wales 441 deaths in children under 1 year were registered as due to accidental mechanical suffocation (see Table).

Deaths in England and Wales in 1956 Registered as Due to Accidental Mechanical Suffocation

	Age at Death					Total Under 1 Year
	Under 4 Weeks	4 Weeks and Under 3 Months	3-5 Months	6-8 Months	9-11 Months	
Male	21	96	98	29	18	262
Female	25	63	64	21	6	179
Total	46	159	162	50	24	441

Two points stand out from these figures. One is that the great majority (83.5%) of these deaths occurred before the age of 6 months, but with no preponderance in the first month, when a baby is most helpless. This could be because the babies, as they get stronger and more mobile, turn over and push themselves into positions where asphyxia can occur. The other point is the remarkable preponderance of males in each age group, except the first. Both these observations have been repeatedly made in the past.

When a previously healthy baby is found dead in its cot suffocation is the first possibility that springs to the minds

of both relatives and doctor. This diagnosis condemns the mother to the agonizing thought that she may have been responsible for her child's death, that the position in which she put down her child was to blame. In Britain it is customary to lay an infant on its side, while in the United States the prone position is adopted, on the grounds that vomit is less likely to be inhaled. There is in fact no good evidence that the position in which a baby is laid down is ever responsible for its suffocation, at any rate after the first few weeks of life. In an infant of 2 months or more its position can be ruled out as the cause of death, and it should certainly be one of the first duties of a doctor to dispel from the parents' minds any idea that there may be reproach on that score.

In a recent case the asphyxia was attributed to a plastic bib becoming adherent to the child's face and obstructing its nose and mouth, and instances of other ways in which accidental mechanical asphyxia may occur are known, such as entanglement with the straps of a harness, passage of the head or body through the bars of the cot, and so on. A recent report in this *Journal*² concerned an infant in whom a "junior" aspirin tablet became impacted in the larynx, causing asphyxia. Another possibility—though purely speculative—is that regurgitation and inhalation of part of a feed might initiate laryngeal spasm and thus lead to asphyxia. Cyanotic attacks in infants are not rare and can occur when a baby is being changed or laid down immediately after a feed; in the ordinary way the child recovers as soon as it is turned over and patted on the back, but it is possible to see how an unattended infant might become asphyxiated.

Apart from asphyxia, however, much pathological evidence has accumulated in the past 20 years to show that a number of unexpected deaths in infancy have been due to acute and overwhelming infection, and statistical analysis of the place of death, whether in cot or bed, has been adduced by Swinscow³ in support of this. Carroll,⁴ writing from the office of the Chief Medical Examiner of Virginia, recently declared that "the diagnosis of suffocation . . . was no longer tenable. Better to make a diagnosis of unknown cause than to state that death was due to suffocation. . . ." Arey and Sotos⁵ think that the diagnosis of suffocation should not be made "simply because an infant is found dead, face down in bed, nor . . . because significant lesions are absent . . . at autopsy." On the other hand Barrett,⁶ in a carefully reasoned article, concluded that only a few cases of unexpected death in infancy are "due to fulminant infections caused by familiar organisms," although others might be due to unknown organisms or a virus: he thought that inhalation of regurgitated food into the lungs might be responsible for the majority.

It is thus clear—as was said in this *Journal* recently⁷—that the main cause of cot deaths is still undetermined. It also seems clear that a diagnosis of accidental suffocation should not now be made unless there is an obvious mechanical cause for it, and unless detailed histological, bacteriological, and perhaps also virological studies have been made at necropsy to exclude a fulminating infection. The view that these deaths may be due simply to the position of the child, without complicating circumstances, is no longer tenable.

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- ³ Swinscow, D., *ibid.*, 1951, **2**, 1004.
- ⁴ Carroll, G. J., *J. Pediatr.*, 1954, **45**, 401.
- ⁵ Arey, J. B., and Sotos, J., *ibid.*, 1956, **49**, 523.
- ⁶ Barrett, A. M., in *Recent Advances in Paediatrics*, 1954. Churchill.
- ⁷ *Brit. med. J.*, 1957, **1**, 1411.

The MINISTER OF HOUSING AND LOCAL GOVERNMENT has made an order setting up a statutory advisory committee to help to solve water supply problems in Kent. This is the first committee of its kind, and its members will represent both water undertakers and consumers in the county.

Medical Notes in Parliament

LORDS REVIEW OF HOSPITAL SERVICE

Divergent opinions on the system of merit awards were expressed in the House of Lords debate on the hospital service on July 2, when Lord NATHAN, who is chairman of the board of governors of Westminster Hospital, invited the House to review the 10 years since the National Health Service Act came into operation.

Lord MORAN enumerated three reforms which had come about. First, consultants had been decentralized and redistributed. They had also been greatly increased in number, and the patient could, without financial anxiety, call them to his home. Second, this decentralization had made possible the up-grading of hospitals throughout the country. The third great reform was concerned with the remuneration of specialists. The merit award meant that his material prosperity now depended on his professional efficiency.

Speaking on the finance of the Service, Lord Moran indicated that in his opinion the time might come when the regions might have to be given a sum of money and told to get on with it, to restore the spirit of economy that was prevalent in the voluntary hospitals and was not quite so evident to-day. He also hoped that the Ministry would take its courage in both hands and bid in the open market—the universities—for the men of promise, competing with the other professions.

He was not happy about the quality of the entry to the medical schools, though this was only an impression and had no roots in statistical facts. Lastly, Lord Moran spoke about discontent among general practitioners, which he attributed not to remuneration but to a general decline in status. The remedy—no doubt this was highly controversial—was that in time the pick of the general practitioners must follow their patients into hospital and would become part of the staff of the hospitals. He believed that to be the most important administrative move in the next decade.

Merit Awards

Lord UVEDALE OF NORTH END, who expressed a critical view of the merit award, also had something to say about the causes of dissatisfaction among doctors. He put first the loss of independence; the introduction of a State medical service had meant more supervision, more attention and records, and more reliance on methods of treatment recommended by the Ministry. The "family doctor," friend and confidant of the patient, was being replaced by the State practitioner. Another cause was the overcrowded surgeries that had resulted from the Health Service, and the increase in the cases of imaginary illness. The distinction awards to specialists should engage the attention of the House. In 1957 there were 2,343 specialists in England and Wales receiving them, at a cost of £2 million to the State. These were secret awards, a principle contrary to what had always been the conception of public policy. The system had been referred to in the medical profession as one of "diabolical secrecy." Where public money was spent the public should know how and why the liability was incurred.

Don't Starve the Teaching Hospitals

Lord EVANS, in a maiden speech, put in a plea for the teaching hospitals, for which he said little had been done in the past 10 years except the provision of funds to keep the machinery going. Out of the 12 in London only two—the Middlesex and the Westminster—had been rebuilt, yet many others were badly blitzed during the war. The comparative cost of the care of patients in teaching and non-teaching hospitals had been recently reviewed. To him the difference between the figures—£67 average cost per patient of a teaching hospital, compared with £41—was surprisingly small, and he could not agree with the Select Committee on Estimates. It must be absurd for the teaching hospitals

virtually to mark time until every other hospital caught up with them. It was essential to maintain the teaching hospital at the highest possible level, whatever the cost, if British medicine was to maintain its high standard.

True and False Economy

Lord AMULREE, viewing a considerable improvement in the hospital service in the past 10 years, was concerned lest too low a limit was placed on the amount of money available for future development. The need was to ensure that hospitals were run with as much economy as possible, not with as much saving of money as possible. Lord DOUGLAS OF BARLOCH presented the case of the senior registrars, and still more, he said, of the senior hospital medical officers, for improved salaries and better prospects of promotion. Viscount ASTOR thought the time had come for another inquiry into hospital administration, going deeper than that of the Guillebaud Committee, who seemed to have felt that they had to protect the service against a potential "Geddes Axe"; and the EARL OF CRANBROOK would include the whole of the administrative side of the Health Service Act.

For the Government, Lord STRATHCLYDE, Minister of State, Scottish Office, seemed to sum up policy and prospects in the assurance that the Government would do everything they could, while maintaining the health of the national economy, to enable the service to consolidate the progress it had made in the first 10 years—which he illustrated with a formidable array of statistics—and to make further advances in the future.

QUESTIONS IN THE COMMONS

Complaints Against Doctors

Mr. J. NIXON BROWNE, Under Secretary, Scottish Office, replying to a question by Mr. H. HUGHES (Aberdeen, North, Lab.) on July 1, stated that nothing in the new administrative arrangements relating to the Franks Report affected any existing rights of objectors and appellants to appear in person or be represented at inquiries or hearings.

Mr. HUGHES asked if that meant that persons making complaints against doctors in the Health Service might be legally represented at all hearings. Mr. BROWNE replied "No." The Franks Committee did not recommend such a change. All matters relating to Health Service procedure of this kind were under consideration, in consultation with the professions concerned.

Attack Rate of Poliomyelitis

Mrs. JOYCE BUTLER (Wood Green, Lab.) asked the Secretary of State for Scotland on July 3 what was the attack rate of paralytic poliomyelitis for children under 15 years, and for persons over 15 years for each of the years 1950 to 1957 inclusive. Mr. J. S. MACLAY stated that separate figures in respect of paralytic poliomyelitis were not available. Experience had shown that about 65% of all the notifications related to this form of the disease, and the following table gave rates on this basis:

Rates Per 100,000 Population		
	Children Under 15 Years of Age	Persons Over 15 Years of Age
1950	47.3	2.5
1951	11.7	1.5
1952	8.9	0.7
1953	15.3	1.2
1954	17.2	1.5
1955	25.5	1.8
1956	10.7	1.1
1957	6.1	0.9

He also informed Mrs. Butler that during 1957 notifications were received that poliomyelitis developed in eight of the 290,000 children who had been vaccinated in 1956 and 1957. Of these eight, only three were affected by paralysis in any degree. The total number of children under 15 who contracted poliomyelitis in 1957 was 122.

Duty on a Gift from U.S.

Mr. RONALD BELL (Buckinghamshire, South, Con.) asked the Chancellor of the Exchequer why an instrument designed for the diagnosis of bowel cancer and given for use at Amersham, Buckinghamshire, by the Memorial Center for Cancer and Allied Diseases, New York, was subject to long delay and to duty on admission to this country. Mr. J. E. S. SIMON, the Financial Secretary, stated that the gift of this instrument was both unsolicited and unexpected, with the result that additional information had to be sought and all necessary formalities completed after its arrival. There was no general exemption from Customs duty in respect of gifts, but he was looking into the possibility of making a concession in this particular case.

W.H.O. Malaria Fund

Mr. A. BLENKINSOP (Newcastle upon Tyne, East, Lab.) asked the Minister of Health on July 7 whether he would make a contribution to the World Health Organization's Malaria Fund. Mr. R. THOMPSON, Parliamentary Secretary, stated that it was not possible in present circumstances to supplement the contributions which the Government made to the regular budget of the World Health Organization. They were in any case already making substantial contributions in this field. Mr. BLENKINSOP asked him to recognize that there was an urgent problem, to attempt to get rid altogether of malaria, a chance that might be lost unless action was taken quickly. The regular budget of the W.H.O. did not provide anything like the funds needed. Why did the Government not follow the example of the United States, who had made a special contribution? Mr. THOMPSON replied that the Government need not stand in a white sheet. They contributed heavily to United Nations funds, but were opposed to the creation of special funds.

Dr. Percy Stocks's Report

Mr. B. JANNER (Leicester, North-west, Lab.) asked the Minister what action he proposed to take on the report by Dr. Percy Stocks to the British Empire Cancer Campaign following his survey of cancer incidence in North Wales and Liverpool (see p. 99); and whether he would arrange for similar surveys to be carried out officially in other parts of the country. Mr. WALKER-SMITH said he understood that cancer research under official auspices was already devoting much attention to epidemiological studies of the causes of cancer with similar aims to those pursued by Dr. Stocks. He did not think that the publication of his results, interesting as they were, called for any special action by him.

Drink and Road Accidents

Mr. G. PAGE (Crosby, Con.) asked if the Minister was able to indicate an early date for the publication of the report from the Medical Research Council on the relation of drink and road accidents. Mr. WALKER-SMITH: The report on the experimental work upon the effect of alcohol on the skill of drivers of motor vehicles has now been considered by the joint committee appointed by the Medical Research Council and the Road Research Board, under whose auspices the work was carried out. It is at present undergoing revision, and will be published as soon as possible.

Imported Egg-whites

Mr. BLENKINSOP asked the Minister what action he was taking to ensure that imports of egg-white were fully inspected before release to manufacturers. Mr. THOMPSON informed him that port health and other local authorities had been asked to pay special attention to the sampling of had been asked to pay special attention to the sampling of imported egg products for bacteriological examination. At present the authorities tried, whenever possible, to sample every batch. It would not, of course, be practicable to sample every tin.

Morphine at Port Medical Centres.—After consultation between the Home Office and other Departments the Home Secretary has decided, as a special case, to authorize the keeping of supplies of morphine for use by nurses in an emergency at port medical centres where suitable safeguards can be arranged. Details will be settled as soon as possible in consultation with the Port Health Authorities and the Port of London Authority.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending June 21 (No. 25) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	0	0	1	0		4	0	5	0	
Dysentery	838	60	198	12	6	489	38	194	5	1
Encephalitis, acute	2	1		0		8	0	0	0	
Enteric fever: Typhoid	4	1	0	0	1	3	0	0	0	
Paratyphoid	4	0	2(B)	0		7	2	0	0	
Food-poisoning	279	75	9	1		225	28	34	0	
Infective enteritis or diarrhoea under 2 years				11	22				20	18
Measles*	6,108	515	160	89	34	22,144	752	164	198	100
Meningococcal infection	16	1	8	0		16	1	5	2	
Ophthalmia neonatorum	14	1	4	1		28	0	7	0	
Pneumonia†	214	21	126	12	1	312	23	138	2	4
Poliomyelitis, acute: Paralytic	22	0	12	1	4	61	4	4	5	2
Non-paralytic	14	2				44	3			
Puerperal fever‡	223	46	2	0		244	35	8	1	
Scarlet fever	657	49	92	30	14	357	31	57	23	25
Tuberculosis: Respiratory	554	42	131	24		627	77	127	20	5
Non-respiratory	99	6	18	4		84	6	16		
Whooping-cough	800	21	45	28	22	1,592	46	129	11	12

DEATHS	1958					1957				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	0	0		0		0		0		
Encephalitis, acute		0		0		0			0	
Enteric fever	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years	3	0	2	0	3	0	0	1	3	
Influenza	8	0	0	0	0	0	0	0	1	
Measles		0	0	0	0	0	0	0		
Meningococcal infection		0	0			0	0			
Pneumonia	34	24	13	4	6	14	16	3		
Poliomyelitis, acute	2	0		0	0	0		0		
Scarlet fever		0	0	0	0	0	0	0	0	
Tuberculosis: Respiratory	75	3	4	0	3	7	3	2	0	
Non-respiratory		1	2	0	2	0	0	0	0	
Whooping-cough	0	0	0	0	0	0	0	0	0	
Deaths 0-1 year	277	23	29	2	13	31	23	8	16	
Deaths (excluding stillbirths)	8,556	593	553	87	14	696	520	112	161	
LIVE BIRTHS	14,138	1190	995	206	350	1248	953	232	378	
STILLBIRTHS	289	14	21			20	20			

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

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

Week Ending June 28

Only small fluctuations occurred in the notifications of infectious diseases in England and Wales during the week ending June 28. The largest were a decrease of 82 for measles, from 6,108 to 6,026, and an increase of 35 for dysentery, from 838 to 873.

The largest decreases in the incidence of measles were 111 in Devonshire, from 256 to 145, 105 in Somersetshire, from 205 to 100, and 91 in Middlesex, from 474 to 383; the largest rises were 91 in Staffordshire, from 86 to 177, 78 in Sussex, from 155 to 233 (Littlehampton U.D. 98), 61 in Essex, from 178 to 239. The notifications of scarlet fever numbered 662 and were 5 more than in the preceding week; the largest variation in the local returns was a fall of 24 in Lancashire, from 103 to 79. The number of notifications of whooping-cough, 783, was 17 fewer than in the preceding week, and the largest variations in the local trends were increases of 24 in Monmouthshire, from 1 to 25, and 21 in London, from 21 to 42. Diphtheria reappeared, after a fortnight without a case, with 5 notifications; 3 of these were from Liverpool C.B.

All the 8 cases of paratyphoid fever were notified in Lancashire.

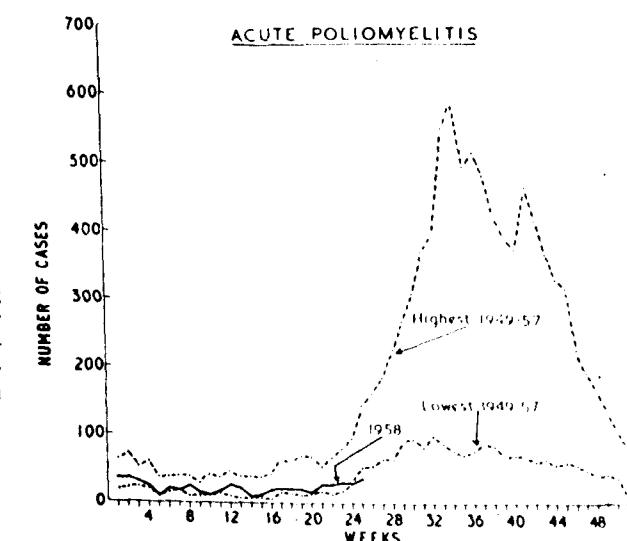
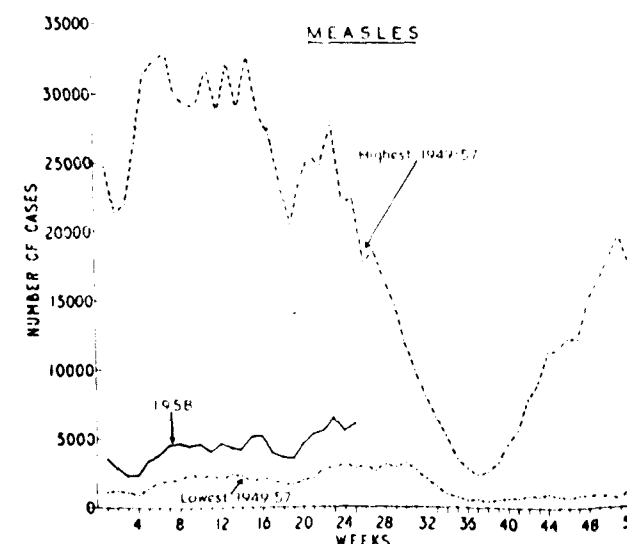
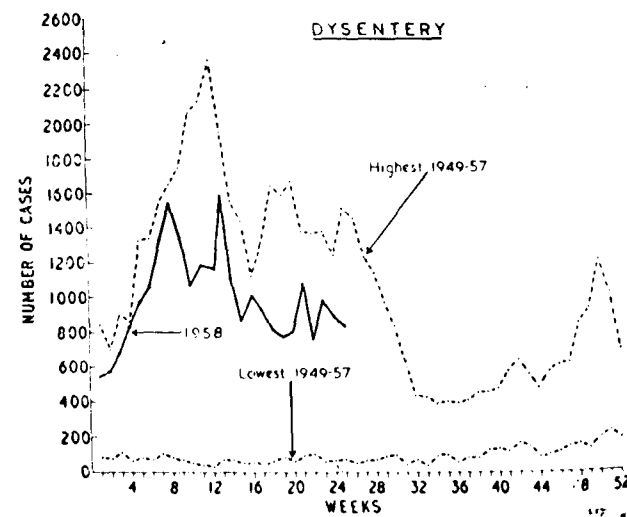
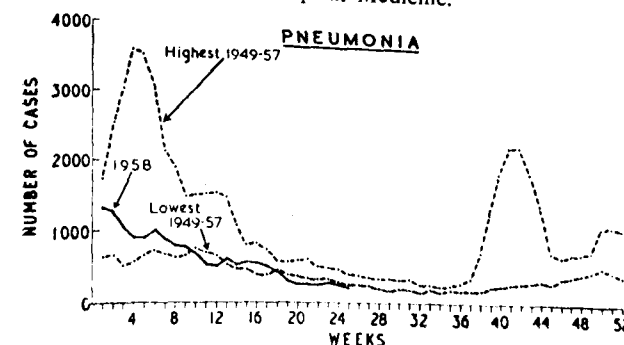
The notifications of acute poliomyelitis numbered 43; the 29 paralytic cases were 7 more than in the preceding week and the 14 non-paralytic were the same number. The largest returns were Yorkshire West Riding 12 (Leeds C.B. 3, Wakefield C.B. 2), Staffordshire 7 (Cheadle R.D. 6), London 4 (Islington 2), Lancashire 4 (Manchester C.B. 2), Yorkshire East Riding 4 (Driffield U.D. 4).

The largest centres of dysentery were Yorkshire West Riding 182 (Barnsley C.B. 45, Thorne R.D. 20, Sheffield C.B. 17, York C.B. 16, Huddersfield C.B. 15, Rotherham C.B. 12), Lancashire 169 (Liverpool C.B. 40, Preston C.B. 29, Manchester C.B. 17, Oldham C.B. 11, Rawtenstall M.B. 10), London 85 (Bermondsey 18, Islington 16, Camberwell 10, Southwark 10), Staffordshire 61 (Brierley Hill U.D. 17, Rugeley U.D. 17, Kidsgrove U.D. 11), Durham 47 (Hartlepool M.B. 22, Waikham U.D. 13), Shropshire 30 (Oswestry R.D. 17, Oswestry M.B. 13), Gloucestershire 29 (Bristol C.B. 29), Warwickshire 25, Middlesex 22, Yorkshire North Riding 22 (Middlesbrough C.B. 21), Hampshire 21 (Droxford R.D. 12), Cambridgeshire 21 (Cambridge M.B. 21), and Essex 21 (Walthamstow M.B. 11).

The largest outbreak of food-poisoning was 42 cases in Margate M.B.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus -----, the figures for 1958 thus ————. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



On July 3, after lecturing at the Middlesex Hospital Medical School on "Cancer of the Prostate," Professor CHARLES HUGGINS, of Chicago, was presented with the Comfort Crookshank award for cancer research. The award, which consists of a medal and cheque, is made triennially by the council of the Middlesex Hospital Medical School. This was the third time the award has been made.

Medical News

International Cancer Congress.—The Seventh International Cancer Congress opened in London on Monday, July 6, under the presidency of Sir STANFORD CADE. The congress is being held under the auspices of the International Union against Cancer. The opening ceremony was performed in the Festival Hall by the DUKE OF GLOUCESTER. After his installation as president by Professor J. H. MAISON, president of the International Union, Sir Stanford Cade delivered his presidential address, and the congress then adjourned for its scientific sessions. Over 2,000 delegates are attending the congress.

Chair of Surgery, Sheffield.—Mr. A. W. KAY has been appointed to the chair of surgery at Sheffield University in succession to Professor R. P. JEPSON. Mr. Kay is lecturer in clinical surgery at Glasgow and on the staff of the Western Infirmary. He graduated from Glasgow with honours in 1939, gaining the M.D. with honours and the Bellahouston gold medal in 1944, and the Ch.M. with honours in 1949. From 1941 to 1945 Mr. Kay was at the Western Infirmary in various capacities. He then spent two years in the R.A.M.C. in charge of a surgical division at Millbank, afterwards returning to the consultant staff of the Western Infirmary and a lectureship in surgery at Glasgow University. Mr. Kay has written on gastro-enterological subjects and on the treatment of shock.

Royal College of Surgeons.—Mr. F. W. HOLDSWORTH, of Sheffield, and Mr. J. CRIDLAN BARRETT, V.C., of Leicester, were elected to the College council on July 3. Mr. E. W. RICHES and Sir ARTHUR PORRITT were re-elected to the council at the same time.

Royal Medico-Psychological Association.—The association's 118th annual meeting was held in London from July 1 to 4 under its president Dr. L. C. COOK, physician superintendent of Bexley Hospital. The scientific part of the meeting included sessions on the selection of patients for out-patient psychotherapy, experimental studies on the regulation of sexual activity, and physical treatment; a visit to Bexley Hospital; and sectional meetings on child psychiatry, mental deficiency, and psychotherapy and social psychiatry. The annual dinner on July 2, under the chairmanship of Dr. Cook, was attended by some 200 members and guests. In proposing "The Guests" Dr. W. GORDON MASEFIELD welcomed first two distinguished colleagues from the United States, Professor L. J. MEDUNA, of Chicago—"pioneer of convulsive therapy and our most recent honorary member"—and Dr. L. B. KALINOWSKY, of New York. Miss PAT HORNSBY-SMITH, deputizing at short notice for the Government Chief Whip, Mr. Edward Heath, responded, and delighted her audience with the account of her new duties at the Home Office. She still had her links with psychiatry, she said, as both the Royal Commission's report on the law on mental illness and the Wolfenden Report concerned her department. Lord MONCKTON, himself a former chairman of St. George's Hospital, and whose wife is at present a governor of St. George's and also of the Bethlem Royal and Maudsley Hospitals, proposed the toast of the Royal Medico-Psychological Association. Founded in 1841, it was the oldest association of its kind. Its membership, now 1,700, was increasing at a rate of 100 a year. Dr. COOK replied to the toast.

Birmingham Mental Hospitals.—On June 26 two new 40-bed pavilions at Hollymoor Hospital, Birmingham, were opened by Dame ENID RUSSELL-SMITH, Deputy Secretary, Ministry of Health. To mark the occasion the Birmingham No. 6 Group Hospital Management Committee has published an illustrated booklet about the modernization of Rubery Hill and Hollymoor Hospitals, both mental hospitals, and the difficulties which beset such endeavours in old and outdated buildings.

Music in Hospitals.—In 1956, following a transatlantic example, a society was formed in Britain to foster interest in music therapy in hospitals, and to assist hospitals by providing the services of professional music therapists. This society, now the Association for Music Therapy in Hospitals, held its first annual meeting in London recently. Last year over £3,000 was raised towards the cost of therapists' fees. The chairman is Lady MONCKTON, and Dame MYRA HESS is chairman of the artists' committee. The association's office is at 50, Belgrave Road, London, S.W.1.

Jerusalem Ophthalmic Hospital.—Despite the Suez crisis and difficulties due to the use of converted buildings, work at the ophthalmic hospital of the Order of St. John of Jerusalem continued satisfactorily last year, it is stated in the annual report. Sir STEWART DUKE-ELDER, the hospital, visited the Middle East, and progress was made with the building of the Warden's House and the Sisters' Home for the new ophthalmic hospital. Members of the research team studying trachoma virus moved from Jordan to the Gambia and London, where the work was continued. While in Amman Sir Stewart Duke-Elder received the Star of Jordan (first class) from KING HUSSEIN.

Haemolytic Disease of the Newborn.—A pamphlet on the aetiology, antenatal diagnosis, and management of haemolytic disease of the newborn is being circulated to all N.H.S. general practitioners and M.O.H.s. The pamphlet, which was prepared by the standing medical advisory committee of the Central Health Services Council, opens by stating that the condition causes each year 300 neonatal deaths and 400-500 stillbirths; and ends: "Planned action can save some 150 liveborn infants annually, and possibly a small number of stillbirths."

Harveian Society of London.—£3,000 has now been raised towards the restoration of the tower of Hempstead Church, Essex, where William Harvey's remains are buried. Mr. A. DICKSON WRIGHT announced this after a service there during the society's annual summer meeting last month.

Hospital Car Service.—Last year 1,836,000 patients were transported over 15 million miles by the Hospital Car Service. Some 5,000 owner-drivers in England and Wales belong to the service, and they do this job in their spare time. The service grew out of the wartime Voluntary Car Pool, and it is organized by the St. John Ambulance Brigade, the British Red Cross Society, and the Women's Voluntary Service for Civil Defence. It is intended for patients who are not fit enough to use buses or trains, the great majority being those needing regular treatment. The work is undertaken at the request of local authorities, who pay a small mileage rate to cover running costs.

Amateur Boxing.—The London Amateur Boxing Association has produced a booklet describing its "London Medical Scheme," for the convenience of boxing clubs. The aims of the Scheme are defined as: (1) To prevent any boxer competing who is not physically fit to box; (2) not to prevent any boxer from competing who is physically fit to box; and (3) to ensure that an injured boxer has completely recovered before recommencing boxing. The booklet discusses the medical examination, the medical record card, and the welfare of boxers. Copies are obtainable (price 1s.) from the L.A.B.A., 69, Victoria Street, London, S.W.1.

W.H.O. in 1957.—The director-general's report to the Eleventh World Health Assembly, which ended on June 13 in Minneapolis, has now been published as No. 82 in the series *Official Records of the World Health Organization*. It describes the work of the World Health Organization in 1957. The report is obtainable from Her Majesty's Stationery Office (price 6s. 9d. net).

Commonwealth Bursaries.—Professor T. GILLMAN, professor of physiology at Natal University, Professor R. J. ROSSITER, professor of biochemistry at the University of Western Ontario, and Dr. T. B. TEOH, lecturer in pathology at Hong Kong University, are among the 13 scientists whose awards under the Royal Society and Nuffield Foundation

NEW ISSUES

SPECIALIST JOURNALS AND ABSTRACTS

The Journals listed below are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Venereal Diseases.—Issued quarterly (£3 annually). The new issue, Vol. 34, No. 2, includes:

COMPARISON OF THE IN VITRO SENSITIVITY OF GONOCOCCI TO PENICILLIN WITH THE RESULTS OF TREATMENT. F. R. Curtis and A. E. Wilkinson.
RESULTS OF LOCAL CORTISONE THERAPY IN SYPHILITIC INTERSTITIAL KERATITIS. A. N. Ashworth.
PRELIMINARY EVALUATION OF THE TRYPANEMAL WASSERMANN REACTION. I. N. Ordwood Price.

PREVALENCE OF VENEREAL DISEASE IN PROSTITUTES. T. Rosenthal and J. Vahdow.

EARLY SYPHILIS. A CASE WITH SOME UNUSUAL FEATURES. Gerald Knight.
ACUTE GONOCOCCAL AND NON-GONOCOCCAL URETHRITIS. W. V. Macfarlane and Hilda M. Johns.

EVALUATION OF THERAPY IN NON-SPECIFIC URETHRITIS. W. Fowler.
BOOK REVIEW.

SERO-REACTIVITY FOR SYPHILIS IN BOMBAY. M. D. Mungale, H. I. Jhala, and W. N. Welinkar.

ORAL PENICILLIN FOR GONORRHOEA. SOME EXPERIENCES WITH PHENOXYMETHYL PENICILLIN (PENICILLIN V) IN WHITE AND NEGRO PATIENTS. R. R. Wilcox.

FILARIASIS WITH CHYLURIA. J. K. Oates.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Tuesday, July 15

LONDON UNIVERSITY.—At St. Thomas's Hospital Medical School, 5 p.m., special university lecture in medicine by Dr. Frank Gerbode (U.S.A.): Some Aspects of Intracardiac Surgery.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—3.30 p.m., Professor I. S. Ravdin (Pennsylvania): Recent Advances in Blood Transfusion.

Wednesday, July 16

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. A. C. Cunliffe: Cutaneous Hypersensitivity.

Friday, July 18

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, Sheffield University. 2 p.m., 375th meeting.

CAMBRIDGE MEDICAL SOCIETY.—At Geography Department, Downing Place. 3 p.m., B.M.A. Lecture by Dr. R. F. Tredgold: Preventive Psychiatry.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. J. R. Bignall: clinical demonstration.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—4 p.m., Charles Tomes Lecture by Professor H. G. Radden: Local Factors in Healing of the Alveolar Tissues.

APPOINTMENTS

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—H. G. Smyth, M.B., B.Ch., Senior Registrar in Mental Deficiency and Child Psychiatry, Little Plumstead Group of Hospitals; N. A. Samaan, M.B., B.Ch., Dip. of General Medicine (Alexandria), M.R.C.P.Ed., Medical Registrar, North Cambridgeshire Hospital and Clarkson Hospital, Wisbech; S. S. A. Jaffery, M.B., B.S., Anaesthetic Registrar, Ipswich and East Suffolk Hospital.

EASTON, ALFRED L. T., M.B., B.Chir., F.R.C.S., M.R.C.O.G., Consultant Obstetric and Gynaecological Surgeon, London Hospital, Whitechapel, E.

HIRD, GORDON, M.B., Ch.B., D.P.H., Medical Officer of Health and Port Medical Officer to the Borough of Boston, Medical Officer of Health to the Rural District of Boston, and Assistant County Medical Officer, Holland (Lincs) County Council.

LEATHAM, AUBREY G., M.B., B.Chir., F.R.C.P., Part-time Assistant Consultant Physician, National Heart Hospital, Westmoreland Street, London, W.

MACGREGOR, G. A., M.D., M.R.C.P., Part-time Consultant Physician, Guildford Group of Hospitals.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Downie.—On June 7, 1958, at the Memorial Hospital, Chapel Hill, North Carolina, U.S.A., to Jean (formerly Paine) and Allan W. Downie, M.B., M.R.C.P., a sister to Susan, Robert, and Timothy—Katherine Marie.

DEATHS

Berry.—On June 24, 1958, at The Corner House, Bramhall Park Road, Bramhall, Cheshire, Arthur William Berry, M.B., B.S., aged 76.

Booth.—On June 25, 1958, at his home, Long Acre, Hurn Way, Christchurch, Hants, Norman Booth, M.B., B.S., aged 75.

Evans.—On June 20, 1958, in Jersey, John Jackson Whatley Evans, F.R.C.S.

George.—On June 16, 1958, at Harold Wood Hospital, Essex, Archibald Louis George, M.R.C.S., L.R.C.P., L.D.S.

Sinclair.—On June 20, 1958, at Southgate, Epping, Essex, George Ian Sinclair, M.B., B.Chir., aged 25.

White.—On June 1, 1958, at his home, Parklands, Edzell, Angus, James White, M.B., Ch.B., D.M.R.E., aged 44.

Wise.—On June 18, 1958, at Meopham, Kent, Harry Mortimer Wise, M.B., late of 206, Burrage Road, London, S.E., aged 85.

Commonwealth Bursaries Scheme were announced this month. Professor Gillman and Dr. Teoh will come to London, and Professor Rossiter will go to Canberra.

Anglo-French Exchange Bursaries.—The following have been awarded bursaries for work in France under the exchange scheme between the Institut National d'Hygiène, Paris, and the Ciba Foundation. All will work in Paris:

Miss J. Carey, demonstrator in pharmacology, St. Mary's Hospital Medical School, to the Institut Pasteur; Dr. Evan Fletcher, physician, City Hospital, Belfast, to the Hôpital Lariboisière; Dr. J. G. Howard, Wright-Fleming Institute, London, to the Hôpital Broussais; Dr. E. M. Jepson, medical registrar, Westminster Hospital, to the Hospice de la Salpêtrière; Mr. J. F. O. Mitchell, assistant surgeon, Royal Infirmary, Dundee, to the Hôpital Boucicaut and other E.N.T. clinics; and Dr. P. M. Peacock, fellow in pathobiology, Johns Hopkins Hospital, Baltimore, to the Institut Gustave Roussy.

Laboratory Animals Bureau.—The bureau's title and address have been changed to the Laboratory Animals Centre, M.R.C. Laboratories, Woodmansterne Road, Carshalton, Surrey (telephone: Wallington 5512).

Lord Stamp, professor of bacteriology at the Postgraduate Medical School of London, has been accorded the honorary Freedom of the Barbers' Company.

COMING EVENTS

The R.M.B.F.—The annual general meeting of the Royal Medical Benevolent Fund will be held on July 30 at 5 p.m. at 11, Chandos Street, London, W.1.

Blood Transfusion.—Professor I. S. RAVDIN, of Pennsylvania, will lecture on "Recent Advances in Blood Transfusion" at the Royal College of Surgeons of Edinburgh on July 15, at 3.30 p.m.

B.B.C. Television.—"Children in Hospital" in the series "Lifeline," July 17, 10.20 p.m.

International Congress on Psychotherapy.—Barcelona, September 1-7. Closing date for registration and for contributions July 31. Details from the Cátedra de Psiquiatria, Facultad de Medicina, 143, Casanova, Barcelona. The congress includes a Section on Psychopharmacology, details of which may be obtained from the Cátedra de Farmacología, Facultad de Medicina.

Course in Nutrition.—The International Children's Centre is organizing a course in nutrition for medical practitioners, to be held in Paris for four weeks from September 15. The course will be in French. Anyone interested should apply to Dr. NATHALIE P. MASSE, International Children's Centre, Château de Longchamp, Bois de Boulogne, Paris, 16.

7th International Congress on Hydatid Disease.—September 20-22, in Beirut, Lebanon. Details from Dr. ELIAS SADER, c/o Lebanese Order of Physicians, P.O. Box 640, Beirut.

British Veterinary Association.—Annual Congress in Douglas, Isle of Man, September 21-26. Details from the general secretary, 7, Mansfield Street, Portland Place, London, W.1.

Aviation Medicine.—Third European Congress, September 23-27 at Louvain, Belgium. Details from Dr. ANDRÉ ALLARD, Melsbroek Airport, Brussels.

Third International Congress of Angiology.—San Remo, September 24-28, on "Experimental and Clinical Pathology of the Peripheral Vascular Diseases." Details from the secretariat of the congress, c/o Clinica Dermatologica, Università di Pisa, Italy.

South African Paediatric Association.—Paediatric congress, October 16-18 in Pretoria. Details from Dr. E. FASSER, 201, Medical Centre, 319, Pretorius Street, Pretoria.

International Society of Audiology.—Sixth congress, October 2-5 in Italy. Details from the secretary general, Dr. CLERC, 45, Rue de Courcelles, Paris, 8.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Animal Fat-free Diet

Q.—What foods should be taken in a diet in which saturated fatty acids are replaced by unsaturated fatty acids?

A.—Many commercial preparations are available containing very unsaturated fatty acids, such as linoleic acid, but a similar effect can be obtained by cooking in olive oil and consuming a small quantity of maize oil each day.

The following is a list of suitable foods, low both in animal fat and cholesterol content:

Cereals.—Bread, toast, crispbreads, waterbiscuits. Biscuits, cakes, pastry only if made with vegetable oil. All breakfast cereals, porridge. Rice, sago, semolina, cornflour, spaghetti.

Eggs.—Egg white (e.g., in meringues), apple snow.

Milk.—Machine-skimmed milk, fresh, tinned, or dried.*

Fats.—Peanut butter and vegetable oils only, such as olive oil, arachis (peanut) oil, corn oil, or sunflower seed oil.

Cheese.—Cottage cheese or home-made from skim milk.

Fish.—All kinds of fish, including shell-fish.

Meat.—Very lean meat, ham, chicken, rabbit.

Soups.—Clear meat, chicken, or vegetable soups only.

Vegetables, salads, fruits, nuts.—All kinds.

Beverages and sweets.—Tea, coffee, fruit juices. Boiled sweets, fondant, marshmallow. Sugar, glucose, jam, honey, syrup, marmalade, jellies. Vinegar, pickles of all kinds.

Fats to use on bread.—At present the only suitable vegetable fat is peanut butter. However, if great distaste is experienced, use a scrape only of butter or margarine.

*To obtain Machine-skimmed Milk:

London.—Contact the manager of the local Express Dairy, United Dairies, or London Wholesale Dairies, and give regular order.

Outside London.—Some large dairies supply skimmed milk; or write to Wilts United Dairies, Trowbridge, for nearest supplier. This wholesale firm covers many parts of England. Some farms have a separating machine.

Halitosis

Q.—What may be the cause of halitosis in a patient who has no infection in the mouth or respiratory tract?

A.—Offensive breath must come from either the nose, mouth, stomach, intestines, or the lungs, and one must exclude the possibility of chronic sinusitis, chronic tonsillitis, dental sepsis, oesophageal pouch, gastric stasis, and bronchiectasis. If these can be excluded the most likely remaining cause is absorption of volatile fatty acids from the intestines, which pass from the blood into the lungs. There is no reason why belched air should cause halitosis. It is merely ordinary air swallowed as the result of relaxation of the upper end of the gullet. Some passes into the stomach, but most of it inflates the oesophagus and is then brought up, often explosively.

Scorpion Stings

Q.—I have heard of a treatment for scorpion stings by a decoction made from scorpions themselves. Is it effective?

A.—Venomous animals are commonly resistant to their own venoms. For instance, the common European viper can withstand four hundred times, and the tiger snake no less than one hundred and eighty thousand times, the dose of its own venom lethal to a guinea-pig. The mechanism of this protection is not understood. Antitoxins to homologous venoms have, however, been reported from time to time in the sera and body fluids of certain snakes, scorpions, and spiders, and neutralizing substances to its own venom,

believed to be auto-antibodies, have recently been demonstrated in the liver and serum of *Heloderma*, the Gila monster.

Nevertheless, the employment of various anatomical parts, physiological fluids, or extracts of poisonous animals for the relief of symptoms of envenomation, although ancient and widespread, is largely futile. Active antivenins can, however, often be prepared from the venom itself. Venoms of scorpions, extracted from excised venom sacs or discharged by electrical stimulation of the end segments of the abdomen, are now used for the production of antivenins, usually in horses. Such antivenins are relatively specific, but sera with fairly wide neutralizing powers have recently been prepared in South Africa, North Africa, Egypt, Turkey, South and North America. They are usually given intramuscularly or subcutaneously. Successful antivenins have also been prepared from spider venoms, especially those from *Latrodectus* spp. (including the black widow). These are potent and specific.

Goat's Milk

Q.—Has goat's milk any advantages over cow's milk for normal healthy adults, children, and babies?

A.—Goat's milk is similar in composition to cow's milk. The fat content, some 4.5%, is much the same as in the milk of Channel Island breeds, but higher than in the milk of Friesian and Shorthorn cows. Goat's milk looks whiter than cow's milk because it contains hardly any carotene, and its vitamin A activity is derived almost solely from vitamin A. In the nutrition of normal people the milk of the two animals may be taken as of equal value, it being understood that both are so treated as to be bacteriologically safe. In allergy to cow's milk, goat's milk may be used to advantage. The vitamin B₁₂ content of goat's milk is decidedly lower than that of cow's milk, but it is not known whether this low content is in any way connected with "goat's milk anaemia" sometimes observed in infants reared on goat's milk.

The principal pathogenic bacteria to be found in cow's milk as secreted—i.e., as the result of disease of the animal—are the tubercle bacillus and *Brucella abortus*. Goats rarely suffer from tuberculosis, but their milk may contain *Brucella melitensis*, which causes a rather more severe form of undulant fever than does *Brucella abortus*. The milk of either animal may become contaminated after milking with other pathogenic bacteria, such as those of the enteric group.

Digital Fungoid Infection in a Cook

Q.—A cook in a canteen has a chronic fungoid infection of most of her fingers. What are the risks to others?

A.—No doubt if this cook handles food some fungal elements will be deposited on the food. However, no secondary growth is likely to take place and such contamination will not give rise to food-poisoning. If the cook uses the same towels and handles dish-cloths, etc., which are used by her co-workers there is no doubt a risk that she will pass the infection to them.

The treatment of such a condition is difficult and indeed often fails. It depends upon the efficient application of fungicide ointments, of which Whitfield's is as good as any. The hands should be kept bandaged, or alternatively cotton gloves may be worn, so that plenty of the ointment will remain in contact with the skin. In many such cases there is also an infection of the feet and possibly of the finger- and toe-nails. These other sites of infection should be sought out and treated at the same time.

Trigeminal Neuralgia

Q.—What is the treatment of trigeminal neuralgia?

A.—The term trigeminal neuralgia is sometimes used inaccurately to include a great variety of scalp and face pains. Genuine trigeminal neuralgia is characterized by sudden stabs of lancinating pain which "paralyse" the patient

while they last, and which are referred to the distribution of the trigeminal nerve only. A similar pain may develop in association with disease of the teeth, gums, the temporomandibular joint (Costen's syndrome), or tumours of the Gasserian ganglion, and can be relieved by attention to the local lesion.

When local abnormalities have been excluded, relief of pain often becomes the first consideration, and it should be emphasized that severe cases can be relieved only by blocking the branches of the nerve concerned, and this is in general by far the most useful measure. Usually the nerve must be blocked by alcohol or sectioned by a surgeon, but there is much to be said for repeated procaine blocks in less severe cases. Such local analgesia may be followed by relief of pain for several days, or even weeks, and it may be repeated as often as desired. This procedure also produces the numbness which the patient will have to tolerate if the nerve is cut, and lets him appreciate what to expect. Simpler methods include frequent self-administered massage or galvanism to the sensitive areas when the pain is absent. Protecting a sensitive area lowers pain thresholds, while vigorous counter-irritation does the opposite. Drugs are of limited value, but some mild cases seem to benefit from large doses of vitamin B₁₂ or vitamin B₁.

Antibiotic Level in Blood Stream

Q.—Is there an accurate method of estimating the level of antibiotics in the blood stream, particularly of streptomycin?

A.—Some antibiotics, such as chloramphenicol, can be assayed by a chemical method, but for most such examinations it is necessary to determine the highest dilution of the serum or other body fluid which will inhibit the growth of a standard sensitive organism. A control series of tubes containing known dilutions of the antibiotic is inoculated in the same way. Since doubled dilutions are usually employed, this is not an accurate method, but it serves to show whether adequate or excessive concentrations are being attained by the treatment employed. Different species of organism are used for the assay of different antibiotics: that usually adopted for streptomycin is *Kl. pneumoniae* (Friedländer's bacillus). If a more accurate method is desired, a similar test can be done, but instead of reading an absolute end-point the degree of reduction of growth in borderline tubes can be estimated by turbidimetry. An alternative is the cylinder plate method, in which dilutions of the fluid to be tested and of a standard solution of the antibiotic are placed in cylinders on plates inoculated with a sensitive organism, and the resulting zones of inhibition are measured.

Sunglasses

Q.—What are the best type of sunglasses? If polaroid are best, may they be worn permanently without ill effect? How do tinted glasses compare with those that are made of transparent metallic mirror?

A.—The best types of sunglasses are those which absorb the sun's rays selectively and cut out the ultra-violet and infra-red rays while transmitting the visual spectrum. Suitable glasses of this sort are those made by Zeiss ("umbral" and "uropol") and also the various tints of Crookes lenses. Chance's Crookes sunglasses are preferable, as they maintain the old Crookes standards. The name Crookes is no longer proprietary, and has been applied to improperly standardized products. Polaroid are quite good as plain sunglasses, but it is difficult to incorporate lens corrections in them and they are expensive. The ordinary dark glasses obtainable from chain stores are efficient in cutting off glare, but they impair visual acuity much more than the quality products for the same degree of protection. Metallic mirror glasses are useful for night driving, as it is easy to cover one segment only of a lens with sprayed metal. There is no selective absorption of rays, however, and as sunglasses they are not very efficient.

"Premenstrual Spotting"

Q.—What is the cause of premenstrual spotting, and is there any satisfactory treatment?

A.—Premenstrual spotting in an otherwise normal woman may occur as a functional disorder, the underlying fault being said to be "irregular ripening of the endometrium." It is postulated that this can be the result of (1) poor function and early breakdown of the corpus luteum, or (2) failure of the endometrium and its vascular apparatus to respond to a normal progesterone stimulus. In either case the endometrium does not develop the secretory phase to the full, or does so only patchily. This feature might be revealed by careful examination of many areas of endometrium removed by curettage at the time when spotting commences. If the endometrial response is at fault no treatment is likely to help. If the corpus luteum is defective then the administration of progesterone, 10-20 mg. intramuscularly daily for 7 to 10 days premenstrually, should arrest the bleeding. Ethisterone is unlikely to give a result unless given in very large doses. It is just possible that an oestrogen (say ethinyl oestradiol 0.05 mg. one to three times daily by mouth) premenstrually might also be effective, but the following period might be excessive. Either progesterone or oestrogen should be discontinued two days before the expected onset of a period.

The difficulty in this case, as in all cases of functional uterine haemorrhage, is that the diagnosis can only be made by excluding an organic cause in the uterus and ovaries. Inspection of the cervix to exclude an erosion and curettage and routine histological examination do not constitute a full investigation. Even some simple condition such as an endometrial polyp is often missed with a curette. Pelvic endometriosis is another possibility, especially if the patient suffers from dysmenorrhoea. Other investigations worthy of consideration are cytological study of cervical scrapings; cervical ring biopsy; hysterosalpingography; culdoscopy; and possibly assay of the pregnanediol excretion during the second half of the cycle.

NOTES AND COMMENTS

Pustular Psoriasis.—Dr. JAMES FAIRLEY (Newtown, I.W.) writes: Your expert ("Any Questions?" June 21, p. 1494) is certainly correct in stating that the treatment of this condition can be extremely difficult. To bind up the hands or feet with any ointment is a misery, and tar preparations can be particularly aggravating. After suffering myself for six years I got immediate relief and within a few days permanent cure on applying friar's balsam with tannic acid (pulv. acid. tann. gr. 60 (4 g.), tinct. benzoin. co. 1 oz. (28 ml.)). This is dabbed on and allowed to dry, and, if then the skin feels harsh and dried up, a little ung. aquos. or "nivea" cream may be applied. For the feet it is a relief to wear open-sided sandals.

Collected Articles from the "British Medical Journal"

The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

- Emergencies in General Practice* (26s. 9d.).
- Refresher Course for General Practitioners*, Volumes 2 and 3 (26s. 9d.).
- Clinical Pathology in General Practice* (22s. 3d.).
- Any Questions?*, Volumes 2 and 3 (8s. 3d. each).

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British Medical Association

ONE HUNDRED AND TWENTY-SIXTH ANNUAL MEETING, BIRMINGHAM, 1958

President's Address

REFLECTIONS ON MEDICAL PRACTICE

BY

A. P. THOMSON, M.C., M.D., F.R.C.P.

Professor of Therapeutics and Dean of the Medical School, University of Birmingham

Within my lifetime medical practice has been completely transformed. Progress in fundamental science and the development of technical skill in its application have changed the whole aspect of the venerable structure of empirical medicine which I explored as a student, and radical reconstruction has been necessary in many directions. It is not of these things, however, that I propose to speak on this occasion. The new knowledge, the new drugs and techniques, enable us to do much more for our patients: these things make our lives more interesting and satisfying, and we are grateful if at times uneasily aware of the difficulty of keeping pace with all of them.

My purpose is to direct attention to the increasing responsibilities that society imposes upon its doctors and to examine some of the consequences that may flow from a wider range of medical activity.

A Duty to Society

Early in the nineteenth century Jeremy Bentham conceived the idea that medicine had a duty to society as well as to individual patients, and he is the spiritual father of Preventive Medicine as it was developed by Thomas Southwood Smith, Edwin Chadwick, and John Simon. Despite their work it was not until 1899 that an Infectious Diseases Notification Act was approved, and it is salutary to recall the spirited resistance to it from those who believed that it infringed the passage in the Hippocratic Oath which proclaimed that whatsoever a doctor saw or heard in the course of his profession should not be published abroad.

Although the opposition to the notification of infectious disease now seems to us a little peculiar it was probably based on the same jealous, but not unhealthy, instinct to preserve the traditional relationship of confidence between a doctor and his patient that has stimulated criticism of much medical legislation in the past fifty years. However that may be, there is now no doubt that a doctor in clinical practice encounters types of responsibility which were never contemplated by Hippocrates, nor by the statesmen who advised her late Majesty Queen Victoria. His primary and ineluctable duty to ensure the best possible investigation and treat-

ment for his patient remains, but, in addition, he must often decide whether or not the issue of a certificate is warranted to obtain pecuniary benefit from the State or to justify absence from work; in many ways the doctor has become a custodian of part of the public purse, a sort of State almoner. Authority, not unnaturally, insists on supervision, so the cost of prescribing and the number of certificates become subject to comparison with the average of an area and a matter for inquiry if either appears to the Minister to be unreasonable.

It is not surprising that novel disciplinary checks of this kind caused resentment in many members of a profession bred in a long tradition of individual freedom, but I see no escape from them so long as a Welfare State remains the ideal of society.

We may justly plead, on the other hand, that administration should be flexible and tolerant and be guided by those who have first-hand knowledge of the difficulties and problems of practice. To a considerable extent, and particularly at certain levels, this has been achieved by the work of this Association and by the co-operation of doctors in the activities of executive councils, regional boards, and hospital management committees. It is disconcerting nevertheless that a general impression prevails that problems of policy tend more and more to be determined by officials in the Ministry of Health who know little of the stress of clinical work and less of the human problems inherent in it. Is it improper in me to suggest that those in official positions at the Ministry might be refreshed by quitting the shelter of Savile Row to share, from time to time, the perplexing duties of a doctor in clinical practice in hospital or in the home?

The Supreme Problem

But contemporary domestic difficulties, important though they sometimes seem, are trivial in comparison with the supreme problem that now confronts the world—the danger of atomic war. Four years ago Lord Adrian, in his presidential address to the British Association, said bluntly that our fate was now squarely in our own hands, and he stressed the urgent necessity for increased knowledge of how the mind of man could be influenced to avoid the catastrophe of conflict. With great authority he pointed out that it was not likely that the most detailed knowledge of brain

physiology would help mankind towards living more peacefully, though it might achieve clearer heads and a more even temper. Our knowledge of human behaviour is based on simple empiricism, and there is a clamant need for the branches of social science to make dispassionate studies of what actually happens in human societies. In Lord Adrian's judgment these large-scale investigations were too important a plant to be left in the hot-house atmosphere of research institutions and Unesco teams, and he made a plea for the recruitment of more social scientists in the universities and added the critical comment that their methods were not yet sufficiently objective and precise.

With all that Lord Adrian said I think we would agree, and when I read his speech I wondered whether medicine had not a duty to take some part in the study of the most urgent problem of our day and generation. For, surely, there is no group of men better equipped and more advantageously placed to contribute to this work than the family doctors of this country. They enjoy the trust and confidence of the vast majority of their patients: the nature of their work admits them to the most intimate aspects of family life, often over long periods of time. They are already aware of many of the motives that determine human behaviour in society, but their knowledge is rarely recorded in permanent form and dies with them.

For this misfortune there are several reasons. In the curricula of most medical schools little attention is given to the functions of medicine in relation to society. The dramatic success of scientific methods in the treatment of individuals appeals to the young, and in teaching hospitals absorbs their attention so exclusively that they tend to ignore that large part of clinical practice which is not measurable in terms of science and which often has no relation to organic disease. The recent revision of the Recommendations of the General Medical Council will enable Licensing Bodies to amend their curricula if they wish, but to avoid any misunderstanding I feel it necessary to say that for my part I would not sacrifice the rigorous discipline of fundamental science in the training of medical students, because it constitutes the firm foundation for future progress and stimulates a critical approach to the problems that confront us. Opportunity should be found, however, to encourage students at some stage to examine the wider functions of medicine in society.

Signs of Renascence

The principal factor that limits any activity by practising doctors in this direction may be simply stated. Most of them are too busy and lack the leisure that is essential to independent thought and fruitful investigation. Despite this difficulty there are signs of a developing renascence of family practice, and we should pay tribute to the remarkable achievements of the College of General Practitioners in recent years. I suggest to the members of that College that they should consider an approach to university departments of social science to examine the techniques that have been developed for the study of human behaviour and the methods for recording information in forms suitable for analysis and in the hope that co-ordinated research may be established.

When I submitted the first draft of this address to the Editor of the *British Medical Journal* he was good enough to send me a report from the *New Scientist* (June 5, 1958) of a lecture by Canon Raven as Visiting Professor of the Philosophy of Science at the College of Medicine of the University of Cincinnati, Ohio. I quote a passage: "I should like to see the province of medicine extended; I should like to see certain departments of the great profession equipped to study the diseases of corporate life. I believe there is room here for the application of precisely the same skills in diagnosis and treatment which the social worker does not have and which the medical man does. I am not depreciating the work of the social worker at all. But I am suggesting that between sociology and medicine there might well be established the same sort of unity which has been established between psychology and medicine."

Canon Raven was particularly concerned with such things as mass hysteria, the ethics of advertising, and the publicity which established enthusiasms with so little factual basis. These are large and important problems admittedly, but I doubt if they are the most suitable for first attempts in joint research. It might be better for us to begin with humbler topics, and I suggest a few at random.

Topics for Research

There has lately been considerable controversy about the eleven-plus examination. Some have contended that the success of a child in gaining admission to a grammar school when its brothers or sisters fail may lead to intense and disintegrating stress in a family, and for this reason plead that all schools should be comprehensive. Is it true? I believe that family doctors could well supply the information necessary for rational policy. What exact knowledge have we of the effects of the employment of married women on their children and their homes? And who could supply more reliable information than the doctors of those families? Does moderate consumption of alcohol and tobacco contribute to the peace and happiness of family life or the reverse?

In a recent book Lord Pakenham reviewed the evidence on which we base our opinions about the problems of juvenile delinquency and criminal conduct. He found that there was very little factual information on which we could rely: opinions were often conflicting and little was done to establish truth. Has not medicine something to contribute in this direction? Family doctors see the delinquent from his birth: they are familiar with his environment and often with his descent.

Study of these matters and many like them might yield information of great practical importance, and in my judgment we, as doctors, should welcome any opportunity to take part in them. To be of value, however, such studies must be serious and not casual, and I fear they are impossible for most doctors in the present conditions of practice. Lists are too large and leisure too restricted to permit sustained effort, but it might be possible for this Association and the College of General Practitioners to find ways and means to sponsor a preliminary trial of a scheme for joint research by a team of family doctors linked with a university department of sociology, and it would be an interesting experiment.

Adventure of this kind, a study of human behaviour in society, would surely restore interest in another problem of fundamental importance which we share with the whole company of thinkers and which medicine, absorbed in the application of its new therapeutic resources, has neglected of late. What is the nature of man? How should we regard the individuals who consult us?

It is a hundred years since Charles Darwin published *The Origin of Species* and about forty since we became aware in this country of the work of Sigmund Freud, and I am fully conscious, like William James, that every opinion must be forged in the face of stubborn and irreducible facts.

The Basis of Continued Life

The broad conclusion from biology is that man to-day is what he is as the result of evolution, natural selection, and the invention of conventional speech and of symbols such as numbers and formulae which not only record and store his past experience and achievement for the benefit of future generations but also bring order to his conceptual thought and enrich it in every field of activity—in literature, art, mathematics, and science. To that we may add that all life depends on green plants, including, of course, the algae of the seas, for they furnish the food of animals and so the nourishment of man. Plants alone seem able to fashion the stuff of life—proteins, sugars, and fats—from stable inorganic material in the air and soil with no other help but the light of the sun. This wonderful photosynthesis is the basis of continued life, and not unnaturally it has been studied diligently. What seems to be emerging is that there

are chemical and physical phenomena common to the activity of plant, animal, and human cells, and much that is now mysterious will become clearer when we know more of the exact role of nucleic acids in living processes.

Man, it seems, is one with nature—not merely with the organic nature of plants and animals but also through photosynthesis with the inorganic world—he has emerged from it and belongs to it. Fifty years ago that opinion had little to support it. Physics and chemistry then were widely separate subjects and there was a gulf between the organic and the inorganic. Pasteur in the 1860's had shattered the hypothesis of spontaneous generation, and we believed that all living things came from living forebears. So, indeed, they do. But was it ever so on this planet? The atmosphere in which we now live is very different from that which surrounded the earth when it first revolved upon its orbit, and it is conceivable, nay almost probable, that conditions may then have favoured the formation of the protein molecule, the stuff of life, from inorganic material in a manner that would be impossible to-day. The identity of man with nature I do not find discouraging; he remains a manifestation of the creative energy that formed the cosmos, and each of us may be, as Rupert Brooke thought, a pulse in the eternal mind, no less.

If we admit the truth of that opinion, are we committed to the belief that all human conduct is determined by forces beyond the control of the individual; that we are passengers in the evolutionary car and have no say in its direction? The irrefutable facts to which I have referred suggest it may be so, and to these might be added the evidence from genetics, for it seems certain that the limits of personal potential are set by genetic constitution, though accident and environment may restrict or encourage its development.

Human Behaviour

Has clinical experience anything of value to add to the discussion of this problem? There are facts in medicine that appear to support the full determinist position. As physicians we are familiar with the disorder of behaviour and the deterioration of character that are a consequence of acquired pathological lesions or inborn errors of constitution, and we are tempted at times to believe that human tution, and we are tempted at times to believe that human personality depends solely on physical conditions. But the fact that in some cases disease overwhelms or distorts an individual does not prove that personality is determined by physical processes alone. On the contrary, is it not general experience that patients show an astonishing variety of attitude and response to illness? Many who are crippled by injury or disease radiate happiness and energy and accomplish much, while others in identical conditions give up the struggle and become a burden to themselves and their kin. This is the common stuff of our daily work, and surely it encourages a belief that free will and courage are not illusions and that to each of us falls the duty of choice in our behaviour. The Freudians to account for such variation in conduct invoke the subconscious, but, important as that may be, I am still persuaded that conscious resolution plays as large if not larger a part.

It may be argued, justly, that research by scientific method is still in its infancy and that as it proceeds it will win knowledge of material processes that determine human behaviour. Equally true is it that research may also reveal much about the self-conscious human individual which defies explanation in measurable terms of matter; the curious sense of guilt, for instance, and the inhibition which have no parallel in animals.

Whatever the future may hold I think it is fair to say categorically at the present time that our scientific knowledge does not warrant the assertion that human life is entirely determined by physical factors, though their influence is great, and our daily work as doctors intimates the existence of free will and the capacity for choice, which in some inexplicable way have "emerged" in the course of the evolution of a self-conscious human being.

My friend Professor Roy Pascal, with whom I discussed this matter, reminded me of *Dichtung und Wahrheit*, the autobiography in which Goethe made a determined effort to define the factors that had influenced him and made him what he was. At first he seems convinced of the dominance of the material: he even says at the beginning that if he had been born a year or two later he would have been a different man. Yet as he proceeded he became more and more impressed by the unpredictable element in his personality and life. In the last book he refers to it frequently. He calls it the "daemonic" element which surged up within him, involuntary and unaccounted for. "It was like chance, since it evinced no sequence of causality: it resembled Providence, for it hinted at coherence."

Conclusion

If, as I believe, we may properly at the present time act on the assumption that man is something more than a completely determined animal, an important conclusion about medical practice follows. The relationship between doctors and their patients is deeper than that entailed by the solution of scientific and measurable problems: it is in truth a personal relationship in which intuition, sympathy, and compassion play a considerable part. To avoid any misunderstanding let us acknowledge that most of the manifest achievement of recent years has been due to distinguished work in basic and clinical science, and that it is our responsibility to encourage all such work and to accept its verified conclusions, but we must never forget the large part of clinical practice which depends on qualities that science cannot yet measure and possibly never will.

Our duty is clear; we have to put at the service of the patient, when it is necessary, all the resources of scientific investigation and treatment, but, in addition, we have to maintain in him the personal interest and concern of a friend.

SITTING, STANDING, AND WALKING*

BY

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It must be clear that what has so far been said about the orientation of the body when attempting to sit might well be repeated for standing, and indeed for any activity in which the individual desires to assume a definite relationship with and towards the outside world; there is therefore no point in repeating all this to serve the same purpose. I propose, therefore, to consider the mechanism of standing upright and how this is upset in such interesting syndromes as the drop attack and syncope.

As in any postural activity, the peripheral mechanism is primarily of reflex order—simple stretch reflexes which are modified by the afferent nerves from neck muscles, vestibular organs, eyes, and so on. It is of interest to mention the important driving function of the muscle spindles and the so-called servo mechanism described by Hammond, Merton, and Sutton (1956), who have given a far-reaching explanation of continued smooth-muscle contraction at the tonic level and the part played by the cerebellum in this mechanism. This is discussed below, after some of the clinical cases have been considered.

*The second of two Oliver Sharpey Lectures delivered before the Royal College of Physicians of London on February 11 and 13, 1958. The first lecture appeared last week at p. 63.

Case 6

The first patient to draw my interest sharply to the sudden failure of the upright posture was a young soldier who was digging a slit-trench. The sudden noise of a passing aircraft upset him and he looked up to make sure it was not a dive bomber—for it was in the days when dive-bombing occurred. He fell at once into the trench. He soon picked himself up, apparently mildly confused, for he attacked the man next to him—very inefficiently—as he felt he had been struck down. He said he thought he had been hit on the back of the head or neck, and that it was for this reason that he had fallen. He was uncertain whether he had lost consciousness, but did not remember hitting the ground.

Full examination and investigation showed that he had a moderately large ependymoma of the fourth ventricle, and I interpreted the sudden falling or drop attack, as it may well be called, as due to sudden medullary compression producing loss of function in that vital region, rather than to a blockage of the flow of cerebrospinal fluid producing an acute hydrocephalus, as is said to occur in colloid cysts of the third ventricle. I did not attempt to decide how the loss of function occurred or to what the fall was due.

Case 7

Some four years later I saw a young man with this story. While running through a bulkhead opening on board ship he struck his head on the low beam and fell sharply to the ground. He remembers that his legs tingled a bit, but he soon picked himself up. He felt a little odd but thought this was due to the blow on his head, though he admits it was not very severe. The same thing happened a second time while playing some deck game. He again ran through an opening, struck his head, and once again fell to the ground and his legs tingled for a short time. This occurred on a troopship, and his companions were so intrigued that they tried the dangerous experiment of pressing on the top of his head. He said that this made his legs tingle and fold up. Fortunately they didn't try this more than twice, and seemed content to achieve a minor response. He was sent to hospital, and there I found that he had a mildly stiff neck and a very minor paraparesis with increased deep reflexes and equivocal plantar responses. There was no sensory change. In his previous history it appeared that while at school, aged 12, he dived into the shallow end of the swimming-pool and struck his head forcibly on the bottom. He was rendered powerless, but was pulled out and carried to bed. There he lay for 10 days unable to move or feel his legs, and with very feeble arms. He improved, however, and in four weeks was up and about, soon playing games, though with a stiff neck that lasted some months. According to the patient at no time were any investigations carried out.

On admission x-ray examination showed that he had an old fracture-dislocation of the odontoid peg which was rotated so that it lay at right angles to its former position with its apex pointing to the lower medulla. Tomograms showed that the medulla and upper cervical cord would have to carry out a considerable bend in order to negotiate the top of the odontoid. It was clear that each time he struck his head the violent impact squeezed the medulla and caused a failure of function, and the legs gave way. Close questioning disclosed no loss of consciousness or something so brief that the patient did not remember it.

Case 8

Some two months ago I saw a 30-year-old man who for two years had been having difficulty with his legs. They had become increasingly weak and he would tend to fall. In the last year he fell often, and if, as was usual, he pulled his head back to avoid striking his face on the ground, then his feet would get much weaker and fail to carry his weight, and if he were picked up he would fold up again. Usually he would ask to be left alone, and after three or four minutes he would regain enough power to pick himself up

and walk on. He said that if he put his head back voluntarily then his lower back and legs would tingle and his feet and legs would get weak so that he could not remain standing. Naturally, he never voluntarily carried out this manoeuvre long enough to produce falling. In its essence this case sounded very like that of the young man with the fractured odontoid; but, as this was 12 years later, I was able to plan some clinical investigations.

Straightforward examination showed that he had no abnormalities in the skull, but his neck could not be extended more than 10 degrees from the vertical before bringing on the tingling, which I suppose might be called the reversed electric sign of Lhermitte. There were no abnormal findings in the upper limbs. In the lower limbs there was a moderate spastic weakness with increased knee- and ankle-jerks, bilateral plantar responses, and about a dozen beats of ankle clonus. Sensory testing showed only a very minor impairment of sense of passive movement in the toes and of vibration sense on the feet, approximately equal on the two sides.

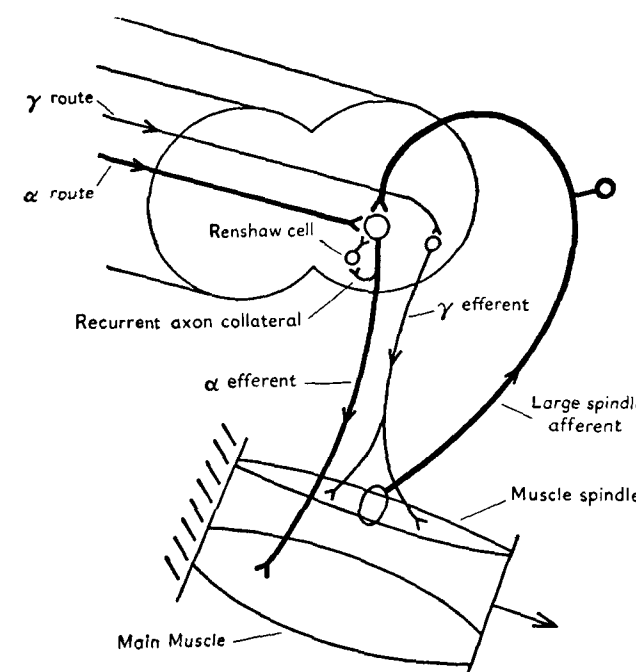
The experiment consisted merely of extending the neck so that tingling was just produced. The only change on examination, which of course had to be rapid, was of a slight depression of touch sensation in the feet. Whether this was genuine depression or merely due to the interference produced by paraesthesiae I cannot say. That ischaemic and post-ischaemic paraesthesiae interfere with sensory testing is well known, and the same may have been happening here. Gently and cautiously the head was taken a little further back. The patient was unaware of anything much happening except an intensification of his paraesthesiae, but his voluntary power was definitely impaired at the ankle and knee—mainly in the dorsiflexors and extensors and also, though not so much, at the hips—again mainly in the extensors. I must stress that this was all done hurriedly—that is, in a short period of time—and that no accurate measurements of power were made, but I had no doubt there was a real difference of power, and the patient had no doubt there was diminution. The deep reflexes remained brisk as before and the plantars were extensor, but tone was very definitely reduced, and the ankle clonus was abolished. Sensory testing showed further increase in the cutaneous impairment to touch and also for two-point discrimination, but the paraesthesiae had increased also.

All these results were confirmed on several occasions. The main point which emerged was that coincident with the onset of weakness there was a profound diminution of tone as estimated by the sense of resistance to passive stretch. Yet the deep reflexes and plantar responses were unaffected. This patient had a compressive lesion extending through the foramen magnum.

The Drop Attack

Here, for the first time, so far as I was concerned, appeared a possible explanation of the drop attack—that it might be due to a cessation of postural tone in the lower limbs. The weakness on voluntary movement was increased but did not appear sufficient to cause the sudden fall to the ground that occurs in the drop attack, the so-called idiopathic form of which is described below. On the other hand, there was the curious observation that the tendon reflexes remained as brisk as before and the plantar responses just as extensor. How can one reconcile these findings? Now, every clinical neurologist at some time or another has seen just such an apparently paradoxical combination and has had as much difficulty in explaining this as I had. Being brought up in the traditional school of neurophysiology which was developed by Sherrington, I believed that the deep reflex such as the knee-jerk was dependent on the degree of tone in the muscle stimulated—the more tone the greater the response, the less tone the smaller the response; in other words, that the deep reflex was a fractional stretch reflex. Yet here were tendon reflexes unaffected by the tone in the muscle. Definite hypotonia had been produced, yet the reflexes were as brisk as ever.

The answer has now been provided by the results of Merton and his co-workers in a series of brilliantly planned experiments both in animals and in man on the nervous control of muscular contraction (see Diagram). So important are these for a proper understanding of the drop



The muscle spindle lies in parallel with the main muscle and its fast conducting afferent is in synaptic connexion with the large α motor neurone supplying the main muscle fibres. A slow conducting γ motor efferent (thin line) supplies the contractile poles of the spindle and thus can alter the bias on the spindle sensory ending. The muscle can be made to contract either by impulses from higher centres exciting the α motor neurone direct (the α route) or by impulses in the γ efferents (the γ route) which activates the muscle indirectly via the stretch-reflex arc (the "follow-up" servo). A subsidiary feedback loop via the recurrent axon collateral and an inhibitory Renshaw interneurone may be concerned in stabilizing the response of the α motor neurone to its excitatory input. (From Hammond, P. H., Merton, P. A., and Sutton, G. G., *Brit. med. Bull.*, 1956, 12, 214.)

attack and the paradoxically increased deep reflex in the hypotonic limb that I make no excuse for summarizing them here.

A muscle is brought into action by motor impulses, but the degree of that contraction is estimated by sensory receptors in the muscle, and in the light of this information, called the "feedback," it modifies the rate of motor discharge. It is true that visual information may modify the motor discharge as may cutaneous impulses, but it is the muscle sense organs which play the major part in assessing or monitoring the performance of the muscles themselves.

The muscle spindles are the sensory organs of muscles. They lie among the main muscle fibres, having the same attachments and therefore altering in size with contraction or relaxation of the muscle itself. It must be remembered that the poles of these muscle spindles are contractile and receive very fine-fibred efferent supply, the γ fibres, whereas the main muscle fibres receive large or α fibres. The reflex connexions of the muscles are such that impulses set up by stretching the spindles excite the muscles' own motor neurones. Thus extension of the muscle results in an augmented contraction which tends to resist the extension. This is the stretch reflex of Liddell and Sherrington (1924). This has the properties of a closed loop self-regulating mechanism using information from the spindles to maintain a constant muscle length. It is clear that this has enormous advantages over a straight-through system in which posture

is maintained by a steady stream of motor impulses without sensory modification or feedback, in that it automatically compensates for changes in load or for fatigue.

This type of stretch reflex would maintain a fixed posture well, but it is clearly inflexible and needs modification for ease of changing muscle-lengths while maintaining postural tone. This modification is carried out by means of the contractile poles of the muscle spindles. The sensory portion of the spindle lies between these poles, hence shortening the poles by impulses along the γ efferents will stretch the sensory spindle so that the stretch reflex will be activated just as if the muscle itself had been stretched. The muscle will then shorten reflexly until the increased rate of spindle discharge has been offset, and that will be when the muscle has shortened to the same extent as the contractile poles of the spindle.

Merton and his associates have named the loop mechanism of the simple stretch reflex the "length servo" mechanism and the modification next mentioned the "follow-up servo."

Experiments have, however, shown also that in de-afferented limbs, in which this whole servo mechanism must be out of action, movements can occur without it: sudden movements almost invariably do through the α efferents to the muscle, and in further work Granit (1955) has shown that the cerebellum and associated structures determine whether the length servo or the straight-through mechanism is to be used in contraction. As Hammond *et al.* (1956) say: "This fits in with, and extends the current notion that the cerebral hemispheres decide what is to be done, and the cerebellum has the job of arranging how it is to be carried out."

We are now coming to the crux of the matter. There is evidence that even when the α route is used, the motor-neurone discharge is subject to servo control. Branches from the motor axons run back into the ventral horn and excite internuncial cells named after their discoverer, Renshaw (1941), which in turn inhibit the neighbouring motor neurones. It may well be that this mechanism provides the stabilizing influence on the motor-neurone pool. Certainly recurrent collaterals which might function in this way are to be found throughout the nervous system.

It has been shown that this Renshaw loop on the α fibres has an appreciable delay of some 2–5 msec., and therefore a brief afferent volley may pass through the loop while the sensitivity is high before the stabilizing influence of the collateral loop can be exerted; the tendon jerk gives just such a brief synchronous nerve volley and it need not necessarily be related to the status of tone in the muscle. In other words, the tonic mechanism is motivated through the muscle spindles and the γ efferents, the tendon jerk through the α efferents. The two are not necessarily related. The γ servo loop is under control from the cerebellum, and when the latter is put out of action this tonic mechanism will fail and hypotonia result. The brief synchronous afferent volley due to the tap on a muscle tendon will get through the motor unit pool and produce a brisk twitch, but the α fibre mechanism cannot respond as a tonic mechanism because of the controlling influence of the Renshaw loop. This comes into action too late to prevent the passage of the impulses necessary for a brief reflex response, but prevents a prolonged reflex response.

Considerable further evidence exists for the α and γ fibres in muscle. In 1919 it was shown by Liljestrand and Magnus that procaine injected into animal muscles abolished tone in the decerebrate state long before there was any alteration in either reflex response or that due to motor-nerve stimulation. In 1924 F. M. R. Walshe showed that injection of procaine into the muscles in Parkinsonism or spastic hemiplegia reduced the tone considerably but left voluntary power, if anything, rather better. This was interpreted by both authors as a selective knock-out of the afferents from the muscle. Recent work, however, has shown that the γ afferents are far more sensitive to procaine, and Matthews and Rushworth (1957a, 1957b) have found experimentally

that this is the probable explanation for the selective action in the previous authors' works.

A further most interesting finding indicating the separate nervous mechanism is that of Gilliat (1954), who produced peripheral nerve ischaemia by means of pneumatic tourniquets. In patients with severe pre-existing spastic weakness the diminution of muscle tone following local ischaemia may outlast any increase in muscular weakness caused by the procedure, and patients report improvement in the mobility and usefulness of the limb for several hours. This must be due to a selective action on the efferent tonic mechanism; in other words, the γ fibres.

Here, if we accept this work—and I have not quoted all the compelling experimental evidence on which it is based—is an explanation which will serve for the paradox of the hypotonic limb with brisk deep reflexes, and here, I would like to submit, is the explanation for the drop attack.

Clinical Description of Drop Attack

The clinical description of such an attack is of a middle-aged individual who for no obvious reason suddenly falls where she stands. Most, though not all, patients are sure they do not lose consciousness. There is no warning, and they do not try to save themselves because the whole episode is so sudden. They often say that they folded up at the knees, and many women have complained about ruining their stockings at the knees, which certainly indicates a falling forward and might support the folding-up suggestion. Many of these patients rise almost as soon as they have reached the ground, without confusion or disturbance other than being shaken by the episode, though some may hurt themselves during the fall or, if frail and elderly, they may well be very shaken and dazed. All these patients are quite sure that they do not trip, that they felt well before the incident, that only their legs gave way, and that they can continue walking as soon as they are on their feet again. Physical examination and investigation of these patients rarely reveals anything of note to explain the happening.

On the basis of Cases 6 and 7 I would like to suggest that it is the lower brain stem which is the site of the dysfunction that produces the event. The nature of the possible lesions are discussed below, but the mechanism is probably best explained on the lines suggested by the physiological work of Granit and of Merton. Interference at brain-stem level, with the connexions of the cerebellum, deprives the postural-tone mechanism of the control by γ -fibre servo loops which go out of action. This causes a failure of postural tone, and the individual folds up and falls to the ground suddenly. The α mechanism cannot take over at such short notice, and in any case is not suited, as has already been shown, to the maintenance of steady postural contraction.

Case 8, in which we could fractionate the drop attack, gives every indication that this hypothesis is feasible if no more, for we were able to produce definite hypotonia yet the deep reflexes were brisk, the former indicating a diminution in γ activity, the latter the integrity of the α pathway.

Given the site of the syndrome, what could produce such happenings? My three opening cases indicate that this can occur with compression of the brain stem. In each of these cases, however, the condition was reversible, which is an important feature of the drop attacks, and it is probable that the compression acted on the vascular supply. In each case a special manoeuvre to produce compression was necessary, and on reversing the process the condition was reversed. It is tempting to suggest that in most cases of this type of drop attack the mechanism is a transient change in the blood supply of the brain stem. There is some evidence that this may be so. In a recently described series of aneurysms of the vessels of the posterior fossa Dimsdale and Logue (1957) were very positive that weakness and collapse of the lower limbs were characteristic of the condition, while Williams and Grahame Wilson (1957) have shown examples of basilar atheroma in patients with the syndrome.

Syncope and Epilepsy

The other types of falling attack of major importance are, of course, those due to syncope and epilepsy, and these often need differentiation. The work of Sharpey-Shafer (1956a) has elucidated many of the mechanisms of syncope. He defines the condition as an acute decrease of the cerebral blood flow producing loss of consciousness. The rapidity of the decrease in flow determines the length of warning symptoms. In cerebral flow it is mainly the arterial pressure which is the governing factor, and when this falls below 50 mm. Hg for a few seconds syncope results. As the arterial pressure depends on the cardiac output and the peripheral resistance it is clear that a fall in either, or of both to a less degree, will be the mechanism involved. The compensating factors are the baroreceptor reflexes which usually keep the cardiac output and peripheral resistance working in opposite directions.

The clinical varieties may be split into several groups.

A. Decreased Filling Pressure and Stroke Output

Normally the diminished output in the upright position due to diminished filling of the heart is compensated by the baroreceptors, but standing for long periods on a hot day may cause overfilling of the lower veins and grossly decreased filling pressure, so that no amount of peripheral vasoconstriction can compensate for this and the individual faints. A rise of intrathoracic pressure as in the Valsalva manoeuvre will cause acute decrease of filling, depending on the height of the intrathoracic pressure, especially if there has been a degree of previous vasodilatation as produced by the warmth of a bed or a bath. Similarly, coughing (Sharpey-Shafer, 1953a) in the powerful short-necked man may raise the intrathoracic pressure high enough to prevent adequate filling of the heart and so decrease output-producing cough syncope.

B. Decreased Stroke Output

This is best seen in the Stokes-Adams syndrome. Here it must be said that if the cerebral anoxia is prolonged enough the convulsion will occur together with voiding of urine.

C. Decreased Filling Pressure and Stroke Output with Vasodilatation

This is best seen in squatting (Sharpey-Shafer, 1956b), for in this state blood is pressed out of the veins of the legs and cardiac filling pressure rises. This gives rise to reflex vasodilatation. If one then stands erect suddenly the hydrostatic fall of filling pressure and cardiac output takes place while this vasodilatation is still present, and this may be sufficient for a few seconds to lower the arterial pressure to a syncope level. This in a minor form is a very common happening.

D. Nocturnal Fainting

These cases are labelled nocturnal, though they need not occur strictly at night. They are, however, given a separate grouping because they are relatively frequent and almost always raise the problem of epilepsy. Usually the subject gets out of bed during the night to empty the bowel or bladder. In the normal person just getting out of bed alone usually has no effect, for the baroreceptors respond very rapidly and constrict the peripheral resistance, thus countering the vasodilatation produced by the warmth. If for some reason the baroreceptors cannot act, then this compensation cannot occur and fainting will result, often quite suddenly on assuming the erect position. Failure of baroreceptors can occur because of the effective use of ganglion-blocking drugs which break the efferent part of the pathway; extensive sympathectomies would do the same. Sharpey-Shafer (1953b) has shown that the pathway can be blocked on the afferent side of the baroreceptor reflex in diseases of the nervous system, such as tabes dorsalis. If after the subject jumps out of bed he empties the bowel there may be sufficient straining to constitute a Valsalva manoeuvre, and this, associated with the warmth vasodilatation, may be enough to cause syncope.

Standing to empty the bladder at night may produce syncope by another mechanism. My attention has been drawn to the pressor effect of the distended bladder by my colleague Dr. Roger Gilliat. This was shown in patients with spinal transection (by Guttman and Whitteridge, 1947), when distension of the bladder could give a blood pressure well over 200 mm. Hg. It may well be that, modified perhaps, this is effective in the whole man and that emptying the bladder reduces this pressor stimulus while the rest of the body is in a state of vasodilatation produced by warmth, and in the upright position may well lower the arterial pressure to a syncope level. There is no doubt that those of us who see many "fitters" and fainters are bound to see a fair number of cases that occur at night in these circumstances.

E. Reflex Fainting

This can be emotional or produced by pressure on the carotid sinus or the eye—the oculo-vagal reflex of Gastaut and Fischer-Williams (1957). In the former the characteristic feature is an acute peripheral vasodilatation taking place in the muscles, but there is associated pallor of the skin suggesting that the cutaneous capillaries are intensely vasoconstricted. With this there is a preceding gasp, a feeling of uneasiness, and nausea, and then the features of cerebral anoxia supervene. Sharpey-Shafer (1956a) points out that in fact there is a decrease of cardiac filling pressure before the vasodilatation, and postulates that owing to the decrease in filling pressure the afferents in the heart are stimulated which then sets off the rest of the reflex. Bradycardia occurs after the vasodilatation, and it is clear that the compensating reflexes are temporarily out of action. The intense vasoconstriction of the skin is due in part to liberation of the posterior pituitary vasopressin, and the skin may remain pale for many minutes after the attack and large amounts of the hormone may be found in the urine after either an emotional or a haemorrhagic faint (Taylor and Noble, 1950). It is interesting that patients with heart failure do not faint—which is attributed to the continued maintenance of the cardiac filling pressure.

Carotid sinus and ocular-vagal reflexes produce their effects by cardiac slowing or arrest and not by vasodilatation primarily. Where vasodilatation occurs it is due to the baroreceptors having been overcome. In Stokes-Adams attacks peripheral vasoconstriction is usual, as can be seen by the overswing of the arterial pressure during recovery.

The work of Gastaut and Fischer-Williams (1957) is most interesting in their attempt to separate syncope from epilepsy. They used the oculo-vagal reflex—that is, firm pressure on the eyeball—to induce syncope which resulted from reflex cardiac inhibition. They studied 100 patients who had had one or more attacks of loss of consciousness in association with pallor, sweating, nausea, malaise, and sometimes convulsions resembling grand mal, but in whom the resting E.E.G. was normal. They recorded the electroencephalogram, the electrodermogram, which measured the amount of sweating on the forehead, and the electrocardiogram.

They observed two types of syncope—the immediate and the delayed. The immediate occurs within one to five seconds of ocular compression and is due to reflex vagal inhibition of the heart. Delayed syncope may occur from 20 to 70 seconds after the compression, when the most important factor is vasodilatation with fall in blood pressure, though bradycardia or cardiac arrest may occur at the same time. These two forms may occur separately or follow one another in the same patient.

When cardiac arrest lasted three to six seconds there were no clinical or electrical abnormalities, but there was some desynchronization of the E.E.G., which is the usual finding with pain of any kind, and there is no doubt that ocular compression is painful. When cardiac arrest lasts about 7 to 13 seconds slow waves appear in the E.E.G., usually but not always associated with disturbance of consciousness. These slow waves have no resemblance to epileptic waves. The relationship of the slow waves to loss of consciousness varies from patient to patient: sometimes there may be complete unconsciousness from the beginning; sometimes there may be a minor absence only. If cardiac arrest lasts more than 14 seconds there is always complete loss of consciousness and then one or two myoclonic jerks. Following this the patient suddenly develops an intense generalized tonic spasm in extension with opisthotonos looking like decerebrate rigidity or a tonic posterior fossa fit. If the tone is different in the two sides then lateral deviation of the head may occur. During the time of the tonic phase the E.E.G. is absolutely flat with no rhythms appearing at all. The spasm lasts 10 to 20 seconds, and during this time heart beats reappear. Even if they appear at the beginning of the tonic spasm they do not prevent its evolution; once initiated it must go on to completion.

As soon as the spasm is over, slow bilateral large waves appear in the E.E.G. and again a myoclonic jerk may be found. This lasts 24 to 30 seconds. The rhythm takes several minutes to reach normality, however, and during this whole period the patient feels odd and faint. The loss of consciousness is certainly due to cerebral anoxia coming on rapidly owing to asystole in these patients, and the critical period of asystole is about 14 seconds. The tonic spasm in the seizure is regarded by these workers as due to a liberation of the reticular substance in the brain stem from the control of higher structure, together with a possible anoxic stimulation of the reticular substance itself. The flattening of the E.E.G. is interpreted as a cessation of function in the cortex which spreads downwards to involve all structures until the reticular substance is reached, where increased activity

takes place. This has been shown also in experimental animals (Ward, 1947). Slow synchronization of E.E.G. rhythm which follows is due to a recovery of the higher structures.

Gastaut and Fischer-Williams go on to analyse the difference between epilepsy and syncope with convulsion. They suggest that the tonic phase in both syncope and epilepsy is due to a similar overaction of the reticular substance in the brain stem. In syncope this is due to the cerebral anoxia causing cessation of function above this level with liberation of the lower structures, which may also be directly stimulated by the anoxia. In epilepsy the brain as a whole is functionally active, as can be seen by the abnormal rhythms in the E.E.G., and it is this epileptic activity which, occupying the brain as a whole, allows the liberation of the reticular substance to produce the tonic phase. The clonic phase of epilepsy is due to attempted inhibition produced in the cortex breaking up the tonic phase. This is impossible in syncope because the higher parts of the brain are functionally dead owing to the precipitating cerebral anoxia. This is an attractive hypothesis, but it still needs some further proof. Gastaut and Fischer-Williams make it quite clear, however, that on E.E.G. studies and on clinical inquiry syncope should be distinguishable from epilepsy. Some of these observations have been made before, though not the same interpretation has been put on them.

An intriguing example is given in the discussion which took place at the Royal Society of Medicine in 1950 on "fits and faints." This case was quoted by Symonds (1950), though the observations were made by Ashby and Denis Williams. The patient was referred as a case of epilepsy by a doctor who was an eye-witness of an attack. In hospital he had an attack, when the pulse stopped completely for 45 seconds. After ten seconds he had a fit, with rolling eyes, rigidity, and a few convulsive movements. In a subsequent induced attack the E.E.G. showed no epileptic activity. This, it must be admitted, is a very similar observation to that of Gastaut and Fischer-Williams. It makes the differentiation between fit and faint both easier and more difficult, for, apart from the E.E.G., the important difference is that of the presence of a true clonic phase in epilepsy, whereas in syncope only a minor myoclonic jerk may be seen. Most neurologists have been brought up on the classical writings of Gowers (1901, 1907) on epilepsy and have believed that frequent and chronic fainters will usually turn out to be sufferers from epilepsy. In fact, Gowers says that "if a patient faints often enough he is sure to have a fit some time." If this new work is accepted, then we must surely alter this sentence to, "If a patient faints often enough he is likely to have a tonic fit sometimes, perhaps an epileptic fit never."

Walking

We now come to walking, which I will deal with very briefly because it is again compounded of the various phenomena already discussed. We find that to walk straight requires the ability to stand straight and to transfer the weight from one leg to the other without any disturbance of equilibrium.

To walk accurately requires also a knowledge of where one's legs are, otherwise they go in the wrong direction, trip one up, and generally misbehave in a way that makes progression a hazardous process.

There must also be an effective mechanism to give information which will grade the amount of muscular contraction necessary to give a smooth performance. Of course, all this has to take place for artificial legs as well as for natural ones.

I saw a 50-year-old man who had a lower limb removed in the mid-thigh region for Buerger's disease. I had to see him for some trivial neurological condition while he was convalescing from this operation, and I saw him subsequently from time to time for the same reason. He was provided with an artificial limb, and eventually he learned to walk moderately well with this. He was brought to my out-patient clinic one day because of an attack—clearly a cerebral thrombosis—which had affected the arm on the side of his amputation. He had minor weakness only, but a moderate sensory loss affecting all modalities and making his hand very clumsy. He said he didn't know where it was or what it was doing. In fact, he now had the greatest difficulty in walking. One could, I suppose, argue that he had lost the sense of position in the artificial limb; which sounds absurd, although no more absurd than the amputee who suffers from chilblains on the toes of the leg which had

been lost. The clue was provided by the patient saying that after the stroke he had lost his phantom leg. This is the patient I mentioned in the first lecture as resembling the patient of Head and Holmes (1912) who lost his phantom after a parietal vascular lesion. From this patient it would appear that to walk adequately one must know the position of the limb in space, and, if one is walking on an artificial limb, then it is only effective if it is possessed by a phantom leg which supplies it with the knowledge that is necessary to make it function as a limb rather than just as a support, and an inefficient one at that.

The ataxic walk of the individual with severe cerebellar disturbance must be due in part to the inefficiency of the automatic grading of muscle effort produced by the disorganization of the γ fibre mechanism as already suggested in an earlier part of the lecture, and the use of the more forceful, but uncontrolled α fibre system, so that improper force is used. If one watches the feet of a patient with inadequate cerebellar control it is possible to see constant contraction and relaxation of the foot muscles going on, so that the toes are clawing into the ground—again this is due to the use of a nervous control not designed for the purpose.

There is, however, another side to cerebellar control, and that is equilibration. For it is possible to have the cerebellum so disorganized in its older part—the flocculo-nodular lobe which forms the greater part of the roof of the fourth ventricle—that there may be gross disorder of equilibration. The patient staggers violently from side to side and is quite unsafe on his feet. Yet on formal testing for cerebellar ataxia as in the heel-knee-shin test there is no disorder. This is because the control of the γ system is intact.

It is remarkable how difficult it is for the patient with a severely damaged cerebellum to compensate alone—how simple it is for the compensation to be effected by another. The patient who can walk only with a stagger from side to side may, if he links an arm with a normal person, walk reasonably well. I have seen such a patient do ordinary relatively sedate ballroom dancing apparently so well and so disproportionately to his ordinary walk that he came labelled as a hysteric.

It appears, therefore, that for the equilibration difficulty sufficient stabilization can be provided by another person, but only so long as the γ system is intact. I remember Riddoch demonstrating this with great verve and ending the demonstration by saying that "clearly one cerebellum was enough for two."

Fatigue

I am brought finally to a few words on fatigue in muscle performance, as in walking or in running. At one time the theory of fatigue in profound effort was attributed to fatigue in the central nervous system, but it has been shown that this is inaccurate, and that fatigue is a peripheral phenomenon due to the failure of the circulation to remove metabolic products of muscular contraction. This is easily demonstrated by fatiguing a limb and arresting the circulation at the moment of cessation of muscular contraction, when there will be no recovery of power until the circulation is established. This is evident as applying to severe effort, as when doing heavy muscular work, but it is also the case for skilled fine movements. It was found experimentally that in skilled tasks, even in the lightest such as writing, the muscles are often working nearer the limit of muscular endurance than is imagined, but that owing to the muscles' proprioceptive servo control fatigue is compensated for automatically until considerable fatigue occurs, when the muscle will suffer a relatively sudden breakdown in its performance.

Conclusion

I have dealt with certain aspects only of the means by which we sit, stand, and walk. These lectures have been really a consideration of not sitting, not standing, and walking very badly, but it is only by study of the dissolu-

tion of such processes that we can ever hope to elucidate the means by which we manoeuvre ourselves into a desired posture as when sitting; the means by which we maintain it, as when standing; and the means by which we co-ordinate all our muscular activity and keep the muscles contracting without overdue fatigue, as in walking.

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HAEMORRHAGIC THROMBOCYTHAEMIA

REPORT OF TWO CASES TREATED WITH RADIOACTIVE PHOSPHORUS

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Epstein and Goedel (1934) first suggested the term "haemorrhagic thrombocythaemia" for the bleeding disorder which is characterized by a persistently raised platelet count. Although bleeding accompanying thrombocytopenia is commonly seen in hospital practice, the association of haemorrhage and thrombocythaemia is extremely rare, and probably no more than 30 cases have been reported in the world literature. Fanger *et al.* (1954) reviewed 28 cases of thrombocythaemia, but in six of them haemorrhagic manifestations were not present. Hardisty and Wolff (1955) analysed the clinical and haematological features of 18 reported cases of haemorrhagic thrombocythaemia plus a further five of their own. Of these 23 patients, 19 were over the age of 40 and there were almost equal numbers of males and females. Bleeding most commonly occurred from the nose and alimentary tract, and,

although bruising was not uncommon, purpura was rarely observed. Blood loss invariably resulted in a hypochromic anaemia, and all cases showed a raised platelet count and leucocytosis.

In addition to bleeding, patients with haemorrhagic thrombocythaemia may have thrombotic episodes. Presumably, these are closely related to the excessive number of platelets, but the mechanism of the bleeding is unknown. Approximately half of the reported cases showed abnormal bleeding-times; otherwise the standard tests of haemostatic function were normal. Hardisty and Wolff (1955) found a qualitative deficiency of the platelets in their five cases, as evidenced by their behaviour in the thromboplastin generation test, but were of the opinion that this was not the only factor involved.

The object of this paper is to present clinical and haematological details, including investigation of the blood-clotting mechanism, of a further two cases of this rare bleeding disorder and to report the beneficial effects of treatment with radioactive phosphorus (^{32}P).

Case 1

A road-worker aged 58 was referred to the department of surgery of Leeds General Infirmary on October 9, 1956, because of chronic bleeding from the alimentary tract for at least six years.

A history was obtained of good health until 1944, when he began to have attacks of abdominal pain. They were at first infrequent, and he was not seen at hospital until April, 1950, when he was found to be anaemic and tender in the epigastrium and right iliac fossa. Occult bleeding from the bowel was detected, and blood examination showed: haemoglobin, 8 g./100 ml.; red cells, 3,410,000/c.mm.; colour index, 0.79; white cells, 16,400/c.mm. (polymorphonuclears 74%, lymphocytes 23%, monocytes 3%). Radiological examination of the alimentary tract failed to reveal any source of bleeding. A diagnosis of peptic ulcer was considered most likely, and treatment of the anaemia with oral and later parenteral iron was advised.

In November, 1950, tonsillectomy was carried out. A good deal of haemorrhage occurred and a bleeding point had to be ligated.

During the following six years he was admitted to various hospitals on numerous occasions because of recurrent alimentary bleeding. Investigations carried out during this period revealed a chronic hypochromic anaemia with leucocytosis, but repeated radiological examinations of the alimentary tract, gastroscopy, and sigmoidoscopy failed to reveal a source of haemorrhage. In April, 1953, a laparotomy was performed, but no abnormality of the stomach, duodenum, small gut, liver, gall-bladder, or spleen was observed. The possibility of a bleeding disorder was apparently not considered, and there is no record of a platelet count having been done, although in 1955 a blood film was reported as showing abundant platelets.

During 1956 the bleeding became more severe and he was admitted to hospital for blood transfusions on eight occasions between January and September. In October a second laparotomy was performed (Professor J. C. Goligher). The stomach and duodenum were explored, but they contained no obvious blood. The jejunum and ileum also looked normal, and blood was first encountered in the terminal normal, and blood was also present in 2-3 ft. (30-60 cm.) of the ileum. Blood was also present in the colon, but no source of haemorrhage was discovered. The liver and spleen looked normal. Repeated blood transfusions were necessary post-operatively, and, in addition to melaena, epistaxis and haemoptysis occurred. On October 24, haematological investigation was requested.

Physical examination showed only anaemia. Blood examination gave the following results. Blood group B, Rh positive; haemoglobin, 6.8 g./100 ml.; red cells,

2,620,000/c.mm.; reticulocytes, 1%; mean cell volume, 89 cubic microns, mean corpuscular haemoglobin concentration, 29%; E.S.R. (Westergren), 21 mm. in the first hour. Platelets numbered 2,110,000/c.mm. and the platelet layer in the haematocrit tube measured 11 mm. The bleeding-time was five minutes (Duke), and Hess's capillary resistance test was negative. White cells 73,600/c.mm. (metamyelocytes 1%, neutrophils 89%, eosinophils 2%, basophils 1%, lymphocytes 4%, monocytes 3%). The blood film showed hypochromia and target cells were present. Bizarre forms of platelets, abnormal in shape and size, were present. Fifteen nucleated red cells per 100 white cells were observed, but no megakaryocytes were seen in the peripheral blood. Sternal bone-marrow aspirate was hypercellular, and erythropoiesis and granulocytogenesis were normal. Mature megakaryocytes were abnormally numerous and surrounded by sheets of platelets. Many immature forms were also present (Fig. 1).

Investigation of Blood-clotting Mechanism.—

Clotting-time (Lee and White), 4 minutes; one-stage prothrombin time (Quick), 15 seconds (control, 15 seconds); prothrombin consumption (Biggs and McFarlane), normal; clot retraction (McFarlane), normal. Calcium clotting time of normal plasma was not increased by addition of patient's plasma. The thromboplastin generation test (Biggs and Douglas, 1953) was normal when the patient's serum was added to the control platelet suspension and the control alumina-adsorbed plasma. It was also normal when the patient's alumina-adsorbed plasma was added to the control serum and control platelet suspension and when the patient's platelet suspension, before dilution and after dilution 1 in 8, was added to the control alumina-adsorbed plasma and control serum. No defect of blood clotting could therefore be detected and the platelet factor seemed normal.

Progress and Treatment (Fig. 2)

During the six weeks from the end of October to mid-December repeated blood examinations showed a hypochromic anaemia, leucocytosis, and thrombocythaemia, the platelet count ranging from 1 to 2.5 million/c.mm. The bleeding-time was usually normal, but occasionally prolonged up to 10 minutes. Melaena continued and blood transfusions were necessary on nine occasions. Cortisone was administered for three and a half weeks in November, without any beneficial effect. On December 14, 3 millicuries of radioactive phosphorus (^{32}P) was given intravenously, the platelet count at that time being 2 million/c.mm. and leucocytes 58,000/c.mm. Two further blood transfusions were necessary during the next 10 days, and the patient was discharged from hospital at his own request on December 24. When seen a week later the haemoglobin had fallen to 6.9 g./100 ml. and a further transfusion was given.

On January 21, 1957, he was seen as an out-patient and was feeling well. No obvious bleeding from the bowel had been observed since his discharge from hospital two weeks earlier and blood examination showed: haemoglobin, 11 g./100 ml.; white cells, 7,600/c.mm.; platelets, 860,000/c.mm. By February 8 the platelet count was 340,000/c.mm. and the haemoglobin 11.5 g./100 ml. Two weeks later the platelets had risen to 910,000/c.mm. and

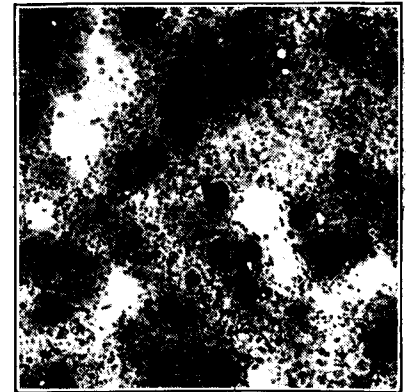


FIG. 1.—Case 1. Bone-marrow film from sternal puncture (Wright's stain), showing increased number of megakaryocytes surrounded by masses of platelets. ($\times 70$.)

occult blood was again found in the stool. A further injection of 3 mC of ^{32}P was given and a course of intramuscular iron ("imferon") prescribed. Thereafter the blood picture returned to normal. Repeated testing of the stool for occult bleeding was carried out, but no further bleeding was observed and the patient regained full activity.

microcytosis, and a polymorphonuclear leucocytosis. Blood transfusions were given, and in October a splenectomy was performed at the Otley General Hospital (Mr. D. Chamberlain).

Pathological Examination of Spleen.—It weighed 568 g. and on section had a rather "beefy" appearance. Microscopically, considerable fibrosis was evident with dilatation of sinuses, the appearances being consistent with a diagnosis of portal hypertension.

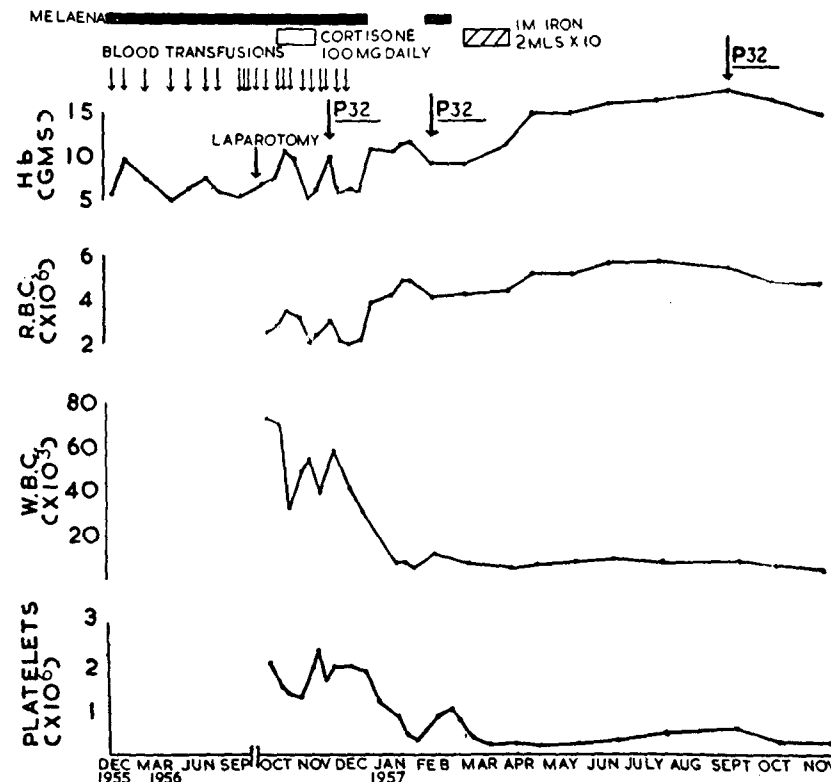


FIG. 2.—Effect of radioactive phosphorus (^{32}P) on the blood picture and bleeding tendency in Case 1.

A third injection of ^{32}P was given on September 20, when the platelet count rose to 600,000/c.mm. When last seen on November 25, 1957, the patient was symptom-free and blood examination showed: haemoglobin 14.8 g./100 ml.; red cells, 4,800,000/c.mm.; white cells, 3,800/c.mm.; platelets 320,000/c.mm.

There had been no evidence of bleeding for over nine months, whereas during the year prior to treatment with ^{32}P he had continuous melaena requiring blood transfusions at intervals of between 7 and 28 days.

Case 2

A maintenance engineer aged 53 gave a history of recurrent episodes of bleeding from the alimentary tract since 1944. Details of his case up to 1952 are deficient, but in February of that year he was admitted to Otley General Hospital under the care of Dr. R. N. Tattersall, complaining of weakness and increasing pallor. The liver was enlarged, hard, and irregular, and the spleen was palpable. Blood examination revealed an iron-deficiency anaemia (haemoglobin, 8 g./100 ml.; red cells, 4,150,000/c.mm.; white cells, 12,800/c.mm.), and the sternal marrow aspirate showed a reactive hyperplasia of the red-cell series. Portal hypertension was diagnosed. Liver-function tests were, however, normal and a barium swallow showed no evidence of oesophageal varices. Improvement in the blood picture followed a course of intravenous iron ("ferrivenin") and a satisfactory haemoglobin level was maintained thereafter until June, 1953, when a hypochromic anaemia again developed. In September, 1953, the blood findings were: haemoglobin, 5.8 g./100 ml.; red cells, 3,700,000/c.mm.; white cells, 17,400/c.mm.; platelets, 145,000/c.mm. A blood film showed marked hypochromia, anisocytosis, and

recurrent melaena. Thrombosis of the splenic vein, spreading to the portal vein, was observed, and the liver was enlarged and cirrhotic. Gastric varices were ligated and the pyloric region was devascularized. A month later he developed pyloric obstruction and a gastro-enterostomy was carried out. Intermittent bleeding from the bowel, however, continued.

When first seen by me in December, 1956, the patient was anaemic and the liver was enlarged, hard, and irregular. Blood examination showed: blood group A, Rh positive; haemoglobin, 9.6 g./100 ml.; red cells, 3,500,000/c.mm.; colour index, 0.9; reticulocytes, 2%; M.C.V. 87 cubic microns; M.C.H.C., 29%; white cells, 57,600/c.mm. (neutrophils 90%, eosinophils 1%, lymphocytes 9%); platelets, 2,100,000/c.mm. The bleeding-time was five minutes and Hess's capillary resistance test was negative. A blood film revealed three nucleated red cells per 100 white cells and numerous platelets, many of which were abnormal, but no megakaryocytes. Sternal marrow aspirate showed a cellular bone marrow with normal erythropoiesis and granulocytopenia. Megakaryocytes were increased in number and many were observed disintegrating into masses of platelets.

Investigation of Blood-clotting Mechanism.—Clotting-time, 10 minutes; one-stage prothrombin time, 17 seconds (control, 15 seconds); clot retraction, normal. Thromboplastin generation was investigated as in Case 1 and was found to be normal when the patient's platelet suspension was mixed with control alumina-adsorbed plasma and control serum. Thromboplastin generation was not impaired when the patient's platelet suspension was diluted 1 in 8. As in Case 1, no defect in blood coagulation could be detected and the platelet factor seemed normal.

Post-operative Course

Six days after operation melaena was observed. Blood transfusions were given and blood examination a week later showed: haemoglobin, 10.1 g./100 ml.; white cells, 37,000/c.mm. (polymorphs 83%, lymphocytes 17%, nucleated red cells, 2 per 100 white cells); platelets, 1,140,000/c.mm.; bleeding-time, 7½ minutes. Melaena persisted during the following two months and repeated blood transfusions were necessary. Spontaneous improvement then occurred and the patient was discharged home on December 21. Thereafter he was seen as an out-patient at regular intervals during the succeeding three years, but melaena necessitating admission to hospital for blood transfusions still occurred. Blood examination always revealed a similar picture—namely, hypochromic anaemia, thrombocythaemia (range 880,000 to 2,100,000/c.mm.), and leucocytosis (range 20,000 to 64,000/c.mm.).

In November, 1954, he was admitted to the Leeds General Infirmary and a laparotomy was performed (Mr. G. H. Wooler) on account of

Although the possibility that the alimentary bleeding was a direct consequence of portal hypertension had to be considered, the blood picture was characteristic of haemorrhagic thrombocythaemia, and it was decided to treat him accordingly.

Progress and Treatment

He was admitted to the Leeds General Infirmary on February 15, 1957, for treatment with radioactive phosphorus. Blood examination then revealed a hypochromic anaemia: white cells, 56,000/c.mm.; platelets, 2,400,000/c.mm.; and the bleeding-time was raised to 8½ minutes. The faeces were examined daily for the presence of occult blood, and on each occasion a positive result was obtained. On February 22, 3 mC. of ^{32}P was given intravenously. A month later the platelet count had fallen to 410,000/c.mm. and bleeding had ceased. A course of intramuscular iron (imferon) was given, and on April 12 a further blood examination showed: haemoglobin, 13.8 g./100 ml.; red cells, 4,700,000/c.mm.; white cells, 18,000/c.mm.; platelets, 230,000/c.mm.

Thereafter he has been seen as an out-patient at monthly intervals. Examination of the faeces for occult bleeding has been consistently negative and the haemoglobin level normal. In June, the platelet and leucocyte counts rose and a further 3 mC. of ^{32}P was given. The red cells at this time had risen to 8,250,000/c.mm., and although the platelets and leucocytes returned to normal following treatment polycythaemia has persisted. When last seen, nine months after the start of treatment, he was symptom-free and the blood findings were: haemoglobin, 15 g./100 ml.; red cells, 8,400,000/c.mm.; white cells, 9,600/c.mm.; platelets, 265,000/c.mm.

There has been no evidence of bleeding for over eight months, whereas before treatment with ^{32}P melaena and chronic hypochromic anaemia were invariably present.

Discussion

The aetiology of thrombocythaemia and the mechanism of the associated bleeding tendency remain largely unexplained. Two factors concerning the aetiology of thrombocythaemia are, however, worthy of mention. Firstly, it is now generally recognized that the myeloproliferative disorders are closely related (Dameshek, 1951), and, whereas orders are myeloid leukaemia and polycythaemia vera are characterized by a proliferation of myeloid and erythroid tissue respectively, excessive platelet production is the predominant feature in thrombocythaemia. The occurrence of episodes of polycythaemia in cases of thrombocythaemia, the high leucocytosis, and the presence occasionally of a small proportion of immature white cells and nucleated red cells in the peripheral blood support this concept. Similarly the occasional coexistence of haemorrhagic thrombocythaemia with myeloid leukaemia (Brugsch, 1933; Hardisty, and Wolff, 1955), myelofibrosis (Hardisty and Wolff, 1955), and polycythaemia vera (Epstein and Goedel, 1934; Uotila, 1938; Mortensen, 1948) also suggest that it is intimately connected with other proliferative disorders of the bone marrow.

The role of the spleen is a second important consideration. Hardisty and Wolff (1955) found that of 23 patients with haemorrhagic thrombocythaemia, approximately half had the spleen removed previously or the spleen was found to be atrophic. Splenectomy invariably gives rise to a temporary increase in the platelet and leucocyte counts, and on rare occasions haemorrhagic thrombocythaemia appears to follow directly on the removal of the spleen as in Case 2, in which the platelet count rose from a normal pre-operative level to 1,140,000/c.mm. within two weeks of splenectomy, accompanied by an increased bleeding-time and severe haemorrhage from the alimentary tract. The association of atrophy of the spleen with haemorrhagic thrombocythaemia was first observed by Epstein and Goedel (1934). The spleen in their case weighed only 7 g.; they considered it to be the most significant aetiological feature and concluded that the

disorder was due to "splenic subfunction." Although in some instances the spleen would appear to be quite normal and in others enlarged, there seems little doubt that in a high proportion of cases of haemorrhagic thrombocythaemia the spleen, or rather its absence, is of direct aetiological significance.

Attempts have been made by several authors to divide thrombocythaemia on an aetiological basis into primary or idiopathic, and secondary types. Rarely it is primary or idiopathic, when it is not associated with any other pathological process and does not follow removal of the spleen. Case 1 appears to belong to this category. More often thrombocythaemia is secondary and follows splenectomy or is associated with splenic atrophy, polycythaemia vera, chronic myeloid leukaemia, or myelofibrosis.

The mechanism of the bleeding tendency in haemorrhagic thrombocythaemia remains unexplained. The bleeding-time in some instances is prolonged, otherwise routine investigations such as the clotting-time, clot retraction, prothrombin time, and capillary resistance are invariably normal. Hardisty and Wolff (1955) were of the opinion that the platelets were functionally abnormal, and in five patients demonstrated an abnormal thromboplastin generation test due to a qualitative deficiency of the platelets. In two of their patients the highly concentrated platelet suspensions yielded normal thromboplastin generation tests, but dilution of the suspension until it contained approximately the same number of platelets per c.mm. as the control suspensions resulted in deficient production of thromboplastin and delay in thromboplastin generation. In the remaining three patients abnormal results were obtained with both concentrated and diluted platelet suspensions. With the use of a similar technique, the thromboplastin generation tests in the two cases reported above were, however, unimpaired both before and after dilution of the patient's platelet suspension, in contrast to the findings of Hardisty and Wolff. In view of these contradictory results further studies on platelet function in thrombocythaemia are obviously indicated.

That the platelets are in some way intimately concerned with the bleeding tendency would seem to be borne out by the effect of treatment with radioactive phosphorus. In previously published papers little reference has been made to the treatment of this disorder, although Mortensen (1948), who regarded thrombocythaemia as allied to polycythaemia and leukaemia and therefore possibly amenable to radiotherapy, observed some beneficial effects of total-body irradiation. It was on similar grounds that treatment with ^{32}P was given a trial in the two cases described. The response in both instances was highly satisfactory and bleeding ceased as the platelet count returned to normal. Further injections of 3 mC. of ^{32}P were given when the platelet count again rose above normal, and on this regime both patients have continued in good health and free from bleeding episodes for nine and eight months respectively. In addition to lowering the platelet count ^{32}P also resulted in a fall of the leucocyte count to normal, and in Case 2 control of the haemorrhagic tendency was followed by a rise in the red-cell count to a polycythaemic level, which was further evidence of the close association of thrombocythaemia and other myeloproliferative disorders.

Summary

The clinical and haematological features of haemorrhagic thrombocythaemia are described and two further examples reported.

Haemorrhagic thrombocythaemia is usually associated with other myeloproliferative disorders or splenic atrophy. It may follow splenectomy but is rarely primary in that it is unassociated with other pathological processes. Case 1 belongs to the latter category, while Case 2 followed splenectomy.

The mechanism of the bleeding tendency is unknown. The bleeding-time is occasionally prolonged, but other

routine tests of haemostatic function are invariably normal. No deficiency of platelet factor as evidenced by the normal thromboplastin generation tests was detected in either of the above patients.

In both patients the platelet count returned to normal and bleeding ceased after treatment with radioactive phosphorus.

I thank Professor J. C. Goligher, Dr. R. N. Tattersall, and Mr. G. H. Wooler for permission to study patients under their care, and Dr. W. Goldie for investigation of the coagulation factors.

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CUSHING'S SYNDROME IN CHILDHOOD

REPORT OF CASE OF ADRENOCORTICAL CARCINOMA WITH EXCESSIVE ALDOSTERONE PRODUCTION

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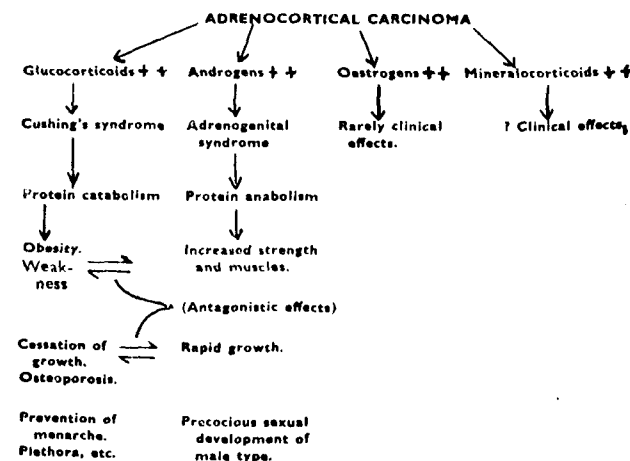
Adrenocortical overactivity in childhood may produce two distinct syndromes. The adrenogenital syndrome is caused by excessive production of androgens, and may manifest itself in three ways. If it starts in intrauterine life in a female, pseudohermaphroditism results; post-natally in a girl it produces virilism; in a boy the "pocket Hercules" variety of isosexual precocity results. An excess of glucocorticoids, on the other hand, gives rise to Cushing's syndrome, without masculinization.

Almost all cases of Cushing's syndrome in childhood are caused by adrenocortical carcinoma. Wilkins (1948) collected 70 cases of cortical carcinoma from the literature, and in his book (Wilkins, 1950) he reviewed 26 cases of Cushing's syndrome, all under the age of 10 years. Twenty-two of these were in girls; as in the adult, Cushing's syndrome in childhood is more common in females. A few other cases have been reported since then, and Guin and Gilbert (1956) produced a further review. The two cases of Cushing's syndrome not associated with carcinoma were reported by Chute *et al.* (1949) (bilateral nodular hyperplasia) and Powell *et al.* (1955) (bilateral cortical adenomas).

Functioning adenomas of the adrenal cortex at any age produce either pure Cushing's syndrome or a pure adrenogenital syndrome. Overproduction of the other two groups of adrenocortical hormones, the oestrogens and mineralocorticoids, appears to be of little importance in childhood. Oestrogen excess, leading to precocious pubertal development of female type, is ex-

tremely rare, while primary aldosteronism has not, to our knowledge, been described in childhood.

Unlike adrenal adenomas, carcinomas are biochemically pluripotent and produce excessive quantities of androgens, glucocorticoids, and also oestrogens (where these have been measured). In the case described below aldosterone was also found in great quantities in the urine. Consequently it is logical that the clinical picture may also be a mixed one in cases of carcinoma, being composed of features of Cushing's and the adrenogenital syndrome:



Since virtually all cases of Cushing's syndrome in childhood are caused by carcinoma one may expect to find evidence of the adrenogenital syndrome in all of them. On the other hand, only some adrenogenital cases (those with carcinoma) will show features of Cushing's syndrome. Now, in some ways the androgens and the glucocorticoids are mutually antagonistic, so that the resultant syndrome of excess of both may be variable. Thus androgens promote rapid skeletal growth and maturation, whereas cortisol (the chief glucocorticoid) abruptly terminates these. Androgens increase muscle bulk and power; cortisol diminishes these, producing fat from muscle and so increasing weakness. Cortisol actually opposes anabolism, leading to porosis of bone and gluconeogenesis with raising of blood sugar. Androgens tend to counteract these by promoting protein anabolism. In the case presented below the two opposing forces seemed so well titrated against each other that bone and tooth age and density, muscular configuration and power, and blood-sugar level did not appear to depart from the normal.

Case Report

A coloured girl was admitted to Groote Schuur Hospital at the age of 2½ years. Since the age of 1 year there had been an abnormally rapid gain in weight. At this age pubic and axillary hair first appeared. Three weeks before admission a facial eruption was noticed. There was no history of menstruation.

Physical examination revealed an obese child, with a Cushing-like facies and signs of virilism (Fig. 1). The obesity included limbs as well as trunk. Her height was 31½ in. (80 cm.) and weight 39 lb. (17.7 kg.). She had a plethoric appearance and a well-marked "buffalo-neck." There was an eruption on the face, which resembled adenoma sebaceum. Axillary and pubic hair were present and the clitoris was enlarged. Strong body odour was obvious. There was no true breast development. Her B.P. was 130/90; Hb, 15 g./100 ml.; P.C.V., 45%. The specific gravity of the urine was 1015. E.C.G. was normal. Blood chemistry: serum Na,

133 mEq/l.; serum K, 5.5 mEq/l.; serum Cl, 102 mEq/l.; CO₂-combining power, 57 vols.%; blood urea, 32 mg./100 ml.; serum alkaline phosphatase, 5.3 units (Bodansky-Shinowara); serum albumin, 4.19 g./100 ml.; serum globulin, 2.89 g./100 ml.; thymol turbidity, 6.3 units; fasting blood sugar, 88 mg./100 ml.; urine concentration test, S.G. rose to 1025.

Radiographs of the long bones showed normal bone age and no osteoporosis. An intravenous pyelogram revealed normally functioning kidneys. The left kidney was depressed and a mass was visible above this kidney. Chest x-ray examination revealed no abnormality.

The 24-hour urinary output of 17-ketosteroids was 39 mg., that of 17-ketogenic steroids (Norymberski) 11.6 mg., and of aldosterone 75 µg. (expected normals for these three steroids are, respectively, under 2 mg., under 3 mg., and under 10 µg. per 24 hours).

Urinary sodium and potassium studies were made over six consecutive days. During this time basal readings were obtained and the effects of a potassium load and of prednisone administration were observed. (See section on steroids below.)

The combination of features of Cushing's syndrome and virilism at this age strongly suggested adrenocortical carcinoma, which was supported by high urinary steroid output. Pyelography indicated that the tumour was on the left side.

Course and Treatment

On March 24, 1957, 50 mg. of cortisone was given by intramuscular injection. On the morning of the 25th this was repeated, and that afternoon left-sided adrenalectomy was performed (Professor J. H. Louw), while the patient received an intravenous infusion of N/2 saline with 50 mg. of soluble cortisol (hydrocortisone). Twelve hours post-operatively the blood pressure dropped from 140/90 to 100/70. Fifty units of soluble cortisol was given intravenously and 50 mg. intramuscularly. 50 mg. of cortisone was then given intramuscularly twice daily for three days. This was replaced by oral cortisone in decreasing dosage until it was withdrawn after five days, when corticotrophin Z, 25 units, was injected intramuscularly on two occasions. Intravenous infusions were maintained for two days after operation. The subsequent post-operative course was uneventful.

Five weeks after the operation the patient had lost 3 lb. (1.4 kg.). She was no longer as plethoric as before; the facial eruption had diminished, and the body odour was less obvious. Blood pressure had dropped to 105/70. Twelve weeks after the operation her appearance had changed dramatically (Fig. 1). She had lost 4 lb. (1.8 kg.) more, her facial skin was quite clear, the buffalo-hump had disappeared, the body odour had disappeared, and the clitoris was smaller. Hirsuties was still considerable. The 24-hour urinary output of 17-ketosteroids had fallen to 1 mg.

Seven months after the operation the clitoris was of normal size and the pubic hair had almost disappeared.

Endocrine Studies

In addition to estimation of hormone output levels in basal state, the effect upon these of potassium loading and of prednisone was investigated. In primary hyperaldosteronism (due to adrenal adenoma) the aldosterone output may become demonstrably abnormal only during periods of high potassium intake (Eales and Linder, 1956). The tumour in such instances resembles the normal adrenal glomerulosa in its secretory response to hyperpotassaemia. In the present case we therefore observed the effect of an extra 100 mEq of potassium in the diet.

Secondly, the dependence of the adrenal tumour on the pituitary was studied by following the plasma cortisol and urinary steroid hormone excretion during the administration of Δ¹-cortisone (prednisone) in doses of 5 mg. twice a day. Prednisone is one of the most potent suppressors of the secretion of corticotrophin by the pituitary.

Estimations of intake and urinary output of sodium and potassium were undertaken at the same time, to ascertain whether the cortical steroids were producing excessive retention of sodium or loss of potassium.

The urinary 17-ketogenic steroids and 17-ketosteroids were determined by the method of Norymberski, Stubbs, and West (1953), plasma cortisol by that of Lewis (1957), and urinary aldosterone by the physico-chemical procedure of Neher and Wettstein (1956). The ketogenic steroids are a measure of the metabolites of cortisol predominantly, but the excretory product of 17-hydroxyprogesterone also contributes to these urinary steroids. 17-Hydroxyprogesterone is andro-

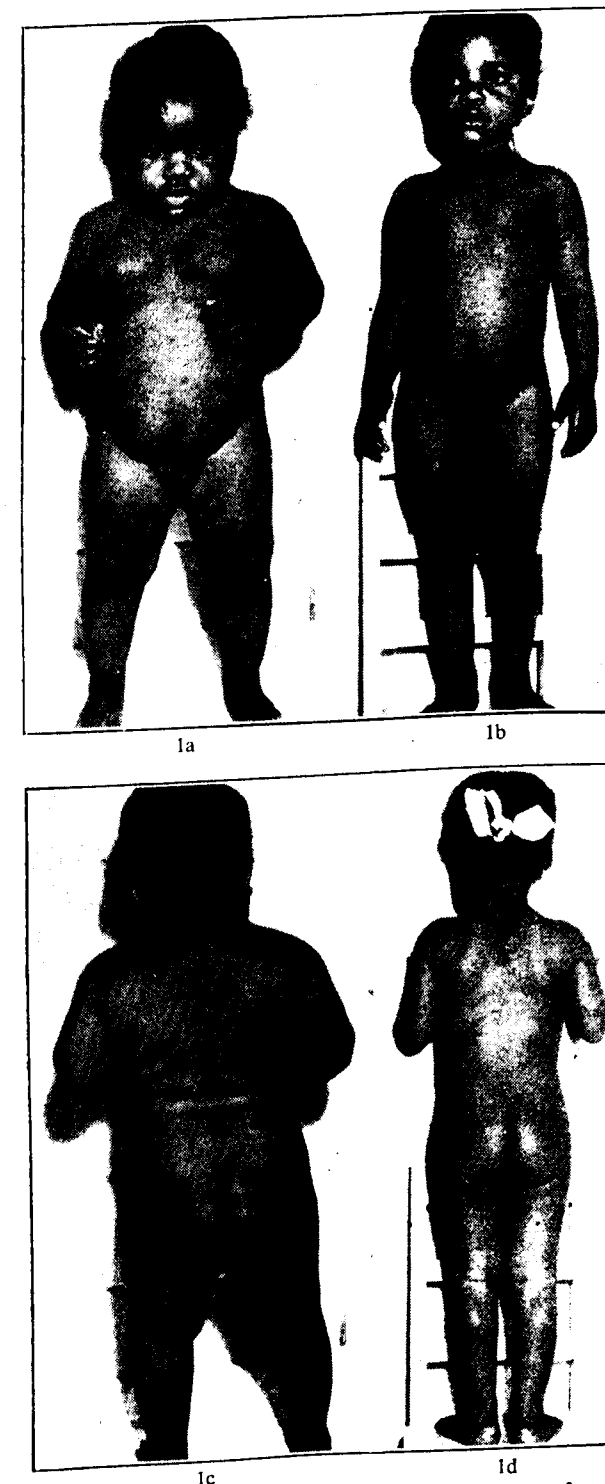


FIG. 1.—Appearance before (1a and 1c) and 12 weeks after (1b and 1d) adrenalectomy.

genic, but is probably not secreted by the normal adrenal: it is an intermediate product in the course of the biosynthesis of glucocorticoids. Further confirmation of the nature of the substance measured by the Neher and Wettstein procedure was provided by chromatography of the acetylated urinary extract in benzene/formamide, whereby the appropriate quantity of a substance with the Rf value of aldosterone diacetate was demonstrated. The material also migrated with aldosterone in the system iso-octane/tert-butanol-water (Eberlein and Bongiovanni, 1955).

Results

The steroid determination (Table I) showed a striking excess of aldosterone, 17-ketosteroids, and 17-ketogenic steroids in the urine and of cortisol in the plasma, represent-

TABLE I

	Urinary 17-ketosteroids (mg./24 Hours)	Urinary 17-ketogenic Steroids (mg./24 Hours)	Plasma Cortisol (µg./100 ml.)	Urinary Aldosterone (µg./24 Hours)
March 3: Normal diet	39	11.6	—	—
" 5: " "	—	—	32	75
" 6: Potassium load	48	5.8	—	—
" 7: " "	—	—	37	75
" 8: Prednisone	43	6.9	—	—
" 9: " "	37	4.0	26	—
" 25: " "	Adrenalectomy	—	—	—
April 7: " "	—	—	—	10
" 15: " "	2.8	—	—	—
May 10: " "	—	—	4	2
" 11: " "	1.0	—	—	—

ing hypersecretion of mineralocorticoid, androgen, and glucocorticoid. Fractionation of the 17-ketosteroids showed an abnormal amount of dehydroepiandrosterone. This is the main constituent of the "β-fraction" as segregated by digitonin precipitation, and is believed to be strongly suggestive of adrenocortical carcinoma.

Potassium loading (100 mEq in addition to normal diet) failed to augment the massive aldosterone output. Prednisone (given for only 48 hours) showed a possible suppressing effect on cortisol and 17-ketosteroid secretion on the second day, but the results were not conclusive and this suppression, if present, was not great.

Sodium and potassium "balance" data are presented in Table II. Urine collections were difficult, and were analysed only on those days when collections were virtually complete.

TABLE II.—Electrolyte Balance

	Sodium (mEq/24 Hours)		Potassium (mEq 24 Hours)	
	Intake	Urine	Intake	Urine
March 5: Normal diet	45.4	22.3	63.9	32.3
" 6: High K intake	43.8	41.0	149.9	74.9
" 8: High K intake and prednisone	47.0	36.4	157.2	78.8
" 9: " "	45.1	33.0	152.9	81.4

We observed no evidence of any considerable retention of sodium, and certainly no excessive loss of potassium. The high potassium intake appeared to augment the urinary sodium. The prednisone had no effect on the electrolyte balance.

The gratifying clinical response to adrenalectomy was mirrored in the hormone studies, which declined to normal levels (and have remained so during a six-months follow-up).

The Adrenocortical Tumour

The specimen (Fig. 2) consisted of a triangular mass of tissue weighing 36 g. and measuring 5 cm. along each border and 3 cm. in thickness. The outer surface was smooth and encapsulated. A small breach at one point was apparently due to operative trauma. At one pole there was a projecting tag of orange-yellow tissue measuring 1.5 by 2 by 1 cm.

On cut section the greater portion was lobulated and bright orange-yellow, a smaller portion appearing more fleshy and brown.

Sections stained with haematoxylin and eosin showed a highly anaplastic carcinoma (Fig. 3). The majority of the cells of the tumour were extremely bizarre in shape and varied considerably in size. The cytoplasm of many cells was finely granular and vacuolated. The nuclei showed many irregularities and mitotic figures were numerous. The tumour cells were divided haphazardly into groups by a fairly extensive network of thin-walled vessels. There was no haemorrhage into the tumour, and no obvious vascular infiltration was noted.

Closely applied to the tumour on its external surface was a well-marked fibrous tissue capsule. On the outer surface of this, and separated by it from the tumour, was a tag of compressed normal-looking adrenal gland tissue.

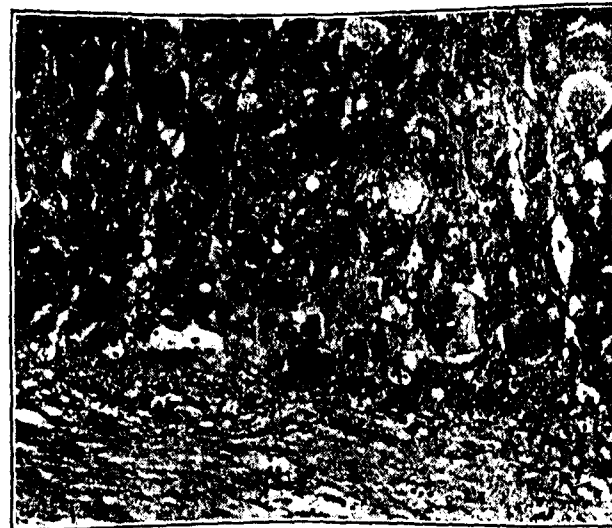


FIG. 3.—Photomicrograph of the tumour and its "capsule." (×500.) Note extreme pleomorphism of cells, and large hyperchromatic nuclei with several mitotic figures.

A frozen section showed varying amounts of fat in different areas. In some areas cells were loaded with fat; in others it was evident as fine droplets in the cytoplasm.

Poncau-fuchsin staining of a section fixed in formal-saline showed the cytoplasm of the tumour cells to be loaded with vivid red fuchsinophil granules which were not evident in the attached portion of normal adrenal.

Discussion

Diagnosis.—In this child the clinical features of Cushing's syndrome and virilism suggested the diagnosis of adrenocortical carcinoma. The very high urinary output of 17-ketosteroids provided confirmatory evidence. An interesting



FIG. 2.—Left adrenal gland after removal.

feature here was the apparent metabolic "balance" produced by the concomitant hypersecretion of glucocorticoids, mineralocorticoids and androgens. Thus there was no disturbance in muscular strength, bone growth, or electrolyte balance. The marked body odour probably was due to excessive apocrine activity. The tumour was lateralized by intravenous pyelography combined with tomography. Presacral air insufflation was rendered unnecessary by this manoeuvre. It is noteworthy that the length of this history (18 months) was not incompatible with a localized carcinoma in this case.

Steroid Findings.—Despite the probable zonation of function within the normal adrenal cortex (Chute *et al.*, 1949; Landing, 1955), the tumour, a strikingly undifferentiated carcinoma, possessed the ability to synthesize all the three major groups of adrenal hormones. While the simultaneous hypersecretion of glucocorticoid and androgen by adrenal tumours is commonplace, and that of glucocorticoid and aldosterone has been described, the present case offers a remarkable example of pluripotency of an adrenal tumour. The increase in aldosterone excretion was notable not only for its magnitude but also for the absence of its expected effect on electrolyte excretion or serum potassium level. The opposing effect of androgens in promoting potassium retention may be relevant in this connexion. In common with some cases of Conn's syndrome of primary aldosteronism, sodium metabolism was not grossly disturbed; arterial hypertension was, however, present. Possible explanations for lack of electrolyte disturbances include the simultaneous hypersecretion of an unknown sodium-diuretic hormone; alternatively, some combination of known hormones may possess sodium-diuretic activity, or conceivably the renal tubular epithelium may lose its responsiveness to aldosterone.

Treatment.—When there is no evidence of secondary deposits, adrenalectomy is indicated in cases of adrenocortical carcinoma. When there is doubt about which adrenal is involved, the transperitoneal approach is favoured. Adrenalectomy may be followed by a period of hypoadrenalism, because the opposite adrenal is usually atrophic. To prevent this, cortisone is usually given pre-operatively and continued during the operation and in the immediate post-operative period. When cortisone is withdrawn, corticotrophin may be given in an effort to stimulate the remaining adrenal gland. In our patient there was a precipitous drop in the blood pressure 12 hours post-operatively. This was believed to be an indication for intravenous cortisol. It suggested that the remaining adrenal was atrophic and not also carcinomatous. The change in the appearance of the patient 12 weeks after the operation was very gratifying. A striking feature was the disappearance of the strong body odour. Though androgen overactivity as judged by the 17-ketosteroid excretion was now controlled, the hirsuties and clitoral enlargement did not disappear until a further four months had passed. These signs of virilism usually take a long time to regress and may in some instances be permanent, in which case clitoridectomy may be necessary.

Prognosis.—If the offending adrenal is removed before metastases have developed, the chances of complete cure appear to be good. Unfortunately, in many cases of Cushing's syndrome in childhood the progress is rapid and adrenalectomy useless. Our patient seems to be fortunate, and the probability of cure must be considered high, since steroid excretion has returned to a normal level.

Summary

The relationship between Cushing's syndrome in childhood and adrenocortical carcinoma is briefly considered. A "mixed picture" of Cushing's and adrenogenital syndromes is characteristic, and is illustrated by a reported case. In this patient an excessive production of glucocorticoids, androgen, and mineralocorticoids (aldosterone) was demonstrated. In some ways the

usual clinical effects of each of these steroids were annulled by the opposing effects of the others.

The offending adrenocortical carcinoma was removed. Its histological appearance is described. The operation was followed by a remarkable improvement, with return to normal in the child's appearance and her hormone output.

We thank Professors J. F. Brock, G. C. Linder, F. Forman, J. H. Louw, and F. J. Ford for their continued help and interest. The patient was under the care of the latter two professors while in hospital. Dr. T. Sacks took the photomicrograph. The costs were covered by grants from the Council for Scientific and Industrial Research of South Africa and the Staff Research Fund of the University of Capetown.

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MULTIPLE EPIPHYSIAL DYSPLASIA

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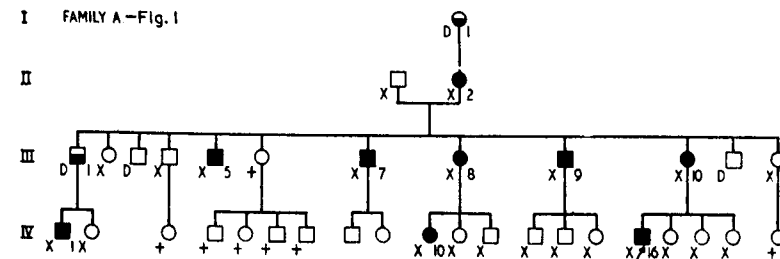
Multiple epiphyseal dysplasia is an uncommon condition, but is likely to be of interest to general practitioners on account of its marked familial features. Although Fairbank (1947) did not stress the genetic aspect in his original description, a number of affected families have since been recorded. Often a correct diagnosis in one member of a family will uncover several previously undiagnosed or misdiagnosed cases. Recognition of this condition is of more than academic interest, since many patients derive benefit from appropriate physiotherapy, while harm may result from treatment based on the wrong diagnosis. To make this condition more widely known, we report three further affected families, with descriptions of the clinical, radiological, and genetic features of these and previously published case reports. The family trees are shown in Figs. 1, 2, and 3. The clinical features are summarized in the Table.

Historical Note.—In 1935 Fairbank suggested the term "epiphyseal dysplasia" for a patient with multiple irregular epiphyseal ossification. To this title "generalisata" was added, but it was changed later to "multiplex" when the epiphyseal changes were found to be multiple rather than generalized. Twelve years later he published a masterly account of the clinical and radiological features of the disease based on a study of 20 patients, many of whom had previously been reported as atypical examples of a variety of conditions, including achondroplasia, stippling of the epiphyses (dys-

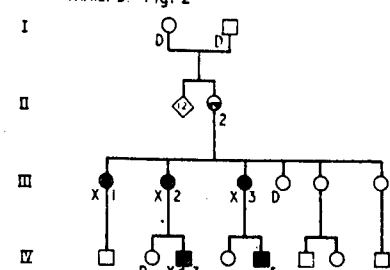
*Medical Research Council, Clinical Genetics Research Unit.

plasia epiphysialis punctata), and Morquio-Braileford's osteochondrodystrophy. Since then a number of cases have been reported in this country—for example, three sisters by Waugh (1952); one case by Scott (1952); four cases, two of them siblings, by Watt (1952); 14 cases in three families by Maudsley (1955); three cases in three generations of one family by Shephard (1956); and, in America, six cases by Jackson *et al.* (1954)—two sporadic and four from one family—and one case by Levy *et al.* (1957).

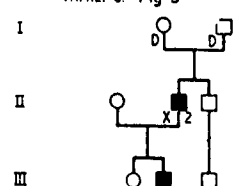
I FAMILY A—Fig. 1



FAMILY B—Fig. 2



FAMILY C—Fig. 3



- ◇ = 12 normal brothers and sisters
 ● = Probably affected, but not examined
 ● = Proved affected
 X = Examined radiographically
 + = Examined clinically, but not radiographically
 D = Dead

FIG. 1.—Tree of Family A. FIG. 2.—Tree of Family B. FIG. 3.—Tree of Family C.

Clinical Features

Definition.—Fairbank defined multiple epiphysal dysplasia as "a rare developmental error characterized by mottling or irregularity in density and outline of several of the developing epiphyses, dwarfism, and stubby digits."

Age at Onset.—Symptoms invariably begin in childhood, but most adults cannot recall their age at onset with any accuracy. The youngest recorded case is that of a 19-months-old infant by Gardiner-Hill (1937), while Shephard (1956) reported a probable example of the condition in an 80-year-old woman. In the present series the ages range from 2 to 71 years.

Symptoms

The most prominent symptoms are joint pain and stiffness, with a variable degree of disability. Since the lesions are multiple rather than generalized, symptoms often predominate in specific joints. Most joints have been incriminated at some time, the hips and knees being the commonest, probably because they are the most liable to weight-bearing strain. In this series the ankles, hands, and spine have also been affected, while the shoulders and elbows have caused disability in other reported cases. However, it must be emphasized that the distribution of symptomatically affected joints does not parallel the radiological distribution, which is often severest in the epiphyses of the wrists, hands, and ankles.

The degree of disability varies from slight discomfort to marked impairment of function. In family A all affected members were fully active and readily able to follow a variety of occupations, such as domestic, manual, and clerical work; none of them was able to indulge in athletic sport without after-effect, and the two youngest members often limped. In family C, in contrast, symptoms were almost continuous, and one patient could walk only with the help of a stick. With severe pain in the hip or knee,

patients may have great difficulty in negotiating stairs. Flexion deformities have been described, particularly of hips, knees, and elbows, while, paradoxically, hyperextensibility of joints due to laxity of the ligaments has also been reported.

Although the changes in the epiphyses are permanent, the symptoms are characteristically transient and fluctuating. Pain and stiffness are the invariable aftermath of strenuous exercise, and for this reason children and young adults are the most likely to seek medical attention. Failure to recognize the true nature of the condition may lead to a false assessment of whatever form of therapy is used, since symptoms usually subside spontaneously after a few days and may not reappear for several weeks. In later life the gradual superimposition of osteoarthritis accounts for the common complaint of pain after rest. All the affected adults of family A noticed stiffness after sitting for a few hours, and, similarly, felt worse on rising in the mornings. This has also been observed in children, and may well be a specific symptom of the disease.

Signs

Dwarfism.—Patients are characteristically short. The reduction in height is of the short-limb type, but epiphysal changes in the spine may also contribute to the shortness. Marked dwarfism is rare, but the affected members of a family can usually be singled out in being several inches shorter than unaffected members. Here comparison with relatives is more important than reference to so-called normal standards.

Stubby Digits.—This feature is probably present to some degree in all cases, and is often striking. The hand is broad, while the fingers are short, squat, and stumpy (see Fig. 4);



FIG. 4.—Broad hands; fingers short and stumpy

the nails may be deformed. The appearance is due to stunting of the phalanges and metacarpals, but gives rise to surprisingly little disability.

Enlargement of Epiphyses.—The affected epiphyses are often enlarged, and this may be accentuated by the presence of muscular wasting. Affected knees have a typical knobby appearance (see Fig. 5), which has earned one of our patients a prize in a seaside competition for knobby knees. Epiphysal bossing may be irregular and lead to secondary deformities such as genu varum or valgum.

Limitation of Movement and Deformity.—In family A only one patient showed slight limitation of extension of the knees; family B and the father in family C, who were more severely affected, showed marked limitation of hip movement, particularly flexion and abduction. Involvement of the lower limbs leads to abnormalities of gait and posture, and a limping or waddling gait is common. Other described abnormalities include dislocation of the patellae, spinal abnormalities, platybasia, and subluxation of the elbows.

Intelligence and General Development.—The occurrence of subnormal intelligence (Fairbank, 1947), sexual infantilism (Buxton, 1930), and osteochondritis dissecans (Watt, 1952) in isolated cases is probably coincidental. No abnormalities of blood chemistry have yet been described. The association of cleft-palate in all three of Waugh's (1952) patients can hardly be coincidental; the family pattern does not fit dominant inheritance, and there was premature closure of the epiphyses, which has not been seen in other affected families, suggesting that some other condition operated in this particular family.

Complications

Osteoarthritis is an inevitable complication, beginning, as may be expected, in early adult life. Severe hip involvement may cause difficulty in natural childbirth and was the reason for termination of pregnancy in one member of the present series; six years later this patient underwent a cup arthroplasty for relief of marked superimposed arthritis of the hips.



FIG. 5.—Knees have a knobby appearance.

Radiographic Features

Radiographic features have been well described previously, notably by Fairbank (1951). Multiple epiphysal dysplasia is a possible diagnosis in any case showing abnormal ossification of more than one epiphysis, particularly when like abnormalities can be demonstrated in other members of the family.

Typical radiographic signs are often found in the epiphyses at symptom-free joints. The changes are not necessarily generalized, and the normal appearance of many epiphyses may lead to the diagnosis not being considered. Some epiphyses may show slight irregularities of shape or ossification which assume significance only if the condition is suspected. Although the changes are usually symmetrical, there may be marked differences between the two sides, especially by the time adult life is reached. This was so in one patient (A, III 9; see Fig. 6) in whom there was gross deformity of the right femoral head; the left femoral head showed a slightly wavy outline, but the significance of this by itself might easily escape notice. Gross delay in the



FIG. 6.—Showing deformity of right femoral head.

Patients Affected with Multiple Epiphysal Dysplasia and Living in England

	Age	Sex	Age at Onset	Symptoms		Signs						Previous Diagnosis	Remarks
				Joints Symptomatically Affected	Pain	Height in cm.	Stubby Fingers	Wasting	Crepitus	Limitation of Movement	Deformity		
Family A:													
II 2	71	F	60	Knees	+	157	+	0	+	+	0	Osteoarthritis	Some disability
III 5	42	M	S.C.	Ankle, hands, knees	+	159	+	0	+	+	0	K.K.	" "
III 7	38	M	S.C.	Knees, right hip	+	163	+	0	+	+	0	K.K.	" "
III 8	36	F	S.C.	Knees, ankles	+	157	0	+	+	+	0	K.K.	" "
III 9	34	M	S.C.	Ankles, hands, knees	+	168	+	+	+	+	0	K.K.	" "
III 10	33	F	S.C.	Knees	+	154	0	+	+	+	0	K.K.	" "
IV 1	26	M	S.C.	"	+	160	+	+	+	+	0	"	" "
IV 10	10	F	9	"	+	127	0	0	0	0	0	"	" "
IV 16	9	M	3	"	+	127	+	+	+	+	0	K.K.	" "
Family B:													
III 2	48	F	25	Elbow, shoulder, knees, ankles, hips, back	+	145	+	+	+	+	+	Polyarthrit	1 in. (2.5 cm.) shortening of left leg. Also wears back brace
III 3	44	F	10	Hips, knees, back	+	147	+	+	+	+	+	Bilateral Perthes's disease	Severe disability necessitating cup arthroplasty
IV 3	12	M	6	Hips, back	+	142	+	+	+	+	+	"	Waddling gait
IV 5	16	M	4	Knees, hips	+	163	+	+	+	+	+	Bilateral Perthes's disease	Waddling gait; attending school for physically handicapped
Family C:													
II 2	48	M	3	Ankles, hips	+	156	0	0	0	+	0	Dislocation of hip; tuberculous osteitis	Some disability
III 2	4	M	1½	Nil	0	90	0	0	0	0	0	Atypical achondroplasia	Occasional limp

S.C. = Since childhood. K.K. = Knobby knees.

appearance and development of epiphyses can also occur as in the patient (C, III 2) in whom no ossification of the femoral heads could be seen at the age of 4 years (see Fig. 7); other epiphyses were thought to be normal, and the diagnosis was not made until the significance of slight thinning of the lateral part of the lower tibial epiphyses was realized. Advanced changes were then found in the hips of the child's father (see Fig. 8).



FIG. 7.—Absence of ossification of the femoral heads at the age of 4 years.



FIG. 8.—Showing advanced changes in the hips of the father of the case illustrated in Fig. 7.

Epiphyses may be seen to be arising from more than one centre of ossification. However, the appearance is quite different from that in dysplasia epiphysialis punctata, as in the condition under consideration the main bulk of the epiphyses arises from a single centre and the accessory centres are few in number and are scattered at the periphery of the cartilaginous epiphysis (see Fig. 9).

There is usually marked similarity in the radiographic features between affected members of the same family but considerable variation from one family to another. The distribution of the major changes appears to be a family characteristic. Even within families, however, some variation can occur. Moreover, members of an affected family may show such slight anomalies of epiphysial growth that it is sometimes difficult to decide, in early childhood, if they are affected or not.

Fairbank (1947) lists a number of conditions in which irregularity of the epiphyses is a feature, including cretinism, stippling of the epiphyses, osteochondrodystrophy, Perthes's disease, and dyschondroplasia. In our experience, the correct diagnosis has been neglected in favour of more common conditions. Thus in family A symptoms had been ascribed to osteoarthritis and rheumatism, two members of family B were thought to have bilateral Perthes's disease, and the father in family C had been told that he had bilateral dislocation of the hips. The radiographic appearances of multiple epiphysial dysplasia are quite distinct,

however. Attention to the following points has been thought to be of most use in diagnosis:

Hands.—The carpus is small in depth and the carpal bones are irregular in shape. During childhood there is marked delay, in ossification of the carpal centres, although their abnormal configuration makes accurate comparison with normal standards impossible. The central parts of the lower radial and ulnar epiphyses are thinner than normal, so that in adult life the lower ends of radius and ulna make a distinct V. The metacarpals and phalanges are not involved in all families, but are usually very short and stubby, with square angular heads.

Ankles.—There is marked thinning of the lateral part of the lower tibial epiphyses during childhood, leading in adult life to a characteristic downward inclination of the ankle-joint from the lateral to the medial side.

Knees.—The femoral and tibial condyles are square and angular. The lower end of the femur is flat and the intercondylar notch notably shallow. Irregularity of the ossification of the femoral condyles may lead to an appearance suggestive of osteochondritis dissecans.

Hips.—The femoral heads show great variation in that they may be absent, grossly deformed, irregularly ossified (as in Perthes's disease), or normal. Progressive flattening and enlargement of the femoral heads similar to that in Perthes's disease may also be seen and lead to permanent deformity and secondary osteoarthritis.

Spine.—This was not radiographed in most of our cases. One child (family B, IV 3) showed changes in the dorsal spine which, without the changes at other epiphyses, would have been indistinguishable from Scheuermann's disease. In the other affected members of this child's family the vertebral bodies appeared flat but normally ossified.



FIG. 9.—See text.

Genetic Aspects

The families were investigated by taking radiographs, so far as was possible, of the knees, ankles, and hands of all the offspring of affected individuals. It was found, however, that clinical examination was reliable for picking out those affected, and the only individuals possibly misclassified are some of the younger members of family A.

The first genetic problem is whether all cases are determined by dominant genes. Fairbank (1947) observed: "It affects both sexes, and as a rule is not inherited or familial." However, one boy appeared to have inherited from his mother, while two sisters are also included in this series. In addition he reported: "J. A. Cholmely has furnished me with details of two cases, who are brothers and apparently the only affected in a family of 10." A number of the families reported since then are similarly inconclusive from the point of genetic determination. But in 1954 Jackson *et al.* reported the disease in a mother, two sons, and a daughter, and in 1955 Maudsley reported its presence in three families. He noted that in the first of these the pattern of inheritance, with 10 of 17 members in three generations affected, strongly suggested that a dominant gene was concerned. His other two families were not fully investigated, but are compatible with determination by a dominant gene. In 1956 Shephard reported a family with three affected members in three generations, again suggesting dominant inheritance.

The three index cases in our families were unselected and were all that could be found among the children attending

the Hospital for Sick Children, Great Ormond Street. A search for further possible cases among children with the diagnostic labels "bilateral Perthes's disease" and "multiple osteochondritis" produced no cases other than one child already known to be a member of family B. In two of these families a dominant gene is clearly responsible, and the third, with father and son both affected, also suggests this type of genetic determination.

All the known examples of the condition to date, with the exception of those reported by Waugh (1952), can be ascribed to dominant inheritance. On this hypothesis, where only sibs were affected, an abnormal parent would have been found on investigation; for example, Watt (1952) notes that the parents of his patients were dead but that the father "was said to be a small man with a large body and short limbs, and had occasional trouble with his hips." On this hypothesis, also, sporadic cases will occur due to fresh mutations, as in the family with one boy affected and both parents and four sibs normal on radiographic examination (Levy *et al.*, 1957). It would appear that, while the gene may not always cause symptoms, it always leads to the development of abnormal radiographic signs.

The second genetic problem is raised by the suggestion made by Maudsley (1955) that there is a similarity of the type of affection within each family. In two of our families the affected members all showed dwarfism and major lesions in the hips, and all the adults had considerable disability. In one of these families, B, all affected members in addition had stubby hands. In family A, on the other hand, the hands were less stubby, and in some instances nearly normal, some patients were normal in height, and patients mostly complained of pain only in the knees, while several had never sought medical advice. The resemblance of the radiological features within families has already been mentioned. This suggests that two genes at least are responsible—one for the relatively mild form seen in some cases, and another for the more severe form; but to prove this point conclusively it would be necessary to take more radiographs than is justified for a point of purely theoretical importance.

Treatment

Although the pathological basis of the condition cannot be influenced in any way, it is of interest that those patients who received physiotherapy, particularly in early life, experienced considerable relief at the time and developed less disability later on. Frequent attacks of pain and stiffness are likely to cause disuse and local muscular weakness, which, in turn, favours instability of the affected joints and recurrence of further attacks of pain. Where benefit was derived from physiotherapy it could be ascribed to the measures directed to improving muscular support of the affected joints, such as non-weight-bearing exercises. One member of the second family had long remissions after courses of underwater exercises, and the children in the present series are attending regularly for non-weight-bearing exercises which they continue to practise at home, in the hope that these will prevent muscular wasting, reduce the number of acute episodes, and delay the development of osteoarthritis, which, however, will eventually dictate the form of treatment.

Illustrative Case Histories

A boy (family A, IV 16) aged 9 was referred to the Hospital for Sick Children, complaining of recurrent pain in the legs since infancy, in acute attacks at intervals of three to four months, when he would be almost completely disabled for as long as a week. Attacks were often precipitated by exercise and resolved spontaneously. His milestones were not delayed and he walked at the age of 18 months. On examination he looked thin and unwell, his height, 50 in. (127 cm.), was normal for his age, but his fingers were short, his knees knobby, and his right leg was of poor musculature (see Fig. 5). Radiographs showed the typical changes of multiple epiphysial dysplasia in him and other members of his family.

A boy (family B, IV 3) was referred to the Hospital for Sick Children at the age of 7 years with a two-year history of pain and stiffness in the left knee. On examination he had a rolling gait and slight shortening of the left leg, and it was thought that the pain in the knee was referred from the hip. Abnormality of the upper femoral epiphyses was noted on x-ray examination and on investigation of similar symptoms in several members of his family; the diagnosis of multiple epiphysial dysplasia was subsequently confirmed. He still has severe pain and stiffness in both hips and usually walks with a limp. On examination at the age of 12 there was some limitation of movement at both hips, his height, 56 in. (142 cm.), was below average for his age, and his fingers and toes were short and stubby. He recently developed inversion of the left foot. Skeletal survey showed dysplasia of the epiphyses of the tibiae, femora, radii, humeri, and lower dorsal spine.

A male child (family C, III 2) was referred to the Hospital for Sick Children at the age of 19 months because his parents had noticed a waddling gait, that his left leg turned out, and that he seemed short for his age. His father was said to suffer from congenital dislocation of the hips, but has since been confirmed as suffering from multiple epiphysial dysplasia. On examination the child was short—28 in. (71 cm.)—and he had a rolling gait and a lumbar lordosis with a protuberant abdomen. The main radiological abnormality was delay in the appearance of the upper femoral epiphyses, which were still not present at the age of 4 years (Fig. 7). He was otherwise well and there had been no delay in the appearance of his milestones.

Summary

Multiple epiphysial dysplasia is a genetically determined condition in which there is irregular and often retarded ossification in several of the epiphyses. Disability may be severe, with recurrent attacks of joint pain and stiffness; subsequently, osteoarthritis may lead to severe limitation of movement. The commonest sites for symptoms are the hip and knee, and the most marked signs are dwarfism and stubbiness of the fingers. The symptoms and signs are remarkably similar in the various affected members of the same family.

Three families, consisting of 15 affected members, are reported, the family pattern being that of dominant inheritance. It is suggested that dominant genes are responsible for all examples of the disorder, although more than one mutation may be concerned to account for differing degrees of severity in different families.

We thank Professor A. A. Moncrieff, Dr. B. E. Schlesinger, and Mr. G. C. Lloyd Roberts for permission to investigate the families of their patients; Sir Thomas Fairbank, Dr. F. B. Kiernander, and Dr. J. A. Fraser Roberts for their good advice; and the photographic department of the hospital for the illustrations. We also thank Dr. C. Worster-Drought, Mr. E. P. Brockman, Dr. O. A. Savage, Mr. J. G. Bonnin, Dr. A. P. Barry, and Miss E. Sheridan for their kind help with various members of the families and the loan of radiographs.

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Mr. RODNEY MAINGOT, F.R.C.S., was awarded a Sydney Body gold medal at a ceremony at Southend-on-Sea Hospital on May 30.

ERGOMETRINE WITH HYALURONIDASE: SPEED OF ACTION

BY

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Intravenous ergometrine given at the crowning of the foetal head or with the delivery of the anterior shoulder is a most effective means of expediting delivery of the placenta and preventing post-partum haemorrhage. This procedure was first introduced by Davis, of Chicago, in 1940. Lister (1950), in Liverpool, and Martin and Dumoulin (1953), of University College Hospital, have demonstrated its efficacy in well-planned clinical trials, and the method is now firmly established in obstetric practice.

Although the technique is widely used by obstetricians, it has one great drawback in that midwives, who in this country conduct the majority of public hospital and domiciliary deliveries, are denied its use because normally they are not trained to give intravenous injections. For this reason a simplified method is often used in which ergometrine is given by intramuscular injection instead of by the original intravenous route (Flew, 1947; Daley, 1951). Although some of the speed and reliability of the intravenous method is sacrificed in this modification the much greater general applicability of the intramuscular injection has led to its general acceptance.

In an attempt to enhance the value of the intramuscular method still further, Kimbell (1954) has advised that hyaluronidase ("hyalase," "rondase," "wydase") be added to the ergometrine injection. The rationale of this method is that hyaluronidase, acting as

a "spreading factor," aids absorption of the drug from the injection site and so shortens the latent period inherent in all intramuscular methods. Kimbell has published results that are superior to those obtained by the plain intramuscular method and even approach the efficiency of the original intravenous technique. The merits of the ergometrine-with-hyaluronidase method justify, he believes, its routine adoption by midwives in their unsupervised practice.

Details of Investigations. The External Recording Method was used in the First Four Days of the Puerperium, the Intravaginal Balloon Method Thereafter

Case No.	Day of Puerperium	Injection Given		Time of Onset of Oxytocic Response
		Ergometrine	Hyaluronidase	
First Control Series				
1	8th	0.5 mg. I.M.	—	3' 50"
2	5th	0.5 " "	—	5' 0"
3	7th	0.5 " "	—	7' 10"
4	2nd	0.5 " "	—	7' 10"
5	2nd	0.5 " "	—	5' 40"
6	6th	0.5 " "	—	11' 40"
7	3rd	0.5 " "	—	7' 10"
8	2nd	0.5 " "	—	4' 20"
9	5th	0.5 " "	—	7' 10"
10	3rd	0.5 " "	—	5' 0"
11	2nd	0.5 " "	—	10' 20"
12	3rd	0.5 " "	—	9' 30"
Mean = 7' 0" (S.D. = 2' 33")				
Main Series				
13	2nd	0.5 " "	330 I.u.	4' 0"
14	3rd	0.5 " "	1,000 "	3' 20"
15	3rd	0.5 " "	330 "	5' 30"
16	3rd	0.5 " "	1,500 "	6' 20"
17	3rd	0.5 " "	1,500 "	5' 0"
18	3rd	0.5 " "	1,500 "	4' 0"
19	2nd	0.5 " "	1,500 "	5' 20"
20	3rd	0.5 " "	1,500 "	5' 20"
21	3rd	0.5 " "	1,500 "	3' 20"
22	6th	0.5 " "	1,500 "	5' 20"
23	2nd	0.5 " "	1,500 "	4' 30"
24	2nd	0.5 " "	1,500 "	4' 30"
Mean = 4' 47" (S.D. = 56")				
Second Control Series				
25	4th	0.25 mg. I.V.	—	40"
26	2nd	0.25 " "	—	50"
27	2nd	0.25 " "	—	40"
28	2nd	0.5 " "	—	50"
29	2nd	0.5 " "	—	30"
30	2nd	0.25 " "	—	35"
Mean = 41" (S.D. = 8")				

* Corrected for small series. Standard deviation = $\sqrt{\frac{\sum d^2}{n-1}}$

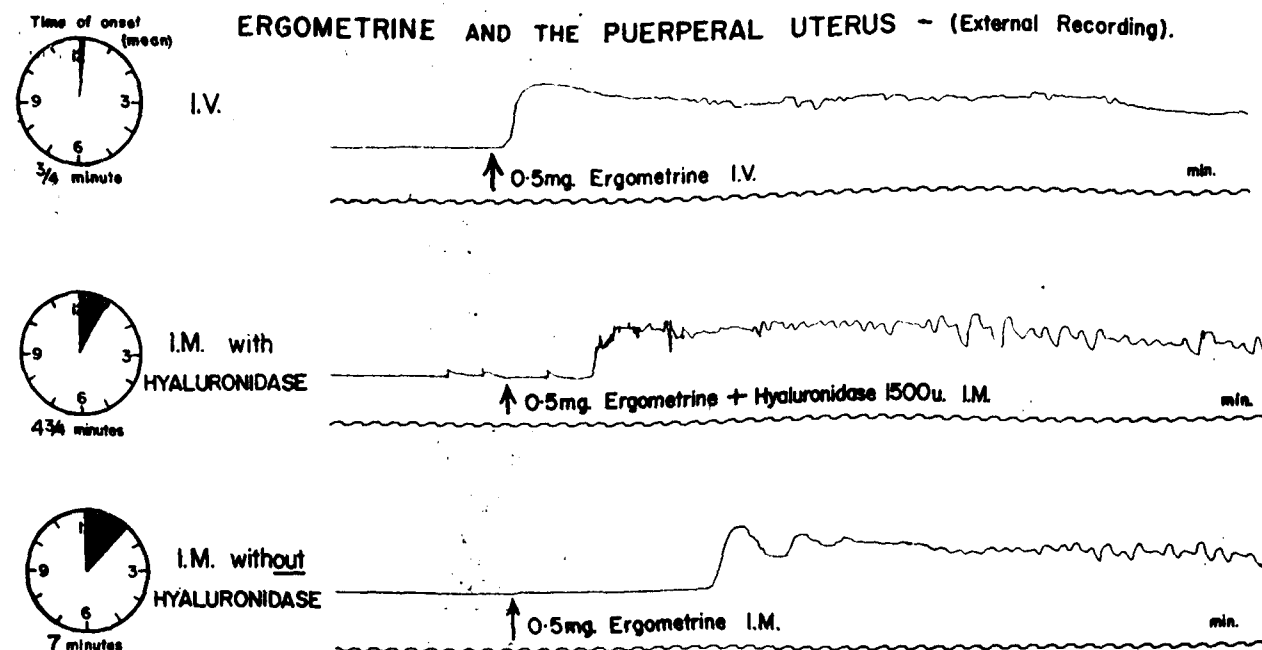


FIG. 1.—External records comparing speed of action of (a) intravenous ergometrine, (b) intramuscular ergometrine with hyaluronidase, and (c) intramuscular ergometrine without hyaluronidase.

This paper reports exact measurements of the delay between injection and response of (a) intravenous ergometrine, (b) intramuscular ergometrine, and (c) intramuscular hyaluronidase-ergometrine mixture.

Method

Records of uterine contractility were obtained from 30 healthy volunteer patients in the early days of the puerperium either, externally, by the "Oxford" tocograph (Embrey, 1955, 1958) or, internally, by the older intra-uterine balloon method (Moir, 1932a, 1932b). After a suitable control period, 0.5 mg. of ergometrine maleate with added hyaluronidase was given by intramuscular injection to 12 patients (main series), and its effect on uterine contractility recorded graphically. In each case the time

than the intravenous injection, which clearly must remain the method of choice in dealing with sudden post-partum haemorrhage. However, for the midwife who normally is not trained to make an intravenous injection, intramuscular ergometrine-with-hyaluronidase may well be worth while in such circumstances, though in practice any advantage may be annulled by the extra time required to prepare the mixed injection.

Another aspect of the matter must be considered. The present work shows that the addition of hyaluronidase confers upon the intramuscular injection of ergometrine a uniformity of action it does not otherwise possess. Without hyaluronidase the latent period before ergometrine takes effect varies considerably, and in some cases there has been a delay as long as 10 or 11 minutes (see Table). Given with hyaluronidase there is good expectation that intramuscular ergometrine will act within five minutes. The longest delay recorded with hyaluronidase in this series has been just over six minutes, which is a distinct improvement on the figures obtained when using the plain intramuscular method. It may be that in this element of uniformity lies the chief merit of the ergometrine-with-hyaluronidase injection. This could help explain the good results obtained by Kimbell in his clinical series, for the use of the hyaluronidase combination avoids the delays that may occur with the plain ergometrine.

While the addition of hyaluronidase slightly increases the speed and uniformity of action of intramuscular ergometrine, it does not follow that the plain intramuscular method is outmoded. Ergometrine alone has some advantages peculiar to itself. It is simple, more quickly prepared, quite efficacious, and better than no method at all. Finally, if midwives are to use ergometrine routinely at the end of the second stage of labour (as distinct from its use in emergency haemorrhage) supervising authorities should not lose sight of the fact that, at present, the addition of hyaluronidase to the injection quadruples the cost.

Summary

The methods of giving ergometrine by (a) intravenous injection, (b) intramuscular injection, and (c) intramuscular injection with added hyaluronidase at crowning of the foetal head, are reviewed and examined.

It is questionable whether the increased speed of action achieved with hyaluronidase added to the intramuscular injection of ergometrine warrants the adoption of the method routinely in the second stage of labour.

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Results

In all cases the well-known oxytocic response to ergometrine was recorded, the only difference between the various groups tested being the length of the latent period from the moment of injection to the onset of the oxytocic effect. The average times were: intravenous ergometrine, 41 seconds; intramuscular ergometrine with hyaluronidase, 4 minutes 47 seconds; and intramuscular ergometrine without hyaluronidase, 7 minutes.

Examples of records obtained with the external apparatus are shown in Fig. 1, and with the internal balloon method in Fig. 2.

Comment

The studies show that the addition of hyaluronidase to the injection undoubtedly quickens the speed of action of intramuscular ergometrine. The mean figures indicate an approximate gain of two minutes, reducing the latent period from seven minutes to five minutes. Valuable as this gain may be in a particular case, the real merit of the method has to be judged by the degree to which hyaluronidase accelerates the action of intramuscular ergometrine and approximates it to that of the intravenously injected drug. Viewed in this context, it is questionable whether a gain of two minutes is sufficient to justify the use of the ergometrine-hyaluronidase mixture routinely at the end of the second stage of labour. Again, it will be noted that even with the addition of hyaluronidase the intramuscular ergometrine still takes almost five minutes to exert its effect. This is certainly too slow for the treatment of the emergency haemorrhage. It is more than five times slower

On June 26 the DUCHESS OF DEVONSHIRE opened a new out-patient department at the Children's Hospital, Sheffield, to replace one which is now too small for its purposes. The new building, costing £110,000, has been insulated so as to lessen noise, and is provided with small "waiting areas" for the clinics instead of the usual large waiting-hall. To please the children, primary colours have been used for the decorating. The department represents the first stage in the development of the hospital.

A COMPARATIVE STUDY OF THE USE OF FERRIC CHELATE IN IRON-DEFICIENCY ANAEMIA

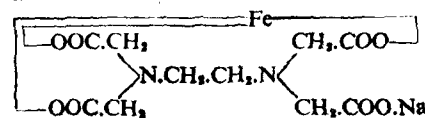
BY

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This paper presents a report on the response of iron-deficient children and young adults to three haematinics. The investigation was designed to compare established iron preparations with a recently introduced iron chelate compound in the way suggested by Cope *et al.* (1956).

Ferrous gluconate ("ferlucon") and ferrous succinate ("ferromyn") in elixir form were chosen as the established preparations. "Sytron" elixir, then on clinical trial, is a ferric sodium salt of ethylenediamine tetraacetic acid (E.D.T.A.), and has the following structural formula:



Present Investigation

The subjects were selected from the patients in a hospital for mentally deficient children; they comprised severe mental defectives of both sexes aged 5 to 18 years. Initially, 250 patients were screened by capillary haemoglobin estimations, and those with a level below 11.5 g./100 ml. were included in the trial. Almost all of these patients were completely helpless, and had to be fed by the nursing staff: that only 30 qualified for inclusion is a tribute to the patience and devotion of the sisters and nurses.

The subjects were divided into three groups of 10 each, the groups being matched as closely as possible according to age and sex. Each group received one of the haematinics for six weeks; at the end of this period, therapy was stopped. The dose was determined according to age and the utilization factor of the haematinic used (Table I).

TABLE I.—Doses Given

Drug	Age in Years	Dose	Dose in mgms.	Daily Elemental Iron (mg.)	Utilization Factor	Daily Utilization (mg.)
Ferric chelate	5-10	2 dr. b.d.	600 b.d.	142.0	Regarded as ferrous sulphate = 14%	{ 19.9 29.8
	11-18	2 dr. i.d.s.	600 i.d.s.	213.0		
Ferrous succinate	5-10	1 dr. t.d.s.	75 t.d.s.	52.5	42% (Nelson, 1955)	{ 22.4 29.4
	11-18	1 dr. b.d.	150 b.d.	70.0		
Ferrous gluconate	5-10	1 dr. b.d.	300 b.d.	68.0	28% (Haler, 1952)	{ 19.0 28.5
	11-18	1 dr. i.d.s.	300 i.d.s.	102.0		

As no utilization factor has yet been determined for ferric chelate, it was assumed to be the same as ferrous sulphate—that is, 14% (Witts, 1936).

Haemoglobin, packed cell volume, and mean corpuscular haemoglobin concentration values were determined before, at the end of, and four weeks after the trial period. Additional haemoglobin readings were taken at weekly intervals to obtain the rate of response. It was not possible to perform estimations eight weeks after the finish of the trial, because maintenance iron therapy was started before this interval had elapsed.

The presence of E.D.T.A. in the sytron elixir, though in small quantities, raised the question of its action upon the blood coagulation mechanisms. In order to assess the possible effect of minimal absorption of versene,

prothrombin activities were carried out on this group in the middle and at the end of the trial period, and four weeks after, using the other groups as controls.

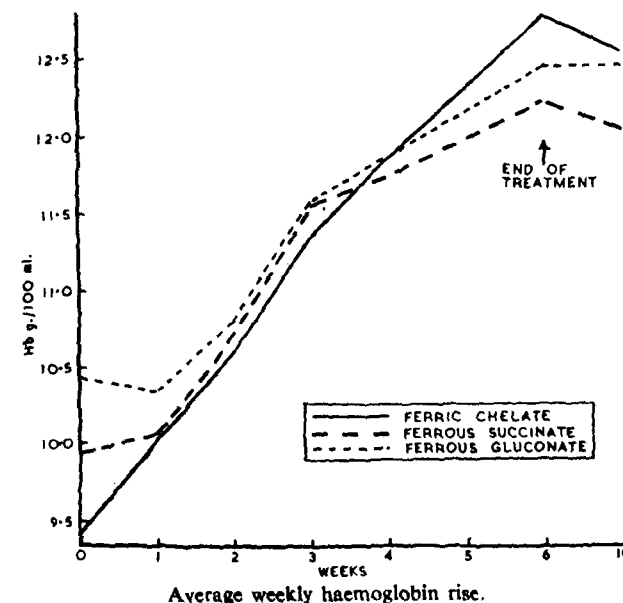
Results

Haematological Response.—Table II shows in detail the response of individual patients. It will be seen that all had a satisfactory response, as shown by a rise in the

TABLE II.—Haematological Response

Case No.	Sex and Age	Before Trial			At End of Trial			Average Weekly Hb Rise (g./100 ml.)	Total Hb Rise (g./100 ml.)	Four Weeks After Trial		
		Hb. (g./100 ml.)	P.C.V. %	M.C.H.C. %	Hb. (g./100 ml.)	P.C.V. %	M.C.H.C. %			Hb. (g./100 ml.)	P.C.V. %	M.C.H.C. %
Ferric Chelate												
1	M 5	9.6	35	27	11.8	41	30	0.37	2.2	11.4	38	30
2	M 12	10.5	39	27	—	—	—	—	—	—	—	—
3	M 11	8.3	32	26	12.1	40	31	0.63	3.8	12.0	39	31
4	F 17	9.6	35	27	13.6	46	30	0.67	4.0	13.6	43	34
5	F 18	11.1	38	29	12.2	39	31	0.18	1.1	12.3	36	32
6	F 14	10.4	38	27	15.1	47	32	0.78	4.7	14.1	44	32
7	F 14	10.5	36	29	12.7	40	31	0.37	2.2	12.6	38	33
8	F 9	6.6	27	24	12.5	42	30	0.98	5.9	12.6	40	32
9	F 8	8.9	32	28	13.0	40	32	0.68	4.1	12.0	37	32
10	M 8	9.4	36	26	12.2	39	31	0.48	2.8	12.0	36	33
Ferrous Succinate												
11	M 6	10.5	37	28	12.0	38	32	0.25	1.5	11.7	35	33
12	M 9	11.2	38	29	12.6	38	33	0.23	1.4	12.0	35	34
13	M 8	10.4	37	28	12.6	38	33	0.37	2.2	12.0	37	32
14	F 18	11.7	41	28	13.6	41	33	0.31	1.9	13.6	45	31
15	F 14	10.5	36	29	12.4	38	33	0.31	1.9	12.7	41	31
16	F 11	6.6	26	25	10.6	34	32	0.67	4.0	11.1	35	32
17	F 5	9.6	33	29	12.2	37	33	0.40	2.6	11.4	32	31
18	F 12	9.3	33	28	—	—	—	—	—	—	—	—
19	F 10	9.0	32	28	10.8	32	34	0.30	1.8	10.4	29	35
20	M 16	9.4	36	26	13.4	42	32	0.67	4.0	12.7	41	31
Ferrous Gluconate												
21	M 13	10.2	36	28	12.8	42	31	0.43	2.6	12.6	41	31
22	M 16	10.5	39	27	13.2	44	30	0.43	2.7	13.0	42	31
23	M 7	11.4	41	28	13.0	43	30	0.27	1.6	11.7	39	30
24	F 5	10.5	37	28	12.3	40	31	0.30	1.8	12.5	40	31
25	F 11	8.9	32	28	10.6	34	31	0.28	1.7	11.2	34	33
26	F 18	11.2	38	29	13.2	44	30	0.33	2.0	13.6	43	32
27	F 14	9.0	35	26	12.6	43	30	0.08	0.5	12.9	42	31
28	F 8	10.9	39	28	11.4	38	30	0.35	2.1	12.1	39	31
29	F 10	10.4	37	28	12.5	41	31	0.45	2.7	12.0	40	31
30	M 9	9.4	35	27	12.1	39	31	—	—	—	—	—

M.C.H.C. The average weekly haemoglobin rise and the total increase of haemoglobin in each patient over the period of the trial are also shown. These last values have been averaged for each group, and are shown in the Figure. From this it will be seen that the mean weekly haemoglobin rise is as follows: ferric chelate, 0.57 g./100 ml./week; ferrous succinate, 0.40 g./100 ml./week; and ferrous gluconate, 0.35 g./100 ml./week. There is a signifi-



cantly greater rise in the patients taking ferric chelate than in the other two groups (0.05 > P > 0.02). The difference between the other two groups is not significant.

Prothrombin Times.—In the group of patients taking the ferric chelate there was a prolongation of prothrombin time (as estimated by Quick's one-stage method) of 0.5 second after three weeks of treatment in three patients, and of 0.5 to 1 second after six weeks in five patients. All of the patients had returned to normal values four weeks after cessation of treatment. None of the patients taking ferrous succinate or gluconate showed any such alteration of prothrombin time.

Side-effects.—Diarrhoea or vomiting, or both, appeared in three patients taking ferric chelate. Cases 1 and 10 had moderate diarrhoea during the first week of the trial, but this cleared spontaneously without treatment or withdrawal of the drug. Case 2 developed severe diarrhoea and vomiting during the second week of the trial, necessitating withdrawal of the drug and vigorous rehydration therapy. Pathogens were never isolated, but in view of the severity and the timing of the attack it may be that it was not due entirely to the drug. It was not thought justifiable to reintroduce the drug after this patient's recovery. Case 28, receiving ferrous gluconate, had mild diarrhoea during the first week. Side-effects were not observed in the patients taking ferrous succinate, but in Case 18 death occurred from pneumonia during the fourth week of the trial.

Discussion

The group of patients receiving ferric chelate showed a significantly greater response to treatment than did the other two groups. They were, however, receiving very much larger quantities of elemental iron (Table I), because the utilization factor used to calculate the dose was an assumed one only. It seems likely that this assumed 14% utilization was too low, and that this accounts for the superior response. That an organic ferric salt should have such a good utilization factor is of interest, and is in marked contrast with inorganic ferric salts. It will also be noted that the dose of ferrous succinate administered was half of that normally recommended (Gillhespy, 1955), yet had as good a therapeutic effect as ferrous gluconate given in standard dosage (Hein and Keibl, 1950). The choice of iron preparation for a given patient would appear to be governed less by pharmacological considerations than by such factors as gastric tolerance, and, especially in children, palatability, together with the comparative cost of dispensing.

The slight prolongation of the prothrombin time observed in half of those taking ferric chelate is difficult to explain. Prolonged hypocalcaemia has been observed in rabbits following intravenous E.D.T.A. (Watson and Blackburn 1956), but serum calcium levels cannot be affected in man by very large oral doses of the drug (Spencer *et al.*, 1956). Although the small alteration in prothrombin time seen in this group is apparently of no clinical significance, its cause has yet to be determined.

The higher incidence of diarrhoea and vomiting in the group taking ferric chelate must also be noted. This is no isolated occurrence, since it was found in preliminary trials with the drug; large doses were taken by my colleagues and myself over several weeks, and all noted some diarrhoea. Prothrombin times were not reduced by more than the one second reported in this trial. The diarrhoea may in part be explained by the relatively large amounts of iron in the doses given, and it would seem reasonable to suggest that doses of ferric chelate lower than those used in this trial would produce an adequate haematinic response, with a reduction in side-effects.

Summary and Conclusions

A group of 30 children and young adults with iron deficiency were treated with elixirs of ferric chelate, ferrous gluconate, and ferrous succinate. Those receiving the ferric chelate showed a significantly greater re-

sponse in haemoglobin rise compared with the other two groups, but this was probably due to the larger amount of utilizable iron given. Diarrhoea was more prominent, and there was some lowering of the prothrombin activity in half of this group, though not of sufficient degree to be of clinical importance. The dose of ferric chelate could probably be reduced below that given in this trial and still give an adequate haematological response but with a lessened likelihood of side-effects.

I am grateful to Dr. L. T. Hilliard, superintendent of the Fountain Hospital, Tooting, for permission to treat patients under his care, and to Professor T. Crawford and Dr. J. L. Stafford for advice and criticism. The work could not have been carried out but for the co-operation of the dispensary and nursing staff of the Fountain Hospital. The sytron was kindly supplied by Parke, Davis & Co., the ferromyn by Calmic Ltd., and the ferlucon by Evans Medical Supplies Ltd.

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TREATMENT OF ANTICHLINESTERASE POISONING

BY

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The recent work in this Establishment (Childs *et al.*, 1955; Askew, 1956, 1957) which has been concentrated upon the search for a practical chemotherapy in organophosphate poisoning has resulted in the development of a combined treatment with 2-hydroxyimino-methyl-N-methyl pyridinium iodide (P.A.M.) and atropine. This has been shown to be effective in all the common laboratory species and against several times the LD₅₀ of the more toxic organophosphates and to eliminate the necessity for artificial respiration. Recent reports from Japan (Namba and Hiraki, 1958) indicate that this treatment has now been used in organophosphate insecticide poisoning in man, in some cases with marked success.

Experiments with P2S

The latest development in these laboratories has been the use of the methane sulphonate equivalent of P.A.M., which is much more soluble than the iodide but is no less effective. We have given this the code name of P2S. Animal experiments have shown that P2S may be expected to be effective therapeutically against the common insecticides such as parathion, malathion, etc., and also against amiton when accidental poisoning has occurred in manufacture or actual use. Human tests have therefore been carried out (G. D. Wedd, H. W. Whitcher, and A. Taylor, unpublished work) in which P2S has been given by intramuscular injection of the 15% aqueous solution in doses up to 20 mg./kg. At this dosage reasonable therapeutic results have been obtained in animals. P2S has also been administered orally in capsules in doses up to 75 mg./kg. In no case have there been any deleterious effects following the administration as exemplified by clinical manifestations, by changes in E.C.G., pulse rate, or arterial blood pressure, or by alterations in the blood picture. The maximum dose of P2S so far given experimentally to one man has been 4.5 g. by mouth followed by 1 g. intramuscularly three hours later.

Further work is required before a standardized treatment can be recommended, and in any case atropine is still essential. Some of the common organophosphate insecticides, however, which themselves are relatively non-toxic to man are slowly converted in the body to very toxic substances—for example, parathion is converted into the very poisonous paraoxon. Repeated dosing with P2S and atropine may therefore be necessary to counteract the effects of successive amounts of, for example, paraoxon, as this is synthesized *in vivo* from the reservoir of parathion.

P2S tends to produce small quantities of cyanide when heated in aqueous solution, the cyanide formation being greater in neutral (pH 7) than in acid (pH 4) solution. Solid P2S decomposes when heated at 150° C. It cannot, therefore, be sterilized by heat either as the solid or in solution. However, Seitz filtration has proved satisfactory. At room temperature aqueous solutions are stable for three months provided that the pH is kept at 4. The solid appears to be stable indefinitely.

P2S plus atropine is unlikely to be effective against poisoning by phosphates in which a diaminoalkyl group is directly connected with the phosphorus atom as in O.M.P.A. or mipafox (Kewitz *et al.*, 1956).

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TWO CASES OF SUBCLAVIAN ANEURYSM ASSOCIATED WITH CERVICAL RIB

BY

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The vascular phenomena associated with a cervical rib, though less frequently observed than the neurological complications, are sufficiently well known that considerable discussion concerning their aetiology has arisen. Coote (1861) first described a vascular complication of a cervical rib which was treated by surgery, an aneurysm of the subclavian artery being present. The infrequency of vascular symptoms was shown in a review of 716 cases of cervical rib by Halsted (1918)—only 19 (5.3%) cases exhibited purely vascular symptoms, whilst 106 had a combination of neurological and vascular phenomena. An aneurysm was present in only 27 of the 716 cases. Eden (1939), in a review of 46 published cases, noted aneurysmal dilatation in nine, while Stammers (1950) stated that such a complication was, in his experience, very rare.

Todd (1911, 1913) postulated that the vascular changes associated with a cervical rib were trophic in nature, induced by irritation of the sympathetic fibres passing in the brachial plexus. Telford and Stopford (1931) enlarged on this theory, but suggested that irritation of the sympathetic fibres produced vasospasm, the infrequency of vascular symptoms being said to result from the distribution of the sympathetic fibres in the plexus. It was suggested that vascular phenomena developed only if there was a concentration of the sympathetic fibres in the lower trunk in its inferior part, the fibres thus being more prone to irritation than in a normal plexus. Their theory was supported by the demonstration of such an arrangement in one of nine subjects studied. The majority of evidence, however,

supports the theory evolved by Lewis and Pickering (1934), who suggested that the vascular symptoms associated with a cervical rib are most probably due to local thrombosis occurring in the subclavian artery, with subsequent ejection of multiple small emboli. Such a view of the aetiology is supported by the two cases reported in this paper.

Case 1

A married woman aged 56 was admitted to hospital and was seen by me on June 17, 1949. She gave a history of sudden onset of pain in the right arm when combing her hair three months previously. The pain was followed by paraesthesia, and since that time she had had periodic attacks of pain and paraesthesia in the right arm and hand, associated with weakness of grip. She had noted some swelling at the right side of the root of the neck for the past five years.

Examination revealed a marked pallor of the distal two-thirds of all the fingers of the right hand. There was full active movement of the digits, and no muscular wasting was apparent. Immersion of the hand in warm water caused the pallor to change to a cyanotic colour. No radial pulse could be detected, but in the right side of the root of the neck a pulsatile swelling could be detected, the pulsation coinciding with the apex beat. X-ray examination revealed the presence of bilateral complete cervical rib. The Wassermann reaction was negative.

A diagnosis of subclavian aneurysm associated with a cervical rib was made, the peripheral vascular changes being thought to be due to multiple emboli, the pain and paraesthesia being ischaemic phenomena.

Operation.—On June 17 a right collar incision was made, the clavicular portion of the sterno-mastoid being partly divided and the brachial plexus exposed. The latter was found to be adherent to an aneurysm of the third part of the subclavian artery, the upper trunk passing anterior to the swelling. The plexus was mobilized and freed and the aneurysm resected, an abnormal vessel arising from its superior aspect being ligated prior to removal of the aneurysm. The anterior two-thirds of the cervical rib was excised and the wound closed. Section of the aneurysm revealed a thrombus adherent to its posterior and inferior walls.

On June 18 the hand was still cyanotic but the pain was relieved; normal colour was present on June 20. The patient was discharged home on June 29, when hand and shoulder movements were normal in range and power. No untoward symptoms were present on examination two months later.

When reviewed on April 13, 1955, the patient stated that she had not experienced any symptoms since the operation. There was no detectable difference in the temperature, colour, and muscle power of the upper limbs, but the right radial pulse was absent.

Case 2

A man aged 39 was admitted to hospital with a history of dull throbbing pain in the left forearm which began suddenly three months previously. The pain gradually extended up the arm and was accompanied by a feeling of coldness in the fingers. When the fingers were cold they were seen to be blue at their tips. Warmth relieved his symptoms, while cold had the opposite effect.

On examination the left hand was cold, clammy, and blue. While there was no wasting, the grip of the left hand was markedly impaired as compared with that of the right. Sensation to touch, pain, and temperature was normal. A pulsatile swelling was present in the left side of the root of the neck. The Wassermann reaction was negative. X-ray examination revealed the presence of a bilateral complete cervical rib.

A diagnosis of subclavian aneurysm with embolic phenomena associated with a cervical rib was made and operation advised.

Operation.—On May 19, 1954, a left collar incision was made and the brachial plexus exposed. An aneurysm of the third part of the subclavian artery was present, the upper trunk passing anterior and lateral and the middle trunk lying also anterior to the swelling, both trunks being adherent to the aneurysm. The plexus was mobilized and the aneurysm resected after division of the clavicle to remove the distal portion; the anterior two-thirds of the cervical rib was excised and the wound closed. No fixation of the clavicle was provided, the arm being retained in a sling.

On May 24 the finger movements were normal, the left hand still colder than the right, but pain had been abolished. The radial pulse was absent. Shoulder movements were begun on the fourteenth post-operative day and the patient was discharged home. When seen one month after operation there were full movements of all the joints of the left upper limb, whilst the clavicle was firmly united and the grip of the left hand was equal to that of the right. He returned to his work of dyer's operative on June 30. In February, 1955, his left hand was slightly colder and paler than the right, but function was normal and no further symptoms had been experienced.

The pathological report by Dr. I. Stewart on the sections of the aneurysm was: "The inner wall of the vessel is deformed by a flattened excrescence coated by a thin layer of laminated fibrin. Its substance is of fibrillae in which cells of the type seen in cartilage lie in pockets singly or in pairs. There are three distinct zones: in one the cells are ranged in columns with small vessels and few fibrillae; in the second and third the structure resembles cartilage but the cells differ in number. The appearances indicate repeated intravascular thrombosis with subsequent organization and cartilage deposition."

Discussion

Both cases described above exhibited purely vascular symptoms, the common initial symptoms of pallor and dull diffuse pain due to ischaemia being well demonstrated. It was thought that the release of emboli from the subclavian aneurysm accompanied by vasospasm produced the vascular symptoms, and section of both specimens reported showed intra-arterial thrombosis. It is evident, however, that there was also a vasospastic element in the development of their symptoms, as shown by their amelioration and improvement in the circulation of the limb after operation. It is feasible to suggest that the vasospasm is due to irritation of the sympathetic fibres in all the trunks, as these were adherent and stretched over the aneurysm. But complete recovery occurred after only a few days, indicating that the vasospastic element was merely a factor in the production of symptoms.

In treatment, excision of the rib alone or scalenotomy without any attack on the aneurysm has often been advocated. It is suggested that excision of the aneurysm is essential to eliminate further vascular symptoms. In Eden's (1939) case excision of the rib alone proved insufficient to prevent further embolic phenomena, and it is for this very reason that excision of the aneurysm should be undertaken.

Summary

Theories of aetiology of the vascular symptoms associated with cervical rib are reviewed.

Two cases of subclavian aneurysm associated with cervical rib are described.

Complete excision of the aneurysm and rib is advised to prevent recurrence of symptoms.

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SPLINTER HAEMORRHAGES

BY

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Splinter haemorrhages are recognized as a characteristic physical sign in patients with subacute bacterial endocarditis. They were first described in this condition by Horder (1920), who thought they were due either to "toxic" damage to capillary walls or to minute emboli. In their textbooks on cardiology Lewis (1942), White (1947), and Wood (1950) state that capillary fragility is increased in bacterial endocarditis and that the splinter haemorrhages and petechiae found in this condition are due to the abnormality in the capillaries. However, Bramwell and King (1942) consider that the white centres which are often seen in the petechiae in bacterial endocarditis indicate that they are embolic in origin.

McNaught (1939) and Sheldon (1941) described splinter haemorrhages seen in bacterial endocarditis in patients who had no other evidence of this disease, and this prompted us to investigate the incidence and significance of these lesions in more detail.

Present Investigation

We have examined the finger-nails of 429 patients and normal individuals and 35 cadavers. The lesions classified as splinter haemorrhages were all beneath the finger-nails; the toes were not examined. The lesions were usually brown or black in colour, but when fresh they were red, and changed in colour during the next few days; they did not blanch on pressure. They were 1 to 3 mm. long, linear, and longitudinally situated beneath the distal third of the nail. They did not fade or disappear spontaneously, but grew out with the nails and could eventually be cut off. As

TABLE 1.—Incidence of Splinter Haemorrhages in Different Types of Disease

Type of Disease	Patients with Splinter Haemorrhages		No. of Patients Without Splinter Haemorrhages
	No.	%	
Systemic arterial embolus (5 had mitral stenosis)	6	86	1
Probable bacterial endocarditis (mitral stenosis, negative blood cultures)	2	67	1
Uncomplicated mitral stenosis	10	44	13
Rheumatic fever (no evidence of mitral stenosis)	3	27	8
Proved bacterial endocarditis (mitral stenosis, positive blood culture) partially treated	1	25	3
Patients with marked purpura at time of examination	1	25	3
Arthritis other than rheumatic fever	1	20	4
Renal disease	4	20	16
Blood diseases not exhibiting purpura	6	19	25
Hypertension	3	18	14
Malignant neoplasms	4	17	19
Heart disease other than mitral stenosis	12	15	68
Miscellaneous	5	13	35
Pulmonary disease	11	12	79
Peptic ulcer	3	12	22
Nervous disease	3	11	24
Endocrine disease	2	11	17
Normal individuals	0	0	35

a rule the patient was unaware of their existence, but occasionally mild discomfort had been experienced. When the "haemorrhages" were associated with a history of recent trauma to the finger-nails they were ignored, as were blemishes which could conceivably have been due to dirt or

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ridges on the nail. Each patient was examined once only, and therefore the actual incidence of the haemorrhages is probably higher than we report.

We found splinter haemorrhages in 77 of the persons examined; in 60 cases there was more than one lesion. The highest incidence (86%) was in seven persons who had suffered recent major arterial emboli (Table I). Five of these patients had mitral stenosis, one was suffering from partially treated bacterial endocarditis, and one had had a recent coronary thrombosis. Of the other patients with mitral stenosis, 44% exhibited splinter haemorrhages, but they were no more common in those patients who were also thought to have bacterial endocarditis. However, we did not have the opportunity to examine any untreated patients with this disease, and the incidence may be higher in such individuals. Splinter haemorrhages did not occur more often in persons with auricular fibrillation than in those with sinus rhythm. In all other diseases the incidence of these lesions was about 15%.

We did not find any splinter haemorrhages in our unselected series of 35 normal persons. However, since we have been interested in this subject about a dozen acquaintances in normal health have shown us their nails, demonstrating lesions which we classify as splinter haemorrhages. We have gained the impression that they are particularly liable to occur after repeated jarring of the hand, unassociated with direct trauma to the nail. For instance,



Splinter haemorrhages under the finger-nail of a man suffering from diabetes and emphysema.

4 out of 12 healthy young women who had played hockey during the preceding week had splinter haemorrhages under their finger-nails. The photograph shows splinter haemorrhages under the nail of an emphysematous diabetic patient with no cardiac disease who was employed in making packing-cases. Five of his finger-nails showed splinter haemorrhages, but he had no recollection of injuring his fingers recently. None of the seven persons with splinter haemorrhages who were examined after death had any demonstrable ante-mortem intracardiac thrombus. However, two had had recent major systemic arterial emboli and two had had pulmonary emboli. One of the latter had a valve-type foramen ovale, and one of the remaining three patients had gross atheroma with ulceration of the aorta. None of the 28 patients without splinter haemorrhages who were examined after death had had systemic emboli, and only two had had pulmonary emboli.

We estimated the capillary fragility of 139 of our patients by means of Hess's test, performed in the following manner. A sphygmomanometer cuff was placed on the upper arm and inflated to midway between the systolic and diastolic arterial blood pressures for five minutes. A count was made of the petechiae which were produced in a circle 1 in. (2.5 cm.) in diameter drawn on the skin of the antecubital fossa. Ten or more petechiae were regarded as indicating excessive capillary fragility.

The capillary fragility was no greater in the patients who had splinter haemorrhages than in other persons (Table II). We did not find that the capillary fragility was increased in our partially treated patients with subacute bacterial endocarditis. Only one out of four grossly purpuric patients had any splinter haemorrhages.

Nail parings containing splinter haemorrhages which had grown out were treated with benzidine and barium peroxide. The lesions gave the green coloration characteristic of altered blood. Nail parings were stained with eosin and examined histologically. The splinter haemorrhages appeared to consist of a homogeneous mass of altered blood embedded in a layer of squamous cells adherent to the under surface of the cut nail.

TABLE II.—Capillary Fragility in Patients With and Without Splinter Haemorrhages

Type of Disease (Same Classification as in Table I)	Patients with Splinter Haemorrhages		Patients with no Splinter Haemorrhages	
	Total No. of Patients Examined	No. with more than 10 Petechiae after Hess Test	Total No. of Patients Examined	No. with more than 10 Petechiae after Hess Test
Systemic arterial embolus	3	1	0	—
Probable bacterial endocarditis	0	—	2	1
Uncomplicated mitral stenosis	7	1	5	1
Rheumatic fever	0	—	3	2
Proved bacterial endocarditis	0	—	2	1
Patients with marked purpura at time of examination	1	0	3	1
Arthritis	0	—	2	1
Renal disease	1	0	6	2
Blood diseases not exhibiting purpura	4	1	13	5
Hypertension	0	—	6	5
Heart disease other than mitral stenosis	0	—	15	4
Miscellaneous	4	0	13	2
Pulmonary disease	6	1	13	5
Peptic ulcer	2	1	4	1
Nervous disease	2	0	2	2
Endocrine disease	1	0	6	2
Normal individuals	0	—	13	2

The difference in incidence of the splinter haemorrhages in normal persons, patients with mitral stenosis, and patients with other diseases confirms our belief that the lesions are neither artifacts nor due to direct trauma to the nails. We do not think they are analogous to petechiae produced by haemorrhages from capillaries, for the following reasons. Splinter haemorrhages are linear, longitudinally placed under the nails, and do not fade as they age, characteristics which would not be expected of capillary haemorrhages. The frequency of these lesions in patients with uninfected mitral stenosis and with no signs of active rheumatic disease makes it unlikely that they are due to a toxic process acting on the capillaries, and the normal capillary fragility in these people confirms this. On the other hand, patients with mitral stenosis frequently have thrombus in the left auricle and are liable to arterial emboli. The high incidence of splinter haemorrhages in these people, and especially in those who had had recent large emboli, supports the other clinical evidence, which suggests that these lesions are embolic in origin.

However, if splinter haemorrhages are emboli in terminal digital vessels it is difficult to explain how they grow out with the nails and become embedded in the avascular squamous epithelium on the under surface of the nail. The histological appearance of splinter haemorrhages and their relation to the other tissues in the finger-tip is to be investigated further.

Summary

Examination of the finger-nails of 464 persons has shown that splinter haemorrhages occur in many patients who are not suffering from bacterial endocarditis. They occurred in 44% of patients with uninfected mitral stenosis and also in about 15% of persons with other diseases. Our evidence suggests that these lesions are usually due to emboli in the terminal vessels of the nail-bed.

We are indebted to Professor C. H. Stuart-Harris, in whose department this work was carried out, for his helpful advice and criticism. We also thank Mr. J. T. Chesterman and Dr. E. K. Blackburn for allowing us to examine their patients, and Mr. J. F. V. Larway for the photograph.

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Medical Memorandum

Perforated Duodenal Ulcer During Pregnancy

Perforation of a duodenal ulcer during pregnancy is a rare and serious condition which requires urgent treatment to obtain a successful outcome for both mother and foetus.

The following case is reported on account of the rarity and importance of the condition, and also because some interesting points occurred during treatment.

CASE REPORT

A primipara aged 30 first attended hospital for routine antenatal care at the 14th and 30th weeks of pregnancy. One week after the last attendance she was admitted with epigastric pain associated with vomiting. A tentative diagnosis of hyperemesis was made, and as the trouble rapidly subsided she was discharged after a stay of three days. She was readmitted that same evening with severe abdominal pain of 12 hours' duration. She had also vomited half a pint (284 ml.) of blood. Her previous history revealed that she had experienced indigestion for three and a half years before she became pregnant, but had never sought medical advice. For the first 30 weeks of the pregnancy she had noticed complete freedom from indigestion.

Examination revealed a young woman of slight build. She was obviously in severe pain and there was a moderate degree of shock. Her temperature was 98.4° (36.9° C.), pulse rate 140, respirations 20, and blood pressure 120/80 mm. Hg. Abdominal examination showed the uterus was 32 weeks by size and obscured most of the abdomen, but there was tenderness with guarding, mainly in the epigastrium. The foetal heart sounds were heard. There were no signs of toxæmia of pregnancy.

A tentative diagnosis of perforated duodenal ulcer was made, and in the circumstances it was decided to treat the condition conservatively by continuous gastric suction; intravenous glucose and saline solution; pethidine, 100 mg. six-hourly; injection of penicillin, 1 mega unit twice daily; and injection of streptomycin, 1 g. twice daily. For the ensuing 24 hours her general condition remained unchanged and the foetal heart sounds were still present.

The serum electrolytes were then within normal limits: Na 126 mEq/l., K 4.87 mEq/l., Cl 84 mEq/l. White blood cells, 17,000/c.mm.; haemoglobin, 84%.

However, after a further 18 hours the membranes ruptured spontaneously and after a further three hours she miscarried and delivered a stillbirth.

The abdomen was diffusely tender, with moderate rigidity, and was silent on auscultation. As her general condition was still satisfactory it was decided that laparotomy would be the safest course, and this was performed. It was by now 60 hours after the onset of pain.

Under general anaesthesia the abdomen was opened through a right upper paramedian incision. There was much odourless bile-stained fluid in the peritoneal cavity. A large perforated duodenal ulcer about 19 mm. in diameter was found on the anterior aspect of the first part of the duodenum. The edges of the perforation were clean-cut, with little surrounding oedema. The perforation was closed with five catgut sutures and the wound closed with a small suprapubic drain to the pelvis.

Gastric suction with intravenous glucose and saline solution, and antibiotics, were continued as before the operation.

Her convalescence was satisfactory, although prolonged, owing to suspicion of a formation of a subphrenic abscess, which, indeed, she never had. She was discharged from hospital two months after admission and has remained well on diet since then, with no recurrence of indigestion. A

barium-meal examination performed three months after discharge showed the "duodenal cap deformed but not tender; appearances probably cicatricial."

COMMENT

During pregnancy activity of a peptic ulcer is infrequent and perforation of a peptic ulcer rare. Mussey (1927) reported only two cases of peptic ulceration in 370 operations during pregnancy at the Mayo Clinic in a period of 10 years.

In a search of the world literature Sandweiss *et al.* (1943) found 13 cases of complications of peptic ulceration during pregnancy; nine were cases of perforation and four were of haemorrhage. He found only one case of perforated duodenal ulcer in 70,310 pregnancies in Detroit in the period 1928-37, and also one case of perforated gastric ulcer in 348,310 pregnancies over a period of three years in New York. Both patients died. Avery Jones (1947) stated that no case of proved peptic ulcer was discovered among 10,000 pregnancies and 2,000 abortions that he reviewed. James (1948) reported one case of perforated duodenal ulcer at the 36th week of pregnancy in a patient with a known duodenal ulcer. Operation for suture of the perforation was performed and four days later spontaneous delivery of a living child occurred. The patient survived and six weeks afterwards a barium-meal examination showed an active duodenal ulcer.

Howkins (1950) quoted Professor Grey Turner's statement that he "has never seen undue activity of a peptic ulcer during pregnancy, but is very familiar with the opposite state of affairs where ulcer symptoms disappear during pregnancy"; also Sir Gordon Gordon-Taylor's statement that he "cannot remember a perforated gastric or duodenal ulcer during pregnancy."

Way (1945) attempted to explain the rarity of peptic ulcer and complications in pregnancy by correlating the hypochlorhydria found in these patients with the increased secretion of the anterior-pituitary-like hormones in the urine. He concluded that the greater the secretion of these latter the more marked the hypochlorhydria. This endocrine explanation appears to be the most likely reason for the rarity of peptic ulcer activity during pregnancy.

Hurst and Stewart (1929) stated that there was no doubt that pregnancy exerts a favourable influence on the symptoms of an ulcer and in some cases appears to lead to actual healing apart from any specific treatment. This they attributed to the mechanical effects of support of the stomach by the rising uterus. This is supposed to relieve the strain on the lesser curvature and improve the local circulation, which promotes healing of any ulcer.

It is noteworthy that most cases of perforated ulcers during pregnancy have a definite history or radiological proof of an ulcer prior to pregnancy. The case here reported occurred in an undiagnosed ulcer case. Treatment was at first by the conservative method, but, after miscarriage, operation revealed a large unsealed perforation, and this was closed and convalescence was uninterrupted. When the patient was seen six months later progress had been quite satisfactory.

I thank Mr. R. A. C. Owen, consultant surgeon at Walton Hospital, for his help and advice in the preparation of this paper.

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Reviews

CHRONIC SCHIZOPHRENIA

Chronic Schizophrenia. By Thomas Freeman, M.D., D.P.M., John L. Cameron, M.B., Ch.B., D.P.M., and Andrew McGhie, M.A. Preface by Anna Freud. Foreword by T. Ferguson Rodger. (Pp. 158+x. 21s.) London: Tavistock Publications, Ltd. 1958.

In this book two psychiatrists and a psychologist discuss the causation, symptomatology, and treatment of chronic schizophrenia, in part based on a study of a group of patients admitted to hospital with this illness. Dr. Anna Freud has written an appreciative preface. A psycho-analytic viewpoint on schizophrenia is put forward, and a good account is given of all the varying psycho-analytic theories about this disease that have been propounded in the last 50 years.

Of special interest is a report on the treatment of 17 chronic patients in a mental hospital, the average duration of whose illness was already eight years. A much more "permissive" regimen was used than is general in ordinary mental hospitals; other nurses in the hospital, in fact, referred to the ward used in this experiment as the rumpus room. Every encouragement was also given to nurses to try to foster as stable a personal relationship with each of their patients as possible, and this was considered by the authors to be the most important aspect of their special psycho-analytically orientated treatment. It is unfortunate that Freeman and his colleagues can as yet give no statistical details of the results achieved by the interesting regimen they devised; and this absence of figures is a weakness of much of the recent writings on the use of psycho-analytic concepts in the treatment of schizophrenia.

It is difficult, really, to compare the effects of the therapeutic methods used in this study with those that could be obtained with the skilled employment of more established methods. For instance, only one of these tragic patients had even been given the benefit of a full or modified leucotomy, though some had already spent up to 12 years of agitated misery in the back wards of the hospital concerned; only some of them seem to have had insulin, and none seems to have had the advantages of the new tranquillizing drugs in large doses. But this is a stimulating and interesting book, and certainly every method that helps even a small number of schizophrenic patients is to be welcomed. The book should be read especially by those who feel that sympathy and respect for the suffering of the individual patient need to be constantly emphasized in the psychiatric treatment of to-day.

WILLIAM SARGANT.

ANALYTICAL PSYCHOLOGY

New Developments in Analytical Psychology. By Michael Fordham, M.D., M.R.C.P., F.B.P.S. Foreword by C. G. Jung. (Pp. 214+xiv; illustrated. 25s.) London: Routledge and Kegan Paul. 1957.

The assembly in book form of nine papers, delivered for the most part to special audiences, is almost bound to give the effect of many targets. Yet the method has advantages for those who prefer the written to the spoken word. The appeal of this book is mainly to the psychotherapist versed in Jung's writings, but it has much to offer to the larger body of psychiatrists who make no claim to be Jungians or Freudians. Both groups will find the first essay, on "Biological Theory and the Concept of the Archetypes," worthy of their attention. It is a careful attempt to open new ground by linking the theory of the collective unconscious with accepted biological theory. The discussion centres on such themes as the possible relation between archetypes and the action of the organic nervous system; the function of the unconscious in the process of discoveries in science; the pitfalls in the attempt to make comparisons between ontological and phylogenetic development in biology or psychology.

The justification for claiming "New Developments" in the title lies, first, in the author's views on child psychology and on the analysis and ego development of children; and, secondly, in his evaluation of transference and counter-transference. In the section "Notes on the Transference," Fordham traces the expansion of Jung's teaching on the transference and adds his personal observations and opinions. Those in touch with the outlook of the C. G. Jung-Institut in Zurich may not go all the way with him, but, while stating his convictions frankly and clearly, he never slips over the border into dogmatism.

The foreword by Jung is a personal tribute to the author, special commendation being given to his presentation of the difficult subject of synchronicity as a principle of explanation, additional to causality. As Jung was the first to use the concept of synchronicity in psychology and in psychopathology his observations are of particular significance.

E. A. BENNET.

CLINICAL ENDOCRINOLOGY

Atlas of Clinical Endocrinology: Including Text of Diagnosis and Treatment. By H. Lissner, A.B., M.D., and Roberto F. Escamilla, A.B., M.D. (Pp. 476; 148 plates, 3 in colour. £7.) London: Henry Kimpton. 1957.

As is stated in a foreword, this is a clinical endocrinology for clinicians. The authors' aim is to present their large experience of clinical endocrine problems. Inclusion of the fundamentals of endocrine physiology, pathology, and chemistry was thought by the authors neither appropriate nor necessary. Emphasis is on the visual presentation, and in this volume the written word takes second place. The illustrations are excellent and most are original, with a few which are classics, such as Cushing's giant and Gilford's progenia. They are offered in profusion, and succeed in giving a vivid impression of the many visible features of the whole range of endocrine disorders. The text is brief and concise, but adequate and well up to date. Symptoms, signs, and diagnostic tests are each divided up into important, less important, and incidental—an excellent feature. The discussion is very sensible, and advice on treatment, though brief, is practical. A few relevant references are given for each section.

Many well-illustrated volumes on endocrinology have been produced, but this is very different from the majority. It contains much interesting and unusual information. There are given, for instance, good details of 30 famous giants together with the present location of skeletons of nine of these. There is an excellent table of the milestones to 2 years of life. The mode of presentation may be illustrated by the chapter on diabetes insipidus, a disorder not well suited to visual handling. Here is shown a very clear diagram of the anatomy of the supraoptic nucleus and some photomicrographs of nerve cells in a normal and a diseased supraoptic nucleus. There is an extremely vivid photograph of a man with severe diabetes insipidus, an excretory urogram showing dilatation of the urinary tract, and a cystogram of the enlarged bladder. There is a remarkable genealogical chart of a family of 679 persons, 88 of whom had the disease through seven generations. A clear chart well illustrates the difference in response of diabetes insipidus, normals, and psychogenic polydipsia in the intravenous hypertonic saline test of Carter and Robbins, and a small table compares the costs of treatment of the patients in different ways.

All other fields are handled with equal thoroughness, and the highly unusual is frequently found. There is, for instance, a page of interesting illustrations of true eunuchs from the Imperial Palace, Peking, from Zanzibar, and from Russia, showing the variety of types. Illustrations of this high quality will not date as must inevitably much of the text in any textbook. The relatively high cost of the book, inevitable in one so well produced, can be justified by the very long period of use to which such a work can be put. It will be found fascinating by all interested in endocrinology and a most valuable work of reference.

C. L. COPE.

CLINICAL ORTHOPAEDICS

Clinical Orthopaedics, No. 10. Editor-in-Chief: Anthony F. DePalma. (Pp. 367+x; illustrated. Single copy 60s., subscription copy 48s.) Philadelphia and Montreal: J. B. Lippincott Company. London: Pitman Medical Publishing Co., Ltd. 1958.

The biographical notice in this volume of Phemister, for over 20 years professor of surgery at Chicago, is welcome, for his work on the growth of bone and on some aspects of abdominal surgery is respected in this country and he had carried out a year's research work in London. The greater part of the book is concerned with affections of epiphyses and apophyses; there is a symposium on metabolic bone disorders, and the chapters on general orthopaedics include spinal conditions and fractures around the femoral neck. As Phemister studied avascular necrosis it is fitting to find many references to this in the contribution on the epiphyses and carpal lunate. During the last 30 years much study has been made of pathological conditions of epiphyses, so that it is not surprising to find the publication of many illustrations and statistics of their origin and subsequent changes which are now familiar. The reader will welcome the chapter on treatment of avulsion of the ischial tuberosity; it includes two most striking illustrations, one being a graphic record of athletic stress on the tubers, depicting high hurdling—a pity one hurdle is falling—and the other of avulsion fracture of all four tubers in mother and daughter in an automobile accident.

Although our knowledge of general metabolism when bone changes exist is still immature, there is evidence of much research work being carried out, and the book under review includes comprehensive reports with many statistical tables, one on calcium metabolism in relation to metastatic malignancy coming from Boston, and another on the relationship of steroid hormones to the development and management of osteoporosis in ageing people from New York. Interspersed between mechanical aids for the injured femoral neck will be found a "spectator letter" on the problem of the physically handicapped children of India, where help is badly needed. Many doctors as well as most of its population are ignorant of what can be done for the deformed and injured child, and it was only 20 years ago that the first orthopaedic department was set up. The book is full of interest, and the collection of essays are of the standard found in previous volumes.

ST. J. D. BUXTON.

FANCIES IN DIET

Fat Consumption and Coronary Disease: An Evolutionary Answer to this Problem. Basic Approach to the Prevention and Arrest of Coronary Disease. By T. L. Cleave, M.R.C.P.(Lond.). Foreword by Percy Stocks, C.M.G., M.A., M.D.(Camb.), F.R.C.P.(Lond.), F.S.S. (Pp. 40. 5s.) Bristol: John Wright and Sons Ltd. 1957.

The author's thesis is that man can rely with confidence on the instinct of appetite to tell him what he should or should not eat, but only so long as his instinct is being exercised on natural substances, not necessarily in their raw state but also cooked in a simple form. In passing, the author deplores the unnatural increase in concentrating and refining processes such as those used in commercial sugar and white flour production.

According to the author, fats existing in their natural environment, even though concentrated and isolated as in butter, can be eaten in strict proportion to appetite and are harmless. On the basis that coronary disease is commonest in the wealthy sections of the community, where least margarine is eaten, he is prepared to discount any great harm from hydrogenation. But he considers that through the agency of arbitrary meals and arbitrary food mixtures—designed or prepared by others without the consumer exercising his preference—there occurs unnatural interference with the exercise of instinct for fats. This may result in over-consumption of fat as in fried foods, pastries, batter puddings, etc. Unnatural fat consumption is likely then to give rise to a higher total fat consumption. The

author considers that consumption of unnatural fat is the only causal agent of coronary disease which best fits all the facts. He considers that this disease is one of the penalties of industrialization, as are possibly many other diseases.

This essay is in essence a plea for the simpler, less sophisticated life—"A little of what you fancy does you good." It is rather a mixture of fact and considerable speculation.

D. P. CUTHBERTSON.

RHEUMATOID ARTHRITIS

La Polyarthrite Chronique Evolutive. By L. Isemein and A. M. Fournier with three collaborators. Preface by Professor F. Coste. (Pp. 315; illustrated. 3,200 frs.) Paris: Masson et Cie. 1956.

This is an exhaustive study of rheumatoid arthritis in all its aspects. It is the product of many years of fruitful collaboration between a physician and a radiologist. Although it is divided into the usual sections, these contain more than routine information, as the personal views of the writers are of considerable interest and should provoke new thought on many aspects of the multifarious problems associated with this disease. It is a useful book, more particularly for the specialist, for whom it is no doubt primarily written. It is well produced on good paper, but is deserving of a more permanent cover. It has an extensive bibliography, a few of the references being to the British literature.

W. S. C. COPEMAN.

SEX PERVERSIONS AND CRIMES

Sex Perversions and Sex Crimes. By James Melvin Reinhardt, M.A.; Ph.D. (Pp. 340+x. 43s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

This is an exasperating book on an important subject. Written primarily for law-enforcement officers, judges, and prosecutors, it nevertheless casts a hopeful eye on medical men and social workers. But it has four main faults. To begin with, it is written in much too journalistic a style, using such chapter headings as "Transvestism: Nature's Cruel Paradox." This is quite out of place in a scientific work, and in any case is not particularly accurate. Secondly, the author is only with difficulty able to restrain his repugnance at some of the more morbid sadistic perversions and crimes of violence. Thirdly, his case histories are not much more illuminating than those that appear in the sensational Sunday Press. The fourth objection may not be generally agreed among psychiatrists—namely, that Mr. Reinhardt's concepts of aetiology are confused and, from the psychodynamic point of view, somewhat superficial. He veers from hereditary to environmental factors, noting on the way some developmental influences of the usual familial type. But he rarely or never looks behind the conscious surface, being content to maintain that the significance behaviour has for society reacts on the behaviour—a generalization which the clinician will not find very helpful. In spite of these faults, it must be conceded that the author, who is Professor of Criminology at the University of Nebraska, has had a great deal of experience of the more regressive sexual perversions, and to those medical men who are unfamiliar with the subject the book may serve as an eye-opener. It may even put them on the *qui vive* to recognize among their adolescent patients such traits as may later take a dangerous antisocial form. This is the best that can be said of a disappointing book.

EDWARD GLOVER.

A Textbook of Histology, by A. A. Maximow and W. Bloom, has been an authoritative work on the subject for nearly 30 years. The seventh edition (W. B. Saunders Company Ltd., Philadelphia and London; 628 pages; 77s.) has been revised throughout to incorporate advances made in the last few years, and some new electron photomicrographs have been added to the many fine illustrations in the book.

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HUMAN BEHAVIOUR AND SOCIETY

"The proper study of mankind is man." This poetic dictum of Alexander Pope was the theme of Professor A. P. Thomson's presidential address at Birmingham on Monday of this week. His purpose, he said, was "to direct attention to the increasing responsibilities that society imposes upon its doctors and to examine some of the consequences that may flow from a wider range of medical activity." With this as his starting point Professor Thomson ranged far and wide in the brief but engaging compass of his talk. The doctor to-day is indeed caught up at almost every intersection of the web of human society. As a man struggling, like other men, to earn a living for himself and his family, he nevertheless enters into the lives of other workers in a way that is unique, intimate, and individual, yet with social consequences which are compelling and of growing complexity. The medical man, as Professor Thomson points out, belongs to a profession bred in a long tradition of individual freedom. It is in the conditions set by this freedom that a long line of discoveries have been made which to-day give mankind a control over his physical destiny that was scarcely dreamed of a hundred or even fifty years ago. The check imposed on bacterial infections has liberated for other purposes beds in tuberculosis sanatoria and fever hospitals. The tightening net cast over malaria is creating problems for societies in tropical countries which are almost frightening in their implications. The once comfortably solid and seemingly indivisible atom is now, to man its discoverer, a source of unlimited power for good or evil. The medical man has to get to grips with the medical and biological problems posed by nuclear energy. Inventions and new techniques pour out thick and fast. To keep abreast with modern knowledge is a hard enough task for even the toughest-minded man with leisure into the bargain. Is it surprising, therefore, that the hard-pressed practising doctor finds it difficult to keep his head above the swirling waters of modern medical science, and feels too that all this somehow conveys

a threat to his individual freedom of choice and action?

Professor Thomson, however, does not hesitate to lay down a new task for the practising doctor. There is, he says, "a clamant need for the branches of social science to make dispassionate studies of what actually happens in human societies." The medical man—especially the family doctor—has, he believes, a contribution to make in such studies. He refers to Canon Raven's suggestion "that between sociology and medicine there might well be established the same sort of unity which has been established between psychology and medicine." The family doctor is the one intimate objective witness of the stresses and strains of relationships in the fundamental unit of human society—the family. Professor Thomson therefore suggests that a team of family doctors might be linked with a university department of sociology in a joint piece of research, and proposes that some such experiment as this should be promoted jointly by the B.M.A. and the College of General Practitioners. "Adventure of this kind, a study of human behaviour in society," he finely says, "would surely restore interest in another problem of fundamental importance which we share with the whole company of thinkers, and which medicine, absorbed in the application of its new therapeutic resources, has neglected of late. What is the nature of man? How should we regard the individuals who consult us?" Here is a challenge to be taken up. Human genetics and human ecology are proper disciplines for the proper study of mankind. Modern medicine is emptying the wards of the fever hospitals and sanatoria. But the wards of the mental hospitals are full to overflowing. The study of human behaviour in society might afford at least part of the explanation of this, and of the other problems to which the new President of the B.M.A. so profitably directs the attention of his colleagues.

UNSATURATED FATS IN TREATMENT OF CORONARY DISEASE

Much has been written and spoken about dietary fats and coronary disease. An excessive intake of fat from early childhood has been incriminated by some as the cause of coronary disease, whereas others, while regarding dietary fat with suspicion, believe that there are many other aetiological facets to this disease. All would agree that coronary disease is in some way associated with a disturbance of fat metabolism, although both the aetiological and therapeutic implications of this association have yet to be determined. In experimental animals the extent and

severity of cholesterol deposition on the arterial wall and of atheromatous lesions can be directly correlated with the height and duration of hypercholesterolaemia induced by a diet high in cholesterol; moreover, reduction of hypercholesterolaemia is followed by a proportional regression of the arterial lesions. From this evidence it has been argued for the human, in whom atherosclerosis develops spontaneously by early adult life, that control of the serum cholesterol may be desirable and that reduction of hypercholesterolaemia in patients with coronary disease is beneficial. But some of the difficulties of gathering clear-cut data and of analysing them are evident from the careful study reported recently by Drs. H. Keen and G. A. Rose.¹

Reduction of dietary cholesterol alone does not decrease the serum cholesterol significantly in man.² Reduction or total avoidance of dietary fat does,^{3,4} but a diet sufficiently low in fat to produce lasting and significant reduction of the serum cholesterol is not tolerable to many people. Until recently, animal or saturated fats and vegetable or unsaturated fats were regarded as interchangeable so far as their effect on serum cholesterol was concerned,⁵ but now evidence has accumulated that most animal fats raise the serum cholesterol and most vegetable fats lower it.⁶⁻¹¹ There is, however, no general agreement on the nature of the cholesterol-lowering action of unsaturated fats. From carefully controlled studies E. H. Ahrens and his colleagues¹² conclude that the more unsaturated the fat the greater the depression of serum cholesterol. On the other hand L. Horlick and B. M. Craig¹³ have shown that a derivative (ethyl linoleate) of one of the unsaturated essential fatty acids, linoleic acid, lowers the serum cholesterol. L. W. Kinsell and his colleagues¹⁴ obtained the same result with ethyl linoleate and with a derivative of another unsaturated essential fatty acid, arachidonic acid, and suggest that the cholesterol-lowering property of vegetable oils may be related more to their content of essential fatty acid than to their lack of saturation. However, the speculation that coronary disease might be due to a deficiency of essential fatty acids¹⁵ has not been substantiated by finding a reduction in their concentration in the serum of patients with coronary disease.¹⁶ Alternatively, corn oil, which is generally acknowledged as the most effective unsaturated vegetable oil, may have some cholesterol-lowering property not explained entirely by its fatty acid composition¹⁷; and J. M. R. Beveridge, W. F. Connell, and G. A. Mayer¹⁸ think that its sterol content may partly be responsible.

Though the mechanism whereby unsaturated vegetable fats lower the plasma cholesterol is uncertain, their substitution for saturated fats is an effective

dietetic treatment for the short-term reduction of serum cholesterol. This effect of unsaturated fats may, however, depend partly on simultaneous restriction of the intake of animal fats. For example, the use of safflower oil, the most unsaturated fat available to-day, as a supplement to a normal and unrestricted diet did not result in reduction of the serum cholesterol in normal subjects.¹⁹ It has not yet been established whether reduction of the serum cholesterol can be maintained for years, though H. Malmros and G. Wigand²⁰ have obtained promising results during one year's substitution of corn oil for animal fats in hypercholesterolaemic patients.

What, then, is the place of unsaturated fats in the treatment of coronary disease? At present there is no evidence in man either that reduction of the serum cholesterol causes regression of atherosclerosis or that the prognosis of hypercholesterolaemic patients with coronary disease is improved by reduction of their high circulating cholesterol. Nevertheless it is probably justifiable to act on an unproved hypothesis and substitute corn oil for animal fats in the hypercholesterolaemic patient with a bad family history of coronary disease. In contrast to this experimental approach, much more basic information is required before the public can be advised either to eat less of saturated fats or more of unsaturated fats. Even so, there are already several types of milk, cheese, and margarine containing unsaturated oils available in retail stores. Some industrial firms, believing that these preparations will be commercially profitable, have launched publicity campaigns. Many people would hold, however, that some of the claims made for these foods, which can cause dyspepsia and diarrhoea and may be expensive, are unsubstantiated and premature. We are still passing through an experi-

¹ Keen, H., and Rose, G. A., *Brit. med. J.*, 1958, 1, 1508.

² Keys, A., Mickelsen, O., Miller, E. V. O., Hayes, E. R., and Todd, R. L., *J. clin. Invest.*, 1950, 29, 1347.

³ Mellinkoff, S. M., Machella, T. E., and Reinhold, J. G., *Amer. J. med. Sci.*, 1950, 220, 203.

⁴ Kempner, W., *Amer. J. Med.*, 1948, 4, 545.

⁵ Hildreth, E. A., Mellinkoff, S. M., Blair, G. W., and Hildreth, D. M., *Circulation*, 1951, 3, 641.

⁶ Kinsell, L. W., Partridge, J., Boling, L. A., Margen, S., and Michaels, G., *J. clin. Endocr.*, 1952, 12, 909.

⁷ Kinsell, L. W., Michaels, G., Partridge, J., Boling, L. A., Balch, H. E., and Cochrane, G. C., *J. clin. Nutr.*, 1953, 1, 224.

⁸ Ahrens, E. H., Blankenhorn, D. H., and Tsaltas, T. T., *Proc. Soc. exp. Biol. (N.Y.)*, 1954, 86, 872.

⁹ Beveridge, J. M. R., Connell, W. F., Mayer, G. A., Firstbrook, J. B., and DeWolfe, M. S., *J. Nutr.*, 1955, 56, 311.

¹⁰ Bronte-Stewart, B., Keys, A., Brock, J. F., Moodie, A. D., Keys, M. H., and Antonis, A., *Lancet*, 1955, 2, 1103.

¹¹ Malmros, H., and Wigand, G., *Min. Med.*, 1955, 38, 864.

¹² Ahrens, E. H., Hirsch, J., Insull, W., Tsaltas, T. T., Blomstrand, R., and Peterson, M. L., *Lancet*, 1957, 1, 943.

¹³ Horlick, L., and Craig, B. M., *ibid.*, 1957, 2, 566.

¹⁴ Kinsell, L. W., Michaels, G. D., Friskey, R. W., and Splitter, S., *ibid.*, 1958, 1, 334.

¹⁵ Sinclair, H. M., *ibid.*, 1956, 1, 381.

¹⁶ James, A. T., Lovelock, J. E., Webb, J., and Trotter, W. R., *ibid.*, 1957, 1, 705.

¹⁷ Jones, R. J., Reiss, O. K., and Huffman, S., *Proc. Soc. exp. Biol. (N.Y.)*, 1956, 93, 88.

¹⁸ Beveridge, J. M. R., Connell, W. F., and Mayer, G. A., *Fed. Proc.*, 1957, 16, 11.

¹⁹ Perkins, R., Wright, I. S., and Gatje, B. W., *J. Amer. med. Ass.*, 1958, 166, 2132.

²⁰ Malmros, H., and Wigand, G., *Lancet*, 1957, 2, 1.

mental phase in the understanding of coronary artery disease, and no specific dietary recommendations, apart from reduction of obesity, can reasonably be made.

ACCIDENT INSURANCE FOR B.M.A. MEMBERS

A new and most valuable practical benefit of membership of the B.M.A. was announced at the Representative Meeting in Birmingham last week. Full members of the British Medical Association have now the opportunity to effect a personal accident insurance on terms so highly favourable as would appear to be unobtainable anywhere else. The matter was introduced at the A.R.M. on a motion by Dr. I. M. Jones as chairman of the Private Practice Committee. The details of an unusually attractive scheme submitted by the Medical Insurance Agency were put before the Representatives and are repeated in an advertisement at pp. 7-8. The scheme provides full cover for death, loss of limbs or sight, and permanent disablement that may result from accident. Any B.M.A. member may take from one to ten units of benefit, each unit costing 10s. per annum. The maximum of ten units, then, can be taken for an annual payment of £5—of which £3 10s. is subject to tax relief within the usual statutory limitations—and for this modest outlay a cover of £10,000 is provided. As Dr. Jones explained to the R.B., the cover is world-wide in scope; there is no barrier of colour, race, or creed to acceptance in the scheme; and it is open to women doctors as well as to their male colleagues. No prior medical examination is necessary. The one essential requirement is full membership of the B.M.A. That is to say, for exactly the same premium the Australian and New Zealand member of the B.M.A. can get exactly the same cover as his fellow member in the United Kingdom.

The welcome announcement last week was the happy culmination of discussions at the last two Annual Representative Meetings. Members were becoming worried about the hazardous position of the young doctor and of those with limited years of service in the N.H.S. Last year the R.B. resolved "that Council be requested to arrange with the Medical Insurance Agency an appropriate insurance policy covering injury or loss of life incurred by doctors carrying out their practice." But the scheme now available is not restricted to accidents incurred only while at work. Any member, say, motoring abroad on holiday is as fully covered as when he is going on his rounds at home. The B.M.A. has added a novel kind of benefit for its members, and one which should go a long way to relieving an anxiety which any practising doctor must experience.

ALLERGIC GRANULOMA

About two years ago, in the United States, a new man-made dermatosis with unique features was seen, which has an important bearing on the understanding of certain problems in general pathology, and perhaps also on the pathology of berylliosis. L. F. Weber and his colleagues¹ in Chicago were the first to report cases of an unusual papular eruption of the axillae in patients who had used deodorant sticks. They were soon followed by others, and more than 70 cases have been recorded. These have now been summarized by W. B. Shelley and H. J. Hurley,² who have also described their researches to elucidate the pathogenesis of the disorder. Shelley gave a first-hand account of the detective trail followed when he delivered the Prosser White Oration to the St. John's Hospital Dermatological Society in London last year.³ The clinical picture consisted of an eruption of flesh-coloured or brownish dome-shaped papules of varying sizes aggregated in the vault of the axillae. Symptoms were minimal or absent. In all cases the axillae had been shaved and a stick type of deodorant used as opposed to a liquid or cream preparation. Histologically the papules showed a sarcoidal granuloma in the dermis. No treatment had any effect on the condition, but it tended to resolve spontaneously over one or two years.

The recognition of this axillary granuloma followed very soon after the introduction of a new type of stick deodorant containing a zirconium salt. The stick was a soap-alcohol gel of sodium stearate, ethyl alcohol, carbitol, and water, to which was added about 10% of a 45% solution of sodium zirconium lactate. Zirconium is a metallic element close to titanium and hafnium in the periodic table. It has been used in medicine in various forms previously without any ill effects—for brain clips and bone screws in surgery, as an ointment for contact dermatitis, and as an intravenous solution for pyodermas. It has been administered to animals by various routes, and no adverse reactions were encountered. Hence it appeared perfectly safe to use as an anti-perspirant and deodorant in place of the standard aluminium salts.

Shelley and Hurley injected each of the constituents of the deodorant stick into control subjects. Only the sodium stearate produced a granuloma, but it occurred in every patient and resolved in a few weeks. Since the incidence of deodorant axillary granulomas was small in proportion to the large number of persons exposed, the sodium stearate could not be the cause. In an attempt to produce this condition experimentally, thirty men were asked to rub a zirconium stick into one shaved axilla and a non-zirconium stick into the other. The chances of success were not great, but one man developed the characteristic zirconium granuloma after a month, and it was confirmed by biopsy. It followed the natural history of the previously described granu-

¹ Weber, L. F., Neuhauser, I., Rubin, L., Slepian, A. H., and Shellow, H. J. *Amer. med. Ass.*, 1956, **162**, 65.
² Shelley, W. B., and Hurley, H. J., *Brit. J. Derm.*, 1958, **70**, 75.
³ *Trans. St. John's Hosp. Derm. Soc.*, 1957, **39**, 1.
⁴ Calnan, C. D., and Sarkany, I., *Proc. roy. Soc. Med.*, 1958, **51**, 321.
⁵ Wegener, F., *Verh. dtsch. path. Ges.*, 1936, **29**, 202.
⁶ Zak, F. G., Strauss, L., and Churg, J., *J. Invest. Derm.*, 1951, **17**, 349.
⁷ Sneddon, J. B., *Brit. med. J.*, 1955, **1**, 1448.
⁸ *Postgrad. med. J.*, 1958, **34**, 262.

lomas. Intradermal injections showed that these patients were allergically sensitive to zirconium itself and reacted to minute amounts.

About thirty American deodorant products were said to contain zirconium salts at one time. It was introduced into stick deodorants in Britain in 1956, but was stopped after a period of only a few months, as soon as the possible harmful effects were brought to the notice of the manufacturers. As a result it is unlikely that the deodorant granuloma will be seen in Britain, though one patient has been reported in this country by C. D. Calnan and I. Sarkany.⁴

Allergic granulomatosis is not an entirely new concept in medicine. It has been used to designate the processes described by F. Wegener⁵ and by F. G. Zak and colleagues,⁶ but in neither of these has there been any clue to the identity of an allergen. The closest similarity to the zirconium granuloma is beryllium disease.⁷ Apart from pulmonary lesions, patients are seen in whom a minute amount of the metal may painlessly penetrate the epidermis and give rise to a sarcoidal granuloma in the dermis. It is always associated with allergic hypersensitivity which can be demonstrated by a positive patch test. The sites of some of these positive patch tests later show a granuloma of the same type.⁸ It is known that an epithelioid granuloma can be produced by many infective agents and different foreign materials. The work of Shelley and Hurley suggests the possibility that small amounts of trace metals other than beryllium and zirconium may be pathogenic as a result of hypersensitivity. They have also proved that a pure sarcoid reaction can be a manifestation of allergy.

HORMONE IN THE PINEAL GLAND

The pineal gland remains till now an unexploited organ. However, extracts of it have long been known to cause a change in skin colour when injected into frogs, toads, and fish. Whereas a hormone in the posterior lobe of the pituitary turns light-coloured frogs dark or indeed black, extracts of pineal gland have the opposite effect, and turn dark skin light. A. B. Lerner and his colleagues¹ at Yale have now isolated the active substance which has this action, and they propose to call it melatonin, though they do not say why they have chosen this name. Their original material was ox pineal gland, and they purified it by testing the effect of fractions on isolated skin of the frog *Rana pipiens* which they made dark with caffeine. Their work was done in the department of dermatology, and they used the most modern chemical methods (including counter-current distribution) such as are rarely seen used in departments of dermatology in Britain.

In preventing darkening of frog skin by the melanocyte-stimulating hormone, their new substance was found to be 100 times as active as adrenaline, 200 times as active as triiodothyronine, and 5,000 times as active as hydroxytryptamine. The new substance had no adrenaline-like activity on the rat uterus and no activity like that of hydroxytryptamine on the clam heart. It

¹ Lerner, A. B., Case, J. D., Takahashi, Y., Lee, T. H., and Mori, W., *J. Amer. Chem. Soc.*, 1958, **80**, 2587.

was not present in ox pituitary, or in the hypothalamus, or in any of the endocrine organs. Nor was it present in the eye. As to its chemistry, these authors confine themselves to the remark that the fluorescence and ultraviolet absorption were characteristic of hydroxyindoles.

PROTECTIVE OINTMENT AGAINST BILHARZIA

Rhodesia is developing fast. New and large irrigation projects and dams are being constructed and more farms are being opened up daily. With all these projects the risks of contracting bilharzia are increasing. It is often necessary in farming to use water from dams and streams. One source of infection is the watering of tobacco seed beds. As the water is usually pumped from the river under pressure, some of the cercariae might be killed by it, but they can withstand a pressure of 200 lb. per square inch (14 kg. per square cm.), which is higher than obtained by the ordinary farmer's pump. The infection is still more likely to occur from handling pumps suffering from mechanical breakdowns.

Dr. William Alves, director of the Bilharzia Research Laboratory in Southern Rhodesia, has therefore recently recommended the use of a repellent ointment to prevent cercarial penetration of the skin and so bilharziasis. The Commission on Schistosomiasis and Tropical Diseases of the United States Army devised this method of protecting soldiers exposed to the disease in the Far East.¹ Alves has made it clear that the ointment is not intended to protect swimmers but only those running an occupational risk. No doubt anglers may be tempted to use it, but as yet they have not been encouraged to try. The ointment is rubbed on the part of the body to be exposed to infection, such as the hands, forearms, ankles, and feet. Half an ounce (14 g.) is sufficient to cover all these parts. Alves's trials were not as extensive as those carried out by the Commission in the Philippine Islands, where a large number of compounds were incorporated into ointments applied to the shaved skin of the tails of mice. This was done in order to ascertain whether any of the ingredients protected the skin against penetration by cercariae during prolonged exposure to water. The mouse was placed in a brass cylinder with its tail exposed to water containing *Schistosoma japonicum* in a Wassermann tube so that the cercariae were more concentrated. Alves exposed his mice to water containing the cercariae of either *S. bovis* or *S. matthei*, and confirmed that the best protection was given by the following ointment, which he is now recommending:

Castor oil	...	...	...	...	40 parts
Lanolin	...	...	...	...	15 parts
Diglycol stearate	...	...	...	...	10 parts
Dibutyl phthalate	...	...	...	...	25 parts
Paraffin wax	...	...	...	...	10 parts

It is difficult to predict how efficacious this method of protection will be, but it is unlikely to be used with the constancy it might deserve. Farmers, miners, and even engineers will probably not cover their hands consistently with the ointment. Anglers may perhaps become infected through exposure of the hands to water

¹ Wright, W. H., Baumen, P. N., and Fry, N., *Amer. J. Hyg.*, 1948, **47**, 44.

harbouring cercariae, yet it is rare to see bilharzia in a person who has only fished and not swum in the water. There is unfortunately little evidence on the extent of this hazard. It is commonly assumed that cercariae can penetrate the skin of any part of the body with equal facility, but this may not be so. The skin of the hands and fingers is thicker and tougher than that of some other parts, and the cercariae may not be able to penetrate it, in which case there would be little indication for the ointment. The second variable factor in assessing the value of the ointment perhaps is that the risk of contracting the disease is greater when exposed to water at a dam or recently constructed project than to swiftly flowing water, to water at an altitude of over 6,000 ft. (1,800 m.) above sea level, or to rivers and lakes which have remained undisturbed for centuries. Men seem to be able to swim off the shores of Lake Nyasa with safety, but not in the smaller side streams entering it, on the banks of which refuse is strewn.

DISSOCIATION IN DEVELOPMENT

It is always easier to appreciate the vagaries of physical development in infancy than to recognize the aberrations of mental development, yet the latter may be of even greater importance. The outstanding "milestones," such as the age at which the head is held up and when sounds and persons are recognized, and the standard of performance with cubes and similar manipulations, are usually noted, and, since A. L. Gesell¹ and his associates brought this subject to the fore in 1925, most doctors have included some simple estimate of mental development when examining infants. With the increasing interest in such conditions as cerebral palsy and behaviour disorders in early childhood the assessment of the mental status and the likely prognosis of affected children are clearly urgent requirements, and any method of examination which will assist in providing this information is to be welcomed wholeheartedly.

Recently R. S. Illingworth² has drawn attention to the significance of dissociation in the different processes of growing up—as in an infant, for example, whose speech acquisition is notably in advance of, or behind, his motor development—and to the ways in which dissociation may be of diagnostic and prognostic value. He considers in particular motor development, which may be related to hypo- or hypertonia, sphincter control, development of speech, and social behaviour. As a result of his studies Illingworth concludes, for example, that isolated delay in motor development is not a sign of mental deficiency, and conversely isolated advanced motor development is not a sign of superior intelligence and may, indeed, occur in mentally defective children. Isolated delay in speech—another common and worrying problem—is likewise not a sign of mental defect and may be present in children of normal or superior intelligence. This is significantly different from delay in speech associated with other signs of retardation, in which the prognosis is bad. As to the age at which infants develop sphincter control, a matter equally

worrying to parents, isolated delay is usually unimportant as a sign of mental development. To appreciate the signs of dissociation adds scope to the methods of assessing child health and represents an advance in technique which is well worthy of study.

ADENOVIRUS VACCINE

The discovery of what are now known as adenoviruses,¹ and the realization that some of these agents are important causes of acute respiratory illnesses in military recruits² while others are responsible for outbreaks of acute pharyngitis and conjunctivitis in civilians,³ gave rise to the hope that a great advance had been made towards identifying the cause of many respiratory infections of otherwise unknown aetiology which bulk so largely as a cause of human incapacity. Vaccines composed of two⁴⁻⁶ or three⁷ antigenic types of adenovirus inactivated by formaldehyde proved effective in preventing the acute infections by adenovirus types 3, 4, and 7, which cause much illness among newly recruited Service men in North America.

The possible value of adenovirus vaccines to civilians, and especially to children, in whom many of these infections occur, has been discussed in recent American papers by M. R. Hilleman⁸ and W. S. Jordan.⁹ Though the distribution of antibodies suggests that adenoviral infections are common in early life,^{3 9-12} relatively few such infections have been detected in general surveys of sick persons.¹¹⁻¹⁷ In various reports reviewed by Jordan⁹ evidence of adenovirus infection had been found in only 0.5 to 3% of civilian patients with various respiratory illnesses. Adenoviruses were uncommon causes of illness in a group of London families¹⁴; and in the U.S.A. they gave rise to only 4% of the respiratory illnesses observed in families in Cleveland¹² and not more than 10% of such illnesses seen in a group of families in Fort Leavenworth, Kansas.¹⁰ In Great Britain, as in other countries, adenoviruses have been incriminated as the cause of outbreaks of generally brief, non-fatal

¹ Rowe, W. P., Huebner, R. J., Gilmore, L. D., Parrott, R. H., and Ward, T. G., *Proc. Soc. exp. Biol. (N.Y.)*, 1953, **84**, 570.

² Hilleman, M. R., and Werner, J. H., *ibid.*, 1954, **85**, 183.

³ Huebner, R. J., Rowe, W. P., Ward, T. G., Parrott, R. H., and Bell, J. A., *New Engl. J. Med.*, 1954, **251**, 1077.

⁴ Hilleman, M. R., Stallones, R. A., Gauld, R. L., Warfield, M. S., and Anderson, S. A., *Proc. Soc. exp. Biol. (N.Y.)*, 1956, **92**, 77.

⁵ Warfield, M. S., Anderson, S. A., and Werner, J. H., *J. Amer. med. Ass.*, 1957, **163**, 4.

⁶ Stallones, R. A., Hilleman, M. R., Gauld, R. L., Warfield, M. S., and Anderson, S. A., *ibid.*, 1957, **163**, 9.

⁷ Bell, J. A., Hantover, M. J., Huebner, R. J., and Loosli, C. G., *ibid.*, 1956, **161**, 1521.

⁸ Hilleman, M. R., *Arch. Intern. Med.*, 1958, **101**, 47.

⁹ Jordan, W. S., *ibid.*, 1958, **101**, 54.

¹⁰ Hilleman, M. R., Werner, J. H., Dascomb, H. E., and Butler, R. L., *Amer. J. publ. Hlth.*, 1955, **45**, 203.

¹¹ Balducci, D., Zaiman, E., and Tyrrell, D. A. J., *Brit. J. exp. Path.*, 1956, **27**, 205.

¹² Jordan, W. S., Badger, G. F., Curtiss, C., Dingle, J. H., Ginsberg, H. S., and Gold, E., *Amer. J. Hyg.*, 1956, **64**, 336.

¹³ Evans, A. S., *New Engl. J. Med.*, 1957, **256**, 377.

¹⁴ Andrews, B. E., McDonald, J. C., Thorburn, W. B., and Wilson, J. S., *Brit. med. J.*, 1956, **1**, 1203.

¹⁵ Tyrrell, D. A. J., Balducci, D., and Zaiman, E., *Lancet*, 1956, **2**, 1326.

¹⁶ Grist, N. R., Sommerville, R. G., and Carson, H. G., *Brit. med. J.*, 1957, **1**, 378.

¹⁷ Morrison, B., Bass, D., Davis, J. A., Hobson, D., Madsen, T. L., and Masters, P. L., *Lancet*, 1957, **2**, 1077.

¹⁸ Kendall, E. J. C., Kiddle, R. W., Tuck, H. A., Rodan, K. S., Andrews, B. E., and McDonald, J. C., *Brit. med. J.*, 1957, **2**, 131.

¹⁹ Wenner, H. A., Beran, G. W., Weston, J., and Chin, T. D. Y., *J. infect. Dis.*, 1957, **101**, 275.

²⁰ Pereira, H. G., and Kelly, B., *Proc. roy. Soc. Med.*, 1957, **50**, 745.

²¹ Sommerville, R. G., *J. Hyg. (Lond.)*, 1958, **56**, 101.

²² Bennett, F. M., Law, B. B., Hamilton, W., and Macdonald, A., *Lancet*, 1957, **2**, 670.

²³ Andrews, B. E., and McDonald, J. C., *Proc. roy. Soc. Med.*, 1957, **50**, 753.

²⁴ Jones, B. R., *ibid.*, 1957, **50**, 758.

²⁵ Macfarlane, P. S., and Sommerville, R. G., *Lancet*, 1957, **1**, 770.

respiratory illness, such as febrile catarrh in the Army¹⁵ and Air Force,¹⁶ pharyngo-conjunctival fever in children,^{14 15 18 20} and epidemic keratoconjunctivitis^{21 22}; they have also been associated with sporadic infections of the respiratory tract or eyes.^{11 20 23-25}

Adenovirus vaccines may prove useful for preventing outbreaks of illness in special groups such as newly recruited Service men, but on present indications it seems doubtful whether yet another series of injections would be worth while for the prevention of generally minor infections constituting only a small proportion of all the respiratory illnesses suffered by the general civilian population. Among children, however, adenovirus infections may be of greater importance, and it remains to be established whether significantly deleterious effects may result from chronic carriage of adenoviruses in lymphadenoid tissues of the body.

UNEXPLAINED MYOCARDIAL HYPERTROPHY

When the common causes of myocardial hypertrophy have been excluded there still remain a few patients whose cardiac enlargement has no apparent explanation. Asymmetrical hypertrophy of the interventricular septum or part of the wall of the left ventricle has been found in young adults, and Donald Teare¹ has recently described eight cases; three were known to have had auricular fibrillation, and there was some electrocardiographic evidence of conduction defects or myocardial damage. All but one of these eight patients collapsed and died suddenly and unexpectedly. In one family three siblings appeared to have the same condition, and two have died with unexplained asymmetrical myocardial hypertrophy. It is interesting to compare this localized hypertrophy of heart muscle with the diffuse cardiomegaly of familial type^{2 3 4} and with congenital glycogenic "tumours" of the heart.^{5 6} The patients with familial cardiomegaly are usually young adults, who may have heart block and may die suddenly; their hearts show a diffuse myocardial hypertrophy chiefly affecting the whole of the left ventricle. In several cases the myocardial fibres have been found to be vacuolated and contain glycogen. This raises the possibility that familial cardiomegaly may represent von Gierke's glycogen storage disease solely affecting the heart, but W. Evans² did not consider this to be a correct interpretation. Congenital glycogenic "tumours" of the heart are multiple myocardial nodules which are usually found in young children with tuberosus sclerosis,^{5 7} and the muscle fibres show vacuolated "spider" cells with demonstrable glycogen. Although these are often described as rhabdomyomata, they are believed to be of developmental origin^{7 8} or to be related to a glycogen storage disturbance.^{9 10}

The histological structure of asymmetrical hypertrophy appears to differ from that of familial cardio-

megaly and the congenital glycogenic nodules: there is irregular overgrowth of the myocardium with bizarre arrangement of the muscle bundles, and the fibres are not vacuolated. Teare prefers to regard the asymmetrical hypertrophies as hamartomata—developmental tumour-like malformations—rather than true rhabdomyomata. It is not easy to decide if these different myocardial abnormalities are interrelated; the anatomical differences between hearts with a developmental abnormality, a metabolic defect, or a true tumour of the myocardium are not always characteristic. The families of patients with unexplained myocardial hypertrophy should be investigated. When more information is forthcoming it should be possible to decide if the localized, as well as the diffuse, forms of hypertrophy have a genetic basis.

GOLD MEDAL OF THE B.M.A.

Last Monday the new President of the B.M.A., Professor A. P. Thomson, had the pleasant task of presenting the Association's Gold Medal for Distinguished Merit to Lord Adrian, O.M., F.R.S. It was awarded by the Council "in recognition of his distinguished services to medicine, particularly his research in the physiology of the nervous system." Like Sir Henry Dale, the previous recipient of the Medal, Lord Adrian has been conspicuously successful in advancing medicine by devoting his life to experiment in the laboratory. Much of the earlier work of this great physiologist was on the transmission of the nervous impulse, to the study of which he began to apply the electronic equipment, with its relatively crude thermionic valves, of the 1920's. A natural development of this interest was the study of the electric rhythms of the brain, first reported by Berger, and Lord Adrian and his colleagues were pioneers in making a rational basis for electroencephalography. Later he devoted his attention to the transmission of sensory impulses, chiefly for smell and sight. As President of the Royal Society in 1950-5 and Master of Trinity College, Cambridge, since 1951, as well as Vice-Chancellor of the University since 1957, Lord Adrian has shown his guidance outside the laboratory to be as illuminating as it was and still is within it. Another side is touched on in the citation which accompanied the presentation of the Medal: "Yet generations of medical students at Cambridge must have had a picture of you that is probably different from that conjured up by these almost overwhelming distinctions of mind and office, borne with a modesty of corresponding dimensions. It is a picture of a man bicycling from the Great Gate of Trinity to the laboratory and the lecture theatre, where the complexities of the central nervous system were made to seem even attractive by your skilful use of clinical neurology as an aid to understanding: a picture of a man for whom a host of students have felt affection as well as veneration."

Sir James Paterson Ross was re-elected President of the Royal College of Surgeons of England on July 10. Mr. A. Dickson Wright was elected, and Sir Archibald McIndoe re-elected, Vice-President.

¹ Gesell, A. L., *The Mental Growth of the Preschool Child*, 1925. Macmillan & Co., New York.

² Illingworth, R. S., *Arch. Dis. Childh.*, 1958, **33**, 118.

¹ Teare, D., *Brit. Heart J.*, 1958, **20**, 1.

² Evans, W., *ibid.*, 1949, **11**, 68.

³ Campbell, M., and Turner-Warwick, M., *ibid.*, 1956, **18**, 393.

⁴ Gaunt, R. T., and Lecutier, M. A., *ibid.*, 1956, **18**, 251.

⁵ Batchelor, T. M., and Maun, M. E., *Arch. Path. (Chicago)*, 1945, **39**, 67.

⁶ Landing, B. H., and Farber, S., *Tumours of Cardiovascular System*, 1956, Armed Forces Institute of Pathology, Washington.

⁷ Prichard, R. W., *Arch. Path. (Chicago)*, 1951, **51**, 98.

⁸ Hertzog, A. J., *ibid.*, 1948, **47**, 191.

⁹ Van Creveld, S., and van der Linde, H. M., *Arch. Dis. Childh.*, 1939, **14**, 14.

¹⁰ Kidder, L. A., *Arch. Path. (Chicago)*, 1950, **49**, 55.

British Medical Association

ANNUAL MEETING, BIRMINGHAM, 1958

SUMMARY OF PROCEEDINGS

THE SECTIONS

SECTION OF THORACIC MEDICINE AND SURGERY

Monday, July 14

Cortisone in Lung Disease

With the president, Mr. A. L. D'ABREU (Birmingham), in the chair, Dr. W. BROCKBANK (Manchester) described the use of cortisone in the treatment of asthma. He said that since the introduction of corticotrophin for the treatment of status asthmaticus its place had been established as a valuable remedy. The results of treatment with cortisone in chronic asthma were less definite, and the use of "blind trial" methods, with an inert control, had been necessary to assess results. Although initial improvement was good, deterioration took place after several months of treatment. Seven patients had died unexpectedly, possibly as a result of adrenal atrophy. Disturbing side-effects sometimes followed withdrawal. Accidents, operations, and infections were particular hazards at this stage. There had been an increased mortality from asthma in older patients in recent years. Steroid therapy might be partially responsible for this. Increase in weight was troublesome during treatment, but increase in blood pressure seldom occurred. Antibiotics were often helpful when infection was present. Cortisone was a habit-forming drug, even in patients deriving no benefit from its exhibition. On the whole, long-term treatment had been disappointing.

Steroid treatment was most valuable in the acute phase, not only in status asthmaticus but in patients given to spontaneous remissions. Prednisolone and cortisone were equally effective, though cortisone was preferred because it was cheaper and because complications occurred more slowly. Treatment aimed at starting with a big dose: 300 mg. of cortisone was given on the first day, the dosage reduced by 25 mg. each day, the course lasting 12 days. If patients relapsed a second course could be given safely. Other blind trials had shown that aerosol inhalations of hydrocortisone failed to bring relief, but inhalation of powdered hydrocortisone was helpful. The dose of hydrocortisone by this method was very small: presumably the drug acted by a local effect on the bronchial tree. The inhalation method was most applicable to less severe cases of asthma, but brisk systemic administration over limited periods was the treatment of choice.

Cortisone in Tuberculosis

Dr. N. W. HORNE (Edinburgh) spoke on the use of cortisone in pulmonary tuberculosis. Early work had suggested that cortisone was helpful in tuberculosis, but it was now apparent that it was not only safe but, sometimes, beneficial. In theory, cortisone was used for its pharmacological action in suppressing inflammatory tissue response. This allowed active multiplication of the tubercle bacilli, a stage at which anti-tuberculous drugs were most active. At the same time the harmful development of allergic reactions and fibrosis was suppressed. Cortisone should only be used at the same time as adequate anti-tuberculous drugs, and was often useful in suppressing hypersensitivity to these drugs. Cortisone was definitely valuable in the treatment of tuberculous pleural and pericardial effusions, the duration of the effusion being halved. It was necessary to continue the treatment for three weeks after the effusion had absorbed to

prevent relapses. The value of cortisone in primary tuberculosis had not been established.

Chemotherapy was so effective in the treatment of pulmonary tuberculosis that the place of added cortisone was difficult to assess. Evidence suggested that cortisone was effective in controlling the systemic symptoms in acute cases. It was not effective in hastening sputum conversion or cavity closure. The radiological changes during cortisone treatment were more difficult to assess. Pulmonary function was probably better maintained in patients receiving cortisone. The physiological action of the drug was sometimes helpful in patients with chronic tuberculosis and impaired renal function.

Sarcoidosis

Dr. HUGH SMELLIE (London) reported on the use of cortisone in 45 patients with sarcoidosis who had been under the care of Dr. Clifford Hoyle at King's College Hospital. Cortisone was imperative in patients showing hypercalcaemia or uveitis. Four patients with hypercalcaemia and uraemia had been treated by a low-calcium diet and cortisone with excellent results. Cortisone reversed the increased calcium absorption produced by calciferol. Eleven patients with uveitis had responded swiftly, but seven had relapsed after cortisone had been withdrawn. Treatment should be continued for at least a year. The indications for treating patients with pulmonary infiltration were less definite. Thirty-nine patients had been treated and the results assessed by serial radiographs. Anti-tuberculous drugs were not used. Those treated before infiltration had been present for less than two years did best; but early treatment had to be weighed against the chance of spontaneous recovery. A defect in pulmonary diffusion capacity was an added indication for treatment. Usually the optimum time for treatment was between 18 months and 2 years from the onset. There was a liability to relapse even after a year's treatment: clearly cortisone controlled the sarcoid reaction but did not eliminate the underlying cause.

AIR COMMODORE C. A. RUMBALL (London) confined his comments to the acute form of sarcoidosis as seen in Service patients. The main clinical features of the disorder were arthralgia, erythema nodosum, fever, and sweating. Radiographs showed hilar adenopathy, the sedimentation rate was raised, and proof of the diagnosis could usually be obtained from liver biopsy or the Kveim skin reaction. At a time when cortisone was in short supply the patients had been treated by daily intravenous corticotrophin, treatment being limited to one month. Although patients with this disease showed spontaneous improvement, response to treatment was rapid, symptoms being controlled in two days. Sections from serial liver-biopsy specimens were shown to demonstrate the histological improvement.

Pulmonary Fibrosis

In describing the use of cortisone in pulmonary fibrosis Dr. A. G. W. WHITFIELD (Birmingham) showed the effect of the drug on radiation fibrosis, interstitial fibrosis (the Hamman-Rich syndrome) and collagen diseases. Radiation fibrosis, after treatment for breast carcinoma, responded well. Treatment had to be maintained for at least three months. Even in the late stages cortisone was of some value, although spontaneous improvement sometimes occurred. Anticoagulants had been used in an attempt to prevent irradiation fibrosis: cortisone had also proved an effective prophylactic. Four patients with the Hamman-Rich syndrome had been treated, but there had been no response. Of the collagen disorders, systemic lupus erythematosus responded best. In polyarthritis nodosa, pulmonary infiltration responded to cortisone. The results in scleroderma were disappointing.

Complications of Cortisone Treatment

Dr. STEPHEN GOLD (London) reviewed the indications for cortisone in dermatological practice, and analysed the complications occurring during treatment of 210 patients.

Gastro-intestinal complications included four patients who sustained perforation or haemorrhage. Glycosuria was usually transient and soon recurred when treatment stopped. Two patients had, however, succumbed to diabetic coma. Mental symptoms developed in five patients, one of whom had a previous history of psychotic disturbance. Cardiac failure developed in four patients and was associated with water retention. One patient developed active tuberculosis while on treatment. Purpura, venous thrombosis, and osteoporosis were rare complications. Complications peculiar to corticotrophin therapy were rigors when the drug was given intravenously and abscess after intramuscular injection. It was concluded that complications were rarely severe enough to merit withholding treatment.

In the discussion which followed Dr. W. S. HAYNES (Kenya) described his experiences in treating with prednisolone 40 Africans suffering from tuberculosis. He drew attention to the recurrence of fever and the appearance of a rash when the drugs were withdrawn. Dr. C. M. FLETCHER (London), Dr. K. ROBSON (London), and Dr. G. W. HEARN (Birmingham) also took part in the discussion.

SECTIONS OF OBSTETRICS AND GYNAECOLOGY AND GENERAL PRACTICE

Monday, July 14

Looking at the Cervix

Dr. H. W. DONOVAN (Birmingham), president of the Section of General Practice, took the chair at the joint meeting with the Section of Obstetrics and Gynaecology, when Professor H. C. McLAREN (Birmingham) spoke on the use of the vaginal speculum, without examination by which he regarded no gynaecological examination as complete. In Britain the left lateral or Sims position was generally used, and one lubricated finger was passed into the vagina in order to assess the size of speculum to be inserted. In a tense, nervous patient a satisfactory examination by speculum might be impossible, in which case, if abnormality was suspected, the patient should be admitted for examination under anaesthesia. However, as Professor McLaren demonstrated by lantern slides, the interpretation of the clinical appearance of the cervix was not always easy. The cervix should be regarded as guilty until proved innocent, for now the cytological examination of smears made the diagnosis of pre-invasive cancer possible. General practitioners should therefore be encouraged to screen normal patients by cervical smears at regular intervals, sending the slides to a special centre for reading. If 10,000 fit women were examined in this way there would be discovered 60 women with pre-cancer of the cervix, 20 with early cancer of the cervix, and 10 with cancer of the body of the uterus.

In the subsequent discussion Professor ALEC AGNEW (Vancouver) said that cytological screening was the greatest recent advance in the diagnosis of gynaecological cancer, and described how in his area the general practitioners played the main part in carrying out these examinations. Dr. E. VON KUENSSBERG (Edinburgh) added that in Edinburgh, under the aegis of the College of General Practitioners, family doctors had carried out such a campaign with very encouraging results, especially in the diagnosis of pre-invasive cancer in women under 40 years of age.

Episiotomy

Mr. J. D. S. FLEW (London) read a paper on episiotomy and methods of perineal repair. He said that the indications for episiotomy were to forestall a spontaneous tear; for ease of vaginal manipulations—e.g., in forceps delivery; for all breech and all premature deliveries; to give more room when the subpubic angle was narrow; to help shorten the second stage in the interests of mother or baby; and as a long-term policy to prevent future prolapse. Except when undertaken immediately preceding vaginal manipulations, episiotomy was performed when the presenting part was well on the perineum, so that the consequent relief of ten-

sion would result in immediate delivery. In cases of foetal distress with the head on the perineum, episiotomy would lead to a quicker delivery than would forceps. In forceps extraction the instrument could usually be applied and the head brought down on to the perineum before performing the perineal incision. The anatomy of the area made a median episiotomy ideal, but to prevent extension into the rectum a J-shaped incision was preferred; but in every case the incision must start in the midline at the fourchette and extend throughout the depth of tissue and not merely cut the skin.

If episiotomy were urgent it could be done at the height of a pain with no anaesthetic at all, but local infiltration or pudendal block afforded excellent analgesia for the operation. Mr. Flew thought that about 70% of primigravidae and 20% of multigravidae required episiotomy, but it might not need to be repeated in subsequent labours. In conclusion, he emphasized the necessity for careful apposition of the incised tissues at repair, not only because it made for good surgical practice, but also because it was important for the future marital happiness of the patient.

In the subsequent discussion Dr. MERVYN GOODMAN (Liverpool) stressed the importance of having a good light and adequate exposure in the lithotomy position for repair of the perineum in domiciliary practice. Dr. A. S. VALENTINE (Sierra Leone) and Mr. S. BENDER (Chester) also spoke.

Use of Pessaries in General Practice

Dr. R. H. D. LAVERTY (Coventry), a vice-president of the Section of General Practice, then took over the chair, and Mr. W. G. MILLS (Birmingham) traced the history of the use of pessaries in the vagina from early times. In the first part of the nineteenth century it was said that there were two fortunes to be made out of gynaecology—by those who inserted pessaries and by those who removed them. To-day, although a prolapse or a retroversion causing symptoms could usually be easily cured by surgery, indications for pessary treatment still existed. Thus a pessary might be used as a temporary expedient for postnatal retroversion or pelvic floor relaxation as well as in patients awaiting operation. A pessary could also be used diagnostically to ascertain whether symptoms were or were not due to an associated displacement. The permanent use of a pessary might be indicated in the aged or infirm, but was not satisfactory in certain circumstances, such as when it was easily extruded or caused pressure symptoms or excited a local reaction. The pessary of choice for prolapse was nearly always either round or oval in shape; the fitting of other types (such as the Simpson shelf pessary for procidentia) fell in the field of the specialist. The traditional type of instrument made of compressible material covered with rubber commonly caused a vaginitis with offensive discharge. This could be avoided by using the modern plastic type, which was particularly easy to insert and remove if made of soft polythene.

The patient with a permanent pessary should be re-examined within three months to ensure that the instrument fitted properly and relieved the symptoms. Douching was unnecessary in most cases with plastic rings, but the doctor should inspect the vaginal walls regularly and change the ring for a different size as necessary. In exceptional cases an early prolapse in a post-menopausal woman appeared to be cured by the use of successively smaller rings. Mr. Mills concluded by summarizing that, while the gynaecologist was responsible for deciding that a pessary was indicated and for the initial fitting, subsequent care belonged to the general practitioner.

Dr. G. I. WATSON (Peaslake, Surrey) and Mr. J. D. LLEWELLYN-JONES (Malaya) contributed to the discussion on Mr. Mills's paper.

Brandt-Andrews Technique for Delivery of Placenta

Mr. NORMAN KIMBELL (Peterborough) described the technique for delivery of the placenta which had been described independently by Brandt in 1933 and Andrews in 1940. This method reduced blood loss in the third stage, the

average duration of which was only 8-9 minutes. The most important signs of placental separation were the onset of bleeding from the placental site and a change in the shape of the fundus from discoid to globular. A hand was placed on the patient's abdomen, so that the thumb was parallel to the symphysis and the palm and fingers were on the front of the uterus just above the pubes. Holding the umbilical cord taut, a gentle upward push was made on the uterus without trying to grasp the organ. If separation of the placenta had not taken place, the cord would be drawn upwards. If separation had occurred, the cord would not rise and the uterus could be pushed upwards while gentle cord traction was made to deliver the placenta.

The routine use of ergometrine intravenously, or intramuscularly combined with hyaluronidase, at the close of the second stage increased uterine tone and enabled the placenta to be delivered by the Brandt-Andrews technique within 5 minutes in most cases. The method, the technique of which Mr. Kimbell illustrated by a film, had been used in over 5,000 cases in the Peterborough area since July, 1954, by both midwives and doctors. Sometimes it had obviated the need for manual removal of the placenta from a woman admitted from the district for that purpose. It had saved many hours of midwives' time, but had not increased either the postpartum haemorrhage rate or the number of cases requiring manual removal of the placenta, nor had inversion of the uterus followed in any case.

Mr. Kimbell replied to questions from Dr. MERVYN GOODMAN (Liverpool), Dr. K. G. DICKINSON (Birmingham), Dr. A. FULLERTON (Batley), Miss JEAN HALLUM (Birmingham), Mr. W. G. MILLS (Birmingham), Miss ELSIE WARREN (London), Dr. H. C. W. BAKER (Birkenhead), Dr. H. W. DONOVAN (Birmingham), Dr. G. I. WATSON (Peaslake, Surrey), and Dr. ROSITA RIVERA-RAMIREZ (Philippines).

SEVENTH INTERNATIONAL CANCER CONGRESS

LONDON, JULY 6-12

The Seventh International Cancer Congress was held at the Festival Hall, London, from July 6 to 12, under the auspices of the International Union against Cancer. It was opened by the DUKE OF GLOUCESTER and attended by 2,500 delegates from 64 countries. The president of the Congress was Sir STANFORD CADE, senior surgeon of the Westminster Hospital. The chairman of the British Organizing Committee was Dr. RALSTON PATERSON, and the secretary-general of the Congress Professor R. W. SCARFF.

The main part of our report consists of dispatches from five special correspondents each of whom reviews a principal subject of discussion. The programme included plenary sessions on cancer control, hormones and cancer, carcinogenesis, and the chemotherapy of cancer; lectures by Professor L. BUGNARD (Paris), Dr. CHARLES HUGGINS (Chicago), Professor V. R. KHANOLKAR (Bombay), and Professor L. KREYBERG (Oslo); experimental and clinical group and sectional meetings; sessions arranged by the International Union; and many proffered papers.

Presidential Address

At the opening ceremony on July 7, Professor J. H. MAISIN (Louvain), president of the International Union, installed Sir STANFORD CADE as president.

The purpose of the Congress, said Sir STANFORD in his presidential address, was to take stock of present knowledge on cancer, analyse the accumulated facts, and critically review the different opinions on debatable points. The Organizing Committee had chosen for consideration what he would term "the front-line advance in cancer research" and the most urgent, important, and promising clinical subjects. Picking out certain of these for comment, Sir Stanford noted the ever-increasing role of biochemistry in cancer research; the reasoned thought which was result-

ing in sounder surgical judgment—"the concept of cancer as a biological disturbance and not merely as a tumour has resulted in surgery being more selective, more discriminating, and serving perhaps a fewer number of patients but to a better purpose"; radiotherapy, which had achieved broader, safer, and more effective reaches of usefulness; and the development of chemotherapy, which alone, or in combination with surgery, or even as an umbrella against implantation of cancer cells during operation had widened the group of medicinal remedies against cancer. Hormonal regulation of cancer of the breast and prostate had made no longer tenable the belief that cancer is autonomous, uncontrollable, and independent of the normal physiological processes. There was a crescendo of progress from the cruder methods of surgical ablation, once the only weapon, to the more selective action of radiation, applicable to an increasing number of patients, the specific effect of chemical substances useful in a limited group, and the physiological methods of hormonal control in two sites.

Progress in early diagnosis was slow; it depended upon the doctor's awareness of cancer and the patients' belief that early advice was always to their benefit. Even prevention of cancer was not beyond the hope of achievement. To-day cancer was indeed "captain of the men of death." It was the universal enemy of mankind. It called for a united international effort.

At the close of the Congress it was announced that the Eighth International Cancer Congress will be held in Russia in 1962. Professor ALEXANDER HADDOW has been nominated president-elect.

I.—CARCINOGENESIS

In the field of non-viral carcinogenesis it is fair to say that no startling new advances were reported. After listening to a number of individual reports, and several general lectures and discussions, one was left with the impression that the various groups of workers in this field are less rigidly divided in their outlook than formerly. The point was made on several occasions that cancer may arise in many ways and that the common factor, if there is one, is to be looked for not in the properties of the agents, exogenous or endogenous, which produce it, but in the type of disturbance which they produce. This disturbance was variously described: a continually stimulated proliferation without the inhibition which normally follows seems its most general property. This may result simply from separation of tissue from its normal contacts, as in the connective-tissue tumours which develop close to plastic or metal sheets implanted subcutaneously in rats by Dr. and Mrs. E. T. OPPENHEIMER and their colleagues (New York), and others, or in pituitary glands implanted subcutaneously in normal mice by Professor O. MÜHLBOCK (Amsterdam), or merely by long-continued culture of tissues *in vitro*. Interference with one of the normal feed-back systems has a similar effect, as in the various cases of tumour development in endocrine glands produced by diversion of their secretions or removal of their target organs, as described by Dr. J. FURTH (Boston) and Professor F. BIELSCHOWSKY (Dunedin).

Mode of Action

That carcinogens often act not directly upon the cells which become neoplastic but on some other tissue or tissues was the conclusion to be drawn from a number of different observations. Dr. H. S. KAPLAN (San Francisco) developed this general theme. Of the examples of such action perhaps the most striking is one which he himself has described—namely, the development of lymphomas in normal thymus glands transplanted to thymectomized, totally irradiated mice. These tumours are sometimes of host, sometimes of donor, origin; in the latter case carcinogenesis is certainly indirect, since the graft has not been irradiated. Some observations of Professor J. W. ORR (Birmingham) brought further support for the hypothesis of indirect action.

In order to bring chemical carcinogenesis into line with this general scheme various theories were put forward. That

of the Madison, Wisconsin, school was represented by Dr. C. HEIDELBERGER and Dr. V. R. POTTER. It assumes that carcinogens combine specifically with certain essential cell proteins, which are then eliminated from the cell. The loss is permanent, and results in uncontrolled growth. Exactly how is not stated. Dr. POTTER suggested a possible mechanism—namely, that a biosynthetic pathway might be stimulated by the deletion of a competing catabolic pathway. He and Dr. S. WEINHOUSE (Philadelphia) agreed that Warburg's theory that the carcinogenic change consists of an irreversible damage to the respiratory mechanism of the cell is no longer tenable. This is a highly speculative field; moreover, the main evidence on which the theory of specific protein deletion is based has been severely criticized, notably at this congress by Dr. D. L. WOODHOUSE (Birmingham), who showed that the case for specific union between carcinogens and cell proteins is not as firmly established as was claimed. Another criticism of a theoretical kind is that since the cellular change produced is heritable it must involve nucleic acid, and, whereas it is known that transmissible "information" can pass from nucleic acid to protein, there is no evidence that the reverse procedure ever occurs. Those that use this argument conclude that the essential attack of a carcinogenic agent is on the nucleic acids, and that alteration or loss of proteins must be secondary or incidental, although quantitatively greater.

Another view, which is constantly reappearing in new forms, is that carcinogens increase the frequency of mutations, assumed to be occurring at a low rate in normal somatic tissues, which confer on the mutant cells a selective advantage in resisting normal growth controls. Sir MACFARLANE BURNET (Melbourne) developed this theory, and expressed the opinion that the study of cancer as a problem in population genetics is likely to be fruitful.

The two-stage theory of carcinogenesis received rather less attention than in recent years. Professor K. SETÄLÄ (Helsinki), who has previously reported a tumour-promoting action on mouse-skin of very large doses of certain commercial surface-active substances, described similar effects by specially synthesized substances of this class where the presence of impurities could be virtually excluded. These observations have caused concern for some years because of the increasing use of surface-active substances as detergents and as food additives. This concern is likely to be increased by Dr. P. SHUBIK's (Chicago) demonstration that one of these substances ("Tween 60") is weakly carcinogenic as well as tumour-promoting on mouse-skin.

Cancer of the Bladder

The debt which experimental research in this field owes to clinical observation, especially in industrial medicine, was freely acknowledged. The remarkable series of researches on bladder carcinogenesis by Dr. G. BONSER and her colleagues in Leeds and Dr. W. C. HUEPER in Bethesda, U.S.A., all derive from observations of the high rate of bladder cancer in dye workers. Dr. BONSER and Professor E. BOYLAND (London) emphasized that we now know enough about bladder carcinogens to make it reasonable to hope that we may be able to eliminate most of the potentially dangerous substances of this class from our environment, or to antagonize their action.

Aetiology of Lung Cancer

Professor L. M. SHABAD (Moscow) described the great reduction in benzpyrene content of the atmosphere of a new industrial town in Russia (Angarsk) by improved methods of fuel combustion and smoke control.

Contributions to the tobacco-lung-cancer problem were numerous. Those who spoke on this subject appeared more willing than formerly to accept the possibility of multiple factors in the causation of lung cancers. Professor L. KREYBERG (Oslo) stressed the importance, and also the difficulty, of accurate histological typing of lung tumours. His careful surveys provide a firm basis for detailed correlation between the frequencies of different kinds of lung

cancer and exposure to tobacco, dusts, and other environmental conditions. The conclusion, previously suspected but now firmly established, is that only squamous and undifferentiated (oat-cell) tumours can be associated with smoking habits. Many puzzles remain: for instance, Dr. E. V. COWDRY (St. Louis) pointed out that histological changes often regarded as precancerous, such as squamous metaplasia, were at least as common in the trachea as in the bronchi, yet cancer is uncommon in the former, common in the latter. Some light relief from these serious, sometimes sombre, deliberations was provided by Professor P. R. PEACOCK's (Glasgow) film showing the gradual conditioning of fowls and other creatures to the practice, and apparent enjoyment, of cigarette smoking: no lung tumours have so far resulted. The application of tobacco tars to various animal tissues still gives widely differing results in different hands. While tumours have been produced with whole tar, and certain crude fractions, in several laboratories, no single constituent has so far been incriminated. The view that a combination of several constituents of tar are involved, possibly in conjunction with atmospheric pollutants, is gaining ground.

Dr. R. DOLL (London) dealt with the criticisms which have been made of the statistical evidence, and concluded that a causal connexion with smoking was still the most probable explanation of the observed facts. Professor W. C. HUEPER (Bethesda) stressed the possible role of metal dusts, not only in industrial workers but also in the general population. Dr. E. L. WYNDER (New York) has been trying to modify methods of cigarette manufacture so as to reduce the hydrocarbon yield on burning. This is an approach of considerable practical interest.

Radiation Hazards

The role of radiation in the aetiology of human cancer also received attention. Dr. R. DOLL pointed out that, although acute leukaemia, monocytic leukaemia, and chronic myeloid leukaemia are positively associated with previous exposure to irradiation, a similar association in the case of chronic lymphatic leukaemia is uncertain. Both this speaker and Dr. R. H. MOLE (Harwell) were of the opinion that there is no threshold dose below which irradiation is safe. Others were inclined to believe that a threshold exists in some cases, but all were agreed that it is hard to conceive an experiment or survey likely to establish this point with certainty. An interesting contribution in this field was that of Professor N. PETROV and his colleagues from Leningrad, who reported the production of a significant number of bone tumours in monkeys by intramedullary implantation of radioactive substances, though these animals are highly refractive to the action of chemical carcinogens applied by this as well as other routes.

II.—VIRUS-INDUCED TUMOURS

In the few years since the Sixth Cancer Congress in São Paulo both the scope and the amount of research into virus-induced tumours have increased tremendously. Dr. L. GROSS (Bronx, New York) has very recently discussed the viral aetiology of mouse cancer in this *Journal* (July 5, p. 1), and it was unfortunate that illness prevented his participation at the last moment in this Congress. For the centre of greatest interest in the viral field was undoubtedly mouse leukaemia and the other tumours produced by this virus or virus-complex.

Mouse Leukaemia

Dr. GROSS has now found that 50% of young, adult C3H mice—of his "low leukaemia" strain—develop leukaemia after irradiation with 150-200 r per week for four or five weeks. Filtered extracts from such tumours were inoculated into newborn C3H mice: 11% developed leukaemia (at 13 months average age) and 5% parotid tumours (at 10 months). Cell-free extracts of normal organs of healthy adult C3H mice inoculated under the same conditions gave rise to only 0.5% leukaemia (at 17 months),

but also, paradoxically, 7.5% parotid gland tumours (at 4½ months)—which therefore arose faster than in the treated group. Serial passage of the leukaemia agents in newborn hosts was found to increase the potency to such an extent that older, suckling mice could be infected.

Since Gross's first reports in this field a number of similar observations have been made. Professor A. GRAFFI (Berlin-Buch) and his colleagues are working with a mouse myeloid (chloro-) leukaemia. The same agent was derived from a number of different, spontaneous mouse carcinomas and sarcomas—but carcinogen-induced sarcomas gave negative results. The tumour yield from the filtrates was dependent upon the age of the hosts at the time of inoculation; it fell from some 40–50% between 1 day and 11 days to 22% at 3–4 months. Splenectomy before injection of the filtrate reduced the number from 72% in the controls to 8%, but if the splenectomy was delayed for one to two months after inoculation the tumour yield rose to 54%. The filtrate appeared to contain a particulate agent with the properties of a nucleoprotein. It was not highly antigenic for mice, as hyperimmune mouse serum did not fully inactivate it, but normal rabbit serum and rabbit anti-mouse bone-marrow antiserum gave no inactivation. Attempts to culture the agent on chorio-allantoic membrane appeared to be unsuccessful during the first ten passages, but at the eleventh passage tumours were produced in 78% of the inoculated mice.

A leukaemia, serially transmissible by cell-free filtrates to adult mice, was described by Dr. C. FRIEND (New York). This disease, unlike those of Dr. Gross and Professor Graffi, is characterized by a very short incubation period of about two weeks. The agent is immunologically distinguishable from normal mouse spleen and serum proteins. Immune sera from rabbits and mice neutralize the agent's infectivity, but sera from mice with other types of transplantable or "cell-free filtrate"-induced leukaemias, and sera from man, both normal and leukaemic, do not contain neutralizing antibody. It is possible to immunize mice with a formalin-treated virus vaccine: 80% of the animals given three intraperitoneal vaccinations resisted challenge with either virus or leukaemic cells and remained completely free of the disease. A similar cell-free agent derived from the brain of a C3HeB mouse bearing a spontaneous leukaemia, and inoculated intracerebrally or intraperitoneally into adult mice of the same strain, was reported by Drs. H. M. SCHOOLMAN, S. O. SCHWARTZ, W. SPURRIER, and P. B. SZANTO (Chicago) to give a 70% yield of leukaemia.

Tissue Culture of Mouse Leukaemia Agent

These agents are intriguing enough, but Drs. S. E. STEWART, B. E. EDDY, and M. F. STANTON (Bethesda) were able to culture a mouse leukaemia agent on trypsinized mouse-embryo mince. The supernatant fluids from such cultures contained an agent which produced multiple types of tumours in 60–100% of newborn mice of two different strains. All tumour-bearing mice had pleomorphic tumours of the salivary glands, and many had up to eight other types of unusual primary tumours and lesions. The latent period between inoculation and tumour production varied from a few days to several months. Further, and yet more remarkable, this mouse-derived agent was not species specific. Tumours have also been produced in rats, rabbits, and hamsters. In the hamster—and for this animal it was not even necessary to use newborn animals—sarcomas of the heart, kidneys, and subcutaneous tissues were the commonest tumours, but many had also haemangio-endotheliomas of the liver and lungs. The agent was highly antigenic, and tumour induction in mice was completely inhibited by passive immunization with rabbit antiserum.

Two other, distinctive, approaches to the subject were described by Dr. R. LATARJET (Paris) and by Dr. J. RYGARD (Copenhagen). The former has tested extracts of leukaemic Ak mouse tissues in newborn isologous mice. The appearance of spontaneous leukaemias in this strain was accelerated, and in a few cases various multiple malignant tumours

appeared. The agent was resistant to enzyme digestion with proteases and nucleases, and preliminary results with inoculated purified nucleic acids from leukaemic tissue suggest that these acids may have some influence on the tumour incidence. Dr. RYGARD has found that some treatments which induce leukaemia in mice also lower their resistance to infections, and has correlated this with a depression of phagocytosis as judged by the rate of clearance of colloidal radiogold from the blood. Furthermore, he found that 2–4-day-old mice also show a low blood-clearance.

In electron micrographs Drs. L. DMOCHOWSKI and C. E. GREY (Houston) and L. GROSS (Bronx, New York) claim to be able to identify the agent in the induced parotid tumours. While Professor A. D. TIMOFEEVSKY (Moscow) reported that he and his colleagues have observed particles 40–80 millimicrons in diameter in a large proportion of human tumours. Fewer particles were present in normal tissues. There was some evidence that these globular virus-like bodies could be cultivated, together with living tissue, on chorio-allantoic membrane, and they had a distinctive antigenic composition.

Mouse Mammary-tumour Agent

The mouse mammary-tumour agent was the subject of four communications. Dr. D. H. MOORE (New York) correlated its physical and biological properties, and in an attempt to fit in all the evidence from filtration, irradiation, diffusion, and biochemistry was forced to postulate the presence in the milk of a particulate inhibitor intermediate in size between two different active forms of the virus. Dr. H. B. ANDERVONT (Bethesda) has observed, within the past few years, the disappearance of the tumour agent from two female mice of the RIII strain—i.e., mammary cancer was absent from their descendants. Current experiments are being directed to finding out whether the disappearance is a result of a change in the agent, in the mice, or in both.

Dr. M. K. DERINGER (Bethesda) produced a substrain (C3He) of strain C3H mice by transfer of fertilized ova from a C3H female to the uterus of a mated C57BL female. The young were nursed by their "foster-mother" until weaned. The new agent-free strain showed a very high incidence of hepatomas—59% in virgin females, 27% in breeding females, 38% in force-bred females, 54% in stilboestrol-treated males, and 91% in breeding males. Recent studies on the mouse mammary-tumour agent were also reviewed by Dr. J. J. BITTNER (Minneapolis).

Viral Tumour of Monkeys

A new virus producing benign fibromatous lesions in rhesus monkeys was described by Dr. C. H. ANDREWES (London) and his colleagues. A year ago at the West African Institute for Medical Research in Nigeria a rhesus monkey in an outdoor cage developed a rapidly growing nodule on the eyebrow. Within the next few months similar growths appeared on the face or limbs of 20 other rhesus monkeys and a baboon. Serial transmission studies showed that the pox-like virus produces large growths which spontaneously regress after about a month. The virus passed a 0.65 μ gradocol membrane, and smears from the growths showed abundant D.N.A.-containing elementary bodies resembling those of vaccinia. Tissue cultures of monkey kidney could be infected and the virus multiplied giving cytoplasmic inclusions and elementary bodies similar to those in the growth themselves.

Benign fibromas in Virginian white-tailed deer also have been investigated by Drs. K. R. DUMBELL (Liverpool), R. MANGOLD and L. G. MACNAMARA (New Jersey), and R. E. SHOPE (New York). This filterable agent was transmitted experimentally to other deer. The incubation period was prolonged and the regression rate high. The few experimental growths that did persist eventually approached, in size and appearance, the naturally occurring ones.

Drs. P. ROUS, S. ROGERS, and J. G. KIDD (New York) transplanted metastatic tissue from the Shope rabbit carci-

noma into newborn rabbits. Many tumours could be propagated serially, and extracts of some 50% of them, inoculated into the hyperplastic skin of adult rabbits, gave a few typical papillomas but no carcinomas. Papilloma virus antigen appeared, however, to be present in the transplanted tumours. A similar phenomenon was discussed by Mrs. M. L. DURAN-REYNALDS (New Haven) and her colleagues. Cortisone treatment of rabbits with regressing methylcholanthrene-induced skin tumours brought about a reactivation, which reversed when the daily cortisone was discontinued. During the stage of active cortisone-induced growth, a filterable agent could be recovered which induced, both grossly and histologically, a papilloma-like lesion.

A number of interesting studies on filterable chicken sarcomas and leukoses—where a viral aetiology is unquestioned—were also reported, but there is no space to summarize them here.

Future Research

In brief, one's immediate impression is that two main factors account for the great advances reported on the viral aetiology of mouse cancers. The first is the use of newborn test animals. The second is the successful propagation of the virus in tissue culture. The latter procedure may result in a considerable augmentation of both virulence and titre. The former has an obvious corollary: that together with a search for new agents—and it may not be long before cell-free filtrates from human tumours will be shown to produce tumours in mice and hamsters—a close study should be made of the reactions of newborn animals to antigenic "insults" of this kind, and, in particular, to the possibility of the animal having acquired an immunological tolerance to a "latent" agent.

III.—IMMUNOLOGY AND IMMUNOGENETICS

Present attempts to discover immunological differences between malignant and normal cells may be expected to shed light on the aetiology of cancer and perhaps also, in the future, on its treatment. Much experimental work in this field involves of necessity the study of tumours that can be serially transplanted, which in turn demands the use of pure lines of animals. Members of such inbred strains, like identical twins, have the same genetic and antigenic constitution. Until very recent times it was only from the mouse that such stocks had been raised, and this is why such extensive use has been made of this species.

Antigenic Changes in Cancer Cells

Recent hypotheses relate malignancy to the loss of cellular components which, it is postulated, are essential to the normal control of cell multiplication. On the other hand, the finding of additional antigenic components in virus-induced tumours is hardly unexpected. Their appearance in other tumours, whether indicative of virus action or not, raises distant therapeutic possibilities. For it is clear that tumours, unlike normal tissues, may survive and grow despite certain degrees of antigenic disparity between them and their hosts. In such experimental situations passive and active immunization have been effected. In fact Dr. G. D. SNELL (Bar Harbor) described such a procedure in his further analysis of the genetic factors influencing the transplantability of tissues in the mouse. He used paired inbred strains whose selected genetic (and hence antigenic) differences were too slight to cause the mutual rejection of grafted tumours. But prior immunization of one strain with the normal tissues of the other protected the host from the otherwise fatal tumour grafts from the partner strain. He has used this method to investigate minor antigenic differences which would cause rejection of a skin graft for example, but which do not suffice to destroy genetically comparable tumour tissue.

Several investigators have attempted the production of antibody fractions directed specifically against tumour antigens. Dr. I. L. SPAR and his colleagues (Rochester, U.S.A.),

using a radioactive label, showed that such preparations when injected into tumour-bearing animals may be selectively taken up by tumour tissue. However, it was by no means certain that this occurs as a result of the simple immunological reaction originally proposed. Be that as it may, the suggestion that such preparations may serve as carriers of radioactive or chemotherapeutic agents and bring about their concentration in the target cells is a hopeful one.

The acquisition of new antigens is not of course incompatible with loss of others. Dr. E. WEILER (Pasadena) demonstrated the disappearance of organ-specific antigen (antigen common to the species but peculiar to a particular tissue) from the liver of rats during the evolution of chemically induced hepatomas and, similarly, from the kidney during the development of stilboestrol-induced renal carcinoma in the hamster. He has recently shown that this latter antigen is apparently lost within a very short time in tissue culture, probably after only a few cycles of cell division. He finds that these antigens are confined to normal liver parenchymal cells and normal renal tubular epithelial cells respectively—that is, to the cells from which these tumours arise. There is as yet no evidence that this loss is in any sense a causal rather than a secondary event, nor that it has any bearing on the changes, possibly allied to malignancy, which accompany the derivation of continuously propagated lines of cells from normal tissue in culture.

Serological Test for Tumour Antigens

Professor L. A. ZILBER and his associates (Moscow) have used an ingenious and sensitive technique for the detection of additional antigens in human and animal tumours (including a chemically induced hepatoma of an inbred strain of mice). Guinea-pigs are sensitized to fractions of tumour tissue and later desensitized with comparable fractions of normal tissue. They are then challenged with the tumour fractions. Anaphylactic reactions denote residual sensitivity to antigen(s) absent from the desensitizing preparations. Their results with this and other methods lead them to recognize that the appearance of these new antigens may be accompanied by some loss of normal tissue antigen, but they at present differ from Dr. Weiler in their views on the extent to which organ-specific antigens are affected.

Reports by Professor G. KLEIN and Drs. E. KLEIN and K. BAYREUTHER (Stockholm) indicate that other kinds of antigens may be suppressed. Their methods enabled them to detect variants from among the cell populations of sarcomas arising in hybrid mice. By transplantation and other tests they showed that, in some tumour-cell lines so derived, iso-antigens (cellular antigens present in some but not all strains of the species) are either lost or suppressed. This is in keeping with extensive previous work on the apparent loss of iso-antigens by tumours in the course of serial transplantation. It also draws attention to the heterogeneous nature of tumour cell populations and the influence of intercellular variation and selection in the successive stages of their evolution towards increased autonomy. These workers made the striking observation that each new sarcoma displayed individual characteristics in the production of variants, although all were histologically similar and had been induced by the same dose of carcinoma in the same tissue of genetically identical mice. By contrast Drs. L. SACHS and M. FELDMAN (Rehovoth, Israel) support the view that in some instances tumours can acquire increased "antigenicity" in response to immune reactions, enabling them to neutralize the host's output of cytotoxic antibodies.

Interpretation Must be Cautious

Some account of current misgivings is perhaps as important as accounts of current research. Dr. P. GRABAR (France) pointed out the need, particularly important to aetiological concepts, to distinguish between absolute and merely quantitative changes in tumour tissue. Dr. T. S. HAUSCHKA (U.S.A.) and Dr. P. A. GORER (London) both

Motoring News

DEPRECIATION

The eternal problem of counteracting wear and tear on motor-cars confronts us all at some stage or another, and there comes a time when decisions have to be made on whether the car should be done up or exchanged for a later model. Car dealers have never been the most popular members of the community, for they are often accused of making large sums of money out of the simplest of business transactions. But they have to live, and, though a few do make big money, trade is seasonal and they sometimes have to cover their losses on narrow profits. The wise car-owner can therefore take advantage of this if he chooses the right time of year to trade-in his used model.

The owner of a small popular model has little to fear from the dealer, because the resale value of modern cars of low horse-power is very high. Demand is great because of their economy and low insurance rates, and they can still be sold easily third- or fourth-hand.

The financially economical period of use for a small car such as a Morris Minor is, in theory, about two years. After this time its basic value begins to drop off, depreciation figures on tax accounts begin to level off, and repair charges loom ahead. The more expensive car, say one costing just over £1,000, retains its value only if it is a popular model which is reasonably economical for its size and is not likely to be superseded by a new model in the near future. A typical example of a car in this group which is selling well at present is the Austin A90. Care is needed when buying the more expensive type of car, since the greater the initial cost the more will the price drop when selling time comes round.

As to the medium-priced luxury models, of which the Rover range are among the best sellers, five years would be an economical period of ownership for a car of this sort if the user is to recover the considerable initial outlay by way of lower repair charges on a quality model which will last well for a number of years. In fact, by careful buying and selling, cars in this class can sometimes be sold after five years for very substantial sums if they have been carefully looked after, often for as much as would be realized on the sale of two cheaper smaller cars used over the same period. But this may be exceptional; it happens to apply to Rovers, while the less popular luxury models often lose value quickly. Buyers of this type of car can afford to buy them new, and second-hand prices have to be slashed to attract the small minority of purchasers who just cannot afford the new price. Though petrol consumption has to be taken into account, many G.P.s find it no more of a financial burden to run a large car and claim considerable tax relief on heavy garage bills than to suffer the relative discomfort of an economy car with the correspondingly small tax allowance on fuel and repairs.

In most cases favourable part-exchange terms are obtained by disposing of a car in favour of a similar new model, preferably through the same dealer as supplied the old one. In this way the trade-in loss covers the running costs for, say, two years, and one starts off with a new model again. This process has to be kept up, however, for if the gap between new and old is allowed to grow then the price gap becomes too great. Many country doctors doing large annual mileages adopt this scheme; the cars are supplied and serviced by the dealer concerned and exchanged at a pre-arranged price.

Car Radios

There are no hard-and-fast rules about which radio sets perform best in which cars, and, unless the makers them-

(Continued at foot of next column)

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Sandosten+Calcium (Sandoz Products Ltd.).—Sandosten is the proprietary name of the antihistamine drug thenalidine (or thenophenopiperidine) tartrate, and it is recommended that it should be given in conjunction with calcium. Tablets are available each containing thenalidine tartrate 25 mg., calcium lactate 579 mg., and calcium gluconate 794 mg. This antihistamine drug is also marketed in ampoules for intravenous injection, in an ointment, a syrup, and a nasal spray.

This combination does not seem to have been tried extensively in Great Britain and the reports of clinical trials emanate from the U.S.A. Internal treatment, with or without local application of the same substance, is reported to have given the best results in allergic rhinitis, but good results also in allergic skin conditions, notably contact eczema, atopic eczema, and urticaria. The duration of action is four to six hours, so that treatment should presumably be given three or four times daily. The few published clinical trials report a very effective action combined with the minimum of side-effects and toxicity.

N.H.S. basic price: 100 tabs., 19s. 8d.

Debendox (Riker Laboratories Ltd.).—Each tablet contains dicyclomine hydrochloride 10 mg., doxylamine succinate 10 mg., and pyridoxine hydrochloride 10 mg.

Since the exact pathogenesis of pregnancy sickness is still unknown, a variety of drugs is being used to counter or prevent it and to reinforce dietary and other advice. The drugs fall largely into three groups—sedatives and antispasmodics, antihistamines, and B vitamins—and there are several proprietary preparations which contain a combination of different drugs from the three groups, as does debendox. Dicyclomine hydrochloride is an antispasmodic, weaker than atropine and having some local anaesthetic action. Its value in the treatment of peptic ulceration and for conditions of increased gastro-intestinal mobility has been reported on favourably. Doxylamine succinate is one of the less active but longer lasting antihistamines. Pyridoxine is vitamin B₆. The tablets are coated so that absorption is delayed and the anti-emetic action takes effect four to six hours after ingestion. The recommended dose is therefore two tablets at bedtime so as to counter the early morning attack which is the usual, but not constant, feature of pregnancy sickness.

N.H.S. basic price: 100 tabs., 38s.

(Continued from preceding column)

selves specify a particular set, trial and error is really the best method of finding them, particularly portables. The small battery-mains portable or transistor models are ideal for use in the car, and they can be taken out for picnics or home use. Battery-mains models will give better reception in a car than battery-only examples. Built-in sets are now available with push-button controls even in the cheap cars. They are a much better buy than manual-tuning sets because there is little difference in the price and the cheapest push-button ones give very good reception. Those fitted in Rover and Humber cars are really good and are well worth the money asked. The Ekco radios on Fords give good reception, though most have manual tuning. Aerials, like the sets, vary too, and their positioning for best results depends largely on where the car is being used (since certain parts of the country have better radio reception than others) and on the set fitted.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Ectopic Pregnancy after Pelvic Tuberculosis

SIR.—Tuberculosis of the female genital tract is a comparatively frequent cause of infertility, and, although the incidence may not be increasing, modern diagnostic methods have allowed the condition to be discovered more often. The finding of an active tuberculous lesion in the endometrium may be associated with gross pathology in the Fallopian tubes and there may be corresponding symptoms of pain and heavy periods. In many cases, however, there is no complaint beyond the infertile marriage. Treatment has been completely altered by modern chemotherapy. Surgical removal of the pelvic organs was formerly practised with some success, but conservative surgery frequently led to fistulous complications, while radical removal could on occasion prove extraordinarily difficult. The patient with quiescent disease would often remain untreated. It was natural that streptomycin and allied drugs should be adopted as an alternative to surgery, and this conservative medical treatment is now widely used.

It is the purpose of this letter to draw attention to a complication of this medical treatment that has not received sufficient notice. I refer to the increased incidence of ectopic pregnancy among these patients, and I attribute this directly to the resolution of the active tuberculous salpingitis that accompanies many (if not all) cases of endometrial tuberculosis. Unfortunately the tube seems often to be left patent but inert, so that the active spermatozoa can migrate but the passive fertilized ovum cannot be propelled into the uterus. Among 29 patients seen personally with pelvic tuberculosis there have been six tubal pregnancies. The two most recent are described briefly below.

* Mrs. R. S. complained of infertility after only a year of married life and had an ovarian cyst impacted in the pelvis. Her husband's seminal analysis was normal. At laparotomy (September 9, 1957) the dermoid was removed, but chronic interstitial salpingitis suggested tuberculosis, which was confirmed by culture and sub-curettage. Treatment with streptomycin and P.A.S. and subsequently isoniazid was given and she was awaiting curettage of the uterus. Pregnancy continued on March 20, 1958.

Mrs. M. B., aged 26, complained of infertility and vague pelvic pain. Two salpingograms showed abnormal results with inadequate tubal spill, and a diagnosis was made of chronic pelvic adhesions, probably associated with appendicitis in the past. At laparotomy on October 8, 1956, chronic interstitial salpingitis was discovered and tuberculosis confirmed on examination of curettings. Chemotherapy with streptomycin and P.A.S. was given for three months, after which curettings were proved negative. A baby was adopted, intercourse became relatively infrequent, and the tubal pregnancy ruptured on June 30, 1958.

There are patients in whom it may be right to foster the tiny hope of successful pregnancy following medical treatment for pelvic tuberculosis, but the disease will surely exact a toll of ruptured ectopics. The day may yet dawn when patients will be asked to accept the almost inevitable infertility of pelvic tuberculosis, and after adequate chemotherapy the diseased tubes at least will be removed. In the case of each patient reported above, *both* tubes were excised at operation, for which the husbands as well as their wives were demonstrably grateful.—I am, etc.,

WILFRED MILLS.

WILFRID MILLS.

Ring Pessaries

SIR,—Dr. D. N. S. Robertson and Dr. F. D. Stott, in their admirable memorandum on "polythene" ring pessaries (*Journal*, July 5, p. 30), mention that they are suitable for those women for whom an operative cure would be an unwarranted risk, for those who refuse to undergo surgical repair, and for women in the midst of their childbearing.

though they do state that surgical repair is the ideal method of treating this common disability. They then proceed to state the advantages of polythene over rubber and vulcanite. They make no mention of celluloid rings, which have been available from Allen and Hanburys Ltd. for many years. I have used them in a great many cases for about 12 years, and have found them most satisfactory. They are inert, produce no tissue reaction and no vaginal discharge, so that douching is not necessary. They do not compress for insertion in the introitus, but when immersed in boiling water for a few seconds they soften and can be bent to any shape, hardening immediately on cooling.

It is my experience that few women need a circular ring, that indeed a circular shape keeps the vaginal walls stretched and does not encourage them to regain their tone, while a pear-shaped support, somewhat like an Albert Smith pessary and wide enough at the base to ensure that it remains *in situ*, is easily inserted. It is always possible to make the patient completely comfortable by altering the shape—for example, to take pressure off the rectum, or give more support to the bladder. I believe that operative measures are often unnecessary where such a pessary is worn for long enough in cases of prolapse after childbirth and combined with exercises to improve muscle tone. It is usual to find that gradually a smaller size becomes necessary as the muscle tone improves, until no further support is required. I well remember one patient, a farm labourer's wife, who presented with a procidentia after her thirteenth confinement: she needed a 95 mm. ring to begin with, but gradually improved and needed narrower and smaller pessaries (she ended up with a 65 mm.), until after four years she was restored to normal and the pessary removed. It is, of course, likely that there will be a recurrence of the prolapse when such patients are much older, but at such a stage it is usually much easier for patients to submit to operation, which can create so many problems for a mother with a young family.—I am, etc.,

London, N.W.1.

ELEANOR MEARS.

Cardiac Arrest

SIR,—I am interested to see in the article on cardiac arrest by Dr. D. W. Blair and his colleagues (*Journal*, June 28, p. 1521) a statement of the need for a visual pulse monitor. I have been using a simple instrument of this type for some eight years and have found it extremely useful. It was described in the *British Medical Journal* (1952, 1, 1188), but the circuit given there has since been improved. No "electronic" parts are used in the electrical circuit, and it is cheap, portable, and easily constructed. As it does not depend on the electrical activity of the heart but on pulsation in the arterioles of the finger pulp, a severe fall in blood pressure or an ineffective peripheral circulation is shown at once and so too are cardiac arrhythmias or variations in output.

I have not been able to interest British instrument manufacturers in the device, but it is made by several firms in the United States.—I am, etc.,

Stow on the Wold.

V. J. KEATING.

SIR,—Dr. D. W. Blair and his colleagues (*Journal*, June 28, p. 1521) are surely right to re-emphasize the need for vigilance in the use of neostigmine, and to attribute their case of cardiac arrest to its too-rapid injection after what might seem a possibly inadequate dose of atropine. Correctly used, neostigmine is a very safe antidote to curare or gallamine, but a sound "drill" should be adopted, such as the following:

Having decided that neostigmine is needed, atropine is given intravenously, the dose (commonly up to 1/50 of a grain—1.3 mg.) depending largely on the anticipated total dose of neostigmine which is to follow. In abdominal cases the atropine is best given just before starting peritoneal closure. Once the peritoneum is securely closed and atropine-induced tachycardia established, the pulse is timed and the state of respiratory activity (or lack of it) noted. The anticipated necessary total dose of neostigmine (usually between 1 and 3 mg. in adults) is then drawn up

and one-third of it injected intravenously. Two minutes later the pulse and respiration are again observed and the second third injected. The last fraction is similarly given two minutes later again, but each injection is preceded by observation of the respiratory activity to make sure that it is necessary, and of the pulse rate to make sure that it is safe, the aim being to have the patient leave the theatre with full respiratory activity and a slightly rapid pulse, for the slowing effect of neostigmine may outlast the accelerating effect of atropine.

The fractional technique enables one to adjust the anticipated dosage up or down to meet the exact requirement, and to give extra atropine in good time should bradycardia threaten. Most textbooks of anaesthesia are seriously deficient in detail on this point. The above procedure is very reliable and convenient in practice and soon becomes second nature.—I am, etc.,

Bristol.

T. R. STEEN.

SIR,—In their account of a case of cardiac arrest (*Journal*, June 28, p. 1521) Dr. D. W. Blair, Mr. W. T. Irvine, and Dr. R. C. Taylor rightly emphasize the value of a means of continuously monitoring the patient's pulse during anaesthesia. Since, however, they appear to imply that such an instrument is not available it should be pointed out that a number of cardiachometers have been designed.

While it is a comparatively simple matter to monitor the heart beat under optimal conditions, reliable operation is much more difficult to obtain under conditions of diminished cardiac output and when friction of towels against skin is present. One of the most useful and reliable instruments for the anaesthetist is that described by Molyneux.^{1,2} This possesses no unnecessary refinements (unless one includes under this heading an audible, as well as visual, signal synchronized with the pulse) and utilizes nine transistors and four crystal diodes. The subject has recently been well reviewed.³—I am, etc.,

Southend-on-Sea.

GORDON P. LOWTHER.

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- ² ——— *Electron. Engng.*, 1957, 29, 125.
- ³ *Lancet*, 1958, 1, 956.

Neurological Reactions with Phenothiazine Derivatives

SIR,—The publication of Dr. E. H. Hare's memorandum (*Journal*, June 21, p. 1462) describing an unusual dystonic syndrome in a patient on chlorpromazine (3-chloro-10-(3-dimethylamino-*n*-propyl)phenothiazine) prompts me to report the following case.

On December 5, 1957, at the urgent request of a London teaching hospital, a man aged 65 who had been attending the outpatient department and "had been seen over a long period by a succession of doctors" was admitted here as an emergency case. On examination he was found to be an emaciated and very ill man. Facial tics (bilateral) caused him to grimace continually and "make faces." Involuntary twitching of the muscles of the mouth, throat, and neck caused great difficulty in articulation (spastic dysarthria) and his speech was indistinct. Every few minutes severe spasm of the left sternomastoid caused the face to be turned to the right side and the head to the ipsilateral side (spasmodic torticollis). The muscles of all the four limbs were in a state of general rigidity, more marked in the legs, while tremors and jerky contractions were more marked in the arms. He was unable to sit still, nor could he dress himself or tie his shoe-laces.

Nothing abnormal was detected in his central nervous system. The knee-jerks were very brisk, the abdominal reflex was present, and the plantar reflexes were flexor. The clinical picture was a combination of pseudo-bulbar palsy and Parkinsonism, although the facial tics and some of the gross tremor were hysterical in nature. Mentally he was quite conscious but obviously very apprehensive.

With rest in bed the acute symptoms and the dysarthria cleared up. The tics and gross tremor responded to the usual method—i.e., suggestion—leaving generalized rigidity of the limbs. He was therefore given benzhexol hydrochloride, 1 mg. once daily for three days and then 2 mg. daily for 10 days, which afforded him great relief. He was free of symptoms for several weeks and expressed a desire to return to work. As the aetiology of his acute symptoms and dysarthria was not apparent on May 1, he was given 50 mg. of chlorpromazine hydrochloride three times a day, and this dose was kept up for four days, when he felt "very well

indeed." On May 5 he was given 25 mg. of promazine hydrochloride (10-(3-dimethylaminopropyl)phenothiazine hydrochloride), thrice daily, and this was continued for some days. On May 10 he went to London by train, but in the evening noticed spasm of the muscles and was unable to walk or talk clearly. He was brought back by car. Next day he could not get out of his bed at all and had a recurrence of the rigidity of the muscles of all the four limbs. He suffered from severe spastic dysarthria and could not articulate at all. Attempts to speak caused severe spasm of the neck muscles with gasping for breath. He had also difficulty in swallowing. The alarming nature of his symptoms caused much concern not only to the nursing staff but also to the other patients on the ward. Promazine hydrochloride was therefore discontinued. Within 30 hours he showed marked improvement, was able to leave his bed unaided and talk normally. He had no more symptoms until his discharge on June 6, 1958. He was an intelligent man who seems to have suffered from chorea at the age of 13 but had been passed fit for the Forces and had also served at Gallipoli.

It is only fair to add that up to 300 mg. of promazine hydrochloride daily has been given here to a large number of patients with great benefit, and no untoward reactions have been noted even after sudden withdrawal of the drug. From a single case it would not be fair to draw the conclusion that chorea in childhood was responsible for the symptoms described above. To enable doctors and nurses to recognize this condition and differentiate it from acute hysterical aphonia, a film has been prepared at this hospital.—I am, etc.,

Belmont Hospital Neurosis Centre,
Sutton, Surrey.

M. N. PAI.

Burns in Sterilizing Rooms

SIR,—The incidence of burns among members of the nursing staff who work in sterilizing rooms is very high. I do not think that this is due to such staff being particularly accident-prone. An examination of the conditions of work in a number of sterilizing rooms reveals a state of affairs that no inspector appointed under the Factories Act would ever tolerate. Ventilation is almost always inadequate, the humidity is appalling, and the sterilizing apparatus is of poor design and badly installed. Steam pipes are often quite unlagged, taps and handles inadequately insulated, and bowl and instrument sterilizers are capable of discharging jets of steam upon the bare arms of the passer-by.

One may wonder, also, for how much longer our surgeons, who have the use of some of the world's best surgical instruments, will continue to allow them to be ruined by boiling in hard water, instead of using hot-air sterilization as has been the practice on the Continent for very many years.

I would suggest that this is a problem that should be attacked by hospital boards with a determination and resolution equal to that devoted to the elimination of static electricity in operating theatres.—I am, etc.,

Hove, Sussex.

REX BINNING.

Wrong Connexions

SIR,—One evening recently I went to anaesthetize for an emergency operation. The Boyle machine had been used since the orderly had gone off duty, so that the labels on the cylinders did not necessarily reflect their state. On opening the valves in turn, it was seen that the "wrong" rotameters registered; the connexions were checked and it was found that the two oxygen cylinders delivered to the nitrous oxide rotameter and vice versa.

The machine is of a "safe" type, with non-interchangeable Schrader connexions to the reducing valves, non-interchangeable threaded unions to the flow-meter block. Certain parts had been renewed the previous day, when presumably wrong union nuts had been fitted to the ends of the tubes. (The latter, of anti-static rubber, bore the correct identifying colours.) Two anaesthetists had used the machine in this state without remarking anything amiss. Calculation shows that when the oxygen meter showed a flow of 2 litres/minute and the nitrous oxide meter showed 6 l./min., which is a common setting, the resultant mixture would be 77% oxygen and total flow 9.2 l./min.

To check everything oneself seems pedantic, and many anaesthetists using familiar equipment in well-staffed theatres take correct function for granted, with a confidence matching that with which they drive off in their cars each morning without investigating oil and water levels. The mistake described did not have dangerous consequences but shows how careful it is necessary to be. If there had been an accident the anaesthetist would have faced H.M. Coroner.—I am, etc.,

Bramhall.

R. N. SIDEBOTHAM.

Pseudo-medical Advertising

SIR,—As medical adviser to an advertising agency, I was very interested to read Dr. R. E. Dawson's comments in your correspondence columns on "pseudo-medical advertisements" (*Journal*, June 21, p. 1482). I think that he is being unnecessarily harsh on advertisers. Most large advertising agencies employ a medical adviser, who is consulted whenever the question of claims in the medical field for any product arises in connexion with advertising. Most manufacturers of medical or semi-medical products also have their own scientific advisers, and, very frequently, also have qualified medical advisers as well. Moreover, there are bodies whose job it is to examine claims made by advertisers, and these bodies have laid down strict rules and codes of standards which are accepted by the majority of newspapers, magazines, and other publications, as well as television interests and by far the majority of service advertising agencies. It is therefore practically impossible for exaggerated benefits to be claimed in normal advertising channels for "useless products." In addition, in the highly competitive commercial conditions applying to-day, such products would not be handled by reputable advertising agents nor would responsible retail outlets accept them for sale.

In my opinion, the public will always buy tonics, vitamins, pain-killers, and indigestion remedies because they would rather pay for them than queue in their doctors' over-crowded surgeries. If they were not aware of the availability of these products, I would hate to think what number of extra patients would waste their G.P.'s time for minor ailments. It is of course quite natural and surely not unreasonable that a manufacturer should, in his advertisement, seek to bring before the public the advantages which his product enjoys over those manufactured by his competitors.—I am, etc.,

Guildford.

DICK GLOVER.

Calcium and Phosphorus Metabolism

SIR,—There are several points in the article by Dr. G. L. Mouzas (*Journal*, June 14, p. 1385) which conflict with my experience of calcium and phosphorus metabolism in 230 patients with renal calculi.¹

Dr. Mouzas states that only four of his patients had parathyroid dysplasia. He apparently requires to have both an elevated serum calcium and a low serum phosphorus, and hypercalciuria, to make the diagnosis of hyperparathyroidism. I have found no single test which is a satisfactory test of parathyroid function, but this does not mean that hyperparathyroidism cannot be present unless all these abnormalities are found, as Dr. Mouzas seems to imply. I have observed patients with hyperparathyroidism in whom only one of these abnormalities was present. Hypercalciuria disappears and the serum phosphorus rises again with the onset of renal failure, and in these patients a raised serum calcium may be the only biochemical sign of hyperparathyroidism. In almost all patients with hyperparathyroidism who are followed up for a sufficiently long period before operation both the serum calcium and serum phosphorus values fluctuate, the lower values often falling within the normal range. Dr. Mouzas regards a raised serum calcium alone as being of no significance. An elevated serum calcium is always pathological and deserves the most careful investigation to discover its cause. Quite apart

from the tendency for these patients to form calculi again, the hypercalcaemia causes renal damage. I also have noticed the frequency with which a low serum phosphorus occurs amongst calculus patients. Occasionally a low serum phosphorus may be the only sign of hyperparathyroidism, although there are other causes of disturbed phosphate metabolism.

It is difficult to interpret Dr. Mouzas' figures for phosphate/creatinine and calcium/creatinine ratios, because the headings of his Table III appear to be transposed. He has shown by 24-hour calcium excretion studies that all patients with a calcium/creatinine ratio above 0.3 had hypercalciuria. It cannot be claimed that this ratio is an effective screening test unless it can also be shown that values below this figure were not associated with hypercalciuria. I note that in seven of his patients the value of the serum alkaline phosphatase is above the upper 1% range, although he states in the text that all were within normal limits.

I think that his interesting group of patients merit further study.—I am, etc.,

Belfast.

MARY G. MCGEOWN.

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- ² ——— *Clin. Sci.*, 1957, 16, 297.

** It is regretted that in the headings of the ninth and tenth columns of Dr. Mouzas' Table III Ca/Cr and PO₄/Cr were accidentally transposed, as Dr. McGeown points out.—Ed., B.M.J.

Rheumatology as a Whole-time Specialty

SIR,—Dr. L. Mandel (*Journal*, June 21, p. 1482), referring to the treatment of the rheumatic diseases, stresses that the doctor must be trained "to treat the patient as a whole, and not the disease or local disability." His conclusion that treatment should be organized by a system of dual control seems, however, unlikely to achieve this object.

This approach to the problem is absurd, in this country at any rate. Consultants in physical medicine are now required to hold a higher medical degree in addition to the specialist diploma. A long training in both general medicine and physical medicine is necessary before senior status is attained. In fact, whether Dr. Mandel likes it or not, physical medicine is the specialty best suited to deal with the rheumatic diseases under the N.H.S., and, in view of the magnitude of the problem, it is hoped that the establishment of physical medicine specialists will soon be increased in order to provide adequate cover for the whole country.—I am, etc.,

Broadstairs, Kent.

R. W. BARTER.

Undescended Testicles

SIR,—I was extremely interested in the paper on the results of hormonal treatment of the undescended testis by Drs. J. Brunet, R. R. de Mowbray, and P. M. F. Bishop (*Journal*, June 14, p. 1367). At the time of passage of the testis through the inguinal canal in normal descent a marked lengthening takes place in the cord without which the vas deferens would be too short to permit such a movement. The remaining testicular descent process—i.e., from the neck of the scrotum to its floor—is brought about by lengthening of the cord, particularly of the vas deferens and cauda epididymis, and of the pars vaginalis gubernaculi (which includes the cremaster muscle). These changes would appear to be under the influence of gonadotrophic hormones, either directly, or indirectly through the testis due to its androsteroid production, and the clinical results published in this paper are essentially in agreement with these views. So long as the mesenchyme of the gubernaculum testis has not been involved by fibrous tissue, which would prevent normal growth changes and anchor the testis or its covering in an abnormal manner, there seems no anatomical reason why hormone treatment should not produce the results quoted.

Mr. Denis Browne's objections to hormone treatment (*Journal*, June 28, p. 1541) do not appear to be based on the anatomy of normal testicular descent. It is unfortunate,

therefore, that he should accuse the endocrinologists of just such a lack of knowledge. As I commented last year on certain of Mr. Browne's anatomical views (*Journal*, June 15, 1957, p. 1420) I do not propose to repeat myself needlessly. I would, however, in all fairness to Mr. Browne, agree that the anatomical criteria put forward by Dr. Brunet and his co-workers would sometimes be difficult to substantiate, as they themselves admit. I would suggest that the important criteria for hormonal treatment of testicular maldescent are that the testis should be somewhere on the track of normal descent and not anchored peripherally. A testis found in Browne's "superficial inguinal pouch" is off the normal course of descent and therefore not likely to descend under the influence of hormones. The difficulty, however, appears to be that of diagnosing accurately when a testis is or is not on the correct line of testicular descent when in the external inguinal region.—I am, etc.,

London, W.C.2.

K. M. BACKHOUSE.

Fatal Haemorrhage from Superficial Varix

SIR,—In our local newspaper recently a 30-year-old mother of five children was reported to have bled to death from a varicose vein in her leg. This recalled a similar death of which I had heard years ago. A tourniquet in that instance had been applied by a lay person between the heart and the hole in the vein. On hearing of another fatality, I wondered if the same mistake had again been made. By courtesy of Dr. L. Manoin, the coroner's pathologist, I was able to see the necropsy.

The body was that of a young woman about seven months' pregnant. The pale skin, pale mucous membranes, and pale organs made plain that blood loss had been severe. Her left leg was swollen. Both her lower limbs showed varicose veins, and many of these varicosities were particularly superficial, even protuberant. About 8 in. (20 cm.) above the left lateral malleolus there was a small opening into one of these extremely superficial varicosities. This opening was only of about one-tenth of an inch (2.5 mm.) in diameter. From a vein above and below it the pathologist expressed blood on to the skin through the hole. Microscopy gave evidence of ulceration at this site.

Her husband and her friends had said that through this small venous opening she had bled to death. They had applied some home-found tourniquets, towels, handkerchiefs, even bed sheeting around the leg above the hole in the vein. They thought this was the correct site for tourniquets, but, no matter how hard they had tried to compress the leg with their tourniquets, the bleeding had continued until she died.

To return to the consulting-room, patients sometimes ask if their varicosities will bleed. The chance of this is usually so small that mostly the medical attendant will be justified in giving an assurance: but, while operation is being arranged for those who require it, any who have particularly vulnerable veins can be told what to do if bleeding should occur. They should apply pressure directly to the bleeding point. The danger of ignorance in this matter is shown by the fate of two persons. To each a tourniquet had been applied between the heart and the hole in the vein. Such "first-aid" measures by part-trained or untrained persons are understandable, but so are the fatal results.—I am, etc.,

Launceston, Tasmania.

W. W. WOODWARD.

Male Homosexuality

SIR,—I was most interested in the excellent article entitled "A Factual Study of Male Homosexuality" by Dr. R. E. Hemphill, Dr. A. Leitch, and Dr. J. R. Stuart (*Journal*, June 7, p. 1317). It was encouraging to find that others had quite independently come to almost the same conclusions as I had myself. As the authors state that "there is surprisingly little factual literature dealing with homosexuality," it would seem that my paper,¹ which would come into this category, has escaped the notice of those interested in psychological and social medicine, no doubt owing to its title, "Venereal Disease and the Homosexual," and to the fact that it was published in a journal mainly concerned with venereal diseases. In it, among other things, I analysed

the life histories and sexual mores of 54 male homosexuals attending a V.D. clinic. My patients differed from those of Dr. Hemphill and his colleagues in that they were free young men-about-town who were contented with their mode of life and were not in any legal or psychiatric trouble.² The only significant difference between their findings and mine seems to be that my patients were attracted to adult or adolescent consorts and were not interested in having sexual relations with small boys.—I am, etc.,

London, W.2.

F. J. G. JEFFERISS.

REFER SUE

¹ Jefferiss, F. J. G., *Brit. J. Vener. Dis.*, 1956, 32, 17.

Occupational Diseases of Musicians

SIR,—In reply to the letter by Dr. M. Anderson (*Journal*, July 5, p. 51) and for the information of others who may be interested, there is a good deal of literature on the occupational diseases of musicians. There is indeed a monograph by Kurt Singer, who was both a specialist in neurology and the music critic for the *Berlin Vorwärts* and who lectured regularly at the Academy of Music in Berlin on the diseases of professional musicians. This was translated from the German by Vladimir Lakond and published by Greenberg in New York in 1932 with the title "Diseases of the Musical Profession: A Systematic Presentation of Their Causes, Symptoms, and Methods of Treatment." There are also numerous articles, the references for which can be obtained from the *Index-Catalogue of the Surgeon-General's Library* and from the *Quarterly Cumulative Index Medicus*.—I am, etc.,

London, N.W.1.

F. N. L. POYNTER.

Iatrogenic Disease

SIR,—Your issue of June 21 opens with an article by Dr. John W. Dundee entitled "Iatrogenic Disease and Anaesthesia" (*Journal*, June 21, p. 1433). I supposed that I was to read of asthma, say, or rheumatoid arthritis or some other disease that by its length and refractoriness provides sustenance for honest doctors, for iatrogenic means "doctor-sustenance," just as carcinogenic means "cancer-begetting," and erogenic "love-begetting." But the learned author defines his word as a malady or an abnormal state produced by physicians. A similar mistake, for such I suppose it to be, is made with the word psychogenic, which means "soul-begetting," not "soul-begotten," as usually intended. I suggest that the word γεννητός (gennētos) is the right suffix, meaning "begotten of"—for example, "Among those born of women (ἐν γεννητοῖς γυναικῶν) there hath not risen a greater than John the Baptist."

For a disease, then, born of a doctor we may write iatrogennete, but we should not write iatrogenic nor yet iatrogenetic.—I am, etc.,

Orpington, Kent.

H. ST. H. VERLUE.

Mortality and Morbidity of Steroid Therapy

SIR,—Dr. Michael Kelly in his letter to you (*Journal*, July 5, p. 50) condemns steroid therapy for arthritis, and to prove his case quotes a number of references, including one from myself. I am misquoted as reporting 6 deaths in 90 patients as due to steroid therapy, whereas I commented that one death followed a car accident and two were from carcinoma. One wonders whether his other references are equally inaccurate.—I am, etc.,

London, S.W.1.

OSWALD SAVAGE.

Alfred Russel Wallace

SIR,—Dr. F. N. L. Poynter's article on the centenary of the Darwin Wallace paper on natural selection (*Journal*, June 28, p. 1538) appeals to me, as I have always been an admirer of these two. The following is a note of a visit I made to Alfred Russel Wallace on March 1, 1905.

While doing a locum at Broadstone I was called to the house to see a servant. Asked Mrs. Wallace if they did not once live

Obituary

ANDRIJA STAMPAR, M.D.

Professor A. Stampar, professor of public health and social medicine at the University of Zagreb and President of the First World Health Assembly in 1948, died on June 26, aged 69.

Andrija Stampar was born on October 1, 1888, in Croatia. He studied medicine at the University of Vienna, graduating in 1911. During the first world war he was interned for four years during the occupation of Serbia, but by the time the new state of Yugoslavia had come into existence he had already made a name for himself in the field of public health and preventive medicine. He was only 31 when he was appointed director of public health in Yugoslavia. In the following years he created the public health services of his country, including a network of health centres covering the remoter areas. In 1931 he was elected professor of hygiene and social medicine in Zagreb University and later he became rector of the university and dean of the medical faculty.



For many years he had been one of the most forceful and effective teachers of public health and social medicine, and at the First World Conference on Medical Education, held under the auspices of the World Medical Association in London in 1953, Professor Stampar, as a vice-president of the Congress, took the chair at the meetings of the section which was concerned with preventive and social medicine. Thanks to his outstanding knowledge of the subject, the meetings of that section were particularly successful.

M. D. M. writes: The death of Professor Andrija Stampar will be a deep sorrow to his many friends all over the world. He will be remembered chiefly for the immense contributions he made to international preventive medicine. He began this work in 1924, and until the outbreak of the last war he was continually associated with the activities of the Health Section of the League of Nations, in the countries of Europe, the Americas, Asia, and the U.S.S.R. After the war Stampar again took up his post at Zagreb University, but devoted a steadily increasing part of his time to the development of international medicine, particularly to the creation and functions of the World Health Organization. In 1946 he was elected first vice-president of the Economic and Social Council of the United Nations. After contributing enthusiastically to the work of the Preparatory Committee for the creation of the World Health Organization he was elected as permanent chairman of the Interim Commission which was authorized to assume the responsibilities of the future World Health Organization. In 1948 he became president of the first World Health Assembly in Geneva. Subsequently, for nearly 10 years he headed the Yugoslav Delegation to W.H.O. Stampar's knowledge covered every branch of preventive and social medicine, but he was particularly interested in rural hygiene, the training of doctors and health workers both in their own countries and abroad, and schools of hygiene. Whilst his outstanding career and his wide knowledge called for the admiration of all who met him, it was his dynamic and lovable personality that made him friends everywhere. He was essentially human, and with a keen sense of humour always ready to help in health problems either national or personal. Stampar was twice

at Dorking, my native town. She said Yes, spoke to me of Dorking people, and said her husband would like to hear of them. Mrs. W. took me into the study and introduced me to the professor. He is a tall thin man with snow white hair and beard; stoops very much; wore a very loosely fitting brown suit, thick soled black shoes.

A. R. W. first asked me about people he had known at Dorking and then got on to the subject of his various residences. Dorking did not suit them, it is too much in a valley. He moved to Croydon, then to Godalming, where they lived nine years, then to Parkstone, now in Broadstone. He hunted all along the Downs from Sevenoaks to Guildford without finding a suitable site for a house, or a house with a proper garden. The present house bears the initials A. R. W.; it is on a slight elevation, looks over moorland to Poole and Poole harbour about three miles off. There is a large clump of fir trees in the garden with a small plot of grass; in front of the house is an acre or two of uncultivated moor. Tea was brought in at this stage (about 4 p.m.). Two cups in the ordinary style for Mrs. W. and myself with cake and bread and butter. A. R. W. had a brew to himself: a little tea and much water straight from a kettle over a spirit lamp, poured off almost directly, cup half-filled with milk, sugar two lumps in a small cup, soon disposed of; another cup, less tea this time, more milk, still sugar two lumps; then more cups with less tea each time, still sugar two lumps.

On my rising to go A. R. W. said he must first show me his blue water-lilies, which he said I had never seen before and probably never would again. We went through the greenhouse and here I had the misfortune to knock over a flowerpot and break it. Happily the plant did not appear injured nor the earth shaken from the roots. A. R. W. made light of it, but I was very much annoyed at my clumsiness and could not enjoy the rest of the interview. The blue lilies are very pretty and have an agreeable scent, they come from Port Elizabeth. He showed me a New Zealand plant grown from seed which had not got accustomed to the seasons and flowered in winter. A. R. W. was very chatty and communicative, and if it had not been for the flowerpot incident I should have enjoyed the whole interview very much.

—I am, etc.,

Bath.

CHARLES A. MARSH.

Alcohol and Driving

SIR,—Dr. R. P. W. Kup (*Journal*, July 5, p. 46) writes: "It would appear fairly logical that people [charged with driving under the influence] with a good defence should resort to such a tactic [electing trial by jury] and those without a reasonable answer to the charge should content themselves with a magistrates' court. . . ." In actual fact, it is the other way round. It speaks volumes that the Recorder of London, Sir Gerald Dodson, is reported in *The Times* of May 22 as having said in the Central Criminal Court on the previous day: "I think everyone would welcome a short Act of Parliament which would deprive drivers accused of being under the influence of drink of the right to be tried by a jury."—I am, etc.,

Isleworth, Middlesex.

H. PULLAR-STRECKER.

1959 Medical Directory

SIR,—The annual schedule, upon the return of which the accuracy of the *Medical Directory* depends, has recently been posted to all traceable members of the medical profession, and its speedy return would be appreciated.

A number of schedules, sent to a doctor's last known address, have been returned through the Post Office marked "Gone away." Although in such cases every effort is made to find a new address, I should like to remind practitioners that, if these efforts are not successful before the book goes to press, the names in question will be omitted from the next edition. Any doctor who has not received the annual schedule, or who has mislaid it and would like a duplicate, is requested to communicate as soon as possible with the Editor, *The Medical Directory*, 104, Gloucester Place, London, W.1. The full name and year of qualification of the doctor should be sent for identification, please.—I am, etc.,

B. STANTON,
Editor,
The Medical Directory.

London, W.1.

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married. He had a large family, several of whom continued to live under his roof in the patriarchal system. His very happy family life was a fitting background to the great contribution he made to the progress of mankind, towards closer collaboration in medicine, and a better understanding between nations.

ISIDOR C. RUBIN, M.D., F.A.C.S., Hon.F.R.C.O.G.

Dr. Isidor Rubin, who had an international reputation in gynaecology, died in London on July 10 during a visit from the U.S.A. He was a pioneer in the invention and development of apparatus for insufflation of the Fallopian tubes.

Isidor Clinton Rubin was born on January 8, 1883, and received his early education in New York. After taking the M.D. of Columbia University in 1905, he became an intern at the Mount Sinai Hospital, New York, remaining there until 1909, where he spent a year visiting Vienna, Berlin, and Paris. On his return to the U.S.A., in 1910, he obtained appointments at the Beth Israel Hospital, and subsequently also at the Mount Sinai and Montefiore Hospitals in New York. From 1937 to 1947 Rubin was clinical professor of obstetrics and gynaecology at Columbia University. Not only was Rubin the author of many papers and several books on his specialty, but he undertook many editorial tasks also; these included membership of the editorial board of the *American Journal of Obstetrics and Gynecology*. Among the honours bestowed on him is the French Legion of Honour and, in Great Britain, the honorary fellowship of the Royal College of Obstetricians and Gynaecologists.

Mr. V. B. GREEN-ARMYTAGE writes: Thirty-three years ago in America those on higher gynaecological study leave were attracted by three outstanding men—Whitbridge Williams, John Sampson, and Isidor Rubin, though hardly less so perhaps by Graves of Boston, Curtis of Chicago, and Masson of the Mayo's. Although hysterosalpingography was already on the map, first in Buenos Aires, and later in Paris, Rubin came straight into the limelight when, after many experiments, he discovered that CO₂ was the ideal gas and method for demonstrating tubal patency, and more particularly when he was able to prove that, in the case of the hitherto long-infertile woman, 18% of those insufflated for the first time conceived within the next few weeks. In 1925 this was indeed hot news. In those days his instrument was not his latest minute compact aluminium one, with a graph rotated by electricity and CO₂ activated by a tablet of "alka seltzer," but a heavy, cumbersome, temperamental affair of cylinders, drums, and tubing run by whirring clockwork. Nevertheless it worked, showing normal oscillations or the rises in pressure due to treatable spasm or organic obstruction.

He was generosity itself to postgraduates, and I recall many a visit to his multi-cubed office in Park Avenue, where we would listen to him, surrounded by nurses, practitioners, and stenographers, as he passed from patient to patient. In those days he was rosy cheeked with rippling auburn hair. He never got rattled; he was always quiet and efficient as he taught us how to work his beloved machine. So impressed was I that, on return to London after many months in the States, I sought out my old friend Clifford White, who was then secretary of the Obstetric Section of the Royal Society of Medicine, and begged him to obtain the ukase to invite Dr. Rubin to give us a paper, whilst I would make myself responsible for his entertainment at the old East India United Services Club. He came, he conquered. His address that October night in 1925 was a triumph. Indeed, with his Heath-Robinson-like apparatus sprawling over the table, he gave us the very first exposition of this technique in Europe. Everything went perfectly, and no one was more thankful than he and I that in a packed Barnes Hall he was even able to convince some of the old diehards of our specialty who were present. This test, by virtue of its proved diagnostic and therapeutic value, made

him a benefactor to all mankind. What wonder then that his own great country and every civilized land has praised and honoured him. France at once made him a Chevalier, and then a few years ago promoted him to be an Officer of the Legion of Honour. In Great Britain our own Royal College made him an Honorary Fellow. But though the flame of his fame burned brightly, and his apparatus was acclaimed the world over, the man himself, the real scientific Rubin, remained ever the same, whether on hospital rounds, in operating theatre, or as a friend met casually of by intent in many of the great cities of the world—calm, humble, humorous, and helpful. Indeed, for him and his charming family life was lovely and pleasant. He had friends in every capital. The younger generation never looked in vain to him for help and guidance: I recall him quoting to a group of them at a clinical meeting those words from Masfield's "Adventurer":

Adventure on, for from the littlest cue

The next to lighten all men, may be you.

Rubin was always welcomed wherever he went. No better living evidence of the high regard in which he and his work was held can be given than the fact that in 1947 111 of his friends, associates, and pupils presented him with a *Festschrift* to which each of them had contributed a special article. If the measure of any man's greatness is the number of disciples he has gained, or the number of persons of all nations he has helped along the ladder of life to greater happiness, then assuredly Isidor Rubin is among the blessed.

Mr. ELLIOT PHILIPP writes: When six weeks or so ago the University of Mexico City awarded several honorary doctorates, it was for one man alone that the whole audience rose to give a warm spontaneous standing ovation. That man was Isidor Clinton Rubin; and the ovation was a measure of the honour, esteem, and affection felt for him in academic and medical circles throughout both the Americas.

It is not given to many men to make even one worthwhile advance in the knowledge of their specialty, but Rubin made several. His first paper was published in 1910 and shows that already, half a century ago, he was concerned with the early diagnosis of cervical carcinoma and the condition we now call carcinoma in situ. It is worth while quoting the last sentence of this first paper: "The important criteria of malignancy in these early cases lie not so much in the relation of the cell nests to the stroma, the depth or extent of epithelial invasion, or evidences of surrounding inflammatory changes, as in the intrinsic morphology of the epithelial cells."

The young man in his twenties had laid a stone in the foundations of the increasingly exact science of early cancer detection. More than that he would himself not claim, although repeatedly his early and his late papers deal with cancer cell detection.

Yet although Rubin had the gifts of a scientific research worker he also had great dexterity as an operator, and a wonderful gentleness and warmth of character that drew people to him. So inevitably he was taken from the laboratory to the clinical field and there became acutely aware of the misery of sterility. With determination and with a band of faithful collaborators at the Beth Israel and Mount Sinai Hospitals in New York he set to work to unravel one problem after another. He did not casually stumble on his discovery that the ovum was conveyed to the uterus by the peristaltic waves of the Fallopian tube. Originally he injected radio-opaque substances into port-mortem specimens, then into a live dog, and in 1914 he carried out the first hysterosalpingography on a patient. In 1919 he was the first person bravely and against the advice of his colleagues (who feared the patient would die of peritonitis) to insufflate the tubes with a gas. He used oxygen and, very soon after, carbon dioxide, which he rightly judged to be safer. This first patient became pregnant shortly afterwards.

He had a severely logical mind and he deduced from his observation of his early insufflation patients that shoulder

pain was diagnostic of stretching the ligaments on the under surface of the diaphragm. Thus he was the first to describe shoulder pain as being of diagnostic value in ruptured ectopic pregnancy.

In his more than fifty years of practice Rubin approached each patient as a human and a scientific problem. He was quiet, gentle, wise, and immensely generous. Above all he was inspiring, yet he detested bombast, hypocrisy and lack of truth, and would not hesitate to criticize a work that he judged prematurely published or inadequately proved.

His consulting-room was adorned by honorary diplomas and fellowships from universities and colleges throughout the world, and two he valued highly were from the University of Paris and from our own Royal College of Obstetricians and Gynaecologists. His high rank in the French Legion of Honour he, too, wore proudly when in France.

His aristocratic and noble patients who came from all over the world to see him adored him, but much more touching was the attention he gave the poor. I took him out to Romford on his only free time—a Sunday morning—last year to see the wards and one or two patients who were either particularly interesting or worrying, but it was at the bed of a woman dying of inoperable carcinoma that he stopped longest to speak words of encouragement. As he left the ward the orderly who had brought him tea said, "That is the finest gentleman I have ever met." And so he was.

To his wife Sylvia, who for so many long years so devotedly encouraged, protected, and helped him, both in his beautifully traditionally orthodox Jewish home and on his world-wide travels, and to his daughters and son, our deepest sympathy goes out. For their love is ours too.

E. L. ELLIOTT, M.B.E., M.B., B.S.

Dr. E. L. Elliott died suddenly after a long illness at his home at Stokenchurch on June 4. He had been in general practice in the district for nearly forty years.

Edgar Lionel (Jack) Elliott, the son of a doctor, was born at Bromsgrove on October 24, 1885. Educated at Marlborough and Guy's Hospital, he graduated M.B., B.S. in 1910, and for a time afterwards was house-physician to Sir William Hale-White. From 1914–19 he served as surgeon lieutenant in the Royal Navy, mainly in the Mediterranean theatre in H.M.S. *Somali* and *Karapara*. After the war he entered general practice at Stokenchurch, joining, and later succeeding, his father. In his younger days he had been a keen sportsman, playing Rugby football and cricket with some success at Guy's; after the war riding and hunting became his main hobbies, and he was a familiar figure visiting remote parts of his practice on horseback. A serious accident in 1931 in which he fractured his spine curtailed his riding, and afterwards he became interested in dinghy sailing. He bought a small cottage on the Dorset coast at Ringstead Bay and spent most of his holidays there. During the second world war he was area medical officer to the Home Guard and was awarded the M.B.E. for his services. He continued in active practice after the war in spite of gradually increasing cardiac failure, resulting from valvular disease and aggravated by Paget's disease. Although the prolonged inactivity of his first long illness was irksome to him, he bore it with great patience and good humour.

Dr. Elliott married Miss Mabel Drew Hobley at Sevenoaks in 1912, and she survives him with one son, one daughter, and one adopted son. Both his sons had joined him in his practice.

C. S. writes: E. L. Elliott had been "The Doctor" at Stokenchurch since 1919. In the tradition of his calling he was much more than just a medical practitioner: the parish council, the village sports clubs, the British Legion, the schools, and many other local organizations had known and valued his wisdom and support. To the ordinary people of the villages and hamlets around Stokenchurch he was "their doctor," a man of vigorous habits and cheerful

countenance, a wise and humane man, a man who would be very gentle with children and very kind to those in distress. His main interests were in his home and family, in his practice, and, of course, in the fortunes of Marlborough and Guy's.

When he succeeded his father in Stokenchurch he was single-handed, but he had a dynamic personality, and in time his practice grew and he was able to found a group practice. As senior partner and "elder statesman" of the firm for twenty years he was an unfailing source of help and encouragement to those who came to work with him. He believed profoundly in the continuing education of general practitioners, and in breaking down the isolation which had often been the lot of the country doctor in the past. A small local society, known as the XX Club and composed of G.P.s from neighbouring practices, owes much to his influence. All those who have attended the XX Club meetings, whether as members or guests, will know how well worth-while such societies are, and will remember Jack Elliott with deep gratitude. They will also wish to extend their deep sympathy to his wife and family.

H. H. BAYLEY, M.D.

Dr. Harry Bayley died suddenly from a heart attack on June 14, at his clinic in Barbados. He was 49 years of age.

Harold Haynes Bayley was born in Barbados and educated at Harrison College, Barbados, and New York. At the age of 16 he went to Columbia University, where he studied natural sciences, and at 18 went up to Sydney Sussex, Cambridge, where he achieved the feat of passing his second M.B. and getting an athletic blue in his first year. From Cambridge he went to King's College Hospital, being awarded the Burney Yeo scholarship. He qualified in 1934 and graduated M.B., B.Chir. in 1935. In the same year he returned to Barbados, where he started in general practice. His main interests lay in laboratory work, and at an early stage he established his own laboratory. His practice grew steadily until by 1948 he had been joined in partnership by Dr. A. L. Goddard and had built a finely equipped laboratory and a private clinic of 23 beds, with a good x-ray department, operating theatre, and all the facilities of a small hospital.

Harry Bayley had great ability and exceptional energy, and while at Cambridge and at King's College Hospital, where his teachers included Professor R. A. McCance and Dr. R. D. Lawrence, he developed an absorbing interest in biochemistry and clinical pathology. These he felt to be the foundation of scientific medicine, and they were to be his special concern throughout his career. General practice in a small West Indian island seemed to offer little scope at first, but by unremitting hard work and determination he was able to give his patients the type of service one associates with the medical department of an English hospital. In 1948 there was an epidemic in Barbados of severe jaundice, which was believed to be a special form of infectious jaundice peculiar to the island. This stimulated Bayley's love of research, and in an exhaustive investigation he proved the disease to be leptospirosis. For a thesis based on this work he was awarded the degree of M.D. in 1942. Other subjects which interested him and on which he published papers were the "bush-teas" of Barbados, larva migrans, the poisonous scorpion fish, and the Galli-Mainini test, using the local *Bufo marinus* toad. His wide scientific training and keen interest in recent developments in medicine helped him to develop a considerable consulting practice. His colleagues found his opinion always sensible and valuable.

Harry Bayley's enthusiasms were not confined to medicine. Astronomy, music, modern languages, and horticulture filled his brief leisure hours, and he had recently completed a remarkably successful hydroponic garden. His gaiety, high spirits, and warm sympathy for his patients made him much beloved in Barbados and the neighbouring

The following degrees were conferred on July 2:

M.D.—T. H. Bewley, F. O. Dosekun, Edna La C. Murphy.
M.A.O.—C. J. B. Orr.
M.B., B.Ch., B.A.O.—Sara R. Abels, Bridget M. Acheson, H. B. Allen,
J. Bennett, P. J. Blackburn, J. S. Brown, R. J. M. Collis, Edith M. Cross.

SCARLET FEVER

Number of Cases vs. Weeks

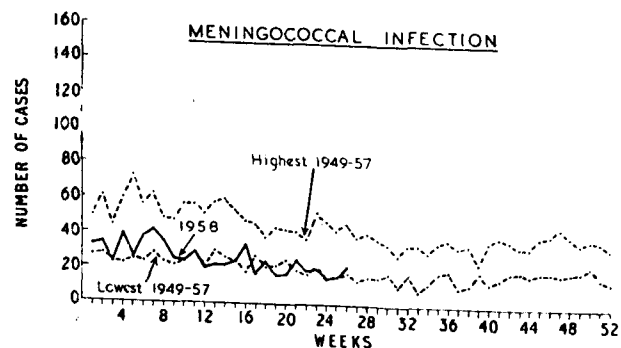
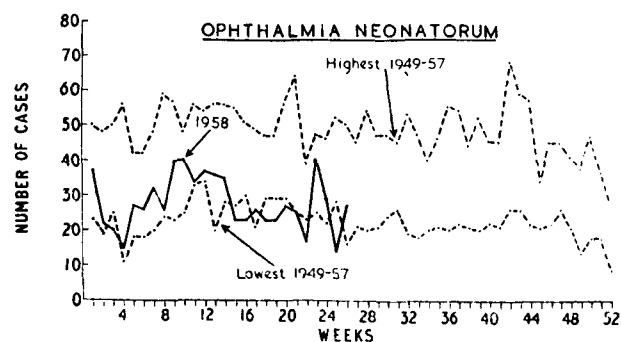
Legend:

- 1958 (Solid line)
- 1949-57 (Dashed line)

Annotations:

- Highest 1949-57 (Pointing to the peak of the dashed line at week 48)
- Lowest 1949-57 (Pointing to the trough of the dashed line at week 32)
- 1958 (Pointing to the peak of the solid line at week 12)

Week	1958 (Cases)	1949-57 (Cases)
0	500	1800
4	800	2000
8	900	1900
12	1000	1800
16	600	1400
20	700	1300
24	650	1350
28	600	1100
32	600	700
36	600	700
40	600	1800
44	600	2200
48	600	2800
52	600	2400

**Week Ending July 5**

The largest variations in the trends of the notifications of infectious diseases in England and Wales during the week ending July 5 were increases of 412 for measles, from 6,026 to 6,438, 81 for food-poisoning, from 261 to 342, 46 for dysentery, from 873 to 919, and 37 for whooping-cough, from 783 to 820.

The largest rises in the incidence of measles were 188 in Lancashire, from 758 to 946 (Liverpool C.B. 263, Blackburn C.B. 117, Manchester C.B. 99), 71 in Warwickshire, from 191 to 262 (Birmingham C.B. 176), 70 in Cornwall, from 156 to 226 (Falmouth M.B. 85), and 54 in Shropshire, from 88 to 142 (Oakengates U.D. 75); the largest falls were 72 in Derbyshire, from 224 to 152, 59 in Gloucestershire, from 220 to 161, and 52 in Denbighshire, from 102 to 50. The notifications of scarlet fever numbered 663, being 1 more than in the preceding week, and there were no large fluctuations in the local returns. The largest rises in the number of notifications of whooping-cough were 25 in Yorkshire West Riding, from 53 to 78, and 20 in Durham, from 35 to 55. Three cases of diphtheria were notified, being 2 fewer than in the preceding week.

The notifications of acute poliomyelitis numbered 48, and there were 1 more for paralytic and 4 more for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 12 (Halifax C.B. 3, Leeds C.B. 2), Essex 6 (Hornchurch U.D. 2, Rochford R.D. 2), Lancashire 4, Staffordshire 4 (Cheadle R.D. 4), Surrey 4 (Woking U.D. 3).

The chief centres of dysentery were Yorkshire West Riding 202 (Thorne R.D. 54, Barnsley C.B. 23, Leeds C.B. 23, York C.B. 15, Rotherham C.B. 13, Sheffield C.B. 13, Bradford C.B. 10); Lancashire 130 (Liverpool C.B. 22, Manchester C.B. 21, Burnley R.D. 13, Rawtenstall M.B. 10), London 119 (Islington 31, Bermondsey, 14, Finsbury 10), Durham 44 (Whickham U.D. 11, Easington R.D. 11), Berkshire 42 (Easthampstead R.D. 40), Essex 37 (Walthamstow M.B. 24), Staffordshire 37 (Rugeley U.D. 14), Middlesex 36 (Willesden M.B. 12), Gloucestershire 29 (Bristol C.B. 19, Gloucester C.B. 10), Warwickshire 25 (Bedworth U.D. 10), Yorkshire North Riding 25 (Middlesbrough C.B. 22), Hampshire 24 (Droxford R.D. 12, Havant and Waterloo U.D. 11), Surrey 21 (Banstead U.D. 10), and Cambridgeshire 20 (Cambridge M.B. 19).

The largest outbreak of food-poisoning notified during the week was 138 cases in Birmingham C.B.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **June 28** (No. 26)
and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available.

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

CASES	1958					1957				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	5	0	0	0	2	4	0	2	0	2
Dysentery ..	873	85	136	3	11	464	40	223	8	2
Encephalitis, acute	2	0		0		4	0	0	1	
Enteric fever:										
Typhoid	1	0	0	0	1	3	0	1	0	
Paratyphoid ..	8	0	0	0		2	1	0	0	1
Food-poisoning ..	261	36	7	3		228	28	73	0	
Infective enteritis or diarrhoea under 2 years ..				16	27				23	44
Measles *	6,026	475	104	44	39	17,417	584	121	173	108
Meningococcal infection	22	1	11	2	2	18	3	5	0	2
Ophthalmia neonatorum	27	1	6	0		22	1	8	0	
Pneumonia †	218	12	133	2	1	252	18	123	5	1
Poliomyelitis, acute:										
Paralytic	29	2	16	0	7	73	8	4	11	1
Non-paralytic ..	14	2				46	1			
Puerperal fever §	170	25	9	1		215	34	6	0	
Scarlet fever ..	662	44	85	16	17	436	44	59	19	11
Tuberculosis:										
Respiratory	565	66	101	19		553	51	150	24	
Non-respiratory	87	7	11	9		71	8	14	5	
Whooping-cough ..	783	42	42	29	67	1,554	49	90	5	21

DEATHS	1958					No comparable figures available.	1957				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire		Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0		0	0	0	0	
Dysentery ..	1	0		0			0	1	0		
Encephalitis, acute		0			0		1			0	
Enteric fever ..	0	0	0	0			0	0	0		
Infective enteritis or diarrhoea under 2 years ..	2	0	1	1	1		0	1	0	1	
Influenza ..	11	1	0	0	0		0	0	0	0	
Measles ..		0	0	0	0		0	1	0	0	
Meningococcal infection ..		1	0				0	0			
Pneumonia ..	313	34	9	8	6		23	11	11	6	
Poliomyelitis, acute	0	0		0	0		0		1	0	
Scarlet fever ..		0	0	0	0		0	0	0	0	
Tuberculosis: Respiratory } Non-respiratory }	61	{ 2 0	{ 6 0	{ 0 0	{ 5 0		5 0	8 1	2 0	4 2	
Whooping-cough ..	0	0	0	0	0		0	0	0	0	
Deaths 0-1 year ..	287	23	20	9	6		36	27	9	17	
Deaths (excluding stillbirths) ..	8,377	661	532	76	151		690	494	107	145	
LIVE BIRTHS ..	14,107	1314	939	209	383		1157	1017	230	518	
STILLBIRTHS ..	324	21	26				15	25			

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

† Includes primary and influenzal pneumonia

§ Includes puerperal pyrexia.

Medical News

Buckston Browne Dinner.—Sir JAMES PATERSON ROSS, P.R.C.S., presided at the Buckston Browne dinner, held at the Royal College of Surgeons on July 9. The toast to "The College" was proposed by Mr. DEREK WALKER-SMITH, who in some light-hearted remarks described after-dinner speaking as "all part of our puritan doctrine of after pleasure—pain." Mentioning the interest shown in the work of the College by the business world, Mr. Walker-Smith said that, in its broadest sense, the industrial future of the country depended on the health of the people, and that depended on the progress of medicine and surgery, which in its turn depended on research. In reply, Sir JAMES PATERSON ROSS said that the College was indebted to Sir George Buckston Browne for enabling it to undertake some of the most important work that had to be done to-day. Only a small number of people realized what research work was being done by the College: all of it had a practical application to medicine and surgery. It was of the utmost importance that research should be fruitful, so that its results might bring healing to all mankind. Proposing the health of the guests, among whom were many leaders of industry, Sir ARCHIBALD MCINDOE mentioned that, besides the President, three past-presidents of the College were present—Sir Harry Platt, Sir Cecil Wakeley, and Sir Hugh Lett, who was the son-in-law of Sir George Buckston Browne and one of the greatest friends the College had ever had. Replying to the toast Sir HARRY JEPHcott described the great influence the College had in building up medical schools overseas: its work was of great public as well as of medical importance.

Royal College of Surgeons.—At the council meeting on July 10 (see also p. 153) Dr. WARREN H. COLE, of Chicago, and Dr. CHARLES W. MAYO, of Minnesota, were admitted as honorary fellows. Dr. G. S. W. ORGANE was co-opted to the council as representing anaesthetics. Dr. I. W. MAGILL, Dr. R. J. MINNITT, Dr. E. S. ROWBOTHAM, Sir HENRY SOUTTAR, and Dr. R. M. WATERS were elected honorary fellows of the Faculty of Anaesthetists. Dr. H. J. WINDSOR, of Brisbane, was admitted to the fellowship as a member of 20 years' standing. The following professors, lecturers, and demonstrators were appointed for the ensuing year:

Hunterian Professors.—W. E. Tucker, R. A. Mogg, E. M. Nanson, J. B. Curtis, C. J. Kaplan, P. H. Jones, G. J. Hadfield, A. G. Parks, T. J. S. Patterson, J. W. Dickson, C. Harvard, A. J. Davies, G. S. M. Botha, and J. S. Calnan.

Arris and Gale Lecturers.—E. R. Smith, G. L. Bourne, and K. M. Backhouse.

Erasmus Wilson Demonstrators.—R. Goodbody, K. M. Laurence, L. W. Proger, R. C. B. Pugh, H. A. Sissons, and M. O. Skelton.

Arnott Demonstrators.—J. Dobson, A. A. Barton, A. Howe, R. J. Last, R. M. Livingston, and B. Cohen.

King Edward's Hospital Fund.—At the Fund's 61st annual meeting in London on July 11, the DUKE OF GLOUCESTER, the president, reviewed some of the improvements the Fund had effected in hospitals during recent years. Grants had been used to provide amenities for patients and better living conditions for nurses; meals had been improved through the Catering Advisory Service and the School of Catering; much money had been spent on mental hospitals; and the influence of the three staff colleges—for ward sisters, future matrons, and hospital administrators—was leading to no less real results. Lord McCORQUODALE, chairman of the management committee, drew attention to the inquiry into means of reducing unnecessary noise in hospitals. The treasurer, Lord ASHBURTON, said the Fund's capital was still £7m., in spite of the fact that since its inception 60 years ago the Fund had distributed over £16m. to the hospitals of London.

Birmingham Cancer Laboratories.—On July 4 Professor A. LACASSAGNE, of the Pasteur Radium Institute, Paris,

opened new clinical research laboratories for the University Medical School in Birmingham. These laboratories, which have cost £50,000, were provided by the Birmingham Branch of the British Empire Cancer Campaign. They are situated on the site reserved for clinical research near to the Queen Elizabeth Hospital and the Medical School at Edgbaston, and will permit all research work on cancer carried on in Birmingham to be centred in one place. Professor JOHN ORR, professor of pathology in the University and director of cancer research, has been intimately concerned with this project. After the opening ceremony Professor L. SEVERI, of Perugia University, unveiled a plaque commemorating the work of Sir Gilbert Barling, the first chairman of the Birmingham Branch of the British Empire Cancer Campaign. A second plaque commemorating a gift from Alfred and Ruth Bullock towards the cost of the laboratories was then unveiled by Dr. O. MÜHLBOCK, of the Dutch Cancer Institute, Amsterdam.

Chair of Parasitology at Liverpool.—At a meeting of the University council on July 8 Dr. W. E. KERSHAW was appointed to the Walter Myers and Everett Dutton chair of parasitology and entomology upon the retirement of Professor R. M. GORDON. Dr. Kershaw graduated in medicine at Manchester University in 1935, proceeding M.D. in 1949 and D.Sc. in 1956. During the war he served in the R.N.V.R., first at sea and later as pathologist to the Royal Naval Auxiliary Hospital in Ceylon. In 1946 he was appointed lecturer in medical parasitology in the Liverpool School of Tropical Medicine, and Leverhulme senior lecturer in parasitology in 1957. He was awarded the Chalmers memorial gold medal of the Royal Society of Tropical Medicine and Hygiene in 1955, and was appointed to the council of that body in 1956. Dr. Kershaw will take up his new appointment on October 1.

New D.C.M.O. at Ministry.—Dr. D. THOMSON is to become a Deputy Chief Medical Officer at the Ministry of Health on October 1, on the retirement of Dr. G. A. CLARK. The other D.C.M.O. is Dr. G. E. GODBER. Before going to the Ministry of Health in 1946 Dr. Clark was professor of physiology and dean of the faculty of medicine at Sheffield University.

Monash University.—At its inaugural meeting on June 19 the interim council of the proposed Monash University in Victoria, Australia, decided that the new university should include a medical faculty. The Government of Victoria promulgated an Act in April to provide for the establishment of a second university in the State, to be named Monash University (after a former Chancellor of Melbourne University), and one of its purposes is to relieve those faculties at Melbourne University which already have to limit their intake of students. The medical members on the interim council are Professor MAURICE EWING, professor of surgery at Melbourne, and Dr. R. R. ANDREW, dean of the Alfred Hospital Clinical School.

Royal Society of Medicine.—Sir GEOFFREY MARSHALL has been elected president for the 1958-9 session. Other changes among the society's officers are that Professor R. H. S. THOMPSON succeeds Dr. G. W. S. ORGANE as an honorary secretary, and Mr. MYLES FORMBY and Dr. F. C. KELLY become honorary directors of photography in place of Professor K. J. FRANKLIN and Dr. D. A. McDONALD. Sir CLEMENT PRICE THOMAS is the immediate past president.

Seventh International Congress of Leprology.—Arrangements to hold this quinquennial congress in New Delhi in November have unfortunately had to be cancelled at short notice. The Japanese Leprosy Foundation has offered, however, to hold it in Tokyo on November 12 under joint sponsorship with the International Leprosy Association. The secretary of the International Leprosy Association (8, Portman Street, London, W.1) urgently requests all who would be able to attend the congress in its new location to inform him at once.

"Biochemical Pharmacology."—This new quarterly from the Pergamon Press Ltd. is described as an international journal for research on the development of biologically active substances—particularly in the field of cancer chemotherapy—and their mode of action at the biochemical and sub-cellular level. Professor ALEXANDER HADDOW, F.R.S., is chairman of the editorial board, and the regional editors include Dr. P. ALEXANDER (executive editor) and Sir RUDOLPH PETERS, F.R.S. The first issue, dated July, 1958, contains original papers, short communications, and book reviews. Annual subscription (including postage) is £6 per volume (£5 5s. if for personal use). The publishing offices are at 425, Fitzroy Square, London, W.1.

Light Diets.—The Hospital Catering Advisory Service of King Edward's Hospital Fund has issued a memorandum on "Light Diets." It is designed to help catering officers or housekeeping sisters fulfil prescriptions for light diets. Copies of the memorandum are obtainable (price 1s., post free) from the Fund's officers, 34, King Street, London, E.C.2.

Bristol University.—Dr. J. CLUTTON-BROCK has been appointed lecturer in anaesthetics and head of the department of anaesthesia. Dr. SUZANNE CLARKE has been appointed lecturer in bacteriology.

Aberdeen University.—At the graduation ceremony on July 4 the University's honorary D.D. was conferred on the Reverend Dr. A. C. IRVINE, senior missionary of the Church of Scotland Mission in Kenya.

Film Award.—A film on congenital obstruction of the bladder neck, made by Mr. D. I. WILLIAMS, Dr. D. EDWARDS, and the film unit of the Institute of Urology, London, was awarded a silver medal at the International Congress of Urological Films in Brussels last month.

COMING EVENTS

Royal Microscopical Society.—Exhibition of photomicrographs, July 23–30, at the Polytechnic School of Photography, 309, Regent Street, London, W.1. Open to non-fellows of the society (admission free) after opening day (July 24 and 29, 10 a.m. to 10 p.m.; other days, 10 a.m. to 4 p.m.).

Cambridge University Postgraduate Medical School.—Course on "Progress in the Biological Sciences in Relation to Dermatology," September 22–27, at Cambridge. The course is intended primarily for practising dermatologists. Details from the Secretary, the Medical School, Tennis Court Road, Cambridge.

NEW ISSUES

The journals listed below are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Annals of the Rheumatic Diseases.—Issued quarterly (£3 annually). The new issue, Vol. 17, No. 2, includes:

PREDNISONE IN RHEUMATOID ARTHRITIS: METABOLIC AND CLINICAL EFFECTS. L. Emmerson Ward, Howard F. Polley, Marschelle H. Power, Harold L. Mason, Charles H. Slocumb, and Philip S. Hench.

GENETIC STUDIES ON RHEUMATOID ARTHRITIS. J. S. Lawrence and J. Ball.

ARTHRITIS ASSOCIATED WITH ULCERATIVE COLITIS. E. G. L. Bywaters and B. M. Ansell.

EFFECT OF LONG-TERM TREATMENT WITH CORTICOSTEROIDS ON ADRENOCORTICAL FUNCTION. F.-E. Krusius and Matti Oka.

RADIOIODINE CLEARANCE FROM THE KNEE JOINT IN RHEUMATOID ARTHRITIS. R. Harris, J. B. Millard, and S. K. Banerjee.

OBSERVATIONS ON THE SHRINK TEMPERATURE OF COLLAGEN AND ITS VARIATIONS WITH AGE AND DISEASE. Patricia C. Brown, R. Consden, and L. E. Glynn.

CLINICAL FEATURES AND COURSE OF ANKYLOSING SPONDYLITIS. M. Wilkinson and E. G. L. Bywaters.

MEASUREMENT AND INTERPRETATION OF SYNOVIAL FLUID VISCOSITIES. C. H. Barnett.

ESTIMATION OF THE ERYTHROCYTE SEDIMENTATION RATE OF CAPILLARY BLOOD. H. E. D. Lloyd.

RELATION BETWEEN THE AFFINITY FOR CONGO RED AND THE GLYCOPROTEIN CONTENT OF SERUM IN RHEUMATOID ARTHRITIS AND RELATED DISEASES. Børge Larsen.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s.

British Journal of Ophthalmology.—Issued monthly (£6 annually). The new issue, Vol. 42, No. 7, includes:

EFFECT OF CERVICAL SYMPATHOTOMY ON AN OCULAR RESPONSE TO HYPOTHALAMIC STIMULATION. J. Gloster and D. P. Greaves.

OPHTHALMIC DISEASE IN HONG KONG. G. C. Dansey-Browning.

PROTECTION OF THE GRAFT WITH CONDOM IN KERATOPLASTY. A. Miklós and L. Masovszky.

REPLACEMENT OF TRAUMATIC IRIS PROLAPSE. R. Stein.

DOMINANTLY INHERITED OPTIC ATROPHY. Ruby Joseph and J. B. Davey.

INCOMITANT STRABISMUS OF UNUSUAL ORIGIN. M. S. Niranjan and M. C. Maudgal.

INFECTION WITH MICROCOCCUS TETRAGENUS AS A COMPLICATION OF PENETRATING KERATOPLASTY. G. J. Romanos.

"AMYLOID TUMOUR" OF THE EYELIDS. S. Agarwal and J. B. Shrivastav.

TWO CASES FROM MALAYA. B. M. McOWAN.

OCULAR CASES OF MEDICAL INTEREST. J. Horton Young.

REFRACTION IN MARKED PTOSIS AND BLEPHAROPTHALSIS. J. D. Marot Cardell.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Tuesday, July 22

SOCIETY FOR THE STUDY OF ADDICTION.—At Medical Society of London, 8 p.m., 6th Kelynaek Memorial Lecture by Dr. M. H. J. Krauwel (Amsterdam): Incidence and Treatment of Alcoholism in the Netherlands.

Wednesday, July 23

● INSTITUTE OF CHILD HEALTH.—5 p.m., Simpson Smith Memorial Lecture by Dr. Willis J. Potts (Chicago): Congenital Atresia of the Oesophagus.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. Janet S. F. Niven: Cytopathological Aspects of Latent Infection.

Thursday, July 24

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At Hospital for Tropical Diseases, 7.30 p.m., clinical meeting.

WEST LONDON HOSPITAL MEDICAL SCHOOL.—5 p.m., Alex Simpson Smith Memorial Lecture by Mr. Harold Burge: Problems in Gastric Surgery.

Friday, July 25

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Mr. W. P. Cleland: clinical demonstration.

● ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS.—5 p.m., William Meredith Fletcher Shaw Memorial Lecture by Professor James Black: Reminiscences of Fifty Years' Medical Practice—Forty-seven of Them in South Africa.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—4.30 p.m., Moynihan Lecture by Dr. Willis Potts: Respiratory Emergencies in the Newborn.

APPOINTMENTS

NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—D. E. Savage, M.B., F.R.C.S., M.R.C.O.G., Gynaecologist, Highlands General Hospital; A. Knudsen, M.D., M.R.C.P., Pathologist, West Middlesex Hospital; R. C. Fuller, M.B., F.R.C.S., Surgeon, Acton Hospital; J. C. MacKillop, M.B., F.F.Hom., Homoeopathic Physician, Royal London Homoeopathic Hospital; Margaret D. W. Hamilton, M.B., F.F.A. R.C.S., Anaesthetist, Willesden General Hospital.

WRIGHT, J. T., D.M., M.R.C.P., Part-time Consultant Physician to the London Hospital, Whitechapel, E.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Carrick.—On July 4, 1958, to Muriel and David Carrick, M.R.C.S., L.R.C.P., of Feering House, Kelvedon, Essex, a daughter—Eugénie Sarah Anne.

Dhanji.—On June 20, 1958, at 27, Belle Vue Terrace, Sandbach, Cheshire, to Iris (formerly Lewis), wife of Dr. Noor Ali Dhanji, a daughter—Judith Soraya.

Dunn.—On July 5, 1958, at home at Bridgnorth, to Sylvia (formerly Matheson), M.B., B.S., and Andrew Dunn, L.D.S., a son—Conal Matheson.

DEATHS

Bell.—On July 4, 1958, Henry Cooke Bell, M.M., L.R.C.P.S.I. & L.M., of The Paddock, Weston-on-Trent, near Derby, aged 64.

Crichton.—On June 27, 1958, James Smith Crichton, M.B., Ch.B., of 9, Addison Crescent, Kensington, London, W.

Dunn.—On June 27, 1958, at his home, Fern Hill, Manchester Road, Burnley, Lancs, William James Dunn, M.D.

Dyson.—On June 28, 1958, Harold Edward Dyson, M.D., of Stoneacre, Hoxey Hill, Westerham, Kent, formerly of Wembley, Middlesex.

Hudson.—On July 11, 1958, Major-General Corrie Hudson, C.B., C.I.E., D.S.O., F.R.C.S. Ed., of Garth Knowle Drive, Sidmouth, Devon, aged 84.

Jackson.—On June 21, 1958, at his home, 96, Lowther Road, Bourne-mouth, Hants, Thomas Sparks Jackson, M.R.C.S., L.R.C.P., aged 95.

Jordan.—On June 27, 1958, at her home, near Lechlade, Glos., Helen Rosalind Jordan (formerly Ashton), M.B., B.S., aged 66.

Macdonald.—On July 2, 1958, at Feltwell, Norfolk, Alexander Lamont Macdonald, M.B., Ch.B.

Smith.—On June 25, 1958, Edward Archibald Smith, M.B., Ch.M., F.R.C.S., of Eastfield House, Wells, Somerset, late of Vancouver, British Columbia, aged 83.

Smith.—On June 26, 1958, at Monmouth, Herbert Smith, M.R.C.S., L.R.C.P., D.T.M., aged 68.

Smith.—On June 21, 1958, at Bromley, Kent, Fleet Floyd Strother Smith, M.D., Colonel, I.M.S. (retired), aged 74.

Stratfield.—On July 2, 1958, in hospital, London, William Hugh Raymond Stratfield, M.R.C.S., L.R.C.P., of 18a, Thurlow Place, London, S.W., aged 79.

Swan.—On June 22, 1958, James Douglas Carnon Swan, M.B., Ch.B., of 370, Dorchester Road, Weymouth, Dorset.

Tuohy.—On June 29, 1958, at a nursing-home, Patrick Gerald Tuohy, M.B., Ch.B., of Shornbrook, Crowborough, Sussex, aged 70.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Chemotherapy for Pulmonary Tuberculosis

Q.—What is the optimum dosage of streptomycin and isoniazid for patients suffering from pulmonary tuberculosis with positive sputum and high E.S.R.?

A.—The optimum dosage for patients under the age of 40 is streptomycin sulphate 1 g. in one injection daily together with isoniazid 100 mg. twice daily. This should be continued at least until three sputum cultures are known to be negative, when P.A.S. with isoniazid can be substituted. It is safer still to initiate treatment with all three drugs until the patient's organisms are known, by laboratory testing, to have been initially sensitive to all three drugs. Otherwise isoniazid resistance may emerge in the occasional patient who has had the misfortune to be infected with streptomycin-resistant organisms, or vice versa. In any case chemotherapy should continue for at least a year after sputum conversion. Streptomycin should not be given every three days with daily isoniazid: with this regime resistant tubercle bacilli will emerge in 10 to 15% of cases.¹ In patients over the age of 40 daily streptomycin is apt to give rise to vestibular upset. These patients can be given streptomycin three times weekly, but then in that event both streptomycin and P.A.S. (5 g. of the sodium salt twice daily by mouth) must be given if drug resistance is to be avoided. Streptomycin is more likely to give rise to vestibular upset, dihydrostreptomycin to deafness. Dihydrostreptomycin may be permanent. At least partial recovery from vestibular upset is usual, especially if streptomycin is stopped as soon as the patient complains of giddiness. Streptomycin is therefore preferable to dihydrostreptomycin. For details of chemotherapy the *Textbook of Medical Treatment*, edited by Dunlop and his colleagues,² may be consulted.

REFERENCES

- ¹ M.R.C. Report, *Brit. med. J.*, 1955, 1, 435.
- ² *Textbook of Medical Treatment*, 1958, edited by D. M. Dunlop, Sir Stanley Davidson, and S. Alstead. E. and S. Livingstone, Edinburgh.

Antibiotic Antagonism

Q.—Since tetracyclines may antagonize the action of penicillin, is it inadvisable to give systemic penicillin at the same time as local tetracycline therapy?

A.—Antagonism between penicillin and tetracyclines is a reality, but strictly conditioned by the concentrations of the two antibiotics. Thus it is demonstrable in the treatment of acute infections in mice only when the dose of each antibiotic is near the minimum effective level, and the only clear illustration of it on record in the clinical field was in the treatment of meningitis, when neither antibiotic was administered intrathecally, and the concentration attained by each in the cerebrospinal fluid must have been at a critically low level.

The mechanism of this effect, when it occurs, is interference with the bactericidal action of penicillin—which is exerted only on multiplying bacteria—by an antibiotic which is bacteriostatic—i.e., prevents multiplication. It is a purely one-way effect: penicillin does not interfere with the action of a tetracycline when the latter is present in a concentration in excess of that necessary for independent effect. There is thus no objection to the treatment specified in the question: the high concentration of tetracycline produced by local application—say, to the eye—would be unaffected by any penicillin in the lacrimal secretion. On the other hand, so little tetracycline would be absorbed that any antagonistic combined effect in the body generally would be most unlikely.

Determining Immunity to Poliomyelitis

Q.—May the usual serum tests—precipitation, complement fixation, or virus neutralization—be used to determine immunity to poliomyelitis?

A.—Antibodies to the three types of poliomyelitis virus may be detected by either neutralization, complement fixation, or flocculation. The last method is experimental and has not been accepted as a routine method.¹ Following infection, specific complement fixing and neutralizing antibodies can easily be detected, but the former fall off much quicker than the latter and will not be found in the absence of neutralizing antibodies.² The neutralization test is therefore the best method of detecting whether a person is immune to poliomyelitis or not. Subjects without antibody must be considered susceptible, although a small proportion of these may in fact be immune as their antibody may be below the detectable level. Detectable antibody to any given type indicates prior infection with, and therefore immunity to, that type but not to the other two, although heterologous antibody may reduce the incidence of clinical disease in some instances. The routine tests in use for detecting neutralizing antibodies are time-consuming and expensive, and attempts have been made to introduce simpler techniques.³ Unfortunately a reliable skin test is not yet available.

REFERENCES

- ¹ Lennette, E. H., and Schmidt, N. J., *Amer. J. Hyg.*, 1957, 65, 210.
- ² Smith, W., Sheffield, F. W., Churcher, G., and Lee, L. H., *Lancet*, 1956, 2, 163.
- ³ Salk, J. E., *J. Amer. med. Ass.*, 1956, 162, 1451.

N-acetyl-p-aminophenol

Q.—N-acetyl-p-aminophenol is being advertised now as a substitute for aspirin. Is this, like most aniline derivatives, a substance likely to cause agranulocytosis?

A.—N-acetyl-p-aminophenol may also be called p-hydroxy-acetanilide, which shows that it is closely related to p-ethoxyacetanilide or phenacetin. It may be regarded as a variant of phenacetin. While acetanilide has some reputation for causing agranulocytosis, though much less than has aminopyrine, phenacetin has rarely been known to do so.¹ The substances which cause agranulocytosis include the sulphonamides and thiouracil; it is very difficult to indicate what chemical groups are responsible. All probably act because they resemble compounds occurring in the body whose place they usurp.

REFERENCE

- ¹ Kracke, R., and Parker, F. P., *J. Lab. clin. Med.*, 1933, 19, 799.

Simple Retroversion

Q.—What is the treatment for a simple symptomless retroversion of the uterus found at post-natal examination?

A.—A symptomless, simple (i.e., mobile) retroversion found post-natally needs no treatment unless it is associated with obvious subinvolution—in which case correction and the insertion of a pessary to maintain the new position for six weeks are advisable. In nearly all women with simple post-natal retroversion the uterus was in that position before pregnancy. A patient who has been told she has a retroversion should be assured that it is normal for her.

X-ray Sterilization of Bone Grafts

Q.—Is it possible to use x rays for sterilizing bone for storage and subsequent grafting?

A.—A good deal of experimental work is being done on the use of x rays for sterilization, particularly in the canning industry. No definitive conclusions have yet been reached which would lead one to expect x rays to be used for a like purpose in medicine. In any case radiation is no respecter of cells, and if a dose lethal to an organism is applied it will also presumably ensure the death of the cells in the tissue upon which the organisms lie. In the case of homografts, which, unlike autogenous grafts, are not, in fact, grafts but implants, their contained cells apparently

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EXPECTATION OF LIFE AND MORTALITY FROM CANCER
AMONG BRITISH RADIOLOGISTS

BY

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AND

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It has been stated, in a report on "The Biological Effects of Atomic Radiation" by the United States National Academy of Sciences (1956), that the average age at death of American radiologists was about 5 years less than the average age at death of American physicians having no known professional contact with radiation. It was inferred from this finding that exposure to the levels of radiation dose which are received under occupational conditions would result in a reduction in the expectation of life, in the same way as the longevity of animals is reduced by large doses of whole-body radiation given at a high dose rate. Others have claimed that, in this respect, the action of radiation is non-specific and that exposure to even very low doses confers some degree of general unfitness to survive. In explanation, it has been suggested that radiation leads to an accelerated rate of senescence due to the accumulation of genetic damage in the somatic tissues (Failla, 1957; Henshaw, 1957).

The present report stems, in its inception, from the various studies that have been made on American radiologists, and gives the causes of death among a similar group of British radiologists during a 60-year period from 1897 to 1956. The investigation had two objects: firstly, to see whether there was evidence for a decrease in the expectation of life as the result of a non-specific ageing effect, and, secondly, to examine the mortality of British radiologists from cancer.

The Study Population

Through the co-operation of the Council of the British Institute of Radiology and the Council of the Faculty of Radiologists, lists were compiled of the members of each society who had a medical or a dental qualification. In subsequent descriptions members with dental qualifications have been classed with the medical members, whether or not they also had a medical qualification.

For the British Institute of Radiology, the lists were made retrospective to 1897, which was the foundation year of its precursor the X-ray Society, the first radiological society in the world. Soon after its foundation the name of the X-ray Society was changed to the

Röntgen Society, and in 1927 this society amalgamated with the British Institute of Radiology, which had been founded separately in 1922, to form the present institute. For the Faculty of Radiologists, lists of members were obtained from the date of its foundation in 1939 and also from the records of its antecedent societies, the British Association of Radiologists and the Society of Radiotherapists of Great Britain and Ireland, which were founded respectively in 1934 and 1935.

The period over which the data were collected includes the period of the early development of medical radiology, and consequently the persons studied include a large proportion, and probably the great majority, of the pioneer British radiologists, many of whom unwittingly exposed themselves to excessive amounts of radiation.

The lists contained the names of all who joined the societies up to December 31, 1954, and altogether records were obtained of 2,035 medical and dental members; 1,461 of these, on the basis of initial addresses in Britain or Eire or of belonging to the Colonial or Armed Services, were regarded as constituting the "Home" population. For simplicity of analysis, the few women in the population (80) were excluded and the study was limited to an analysis of the mortality among the 1,381 men in the "Home" population.

For each member of the population the following data were recorded:

Name and qualifications; address on entry and last known address; sex; date of birth; date of joining one of the societies; status on January 1, 1957; and (if dead) the date and cause of death.

The information required had to be obtained from a number of sources. It was sought primarily from the records of the societies, but when these were inadequate it was sought in the records of the General Register Office, the General Medical Council, the British Medical Association, other professional organizations, or the hospitals in which the members worked. In a few instances information was obtained direct from the member himself, or from other members or relatives. Whenever a member was known to have died, a copy was obtained of the cause of death entered on the death

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play no part in the incorporation into the host, and any simple and non-specific form of sterilization would be suitable.

Notification of Industrial Dermatitis

Q.—Are there any regulations for reporting industrial dermatitis?

A.—H.M. Factory Inspectorate of the Ministry of Labour and National Service is concerned with the prevention of dermatitis in establishments under the Factories Acts, and expert advice, including that from the medical branch, is available to any employer.¹ Dermatitis is not a notifiable industrial disease under the Factories Acts, but, with certain qualifications, occupational dermatitis is prescribed for injury benefit under the National Insurance (Industrial Injuries) Act.²

REFERENCES

- ¹ *Dermatitis in Industry with Special Reference to Barrier Substances*. H.M. Stationery Office Form 330.
- ² *Notes on the Diagnosis of Occupational Diseases Prescribed under the National Insurance (Industrial Injuries) Act, 1946*. H.M. Stationery Office. Price 1s. 6d.

Thermometer Hygiene

Q.—What is a proper technique for thermometer hygiene when recording a number of temperatures in the course of a round of visits?

A.—When temperatures are taken in the axilla, which is perhaps preferable in the circumstances, there is little risk of transmitting infection unless from a patient with an infective dermatitis in that area. Oral use clearly demands that a reliable process of disinfection be regularly employed. The most comprehensive study of this problem was made by Frobisher, Sommermeyer, and Blackwell.¹ They considered several classes of germicide unsuitable for various reasons, and found others, which are credited with high activity in other types of use, to be ineffectual. Their best results in disinfecting glass rods or actual thermometers contaminated with tubercle and diphtheria bacilli, staphylococci, and streptococci were obtained with 70% ethyl or isopropyl alcohol, the latter being rather more effective. The results were improved by preliminary wiping on cotton-wool wet with a mixture of equal parts of tincture of green soap and 95% ethyl alcohol. If this is done, carrying a thermometer in a case containing spirit of the right concentration should evidently be safe, but it would be advisable to renew the contents frequently.

REFERENCE

- ¹ Frobisher, M., Sommermeyer, L., and Blackwell, M. J., *Appl. Microbiol.*, 1953, 1, 187.

A.I.H. in "Normal" Partners

Q.—What part can artificial insemination, using the husband as donor, play in the treatment of infertility when both husband and wife are apparently normal? Is the chance of conception increased when the semen is placed in the uterus instead of in the vagina?

A.—A.I.H. has no place in the treatment of infertility when both husband and wife are apparently normal and when coital effectiveness has been demonstrated by a satisfactory post-coital test. However, since this important test is so often omitted in the so-called investigation of infertility as generally practised outside special fertility clinics, it is possible that the apparently normal husband and wife referred to do not have mechanically effective intercourse. If appropriate investigation shows this to be the case, and advice intended to improve coital technique still fails to produce a satisfactory post-coital test, then clearly A.I.H. would be a logical procedure to recommend. Nevertheless, early conception after resorting to A.I.H. in cases of this kind is the exception rather than the rule.

Adequate data on which to base an answer to the second part of the question are not available. Such as exist do not suggest that superior results from A.I. necessarily follow intrauterine insemination, except, of course, when cervical hostility is the reason for using A.I. By cervical

hostility is meant the condition in which the cervical secretions, by reasons of their quality, quantity, or both, do not permit the passage of spermatozoa through them. This is a commonly encountered finding in subfertile couples and frequently defies attempts at treatment. In such cases the object is to place some spermatozoa above the cervical block in the hope that they will then be able to proceed through the uterus and tubes.

NOTES AND COMMENTS

Toxicity of "Albamycin."—Dr. A. R. H. HICKS (medical adviser, Upjohn of England Ltd., Crawley, Sussex) writes: I have read with some concern the answer of your expert to the question, "Does albamycin (calcium salt of novobiocin) have a toxic effect on the liver?" ("Any Questions?" June 21, p. 1493). The occurrence of diffuse hepatic necrosis in the case cited by Bridges *et al.*¹ is possibly attributable to novobiocin, but it must be considered in relation to the dose of novobiocin which the patient received. The boy, aged 14 years, received 2 g. novobiocin 12 hourly, orally for eight days. The weight of the boy is not given but is unlikely to be more than 50 kg. He received, therefore, about 80 mg. per kg. of body weight daily for eight days—more than five times the recommended dose (15 mg. per kg. of body weight daily). A report from the Upjohn Company (presumably Larson *et al.*²) is quoted as describing the occurrence of severe degenerative changes in the liver and kidneys in dogs receiving 300 mg. albamycin per kg. of body weight daily. These changes were only noted when doses of 300 mg. were given intravenously for five days. When the same dose was given orally no degenerative changes in the liver or kidneys were observed at necropsy. Welch *et al.*³ report on a series of 208 adult males who were given 10 g. novobiocin over a 12-day period. Only one of these exhibited a drug rash and three of them showed a yellow discoloration of the sclerae which faded gradually on discontinuation of the drug. By now many thousands of patients have received albamycin and the many reports which have been published demonstrate conclusively that it is an effective drug and that its use, in the recommended dosage, is accompanied by but few side-effects—most of these being insignificant clinically. To my knowledge there has been no further reference to any toxic effect on the liver. If potent drugs are given in doses greatly in excess of those recommended by the manufacturers it is not unlikely that disasters will occur from time to time, and it is not unreasonable to assume that novobiocin could have been responsible for the pathological changes described earlier. However, the omission of details concerning the unprecedented high dosage employed must have given a very false impression of albamycin, a drug which wide usage has shown to be extremely useful and safe in the normally accepted dose range.

REFERENCES

- ¹ Bridges, R. A., Berendes, H., and Good, R. A., *J. Pediatr.*, 1957, 50, 579.
- ² Larson, E. J., *et al.*, *Antibiot. and Chemother.*, 1956, 6, 226.
- ³ Welch, H., Lewis, C. N., Putnam, L. E., and Randall, W. A., *Antibiot. Med.*, 1956, 3, 27.

Correction.—The obituary of Dr. Anna M. Williams (June 14, p. 1423) stated that she was born abroad. She was, in fact, born in Edinburgh, and up to the time of graduation she spent nearly all her life in Scotland.

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certificate. This last information was omitted in a few cases in which the member was reported to have died abroad and there was little doubt about the cause of death—e.g., accidental death or death through enemy action. It proved possible to trace all but four members of the male population, and the subsequent analyses are therefore based on the 1,377 males whose status was known on January 1, 1957. The fact that those whose deaths had not been recorded were alive after this date was confirmed by (1) personal contact or (2) discovering that they had subsequently paid a subscription to one or other medical society.* The majority (probably the great majority) of these men were or are engaged in the practice of diagnostic radiology, and the group as a whole may be regarded as a group of radiologists.

It seems likely that most full-time radiologists in Britain and Eire are, or have been, members of one or other society. The survey is, however, deficient in that it does not include a number of radiologists—mostly perhaps part-time—who have not been members of either society. It is also possible that in the past such people may have been those least protected from radiation. Some indication that such workers have been overlooked arose when, during the course of the survey, the records were brought to our notice of a part-time diagnostic radiologist who recently died from aplastic anaemia and who had never been a member of either of the two societies.

The Extent of Radiation Exposure

It is only recently that active steps have been taken to record the amounts of exposure received by the staffs of radiological departments. Available evidence suggests that exposure, under modern conditions, is almost always well below the weekly maximum permissible dose of 0.3 r (Godfrey, Osborn, and Templeton, 1957). This, however, has not always been the case, and during its formative years medical radiology was often practised without any protective measures being taken. In the earliest days it was common practice for a radiologist to test the condition of his x-ray tube by the deliberate exposure of his hands, and he assessed the state of the tube by the density of the shadows of his hand bones cast on a fluorescent screen.

Hunter (1955) states that protective clothing was introduced in 1903, and Cuthbert Andrews (personal communication) says that by 1909 the wearing of such clothing was a fairly general practice. The clothing was clumsy and bulky to wear, and to obviate this steps were taken, during the first world war, to incorporate protective shielding into the x-ray equipment. In spite of this, radiation damage continued to occur, and in 1921 the British X-ray and Radium Protection Committee was formed as the result of co-operative action between the Royal Society of Medicine, the Röntgen Society, and a number of other interested bodies. This committee issued its first recommendations in July, 1921. There is reason to believe that the action of the committee was fairly quickly effective in arresting the sequence of casualties to x-ray and radium workers. In this survey, therefore, the study population has been divided into those members entering before 1921 and those joining one or other society in 1921 or afterwards. It is assumed that those joining after 1920 would on the whole commence the practice of radiology under recognized conditions of protection, and the comparison of these two sections of the population should be of value in ascertaining whether any significant radiation effects had occurred.

There is little point in attempting to assess the total exposure to radiation of individual members. No data exist

*Except in one instance, when the only evidence that the member was alive later than 1954 was that his address was given in the British and Canadian Medical Directories. He joined the institute in 1949, when aged 30 years.

which permit such estimates to be made with any confidence. It seems reasonable, however, to proceed on the assumption that the average exposure of the pre-1921 members was excessively high, and that the average exposure of the post-1920 members has been within the various permissible limits that have been recommended.

Calculation of the Expected Mortality

To calculate the mortality expected among the members of the societies it is necessary to know the population at risk at each age and in each year from the date when the first members joined the first society (1897) until the end of the period of observation (December 31, 1956). Members were regarded as being at risk from the year in which they first entered a society until either their year of death or the end of 1956, whichever was the earlier, irrespective of the actual length of time membership may have continued. Each member was considered as being at risk for half a year in the year in which he first entered, and, in the event of death, for a similar period in the year in which he died. Members entered the population and deaths occurred more or less equally in each month, so that both events may be regarded as having occurred, on average, at mid-year. The population at risk was then obtained by counting the members at risk at each year of age and for each year from 1897 to 1956, and then adding in each five-year age group the numbers of "man-years" at risk for the period 1897 to 1915, for the quinquennia from 1916 to 1950, and lastly for the period 1951 to 1956.† Separate counts were made for the members who first entered the population before January 1, 1921, and for those joining on or after that date. The numbers of man-years at risk in each five-year age period and for each period studied are shown separately in Table I.

The expected numbers of deaths were estimated, as a first approximation, by assuming that the mortality should be the same as that recorded for all men in England and Wales in the same age groups and over the same periods of time. The numbers of man-years at risk were therefore multiplied by the corresponding age-specific male death rates (McKenzie, Case, and Pearson, 1957), and the total numbers of deaths expected were obtained by adding together the results for all the age groups.

These figures are, however, not the best estimates which can be made, as over the years there has been an appreciable difference between the mortality experience of different socio-economic classes and of different occupational classes. These differences can be allowed for by utilizing the data published in the Registrar-General's Occupational Mortality Supplements. Data have been published for the periods 1910-12, 1921-3, 1930-2, and 1949-53 (Registrar-General, 1923, 1927, 1938, 1958), and they are given separately for different social and occupational classes (including the medical profession). The data are also published in each instance for various age groups up to and including those 75 years of age and over. Some slight variations were made in the definition of the first socio-economic class in the different reports, but in general the class has corresponded to the members of the major professions, senior business executives, etc.

It is reasonable to suppose that the mortality of radiologists would most closely correspond to that of the first social class, which includes all members of the medical profession. The mortality of doctors as a whole has, however, differed appreciably from that of this class. To some extent this may be the result of specific risks associated with general practice, and it is possible that the conditions of life of men in social class I provide a better indication of the conditions of life of radiologists (apart from the latter's specific radiation exposure) than the conditions for the medical profession as a whole. Separate estimates have therefore been made of the total numbers of deaths which

†These periods were chosen for convenience, since age-specific death rates have been published by McKenzie, Case, and Pearson (1957) for cancer of various sites for quinquennia from the period 1911-15.

would have been expected if the mortality of the members of the radiological societies had corresponded on the one hand to that of doctors and on the other to that of men in social class I.

To make the necessary corrections the mortality rates at each Census period were calculated for male doctors and for men in social class I for each age group for which data were given. These were expressed as percentages of the corresponding rates for all men during the same period, and the estimates of the correcting factors required for each of the periods studied were obtained by interpolation. Thus in 1921-3 the mortality of men in social class I aged 55 to 64 years was 88% of the general male population; in the period of 1930-2 it was 95%. Therefore in the quinquennium 1926-30 the correcting factor for social class at ages 55 to 64 years was taken to be $\{88 + 6/9(95 - 88)\}/100$ or 93%. The numbers of deaths expected in each age group calculated on the mortality rates for England and Wales were multiplied by the corresponding correcting factors, and the results summed for all ages and periods to give the corrected estimates of the total mortality (estimates B in Tables II, III, and IV).

These corrections are, however, less satisfactory than might be thought. The reason lies in the fact that above the age of 65 years the Registrar-General's occupational mortality rates are increasingly biased, because a proportion of retired

men fail to give their last occupation on the Census schedule, whereas this is nearly always obtained by the Registrar on the registration of a death. As a result the mortality of all occupations (and of all social classes) is artificially increased in the older age groups, while a very low mortality is recorded for men classified as being unoccupied. This factor cannot be ignored, though it is perhaps less likely to affect the recorded mortality for doctors and for men in social class I generally than for men in most other occupations. It has therefore been thought wise to make a second estimate of the corrected mortality (for both social class and occupation) on the assumption that the mortality at ages over 65 years bears the same relationship to that for all men as does the mortality at ages 55 to 64 years—the oldest age group for which the data can be relied on with confidence (estimates A in Tables II, III, and IV).

The total numbers of deaths expected to be attributed to all types of cancer, and the appropriate corrections for occupation and social class, were calculated by the same method. Data are not available in the same detail to enable similar estimates to be made for expected cancer mortality at specific sites, and a more approximate method was used for this purpose. The numbers of expected deaths were calculated from the national mortality rates in the same way, but in deriving correction factors for social class age was ignored, and the appropriate factors for each

TABLE I.—Number of Years Lived in Five-year Age Groups by Radiologists who Came Under Observation Before or After the Beginning of 1921

Group of Radiologists	Age (Years)	No. of Man-years at Risk During								
		1897-1915	1916-20	1921-5	1926-30	1931-5	1936-40	1941-5	1946-50	1951-6
Joined Society before January 1, 1921	20-	7	2	0	0	0	0	0	0	0
	25-	82	16	5	0	0	0	0	0	0
	30-	225	58	65	5	0	0	0	0	0
	35-	410	110	105	102	65	5	0	0	0
	40-	527	188	244	164	101	65	5	0	0
	45-	532	230	248	231	161	99	65	5	0
	50-	433	232	236	224	209	147	97	65	5
	55-	299	187	178	201	197	187	118	89	61
	60-	148	142	121	148	152	164	144	87	102
	65-	60	74	48	88	108	117	129	116	81
	70-	18	21	5	31	56	65	80	93	72
	75-	6	4	1	1	12	33	31	35	47
Joined Society on or after January 1, 1921	80-	5	1	1	2	1	6	23	28	32
	85 or above	4	1	1	2	1	6	23	28	32
	All ages	2,756	1,266	1,430	1,262	1,067	888	692	518	400
	20-	—	—	1	2	4	0	2	2	1
	25-	—	—	18	77	62	48	47	106	52
	30-	—	—	53	177	225	201	232	366	568
	35-	—	—	41	198	315	346	314	522	944
	40-	—	—	55	165	315	394	431	381	839
	45-	—	—	31	150	215	362	423	503	545
	50-	—	—	16	100	178	239	377	459	645
	55-	—	—	12	47	106	186	239	359	561
	60-	—	—	12	36	67	108	164	226	407
	65-	—	—	1	16	43	68	101	141	238
	70-	—	—	0	6	12	39	52	88	140
	75-	—	—	0	0	5	7	26	38	98
	80-	—	—	0	0	0	1	2	11	35
	85 or above	—	—	0	0	0	0	1	0	7
	All ages	—	—	240	974	1,547	1,999	2,411	3,202	5,080

TABLE II.—Numbers of Deaths from All Causes; Observed and Expected, by Date of Death

Period	Pre-1921 Population					Post-1920 Population				
	No. of Deaths Observed	No. of Deaths Expected from Mortality of			No. of Deaths Observed	No. of Deaths Expected from Mortality of				
		General Population	Men in Social Class I A* B*	Doctors A* B*		General Population	Men in Social Class I A* B*	Doctors A* B*		
1897-1915	26	44	39 - 39	40 - 40	—	—	—	—	—	
1916-20	21	25	22 - 22	24 - 24	—	—	—	—	—	
1921-5	27	29	26 - 27	31 - 30	0	2	2 - 2	2 - 2	2 - 2	
1926-30	46	35	32 - 33	38 - 36	6	9	8 - 8	9 - 8	9 - 6	
1931-5	31	37	35 - 36	40 - 38	13	16	14 - 15	17 - 16	16 - 14	
1936-40	41	42	40 - 42	44 - 43	23	25	23 - 23	25 - 22	25 - 22	
1941-5	38	39	38 - 41	38 - 39	30	32	30 - 31	31 - 30	31 - 30	
1946-50	35	37	37 - 41	35 - 37	37	42	41 - 42	39 - 39	39 - 39	
1951-6	37	36	37 - 41	33 - 37	52	75	75 - 79	68 - 71	68 - 71	
All periods .. .	302	324	306 - 322	322 - 323	161	201	193 - 200	192 - 193	192 - 193	

* Estimates made on different assumptions about the relative mortality of men in these social groups aged 65 years and over: see section on "Calculation of the expected mortality."

period were obtained by interpolation from the standardized mortality ratios for ages 20 to 64 years published by the Registrar-General.* For example, the standardized mortality ratio for cancer of the stomach was 60% for social class I in 1921-3 and 55% in 1930-2; the correcting factor for the quinquennium 1926-30 was therefore calculated to be $\{60 + 6/9 (55-60)\}/100$ or 57%. No figures are available for the years prior to 1921, and the standardized ratios for 1921-3 have been taken as the correcting factors for all the preceding years. In the case of leukaemia the earliest available figure was 163% in 1930-2.

The Expectation of Life

Results

The numbers of deaths reported among those members who entered the population before January 1, 1921 (the "pre-1921 population"), and among those who entered in 1921 or later (the "post-1920 population") are shown in Table II separately for nine periods between 1897-1915 and 1951-56. The numbers of deaths in each group are compared with the numbers which it is estimated would have occurred among comparable groups representative of (1) all men in England and Wales, (2) men in social class I, and (3) male doctors. For reasons which have been stated previously two sets of figures are given for the expected numbers of deaths for men in the last two categories, and it is likely that the best estimate lies somewhere between them. The total numbers of deaths for each of the two populations are shown in Table III, subdivided according

TABLE III.—Number of Deaths from Cancer and Other Causes: Observed and Expected, All Periods

Group of Radiologists	Cause of Death	No. of Deaths Observed	No. of Deaths Expected from Mortality of		
			General Population	Men in Social Class I	Doctors
Pre-1921	Cancer	55	48	42 - 47	35 - 42
	Other cause	247†	276	264 - 275	287 - 281
	All causes	302	324	306 - 322	322 - 323
Post-1920	Cancer	24	38	36 - 37	26 - 29
	Other cause	137	163	157 - 163	166 - 164
	All causes	161	201	193 - 200	192 - 193
All members	Cancer	79	86	78 - 84	61 - 71
	Other cause	384†	439	421 - 438	453 - 445
	All causes	463	525	499 - 522	514 - 516

* See footnote to Table II.

† Including two deaths attributed to aplastic anaemia and one death for which information about the cause was not obtained.

to whether the deaths were attributed to cancer or to other causes. It is clear that the total of observed deaths (463) is less than would have been expected if the members had suffered a mortality similar to that experienced by all men in England and Wales over the same period (525). It is also less than expected for men either of the same social class (499 to 522) or of the same profession (514 to 516). If the deaths attributed to cancer are excluded the relative differences between the observed and expected numbers of deaths are more marked, and the difference from the smallest number which could reasonably be expected approaches statistical significance (observed 384, expected 421; $P=0.07$).

When the radiologists who joined before and after January 1, 1921, are examined separately it is found that the actual number of deaths was less than the expected number in both groups and that the deficiency was more marked among those who joined later. In the pre-1921 group, however, there was a small excess of deaths due to cancer, and if these are excluded the deficiency of deaths due to other causes is of the same order in both the groups.

*The standardized mortality ratios published for 1930-2 are for the age group 35 to 64 years and these ratios have been used for this period.

These findings should not be interpreted to mean that radiologists have an increased life expectancy as a result of their occupation. A large part of the deficiency is contributed by the experience of the first few years, and much of this is likely to be an artifact due to the exclusion of men who were particularly unhealthy. It is common actuarial experience that men who voluntarily join some organization have a healthier record than average for a few years, because those who know they are seriously ill tend not to undertake new responsibilities. In the course of time the effect of this type of selection must be expected to disappear, and it is unlikely to be appreciable after five years (Jordan, 1952). Whether it has contributed to the present results can be tested by calculating separately the number of deaths expected to occur within the first five years of joining one or other society. When this is done it appears that the deaths observed during this period were markedly fewer than those expected (24 against 42 expected on the basis of the national rates); it would therefore seem reasonable to exclude this part of each individual's membership from the study. The results obtained by so doing are shown in Table IV. The total mortality is still lower

TABLE IV.—Numbers of Deaths from Cancer and Other Causes: Observed and Expected, First Five Years at Risk Excluded

Group of Radiologists	Cause of Death	No. of Deaths Observed	No. of Deaths Expected from Mortality of		
			General Population	Men in Social Class I	Doctors
Pre-1921	Cancer	54	46	41 - 46	34 - 41
	Other cause	239†	261	251 - 262	273 - 267
	All causes	293	307	292 - 308	307 - 308
Post-1920	Cancer	22	35	32 - 34	23 - 26
	Other cause	124	141	139 - 144	145 - 143
	All causes	146	176	171 - 178	168 - 169
All members	Cancer	76	81	73 - 80	57 - 67
	Other cause	363†	402	390 - 406	418 - 410
	All causes	439	483	463 - 486	475 - 477

* See footnote to Table II. † See footnote to Table III.

than that expected from the experience of comparable social and professional groups (439 deaths against the lowest estimate of the expected number of 463), and the mortality from causes other than cancer is also lower than that expected—though now clearly not significantly lower (observed deaths 363, least number of expected deaths 390; $P=0.17$).

The slight deficiency of deaths due to causes other than cancer could have arisen because of an inadequate correction for social class and occupation. The correction for class and occupation could not be very accurate, as so many of the deaths occurred at ages 65 years and over and the occupational mortality data available for these ages are known to be unreliable. There has, however, been little change in life expectancy at these older ages over the last half-century, and it seems unlikely that social factors can have had a greater effect on mortality in this age group than at ages 55 to 64 years. It is believed, therefore, that the alternative method which has been used for correcting for social factors will have over-corrected rather than under-corrected the expected mortality. That the deficiency is not due to an error of this type is, moreover, suggested by examination of the mortality among men aged 45 to 64 years. Men in this age group will have had the maximum exposure to occupational radiation, and the corresponding correcting factors for social class and occupation are believed to be reliable. The results for this age group, after exclusion of the deaths which occurred during the first five years of membership, are shown in Table V. It is clear that in this group also there is no evidence of any excess mortality from causes other than cancer among either the pre-1921 or the post-1920 radiologists.

TABLE V.—Number of Deaths from Cancer and Other Causes, Men Aged 45-64 Years: Observed and Expected, First Five Years at Risk Excluded

Group of Radiologists	Cause of Death	No. of Deaths Observed	No. of Deaths Expected from Mortality of		
			General Population	Men in Social Class I	Doctors
Pre-1921	Cancer	22	18	16	14
	Other cause	69	82	76	88
Post-1920	Cancer	13	19	17	12
	Other cause	63	67	65	70
All members	Cancer	35	37	33	26
	Other cause	132	149	141	158
All causes		167	186	174	184

Another explanation for the difference could be that the standard chosen for comparison was unsuitable. It is conceivable that, apart from the radiation to which they are exposed, radiologists may constitute a particularly sheltered group with a favourable expectation of life. It is, however, difficult to believe that any such added advantage over other doctors and other men of the same social class could be so great as to outweigh a substantial occupational hazard due to radiation.

Discussion

Experimentally it has been shown by several workers that a single sublethal dose of whole-body radiation shortens the average expectation of life of exposed animals. Experiments on rats and mice have shown that for such doses the reduction in life-expectancy is of the order of 25 to 50% per 1,000 r. Furthermore, it has been considered that the amount of shortening is proportional to the dose received. Mole (1957) has reviewed the existing experimental data on the effect of chronic irradiation on animals—that is, daily exposure, five, six, or seven days a week at dose levels permitting survival for at least six months. With doses of γ -rays, or their equivalent in fast neutrons, of 10 r per week or more there is a demonstrable and significantly reduced expectation of life. For doses of less than 10 r per week the position is equivocal, and in none of the nine reported studies at such low dose rates do the life-expectancies of the experimental groups differ significantly from the controls.

There has, however, been a tendency to draw conclusions about the possible effects of really low radiation doses from the effects observed to follow either single sublethal doses or chronic exposure at comparatively high dose rates. To effect such extrapolations Blair (1956), in particular, has developed a general mathematical theory of the effect of radiation on life expectancy, and, using this theory, Hursh (1956) has calculated that a man exposed to 0.3 r per week—the maximal permissible dose—for 20 years would suffer, in an expected life-span of 65 years, a reduction of life expectancy of two years. Jones (1957) has stated that he considers that in man a whole-body dose of 1 r will reduce the expectation of life by about five days. Failla and McClement (1957) have re-examined the theoretical background of the deductions from animal studies about the possible effects of low-dose exposure in man, and they have suggested that, so long as the exposure rate does not exceed 0.5 r per day, the reduction in life-expectancy per r of whole-body dose is likely to be one day.

There can, however, be no substitute for observations made directly on man. Warren (1956) studied the average age at death of American radiologists and claimed that the finding of a reduction of about five years in comparison with physicians not practising radiology was evidence of an ageing effect of radiation. He thought also that, as the average age at death was reduced for each of the several

causes of death studied, the effect was non-specific. The use of the average age at death as a biological indicator can, however, be justified only if the contrasted populations (1) have a similar distribution of ages at entry, (2) have a similar rate of loss from all causes other than death, and (3) are studied over the same period. In the comparison which has been made between radiologists and non-radiological physicians these conditions have not been met. Since radiology requires postgraduate study the age at entry is raised and the proportion of radiologists in the youngest medical age group is small. Since radiology is a young and growing specialty, the proportion of radiologists in the oldest age group is also small. Hence the test used by Warren—a comparison of their average ages—suggested that the groups were comparable when in fact, as Seltzer and Sartwell (1958) have shown, there is a difference in the age distribution of the groups which is sufficient to account for the whole of the reported difference in the average age at death. It must be concluded, therefore, that Warren's data are not evidence of a reduction in longevity consequent upon occupational exposure to radiation.

Dublin and Spiegelman (1948) reported that the mortality of American specialists in radiology was less than that for all physicians—that is, 90%—but slightly more than that for all specialists (which was 78% of the rate for all physicians). Only 95 deaths were, however, recorded among the radiologists, and the differences are not large enough to be significant.

The mortality data for British radiologists, published by the Registrar-General for England and Wales (1958), relate to even smaller numbers. It may be noted, however, that only eight deaths were recorded among radiologists aged 20-64 years between 1949 and 1953, when the number expected from the rate for all occupied and retired men was 12. The standardized mortality ratio of approximately 70% compares with ratios of 89% for all doctors and 98% for all men in social class I.

The most reasonable interpretation of the results of the present study is that the expectation of life of British radiologists is similar to that of other men of comparable status and has not been substantially altered by their occupational exposure to radiation. This negative finding is all the more striking when the analysis is confined to those radiologists entering the population before 1921. This group of men contains the pioneer radiologists, and an analysis of the deaths from skin cancer (see below) provides good evidence that these men suffered excessive exposure, at least to their limbs.

It may be argued on theoretical grounds that an analysis of the deaths from all causes does not necessarily provide a true indication of whether a group of men is ageing at an accelerated rate. Certainly the process of ageing and the fact of death may be dissociated, and it is possible to visualize circumstances—for example, the outbreak of a severe epidemic causing a high proportion of deaths—in which the total number of deaths would provide a very inadequate measure of the ageing process. Under modern conditions, however, and in the absence of a direct measure, it is reasonable to accept the mortality rate from all causes as a first approximation to the rate of ageing. It can be held, therefore, that the present study provides no evidence of an ageing effect in man under the circumstances of radiation exposure examined. If such an effect does exist, it is apparent that in the case of radiologists it must be very small.

The Mortality from Cancer

Results

The numbers of deaths attributed to cancers of all types and the corresponding expected numbers are shown in Table III. The total cancer mortality is close to that which would have occurred among men of similar social class (79 deaths against an estimate of between 78 and 84), but it is slightly more than would have been expected from

comparison with the cancer mortality of doctors—that is, between 61 and 71. When, however, the population is divided according to the date of joining one or other society, it is seen that there is no reason to suppose that there has been any excess among those joining after 1920; there may, however, have been an appreciable excess among those joining in the earlier years. Among this group 55 deaths were attributed to cancer, and the lowest estimate of the mortality expected among a comparable group of doctors is 35 ($P<0.01$). Exclusion of the first five years at risk makes no appreciable difference to the results (Table IV).

TABLE VI.—Numbers of Deaths from Cancer of Different Types: Observed and Expected, All Periods

Type of Primary Cancer	Pre-1921 Radiologists			Post-1920 Radiologists			All Members		
	Obs. No. of Dths.	No. Expected from		Obs. No. of Dths.	No. Expected from		Obs. No. of Dths.	No. Expected from	
		Gen. Popn.	Soc. Cl. I		Gen. Popn.	Soc. Cl. I		Gen. Popn.	Soc. Cl. I
Stomach	8	9.9	5.6	2	7.3	4.2	10	17.2	9.8
Intestines and rectum	9	10.9	11.2	5	6.7	6.9	14	17.6	18.1
Pancreas	6	1.4	1.6	1	1.3	1.6	7	2.7	3.2
Lung	5	3.2	3.0	7	9.0	7.6	12	12.2	10.6
Skin	6	1.0	0.6	1	0.4	0.2	7	1.4	0.8
Leukaemia	2	0.3	0.5	1	0.7	0.9	3	1.0	1.4
Other	19	21.0	18.4	7	12.9	13.5	26	33.9	31.9
All types	55	47.7	40.9	24	38.3	34.9	79	86.0	75.8

The numbers of deaths attributed to cancer of different primary sites are shown in Table VI, in comparison with the numbers expected from (1) the mortality of all men in England and Wales, and (2) the mortality of men in social class I. As has been stated previously, it was not possible to make separate estimates of the mortalities to be expected specifically among doctors, and the estimates of the deaths which would have occurred among men in social class I have been made with a less detailed method than that used to derive the figures in the previous Tables. The estimates for the total numbers of cancers of all sites shown in Table VI had also to be made by the same methods and the figures for total cancers are therefore slightly different from those in Table III. The numbers of cases of each type of cancer are so small that it would be possible to recognize only gross differences in mortality, and small inaccuracies in the estimates of the expected numbers are unimportant.

No appreciable difference is made to the results by omitting the experience of the first five years' membership. One cancer death (due to cancer of the stomach) occurred in this period among the pre-1921 members, and the expected number of deaths for each site is reduced by about 4%. Two deaths (due to cancer of the pancreas and to a cerebral tumour) occurred among the post-1920 group, and the expected numbers of deaths are each reduced by about 10%.

From the data in Table VI there is no reason to believe that there has been any excess of cancer of any particular type among the post-1920 population; it should, however, be noted that the one death attributed to skin cancer was due to a typical radiation cancer of the fingers. Among the pre-1921 members the number of deaths from cancer of the skin was significantly greater than the expected social class mortality ($P<0.001$), and there is also evidence of an excess of deaths from cancer of the pancreas ($P<0.01$). Only two deaths were attributed to leukaemia; the disease, however, was seldom recognized in the early part of this century, and less than one case would have been expected (expected number 0.5, $P=0.09$). For other types of cancer, considered either as a group or individually, the numbers are close to those which it is estimated would have occurred among comparable non-radiological populations.

Other data for cancer in radiologists are few. Cases of skin cancer among the early radiologists have been reported by many authors, and there can be no doubt that the incidence was increased in several countries. There are good

grounds for believing that there was also an excessive incidence of leukaemia among radiologists in the U.S.A. (Dublin and Spiegelman, 1948; March, 1950). The mortality from types of cancer other than leukaemia was also slightly raised in Dublin and Spiegelman's study (133% for radiologists and 98% for all specialists against a standard of 100% for all doctors). The number of deaths from cancer other than leukaemia was, however, very small (13), and data were not given separately for the different types of the disease. Of the eight deaths among British radiologists reported by the Registrar-General (1958), one was attributed to cancer of the lung and one to leukaemia.

That ionizing radiations are an aetiological factor in certain forms of human cancer is well established. There is no doubt that radiations can induce tumours of the skin, bone, bone marrow, thyroid, and pharynx. There is reason to believe that tumours of other sites can also be induced, although the human evidence for this is not so strong. Animal studies, however, provide evidence that radiations can induce tumours in many deeply seated organs. It is of some importance, therefore, to find no evidence of an excess of cancer at any site in the post-1920 population. This presumably reflects the adequacy of the protective measures that have been recommended, but it is too early to be certain that they are wholly adequate, since half the members of this group have been observed for less than 15 years, and induction periods of 15 to 20 years and longer have been recorded for many radiation-induced tumours.

The study of the pre-1921 population reveals that the excess of cancers can be ascribed to an increased mortality from tumours of three particular sites: the skin, the bone marrow, and the pancreas.

The excess mortality from skin cancer is in keeping with the numerous reports of the development of tumours in skin showing evidence of radiation damage. In addition to the six cases in which death was ascribed to skin cancer, there are two in which this tumour is recorded as an associated cause. Records were also obtained, during the course of the survey, of a further 15 cases of severe damage to the skin of the hands, face, and legs. Many of these will have had associated tumours, and it is reasonable to assume that even this number is not comprehensive.

The increase in the mortality from leukaemia is appreciably less than might have been expected on the basis of the data for American radiologists. This is perhaps not so surprising as might appear at first sight. There seems little doubt that in Britain protective measures were introduced at a very early stage in the development of radiology: firstly, the use of heavy protective clothing, and, secondly, the combination of lighter apparel with shielding incorporated into the x-ray apparatus. These measures, coupled with the fact that x-ray beams of low penetrability were used and that only a small number of persons were at risk in the very early days, may explain the failure to find any large excess of deaths attributed to leukaemia. It has, however, already been pointed out that leukaemia was comparatively seldom diagnosed during the early part of the century, and it is worth noting that in two cases death was ascribed to aplastic anaemia. Both individuals concerned entered the population before 1921, and the deaths occurred in 1921 and in 1941. In the first case the illness is described as being of only a few weeks' duration; in neither case has it proved possible to check the validity of the death-certificate diagnosis. From previous experience (Court Brown and Doll, 1957) it appears that many cases in people suffering considerable radiation exposure may be examples of acute aleukaemic leukaemia, and it is possible that one or both cases may fall into this category.

There remains the unexpected finding of a significantly increased mortality from cancer of the pancreas. The fact that this occurs in the heavily exposed section of the population suggests that it may be related to radiation exposure. The pancreas is, however, a deeply seated organ and would of necessity have received proportionately smaller doses than the bone marrow. It would therefore have to be

postulated that the pancreas possessed a most unusual degree of sensitivity to radiation carcinogenesis. In the absence of supporting data it would be unwise to conclude that this increased mortality is a specific radiation effect. If confirmatory data are not forthcoming it may be presumed that the present findings are due to the operation of chance.

Applicability of the Findings

It is clear that under modern working conditions—that is, the provision of and adherence to adequate protective measures—the personnel of medical radiological departments have not run any substantial risk of (1) a reduction in the expectation of life from a non-specific ageing effect, or (2) an increased mortality from the common forms of cancer. These conclusions, however, are based on the study of fewer than 1,400 men, and in a group this size a very small risk would not have been easy to detect. Much larger numbers of persons are employed in industrial plants associated with the use of radiation sources of various kinds, and there can be no doubt that these numbers will increase considerably in the ensuing decades. These men are, on the whole, exposed to more energetic sources of radiation, and in some cases to types of radiations—for example, fast neutrons—for which the relative biological efficiency for the induction of delayed radiation effects may have a value greater than that of γ rays or medium voltage x rays. It is therefore necessary to be cautious in generalizing from the present experience.

The findings do, however, suggest that, so long as care is taken to introduce and observe the recommended measures of protection, the long-term somatic risks of radiation will be very small.

Summary and Conclusions

A study has been made of the causes of death of 1,377 male British radiologists during a 60-year period from 1897 to 1957.

A comparison of the observed and expected numbers of deaths from all causes provides no evidence that occupational exposure to ionizing radiations has caused a detectable non-specific shortening of the expectation of life. This is particularly striking, since the population includes most of the pioneer British radiologists, many of whom are known to have suffered from specific effects of over-exposure—that is, radiation dermatitis and skin cancer.

A significant excess of cancer deaths was found among those men entering the practice of radiology before 1921, the year in which the first committee to advise on protection was formed. The excess was confined to tumours of the skin and pancreas and (possibly) leukaemia.

No excess mortality from cancer was found in those men entering radiology subsequent to 1920; but it is as yet too early to be sure that the cancer hazard has been eliminated.

The suggestion that this survey should be undertaken was made by the External Radiation Subcommittee of the Medical Research Council's Committee on Protection against Ionizing Radiations, and we should like to record our indebtedness to the chairman, Dr. J. F. Loutit, and the other members of the subcommittee. We would like to thank the Council of the British Institute of Radiology and the Faculty of Radiologists for permission to make use of their records, and the members of their staffs for their ready assistance. We would like also to thank the General Medical Council, the British Medical Association, and the many persons who helped us to obtain information about the individual radiologists, and particularly Mrs. Tana Lloyd, Miss Flora Callaby, and Mrs. Marie Kidd, of the staff of the Medical Research Council, who collected the greatest part of the data.

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PRELIMINARY REPORT ON MASS VACCINATION OF MAN WITH LIVE ATTENUATED POLIOMYELITIS VIRUS IN THE BELGIAN CONGO AND RUANDA-URUNDI*

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Vaccination of man by oral administration of live attenuated poliomyelitis virus has been employed in clinical trials in the United States of America (Koprowski, 1955; Koprowski *et al.*, 1952, 1956a, 1956b). Several attenuated strains representing the three types of poliovirus were investigated, and the number of persons vaccinated in each trial was kept purposely small until a strain could be found which would satisfy laboratory and clinical criteria of safety. Such strains finally became available (Koprowski, 1957), and therefore it was decided to organize a clinical trial on a larger scale than had been previously attempted.

While participating in a rabies course organized by the World Health Organization in 1955 in Muguga, Kenya, one of the authors (H. K.) had the opportunity, through

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the kindness of Dr. T. J. Wiktor, Veterinary Service, Belgian Congo, to contact one of the other authors (G. C.) and to propose a programme of experiments for the evaluation of attenuated strains of poliovirus in chimpanzees. Following the successful outcome of preliminary negotiations, a chimpanzee colony was established in Lindi (Stanleyville, Belgian Congo) and experiments were initiated after necessary permission and financial support had been obtained from the Government of the Belgian Congo.

In the course of this work, results of which will be published elsewhere (Courtois *et al.*, 1958), caretakers of the animal colony were vaccinated with attenuated virus in order to protect them against possible exposure to the virulent poliomyelitis used for challenge of vaccinated chimpanzees. The successful outcome of the programme for immunization of the caretakers prompted us to undertake clinical trials in the Belgian Congo on a much larger scale than had been attempted so far. Authorization to conduct such trials was obtained in the second half of 1957 from Dr. Charles Dricot, Physician-in-Chief, Government of Belgian Congo, to whom we express gratitude.

Material and Methods

Virus Strains.—The Chat strain of type 1 poliovirus and the Fox III strain of type 3 poliovirus were chosen for vaccination purposes (Koprowski, 1957). The large pools representing each strain were prepared in the Laboratories of the Wistar Institute, Philadelphia, Pa., and tested for lack of virulence in rhesus monkeys injected intracerebrally and intraspinaly and in chimpanzees injected intracerebrally (the latter tests were done in Lindi Camp, Belgian Congo). None of the intracerebrally injected monkeys and intraspinaly injected chimpanzees (five animals were injected with aliquots of undiluted material representing each pool) showed signs of illness, and histological examination of the central nervous system showed only one chimpanzee with mild lesions of the spinal cord suggestive of poliomyelitis infection (Fox III). Signs of polio infection were found in some of the rhesus monkeys injected intraspinaly with the undiluted material; this, however, has not deterred us from using these strains for mass vaccination purposes, as there is no strain of attenuated poliovirus available anywhere in the world completely devoid of pathogenic properties when injected intraspinaly into rhesus or cynomolgus monkeys (Sabin, 1957).

For additional testing, aliquots of each pool were injected into 20 rabbits, 14 infant mice, 5 guinea-pigs, and 12 adult mice in order to rule out the presence of other viral agents, such as B virus, lymphocytic choriomeningitis, and Coxsackie viruses. Although the material was filtered through bacteria-retaining filters, rigid tests for bacterial sterility were completed before the virus pools were used in man.

The efficiency of each virus preparation was finally checked by feeding the virus to a small group of infants and adults in the United States of America. These indi-

viduals had no antibodies against the type of virus administered, and in no instance was there a reaction of any kind. This procedure also made it possible to determine the minimum immunizing dose of the virus, which was found to be $10^{3.7}$ TCD₅₀ (tissue culture doses) for non-immune children and adults and $10^{5.0}$ TCD₅₀ for infants less than 1 month old.

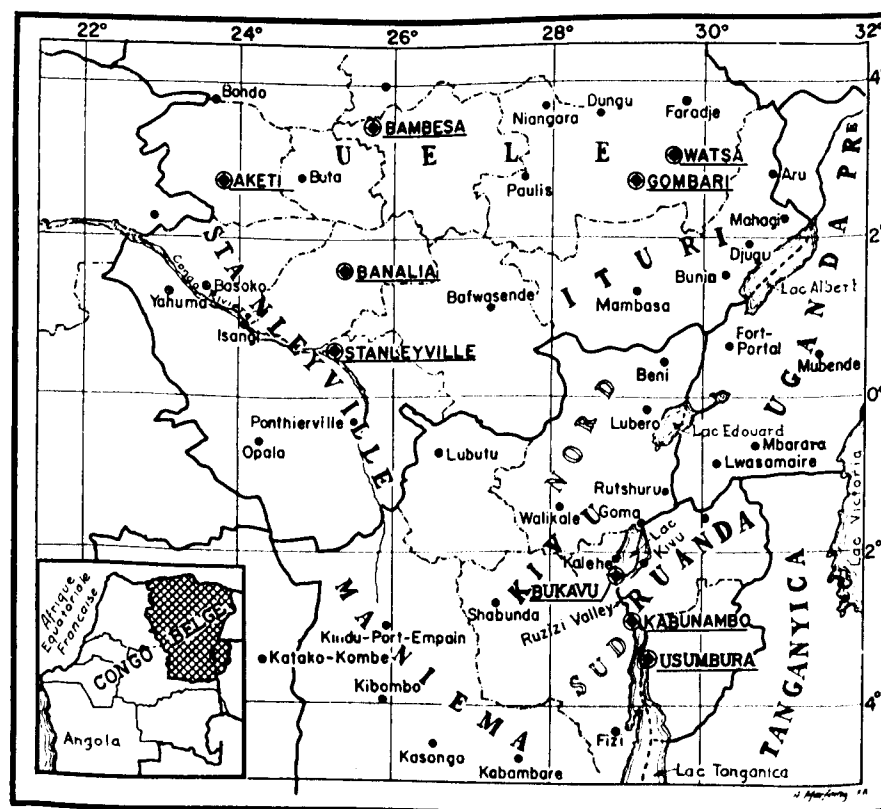
Method of Administration of Virus to Man.—The virus preparation was administered either in capsule (Koprowski *et al.*, 1956b) or in liquid form. Administration of the liquid was accomplished either by immersing an automatic pipette into a large container of virus preparation and squirting 1 ml. direct into the mouth of the recipient or by simply using a tablespoon. The approximate minimum dose fed to each individual was $10^{5.3}$ TCD₅₀ of each strain. Throughout the above period the container of virus suspension was kept at 4° C.

Determination of Neutralizing Antibodies.—In localities where prophylactic vaccination was contemplated a certain number of individuals chosen at random were bled and the presence of neutralizing antibodies against all three types of poliovirus was determined by means of the immuno-inactivation test described by Gard (1957). Immunization of the total population of the community was decided upon only if 12% or more of the sera collected were found to have no antibodies against a given type of virus.

Since type 1 virus was incriminated in most outbreaks of paralytic poliomyelitis, including those in the Belgian Congo (see below), it was decided to give priority to vaccination with attenuated type 1 virus wherever it was statistically feasible.

Vaccination of Populations in the Absence of a Poliomyelitis Epidemic

Localities where trials took place are shown on the accompanying map of the Belgian Congo, and the total number of persons vaccinated is given in Table I.



Map showing locations in the Belgian Congo and Ruanda-Urundi (Aketi, Stanleyville, Ruzizi Valley, Banalia, Gombari, Watsa, and Bambesa) where mass vaccination trials with live attenuated poliovirus were conducted. The small insert map shows the same region (cross-hatched) in relation to the surrounding geographical area.

TABLE I.—Number of Persons Vaccinated with Live Attenuated Poliovirus* in Various Communities in the Belgian Congo and Ruanda-Urundi

Town	Adults		Children Under 15 Years	Total
	Males	Females		
Stanleyville	1,651	1,005	1,572	4,228
Aketi	1,371	1,028	1,978	3,482
Gombari	3,136	4,753	4,900	12,789
Watsa	219	946	1,268	2,433
Bambesa and Kule-Ponge	62,140	62,200	91,164	215,504
Ruzizi Valley	1,267	1,343	1,572	4,182
Banalia				
Total	69,784	71,275	103,537	244,596

* Chat strain type 1 poliovirus. In addition, 2,511 persons were vaccinated with type 3 poliovirus, Fox III strain; 134 men, 130 women, and 2,247 children.

Aketi.—Here 1,978 school-children, most of them between 5 and 15 years old, were chosen for vaccination. One hundred serum specimens obtained by random bleeding of future recipients of the vaccine were examined by means of neutralization tests; 15% were found to have no antibodies against type 1 and 43% no antibodies against type 3 virus. The Chat strain virus preparation was administered in capsules to 1,978 recipients (see Table I), and those who showed no antibodies against this type were bled again two months after vaccination. During that period rigid clinical observations failed to show any signs of illness which could be attributed to the vaccine. All but two of the vaccinated children who had no antibodies to type 1 virus before vaccination developed determinable serum antibodies against type 1 poliovirus following vaccination. Six months after vaccination with type 1 virus, the Fox III strain of type 3 virus was administered to the same population. Again no signs of illness were observed, and all but two who had no antibodies to type 3 virus before vaccination developed type 3 antibodies following vaccination.

Stanleyville.—During the 12 months preceding the mass trial at Ruzizi Valley (see below) infants, children, and adults of European and native origin living in Stanleyville were vaccinated with Chat and Fox III virus strains. A large group of school-children, mostly of European origin, were vaccinated with living virus every week during that period of time. The total number was 4,228 (see Table I), and careful clinical observations failed again to reveal any detrimental effects of the vaccines.

Ruzizi Valley.—A mass vaccination trial was decided upon after preliminary testing of 84 serum specimens collected at random from inhabitants of Ruzizi Valley revealed that 12% had no neutralizing antibodies against type 1 virus and 15% had no antibodies against type 3 virus. The trial began on February 24, 1958, and was completed by April 10. The native population were informed by their chiefs about the vaccination project and assembled daily at previously fixed rally points. From 3,000 to 11,000 persons were vaccinated daily by members of one or two vaccination teams. The vaccine used was a preparation of Chat type 1 poliovirus, given orally as a liquid. Included in the trial were two missionary schools whose pupils were divided into two groups, one receiving the vaccine and the other a placebo. Medical authorities were asked to report any occurrence of illness which could be attributed to vaccination, but none was reported. For evaluation purposes 450 blood specimens were obtained at random before vaccination from individuals who were less than 15 years old. The total number of children and adults vaccinated in the Ruzizi Valley was 215,504, as indicated in Table I.

Vaccination Against Poliomyelitis in Face of an Epidemic

Banalia.—Between the end of November, 1957, and the first days of January, 1958, eight cases of paralytic poliomyelitis in native infants and children less than 5 years old were observed in Banalia. Signs of paralysis in the latest two cases were observed five days before vaccination was started. The total population of Banalia was 4,182, and the number of children less than 5 years old was 674 (Table II). Since all cases of paralytic poliomyelitis

TABLE II.—Age and Sex Distribution of Inhabitants of Banalia Vaccinated with Live Attenuated Poliovirus

Age	Males	Females	Total
<5 years	312	362	674
5-14	497	401	898
Adults (over 14 years)	1,267	1,343	2,610
Total	2,076	2,106	4,182

occurred in children less than 5 years old, the actual incidence for that age group was 1.2%.

Following the recommendation of the Expert Committee on Poliomyelitis of the World Health Organization (Report of the Expert Committee, 1957) and upon the request of the Médecin Provincial of Province Orientale, Chat type 1 virus was administered to every inhabitant of Banalia. Blood specimens were obtained before vaccination, including samples from three of the persons who had contracted paralytic poliomyelitis most recently. Sera from these three patients were examined by means of a complement-fixation test for the presence of antibodies against antigens representing each of the three types of virus. No antibodies were discovered against type 2 and type 3 viruses, but sera in dilutions 1:16, 1:16, and 1:32 were found to fix complement in the presence of type 1 antigen; the outbreak would therefore seem to have been caused by type 1 virus. Not a single case of paralytic poliomyelitis was observed in Banalia following oral vaccination with the Chat type 1 strain of virus.

Gombari, Watsa, and Bambesa.—Within three weeks of the occurrence of the last paralytic case in Banalia, outbreaks of paralytic poliomyelitis were reported in Gombari, Watsa, and Bambesa. In Gombari, a village of 3,482 inhabitants, 12 cases of paralysis were reported. In Watsa, out of 12,789 inhabitants, two cases were observed. In Bambesa seven cases were noted among 2,350 inhabitants. Live attenuated Chat type 1 virus was administered within five days of the occurrence of the last reported case of paralysis. Again, as in Banalia, every inhabitant of Gombari, Watsa, and Bambesa received the vaccine. After the fourth post-vaccination day no new cases of paralysis were observed in these localities.

Summary and Conclusions

A total of 244,596 inhabitants of the Belgian Congo and Ruanda-Urundi of both sexes and all ages were vaccinated with live attenuated Chat strain type 1 poliovirus by the oral route. Of these, 2,511 also received the Fox III strain of attenuated type 3 virus. No sickness was reported following administration of the virus.

Figures based on a preliminary survey of neutralizing antibodies in the population who were later vaccinated indicated that 12% had no antibodies against the type 1 virus which was used as vaccine. More exact data on the proportion of polio-susceptible individuals will be obtained when laboratory tests on the large number of sera collected during the actual trial are completed.

Following recommendation of the Expert Committee on Poliomyelitis of the World Health Organization, the live Chat type 1 virus was administered during four epidemic outbreaks of paralytic poliomyelitis in the Belgian Congo. After vaccination no more cases of paralysis were reported in the four localities involved in the outbreaks.

We thank all the officials who gave us permission to carry out the mass vaccinations: Dr. Dricot, Physician-in-Chief, Government of the Belgian Congo; Dr. Gillet, Chief of the Hygiene Service at Bukavu, under whose control the Belgian Government has placed the experiments; Dr. Claessens, Dr. Gillart, and Dr. Van Daele, Provincial Physicians. We especially thank Mr. Brakel, who took part in the vaccination campaign during the epidemics. We likewise thank all those who contributed directly to the vaccination programme: Dr. Meyus, Dr. Dewolf, Dr.

Progress of 53 Patients with Anorexia Nervosa in Hospital and Subsequently

Case No.	State	Age	Occupation	Highest Previous Weight		Duration of Weight Loss	Weight on Admission		Days in Hospital	Weight Gain in Hospital		Method of Review	No. of Years After Admission	Condition
				st. lb.	kg.		st. lb.	kg.		lb.	kg.			
1	S.	20	Secretary	8 8	54.4	3 yrs.	5 5	34.0	18	2	0.9	A	8	S. No improvement. Refused to be seen. Still not eating.
2	S.	21	Teacher			2½ "	5 11	36.7	28	Loss 5	2.3	Q	14	S. Well. 9 st. 4 lb. (59 kg.). Attributes recovery to hard work. T.D.W. 11 years
3	S.	22	Shop asst.	7 0	44.5	3 "	4 9	29.5	34	7	3.2	Q	11	S. Well. 7 st. 8 lb. (48.1 kg.). Improved after leaving hospital. T.D.W. 3 years
4	S.	16	Clerk	8 5	53.1	1 yr.	4 9	29.5	29	3	1.4	I	13	S. 6 st. 4 lb. (39.9 kg.). Improved, but still nervous. Regular work as technician. Untraced. 4 years later (1950) admitted to a psychiatric hospital weighing 5 st. 12 lb. (37.2 kg.). Discharged 7 st. 10 lb. (49 kg.)
5	S.	23	Telephonist	9 0	57.2	9 mths.	6 4	39.9	130	10	4.5			S. Well. 7 st. 7 lb. (47.6 kg.). Attributes recovery to her return to church life. T.D.W. 4-6 years
6	S.	20	Clerk	7 7	47.6	4 yrs.	4 0	25.4	47	11	5.0	I	20	M. Well. 6 st. 11 lb. (44 kg.). Daughter aged 16 years. Attributes recovery to "a complete reversal of mind. I must have had a lot of will-power to bring my weight down to 4 st. 8 lb." (29.0 kg.). T.D.W. 3-4 years
7	S.	22	Typist			9 mths.	4 8	29.0	24	2	0.9	Q	21	
	S.	33					4 11	30.4	34	2	0.9			
8	S.	13	Schoolgirl			18 "	4 10	29.9	39	9	4.1	I		
9	S.	15	Nil			6 "	4 6	28.1	55	Loss 7	3.2			
10	S.	23	Secretary			18 "	7 3	45.8	10	Loss 2	0.9	Q	16	Died in 1927, 2 years later, at home M. Well. 9 st. (57.2 kg.). 2 children. T.D.W. 3-4 years
11	S.	30	?			12 yrs.	6 13	44.0	48	6	2.7			Died the day after admission
12	S.	18	Typist			10 mths.	7 0	44.5	72	Loss 13	5.9			Died of pulmonary tuberculosis 2 months after discharge. Became febrile in 4th week of admission. Excluded from weight-gain analysis
13	S.	26	Clerk	9 0	57.2	7 yrs.	5 10	36.3	16	17	7.7			Traced to 9 years after admission (1945). Not improved
14	S.	19	Machinist	8 4	52.6	2 "	6 6	40.8	45 (22)	17*	7.7	I	6	M. Well. 9 st. 5 lb. (59.4 kg.). Continued to improve from last admission. Married for a year. Works regularly. Admits "I could get my own way but for that tube." T.D.W. 4 years
	S.	20					5 13	37.6	33	Loss 1	0.45			
	S.	20					5 13	37.6	21	Loss 1	0.45			
	S.	21					6 10	42.6	44 (31)	9*	4.1			
15	S.	21	Typist	10 0	63.5	3 "	6 1	38.6	21	14	6.4	I	11	S. 6 st. 6 lb. (40.8 kg.). Improved, but nervous. Works regularly
16	S.	22	?			5 mths.	7 8	48.1	12	1	0.45			Untraced. Admitted 1929. Neighbours think she died 20 years ago
17	M.	35	Housewife			6 yrs.	4 2	26.3	38	5	2.3			Died 16 years later, weighing not more than 5 st. (31.8 kg.)
18	S.	17	Typist			4 mths.	5 8	35.4	17	Loss 4	1.8	Q	16	M. Well. 11 st. 4 lb. (71.7 kg.). No children. Was sent first to a mental hospital ? schizophrenia. Subsequently developed pulmonary and renal tuberculosis
19	S.	16	"	9 8	60.8	6 "	6 1	38.6	81	47	21.3	I	17	M. Well. 10 st. 4 lb. (65.3 kg.). 2 children Recovered in hospital
20	S.	17	Clerk	9 0	57.2	4 "	6 2	39.0	128 (42)	19*	8.6	I	5	S. Well. 8 st. 12 lb. (56.2 kg.). Continued to improve after admission
21	S.	19	Librarian	11 6	72.6	3 yrs.	6 2	39.0	35	5	2.3	I	7	M. Well. 10 st. 9 lb. (67.6 kg.). Frightened by influenza bronchitis and began to eat. T.D.W. 6 years
22	S.	12	Schoolgirl	7 0	44.5	1 yr.	5 0	31.8	38	2	0.9	Q	5	S. Now well nourished. Thinks people talk about her. Under observation in mental hospital
23	S.	21	Clerk	16 0	101.6	5 yrs.	3 9	23.1	25	6	2.7			Died a year later of inanition
24	S.	21	Lab. technician	9 6	59.9	2 "	5 10	36.3	19	2	0.9			Died a few months later of inanition
25	S.	21	"	8 12	56.2	3 "	5 7	34.9	85	16	7.3	Q	9	S. Hysteria simulating diffuse lupus
26	S.	40	Nil			5 "	4 5	27.7	59	19	8.6			S. Died of inanition 17 years later without improving meanwhile
27	S.	41	Housework			4 "	4 4	27.2	76	12	5.4			Untraced. Admitted 1912
28	S.	21	Nil			2 "	5 4	33.6	36	6	2.7			M. Well. 8 st. (50.8 kg.). 3 children. T.D.W. 2-3 years
29	S.	18	Nil			7 mths.	6 5	40.4	7	1	0.45	Q	15	S. Well. 7 st. 7 lb. (47.6 kg.).
30	S.	22	Tin sorter			2 yrs.	3 8	22.7	46	12	5.4	Q	13	S. Died 4 years later. Weight 4 st. 11 lb. (30.4 kg.)
31	S.	25	Farm worker	9 7	60.3	5 "	3 9	23.1	11	2	0.9			S. Died 9 years later without improving meanwhile
32	S.	27	Nil	7 5	46.7	5 "	4 3	26.8	47	13	5.9			M. Well. 9 st. (57.2 kg.). Recently married. E.C.T. without benefit 1 year after admission. Leucotomy suggested but refused. T.D.W. 4 years
33	S.	13	"	8 0	50.8	3 mths.	6 4	39.9	26	10	4.5	Q	8	M. Well. 9 st. 2 lb. (58.1 kg.). Continued to improve after leaving hospital
34	S.	23	Housework			8 "	6 6	40.8	38	6	2.7	I	15	S. 7 st. 6 lb. (47.2 kg.). Neurotic, but works regularly as shop assistant
35	S.	19	Draper's asst.			6 "	6 3	39.5	25	13	5.9	I	18	M. Well. 9 st. 3 lb. (58.5 kg.). 2 step-children. T.D.W. 2-3 years
36	S.	22	Shop asst.			5 yrs.	6 4	39.9	18	5	2.3	I	6	S. Well. 11 st. 13 lb. (75.8 kg.). Leucotomy elsewhere 3 years after admission when weight 5 st. 13 lb. (37.6 kg.). Immediate weight gain. T.D.W. 8 years
37	S.	29	Clerk	12 0	76.2	10 "	6 13	44.0	24	10	4.5	I	5	Untraced. Admitted 1936
38	S.	36	"			14 "	5 13	37.6	70	22	10.0	I		S. 6 st. 3 lb. (39.5 kg.). Undernourished. Symptom-free. Catamenia regular. Works regularly
39	S.	20	Shop asst.			1 yr.	5 6	34.5	33	2	0.9	I	6	S. Well. 7 st. 1 lb. (44.9 kg.). Anxious and easily tired. T.D.W. 6 years
40	S.	36	Governess			5 yrs.	4 13	31.3	8			Q	24	Relatives refused to disclose information; therefore presumed not to have recovered
41	S.	22	Housework			4 mths.	5 4	33.6	48	14	6.4			Died 9 months later of pulmonary tuberculosis
42	S.	20		9 6	59.9	3 yrs.	5 7	34.9	51	11	5.0	Q	20	S. Well. 11 st. (69.9 kg.). Recovered after going to Malaya with married sister
43	S.	14	Stock-room asst.			3 mths.	6 0	38.1	23	12	5.4	I	8	S. Well. 8 st. 11 lb. (55.8 kg.). T.D.W. 1 year

* = Patients treated with intubation. T.D.W. = Total duration of weight loss. A = Almoner's visit. I = Interview. Q = Questionary. The numbers in brackets represent number of days intubated.

Progress of 53 Patients with Anorexia Nervosa in Hospital and Subsequently—(continued)

Case No.	State	Age	Occupation	Highest Previous Weight		Duration of Weight Loss	Weight on Admission		Days in Hospital	Weight Gain in Hospital		Method of Review	No. of Years After Admission	Condition
				st. lb.	kg.		st. lb.	kg.		lb.	kg.			
44	S.	24	Clerk	8 3	52.2	1 yr.	6 6	40.8	49	28	12.7	Q	10	M. Well. 8 st. (50.8 kg.). 1 child. T.D.W. 3 years
45	S.	27	Artist's model			1 "	6 7	41.3	81	9	4.1			Untraced. Admitted 1934
46	S.	19	Domestic servant	11 0	69.9	10 mths.	5 9	35.8	19	2	0.9	I	21	M. Well. 8 st. 3 lb. (52.2 kg.). 4 children. T.D.W. 4-5 years
47	S.	21	Clerk	7 10	49.0	15 "	5 3	33.1	28	4	1.8	Q	20	S. Well, but thin. Works regularly
48	S.	24					4 11	30.4	15	4	1.8			Untraced. Admitted 1897
49	S.	19	Housework	10 0	63.5	3 yrs.	5 8	35.4	50	13	5.9	Q	21	S. Well. T.D.W. 8 years
50	S.	20	Teacher	7 3	45.8	3 "	4 12	30.8	52	4	1.8	I	2	S. Well. 8 st. 10 lb. (55.3 kg.)
51	M.	25	Typist	9 2	58.1	2 "	6 10	42.6	68 (53)	18*	8.2	Q	3	M. Well. 7 st. 13 lb. (50.3 kg.). Pregnant. Continued to gain from admission. 1 child aged 2 years
			Housewife			15 mths.	5 11	36.7	39 (35)	25*	11.3			
52	S.	15	Schoolgirl	6 8	41.7	8 "	5 5	34.0	47 (7)	23*	10.4	I		S. Well. 8 st. 8 lb. (54.4 kg.). Defaults school
53	S.	31	Unemployed	11 0	69.9	3 yrs.	5 11	36.7	48 (28)	42*	19.1			Recent admission. 9 st. 12 lb. (62.6 kg.) after 4 weeks' convalescence

* = Patients treated with intubation. T.D.W. = Total duration of weight loss. A = Almoner's visit. I = Interview. Q = Questionary. The numbers in brackets represent number of days intubated.

(Case 24), admitted in 1943, was, according to her doctor, "of sufficient nuisance value for me to remember her. After leaving hospital she went downhill and died at home a few months later. She simply died of inanition, and there was no question of secondary infection."

One patient (Case 26), admitted in 1938, was still alive in 1953. Then her doctor wrote, "She is at present grossly emaciated, with severe chilblains of both hands and feet." She herself replied that she was fairly well, but that she dreaded the winters because of her chilblains. On January 28, 1954, she was admitted to hospital, having been found unconscious on the floor by her sister. She died within eight hours, and at necropsy death was attributed to myocardial degeneration. No other abnormality was found apart from extreme wasting of all tissues.

One patient (Case 30), who was intubated during her admission in 1953, died four years later. Her weight gradually fell to 4 st. 11 lb. (30.4 kg.) three weeks before she died, and she was finally admitted to hospital elsewhere in coma, with a blood-sugar level of 34 mg. per 100 ml. There had been at least two previous episodes of hypoglycaemic coma. Necropsy was not performed.

Follow-up of Surviving Patients

Of the 49 patients admitted up to 1953, 32 remain, and 15 of them have attended for interview and examination. Eleven others, mostly living out of London, have replied to questionnaires, and further information about them has been obtained when possible from their doctors. The relatives of one patient (Case 40) wished not to disclose her subsequent progress; one (Case 1) refused to be seen by an almoner who visited her home. Of the remaining four (Cases 22, 25, 32, and 42) adequate information has been obtained from their relatives and doctors and from other hospitals.

Twenty-three patients have recovered completely, the period of follow-up ranging from 3 to 21 years, with an average of 13 years. All are well nourished, happy, and fully employed; 12 have married and 6 of these have borne children. One patient (Case 36) was cured by leucotomy, performed elsewhere.

Six other patients reviewed 5 to 13 years after admission (average nine years) have improved. Thus five are at regular work, but are still underweight, with neurotic symptoms. These are unlikely to improve further, whereas one (Case 22), still only 17 years of age, has recently regained her normal weight, and may eventually also recover her normal mental outlook.

Three patients, on the other hand, have not improved. One (Case 1) is still poorly nourished and confined indoors, another (Case 25) is a gross hysteric, and another (Case 40), presumed from the attitude taken by her relatives not to have recovered, may have died.

Summary of Progress.—Thus out of a series of 53 patients with anorexia nervosa 10 have died, 3 have not improved, 6 have improved, and 23 have recovered. Seven are unaccounted for. The four admitted since 1953 have not as yet relapsed. These are among the seven treated with intubation; two others admitted earlier who were intubated are in the recovered group, and one who was not kept under surveillance has died.

Comment

The outcome in this as in most other reported series was largely unaffected by hospital treatment. Those patients who recovered did so of their own volition and in the fullness of time, mostly after their environment had deliberately or accidentally been changed. Only a few when questioned in retrospect could give a precise reason for recovery, and in these it was often as whimsical as the circumstance which had first precipitated the illness.

Thus one patient had been grossly underweight for six years until she developed bronchitis. It then occurred to her that if she did not eat she would die, whereupon her appetite returned and she recovered. Another, in the beginning, had tried repeatedly to diet, but had been defeated by hunger. At the age of 18 years she lost her appetite during an attack of influenza; she then succeeded in suppressing it further until her weight fell from 11 st. to 5 st. 9 lb. (69.9 to 35.8 kg.), and it remained at this level despite hospital treatment followed by four months at a convalescent home. Her eventual recovery she attributes to leaving home for domestic service; and now, at the age of 39, she frankly admits that the whole illness "was due to my own silliness in trying to starve myself."

It should not be inferred, however, that anorexia nervosa is best left to its own devices, for the mortality rate alone demands a most vigorous approach to treatment. Of the 53 patients under review, 10 died, and, although this is the highest death rate so far recorded, it has also been substantial in many other published series. The lowest weight recorded in the present series, 3 st. 8 lb. (22.7 kg.), was in a patient who recovered completely. Even so, the most emaciated patients are in greatest immediate danger, especially if their deterioration has been rapid (Emanuel, 1957).

Treatment by Psychiatric Methods

Psychiatrists almost without exception consider psychotherapy the appropriate treatment. Thus Du Bois (1949) claimed, "It is the neurosis and not the appetite that must be the prime focus of attack by the physician. Therefore psychotherapy is the major remedial agent. Little reference should be made to diet, and the family and nursing personnel are instructed to avoid talking about food or the patient's dietary habits. During the early weeks of treat-

ment psychotherapy consists of reassurance and explanation . . . and at the end of approximately three weeks it proceeds gradually to a deeper level." Yet of his 10 patients none was cured. Five remained thin and unhappy, two defaulted, and three were still under treatment. Similarly in Nemiah's (1950) series, although one patient gained 10 lb. (4.5 kg.) while in hospital, and another 20 lb. (9 kg.), there was no response from the remaining 12. Rahman *et al.* (1939) were forced to conclude, after treating 12 patients in this way, that much time and patience was required, and that the under-cover hostility met with made it difficult or impossible to establish a satisfactory therapeutic rapport.

Waller *et al.* (1940) have claimed a specific psychopathology for the illness, based on fantasies of oral impregnation which both their patients had experienced. Yet even psychiatrists are now sceptical of Waller's Freudian hypotheses (Kay, 1953), and are discouraged by the results of treatment based upon them. Kay and Leigh (1954) believe that psychotherapy is not the treatment of choice unless (1) there is no urgency, (2) a good relationship can be quickly established, and (3) the patient is able to formulate a complaint which could be used as a basis for therapy.

Whereas recent views on treatment have largely ignored its "somatic" aspect, it cannot be overemphasized that the danger to life is entirely from malnutrition or its consequences, and that the patient who succumbs does so only from starvation. But in endeavouring to reclaim anorexia nervosa it must first be established why it has strayed from the realm of somatic medicine to the borderlands of psychiatry (Cobb, 1943). The discouraging results of treatment based on general medical principles is one of the more obvious causes of its defection. Yet probably the most important is its tendency sometimes to simulate the psychoses, particularly schizophrenia, thus suggesting to physicians that it is a disease outside their competence to treat.

Neurotic symptoms and depression are common (Kay, 1953) and easy to understand. They may, in fact, be the direct outcome of inanition (Schiele and Brozek, 1948). Peculiarities of behaviour or "the perverse conceits and strange notions" described by Gee (1907), on the other hand, are more disconcerting. "One of these girls," he observed, "when she was alone in the drawing-room, was overheard to tell her parrot that she was not much longer for this world. Lost in her museful moping, she takes delight in nothing and loves to be alone, though solitude does her more harm. . . . Sometimes she will think that exercise is very necessary and will take long walks far beyond her strength, or she will try the ecoprotic powers of leaping and dancing in her bedroom before daybreak until the awakened household protest against the continuance of such preposterous therapeutics." Despite this and similar instances, Kay and Leigh (1954) have reassuringly concluded that schizophrenia and anorexia nervosa are in no way allied. Furthermore, none of the patients in the present series has developed schizophrenia or any other psychosis requiring prolonged institutional care.

Hurst's Method of Treatment

The best results of treatment have been claimed by Ryle (1936), Ross (1936), and Hurst (1939), based on almost identical principles. These principles were most clearly enunciated by Hurst, who said that with explanation, firmness, and good temper the most resistant patient could be persuaded to consume a full meal, her progress thereafter being uninterrupted. Hurst, however, gave no details of the results he obtained, and Ryle, while stating that in the majority of well-handled cases recovery is complete, did not deal specifically with the immediate outcome. Many of his cases were in fact mild. Thus in 11 of his 46 female patients, who did not have amenorrhoea, the criteria for diagnosis were not fulfilled; and having traced 37 patients, 17 of the 21 who had recovered had not required institutional treatment. All 19 of Ross's patients, on the other

hand, increased weight by at least 14 lb. (6.4 kg.) during admission.

But the ineffectiveness of Hurst's method in the hands of others and the difficulties entailed have never been adequately stressed. It was doubtless employed in many of the patients in the present series with results which were almost wholly discouraging.

Treatment with Intubation

All seven patients who were intubated gained weight, an average of 22 lb. (10 kg.) per patient, and their condition on discharge from hospital was good. Forty-four patients, on the other hand, not treated in this way gained an average of only 9 lb. (4.1 kg.) per patient, only seven gaining more than 14 lb. (6.4 kg.). Berkman *et al.* (1947) cautioned against intubation on the premise that the aggressive treatment of patients who are extremely emaciated might prove disastrous, and it has been used only inconsistently and in extreme cases by others (Rahman *et al.*, 1939; McCullagh and Tupper, 1940; Farquharson, 1941).

The method, however, has obvious advantages. Because little active co-operation is sought the initial resistance is never as great as to normal feeding, and at this stage the more enfeebled the patient the easier it is in any case to overcome (Lasègue, 1873). Furthermore, the protracted ordeal of each meal is avoided, and because calorie intake can readily be made to exceed requirements the rate of recovery is always maximal. The patient should still be encouraged to eat at meal-times despite the postprandial discomfort and superadded anorexia of prolonged starvation (Fenwick, 1880; Carlson, 1916). Meanwhile as weight inevitably increases so may depression and other nervous symptoms disappear (Schiele and Brozek, 1948; Keys *et al.*, 1950).

One patient in the present series, who was successfully intubated, died four years later, thus emphasizing the need for close liaison with the family doctor and all others concerned in the patient's care. In this way intubation may have to be employed repeatedly on patients who will eventually recover, but meanwhile the more recalcitrant are saved from dying of inanition.

Treatment with Leucotomy

A few patients resist medical treatment in any form. They constitute Ryle's (1936) psychotic group with inadequate personalities, but who at first are indistinguishable from their fellows. Anorexia in these, if they survive, persists indefinitely, and their treatment presents the greatest problem. In some the response to leucotomy has been excellent (Sargent, 1951; Sifneos, 1952; Mallinson, 1953; Sands, 1953), although Carmody and Vibber (1952) stressed that it should be considered only in refractory cases and in those who are frankly psychotic or of the obsessive compulsive group. Two patients in the present series recovered spontaneously after having been refractory for 8 and 11 years, and the selection of cases needing leucotomy is therefore still difficult.

Summary

The progress of 53 patients with anorexia nervosa has been studied, during and after their stay in a general hospital.

In-patient treatment was ineffective except in those who were intubated. Follow-up shows that 10 patients have died, 8 of them solely of malnutrition, others of the same severity recovering spontaneously after a varying number of years. Twenty-three patients have recovered completely.

The importance of the nutritional aspect of treatment should be stressed, and, whereas leucotomy may rarely be required, specialized psychotherapy is not indicated.

I am grateful to the physicians of the London Hospital for permission to study and publish their cases, and I am particularly

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TWO CASES OF COW'S-MILK ALLERGY

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Acute allergic reactions to cow's milk in infancy are uncommon enough to justify a description of two cases that presented problems in diagnosis and management. In particular, the occurrence of ascites in one case deserves mention as a sign not previously reported.

Case 1

The patient, a female infant, was delivered by caesarean section after a 38-weeks' pregnancy. She was the first child of healthy parents and there was no family history of allergy. The neonatal period was uneventful. She was fully breast-fed until 3 weeks of age, when she was given a bottle feed of dried milk ("ostermilk No. 2"). Immediately after this feed she vomited, and the next day developed diarrhoea with much mucus but no blood in the stools. Rapid deterioration with fever, intense irritability, and further vomiting led to her admission to the Children's Hospital, Birmingham, on July 26, 1956, within 48 hours of the first feed of cow's milk.

On admission she was shocked with peripheral cyanosis, a fever of 103° F. (39.4° C.), pulse rate of 160, and respiration rate of 50. Her cry suggested pain. The abdomen was distended and tympanitic, but no other signs were found.

Investigations.—Cerebrospinal fluid, normal. X-ray examination (Dr. R. Astley) of chest, normal; of abdomen: "The small and large intestines are fairly full of gas, with

a few small fluid levels. In addition there is some diffuse opacity, and the abdominal distension is not entirely due to intestinal gas. Consistent with peritonitis." Paracentesis abdominis: clear straw-coloured fluid obtained without difficulty; microscopy showed some red cells, a few endothelial cells, and lymphocytes; no organisms were seen or cultured. Blood count: haemoglobin, 100% (14.8 g. per 100 ml.); W.B.C., 6,600 per c.mm. (metamyelocytes 1%, myelocytes 3%, polymorphonuclears 35%, eosinophils 1%, lymphocytes 54%, monocytes 6%). Urine, normal. Blood urea, 19 mg. per 100 ml. Stool: many fat globules, no pathogens isolated. Blood culture: *Staphylococcus albus* (contaminant).

Before paracentesis a diagnosis of primary peritonitis had seemed likely, but the nature of the ascitic fluid ruled this out. In the absence of a diagnosis the patient, who presented the picture of an overwhelming infection with intense toxæmia, was treated with oxygen, subcutaneous fluids, penicillin, and streptomycin. Her condition improved quickly and within a few hours of admission she tolerated oral feeds of 5% dextrose in 0.18% saline. The following day the fever had settled and she had gained 11 oz. (340 g.), but was still passing loose green motions with much mucus. The improvement continued and on the second day after admission quarter-strength feeds of dried milk (half-cream national dried milk) were started. Within a few hours she became ill once more; bile-stained vomits and frequent watery stools led to a weight loss of 6 oz. (170 g.). The pyrexia recurred, the abdominal distension increased, and a fine erythema appeared on the trunk and face. At this point the diagnosis of cow's milk allergy was first suggested. Consequently streptomycin and penicillin were discontinued and the feed was changed to expressed breast milk. The resulting improvement was dramatic; the fever settled, vomiting ceased, the motions became normal, abdominal distension subsided, and she started to gain weight.

Tests were undertaken to confirm the diagnosis of cow's milk allergy and, if possible, find a substitute for cow's milk: (1) *Scratch tests* on Infant*: breast milk, negative; half-cream national dried milk, positive; evaporated milk, positive; goat's milk, positive; "soyolk" (soya-bean milk), negative; "nutramigen" (a synthetic food in which amino-acids and simple peptides have been obtained by enzymic hydrolysis of casein), negative; "allergilac" (dried milk from which most of the lactalbumin has been removed and acid added), negative. (2) *Passive transfer test* (Prausnitz-Küstner reaction)*: Serum taken from the infant was injected intradermally into the mother's forearm; 24 hours later a drop of milk to be tested was placed on the skin areas thus treated and a scratch made through each drop. Control tests were carried out in untreated areas on the opposite forearm:

	"Treated" Areas	Control Areas
Breast milk	Negative	Negative
Half-cream national dried	Positive	"
Evaporated milk	"	"
Soyolk	"	"

These tests confirmed the diagnosis of cow's milk allergy, but, as will be seen, were of no help in choosing a substitute.

During the next three weeks she was fed on expressed breast milk and gained over a pound (450 g.) in weight; the stools remained normal and she did not vomit. Four weeks after admission she was given a 6-oz. (170-ml.) feed of breast milk containing approximately 0.5 g. of soyolk powder. Within an hour of the feed she vomited copiously. The following day a similar feed had the same effect. The next day she tolerated a feed containing nutramigen in the

* "Positive" signifies appearance within 10 minutes of a weal and surrounding area of erythema greater than 2 cm. in diameter. "Negative" signifies absence of weal and little or no erythema. (Separation of test results into these two categories presented no difficulty.)

same dilution; during the ensuing five days the amount of nutramigen was gradually increased, but when the concentration reached eight times the original one vomiting recurred. On returning to pure breast-milk feeds vomiting ceased. Our third, and successful, choice was allergilac, which was added to breast milk at first in a dilution of 1 fl. dr. (3.5 ml.) of full-strength milk to 6 oz. (170 ml.) of breast milk; during the next nine days the amount of allergilac was increased up to full strength. She made uneventful progress and was discharged at the age of 10 weeks in excellent condition, but with a small patch of eczema on the forehead.

When she was four months old one drop of boiled cow's milk was added to each allergilac feed without ill effect, and thereafter the quantity was slowly increased, until two months later she was on full-strength cow's milk. No vomiting occurred during this period. Solids were then introduced, and she tolerated a normal toddler's diet, including cereals, eggs, meat, fish, etc. At 6 months the scratch test with cow's milk was negative and the passive transfer test gave only a slightly positive reaction.

Further progress has been uneventful, though the small patch of eczema on the forehead persisted to the age of 7 months.

Case 2

The patient, the fourth child in the family, was born normally at term. Birth weight, 8 lb. (3,630 g.). During the pregnancy, which had been complicated by excessive vomiting, the mother took between 1 and 2 pints (570 and 1,140 ml.) of milk daily. The three siblings were healthy, but the mother had always had eczema of the hands, and a paternal uncle suffered from asthma.

During the first few days of life two complementary feeds of cow's milk were given. A rash with "blisters" appeared on the buttocks at this time and took some weeks to fade. From the end of the first week until the age of 4½ months she was entirely breast-fed and thrived. Introduction of cow's milk was then tried, but each attempt led to pronounced resistance, the baby spitting out the milk vigorously; "blisters" appeared wherever milk touched the skin, and an erythematous rash occurred on face, neck, and trunk. Boiled cow's milk, three different popular dried milks and allergilac produced the same result whether given by bottle, cup, or spoon. Though there was no vomiting, she lost weight during out-patient observation. At the age of 6 months the mother's milk was failing and the infant had to be admitted to hospital to find a substitute for breast milk or, if the search proved unsuccessful, to desensitize her to cow's milk.

On admission she was contented and not obviously wasted, though her weight was only 12 lb. 8 oz. (5,585 g.). The following sensitivity tests were carried out: (1) *Scratch Tests on infant*: Breast milk, negative; cow's milk, positive; half-cream national dried milk, positive; full-cream national dried milk, positive; allergilac, positive; goat's milk, positive; soyolk, negative. (2) *Prausnitz-Küstner reaction* (intradermal injection of patient's serum into her father's forearm and scratch testing 24 hours later): No reaction to half-cream national dried milk, full-cream national dried milk, unmodified cow's milk, allergilac, soyolk, breast milk.

Soyolk therefore seemed suitable for trial. For three days this feed was given with no ill effect, although her resistance to feeding by bottle, cup, or spoon was such that it had to be given by intragastric tube. Then vomiting started and, far from being relieved by chlorpromazine, was apparently aggravated by it. Consequently, after a short period of dextrose feeding, a slow intragastric drip of breast milk was started, and vomiting ceased. At this point a barium-meal x-ray examination showed no anatomical abnormality of the oesophagus, stomach, or duodenum, but the stomach emptied slowly.

Three weeks after admission we tried goat's milk, despite the positive skin test, as an adequate supply of breast milk

could not be guaranteed. A feed of 1 fl. oz. (28 ml.) of goat's milk and 5½ fl. oz. (156 ml.) of expressed breast milk was given, but was immediately vomited. For the next 10 days her feed consisted of breast milk alone, with two notable exceptions: one feed contained a small amount of soyolk and the other consisted of a full-strength dried milk feed given in error. These two feeds were the only ones to cause vomiting. As all these feeds were given by intragastric tube, it seems unlikely that a different taste or smell was responsible for the vomiting.

A desensitization course of cow's milk was started at the end of the fifth hospital week, when she was 7½ months old. A feed containing one drop of cow's milk in 8 oz. (230 ml.) of breast milk was given without incident, but when on the following day two drops were added to the feed she vomited. On this, as on the five subsequent occasions when an increase led to vomiting, no further increase was made for two or three days. After five weeks she was tolerating full-strength cow's milk.

When, during the period of desensitization, occasional feeds were offered by bottle or spoon she still refused them; and after desensitization it took five weeks of patient persistence on the part of the nursing staff before she accepted feeds from cup or spoon. Chlorpromazine was given for part of the time and seemed to help. Mixed feeding was then introduced without difficulty.

At 10 months she was discharged home, where good progress continued. Her mother had no difficulty in feeding her with solids, but at 16 months she still resented milk if it was not disguised.

Incidence

In British paediatric practice cow's-milk allergy is regarded as uncommon and in many of our standard textbooks is not mentioned, but Sheldon (1951) and Holzel (1955) give full descriptions. In other countries estimates of its incidence vary widely. Vest (1953) discovered only nine cases among 1,500 infants seen in a 25-year period (incidence 0.06%), and Collins-Williams (1956) found an incidence of only 0.3% in 3,000 infants and children. On the other hand, De Toni and Mitolo (1955), basing their opinion on the finding of positive intracutaneous skin tests in 14% of 132 healthy infants, regard cow's milk allergy as a very common condition during the first months of life, and stress its importance in the causation of many allergic conditions. Similarly, Clein (1951) found the high incidence of 1 in 15 infants (6.7%), but he attributes to cow's milk allergy such common symptoms as colic, "always chesty and snuffly," or "very unhappy all the time."

Loveless (1950) obtained information from a poll of specialists in allergy and paediatrics and estimated the incidence to be 1.5%. In our experience the condition is rare. One of us (O. H. W.) has seen approximately 2,000 infants and children during the period in which these two cases came under our care. All would agree that severe anaphylactoid reactions, such as were described by Cumming (1928) and Ashby (1929), are rare. In 1955 Collins-Williams reported another such case and stated that it was the 30th case of acute allergic shock due to milk in the English literature. In the milder reactions the diagnosis must often remain in doubt, at least to the sceptical observer.

Symptoms and Signs

Onset of Symptoms.—Symptoms may occur, as in our first case, immediately after the first feed of cow's milk. Vest (1953) suggested that placental transfer of antigen may then be responsible for sensitization. Collins-Williams (1955) stressed that a high milk intake during the pregnancy may be dangerous, but Clein (1951) could find no connexion between maternal milk intake during the pregnancy and subsequent development of allergy in the infant. More commonly the first symptoms occur one to five weeks after starting cow's milk or when cow's milk is reintroduced after a period of breast-milk feeding. Symptoms usually appear during the first four months except when introduc-

tion of cow's milk has been delayed until the second six months, as it was in Cumming's (1928) and Ashby's (1929) cases.

Typical symptoms are acute shock with peripheral failure, wheezing, vomiting, diarrhoea, abdominal distension, fever, and the appearance of a rash where milk touches the skin. Ashby (1929) and Rubin (1940) described the presence of blood in the stools. Some writers attribute many common symptoms in infancy to milk allergy; but we, in agreement with Bachman and Dees (1957), regard as unconvincing the evidence for milk allergy being a cause of such conditions as colic, a constant runny nose, a cough, or persistent crying. Warren (1957) described a case which presented with marasmus. Ascites, a prominent feature in our first case, has to our knowledge not been previously reported and led to much diagnostic difficulty; another unusual feature was the high fever, so that the picture at first suggested a severe infection rather than allergy. The symptoms and signs in our second case were more typical; spikes of fever again accompanied reactions.

Diagnosis

The diagnosis is usually made on clinical grounds and without inquiry into the diet is apt to be missed. Sometimes, as in our first case, the diagnosis is not made until the second attempt at introducing cow's milk has led to relapse. The diagnosis is confirmed by the rapid improvement that occurs when cow's milk is replaced by breast milk and the recurrence of symptoms when cow's milk is reintroduced. We agree with Vest (1953) that further tests are often unnecessary and at times their results are difficult to interpret.

Direct Skin Test.—Most writers (Hill, 1939; Loveless, 1950; Miller, 1950; Rosenblum and Rosenblum, 1952; Collins-Williams, 1955; Tudor, 1956; Bachman and Dees, 1957) find this test of little value; positive results are not conclusive, and negative results do not rule out the diagnosis. If the test is of limited value in diagnosis, it gives even less help in choosing a substitute for cow's milk. Despite negative skin tests, both our patients were unable to tolerate soyolk, and Case 1 reacted similarly to nutramigen.

Passive Transfer Test (Prausnitz-Küstner Reaction).—This test is useful and when positive is proof of allergy (Miller, 1950), but a negative reaction does not rule out the diagnosis. Positive reactions may be commoner in patients with acute allergy. Thus in our first case the reaction was positive, while in our second case, with less severe manifestations, it was negative.

Eosinophils in Stools.—Rosenblum and Rosenblum (1952) and Bigler (1955) stressed the value of this test, but Bachman and Dees (1957) found it disappointing.

Progress

Death from milk allergy undoubtedly occurs (Holzel, 1955), and possibly is not quite as rare as a search of the literature would suggest. The clinical picture in our first case made us realize how easily we might have arrived at a mistaken diagnosis of "overwhelming infection with intense toxæmia," and if the infant had died not even the necropsy examination would have given the correct diagnosis.

In the survivors the condition is commonly self-limited and cow's milk is tolerated during the second six months of the first year (Clein, 1951; Rosenblum and Rosenblum, 1952; Vest, 1953), but according to Clein 15% of cases remain sensitive to cow's milk. As both our cases were given desensitization courses we cannot comment on this point.

Sequelae.—Eczema and other allergic manifestations were regarded as common by Rubin (1940), but as uncommon by Vest (1953) and Collins-Williams (1955). Except for a small patch of eczema in our first case we noted no such manifestations, not even when during the later

months of infancy food substances other than milk were introduced into the diet. Cumming (1928) mentioned that in his case of extreme hypersensitivity, weaning was very troublesome; in our second case we had the greatest difficulty in persuading the infant to take feeds from the bottle and for long periods had to resort to feeding by oesophageal tube. Even some time after desensitization an intense distaste for cow's milk persisted and presented a real problem in management.

Treatment

Immediate treatment consists of withdrawal of cow's milk and, in cases of acute reactions, treatment for shock. Breast milk is the feed of choice, but if it is not immediately available a clear fluid mixture—for example, 5% sugar in one-fifth normal saline—can be used to tide the infant over the immediate emergency. A breast-milk bank provides an invaluable service for these infants, but as they may remain intolerant of cow's milk for several months it is unwise to rely entirely on this service; therefore the search for a substitute should start as soon as possible. In this search, which may be difficult and at times, as in our second case, fruitless, one has little to guide one but trial and error.

1. *Evaporated Milk.*—Ratner and Gruehl (1935) and Collins-Williams (1955) suggested that evaporated milk is somewhat less allergenic than boiled, dried, pasteurized, or unmodified cow's milk, but Collins-Williams's (1955) case of allergic shock occurred after evaporated milk.

2. *Goat's Milk.*—According to the literature on severe cow's milk allergy, goat's milk is a valuable substitute (Hill, 1939). However, our patients gave strongly positive skin reactions with goat's milk and, more significant, the second patient vomited immediately after the first trial feed.

3. *Soya-bean Milk.*—Most writers have had good results with this preparation (Clein, 1951; Rosenblum and Rosenblum, 1952; Vest, 1953; Ratner *et al.*, 1955; Collins-Williams, 1956; Tudor, 1956); but cases of sensitivity to it are on record (Vest, 1953), and our two cases were sensitive.

4. *Nutramigen.*—Unlike Rosenblum and Rosenblum (1952) we found nutramigen of no value in the patient on whom it was tried.

5. *Allergilac* is prepared specially for use in infantile eczema; we have not seen a mention of its use in severe cow's milk allergy, and were surprised to find it so successful in our first case.

6. *Other Substitutes.*—Vest (1953) suggested the flour of various nuts or 10% oatmeal porridge and wheat germs, and Holzel (1955) described a pudding made with "farex" and eggs.

Desensitization.—Vest (1953) stated that cow's milk is best avoided until cure has occurred—that is, until the infant can tolerate cow's milk without desensitization. Collins-Williams (1955) described a case in which desensitization was not started until the age of 7½ months, and even at 2½ years only four teaspoonfuls of cow's milk could be given in a day. When, as in our second case, the infant has to be reared on expressed breast milk, desensitization is urgent, as supplies of breast milk are not inexhaustible. Even when a substitute has been found, it would still seem preferable to start desensitization early, because the nutritional adequacy of the substitute food will often be in doubt (Fries, 1957) and because weaning on to solid foods will be easier if the patient can already tolerate cow's milk. We suggest that desensitization is started when the infant has fully recovered from the acute allergic illness and is making a satisfactory gain in weight. In the first case this was three months after admission, at the age of 4 months, and in the second case five weeks after admission, at the age of 7½ months.

Summary

Two cases of severe cow's-milk allergy are described. In one patient, in addition to the severe collapse produced by the first feed of cow's milk, ascites was a

presenting feature and caused diagnostic difficulty. In the second patient gastro-intestinal symptoms and urticaria after feeding with cow's milk were followed by refusal of milk which persisted for some weeks after desensitization.

Diagnosis of cow's-milk allergy is mainly clinical. The passive transfer test is a useful aid, but the direct skin test is of little value. Treatment consists in withdrawal of cow's milk and substitution of a suitable alternative, the choice of which is a matter of trial and error. Alternatively, desensitization to the milk is carried out.

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DIABETIC COMA IN INFANCY*

BY

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During infancy diabetes mellitus presents as an acute metabolic disturbance.

Both Gaisford and Lightwood (1954) and Paterson (1956) state that diabetes is very rarely seen under the age of 1 year, but Schwartzman *et al.* (1947) collected details of 57 cases in this age group, and Keidan (1955), reviewing the literature, added 22 cases, six of these being transient in the first month of life.

Since that time sporadic cases only have been reported, but details of the following two cases are presented "to augment the knowledge of this group" (Schwartzman *et al.*, 1947). As guidance on the management of diabetic coma in small babies is difficult to obtain, certain aspects of treatment have been discussed. These comments are based on experience in these two cases, on a further two cases in patients under the age of 2 years (not reported here), and on the available literature. Recent experience in the treatment of problems in adult diabetic coma has been utilized and adapted.

Case 1

A full-term female baby born on October 30, 1954 (Birth weight 2.6 kg.), progressed normally until she was first admitted to hospital on July 10, 1955, with irritability, cough, loose bowel motions, and temperature suggesting an infection of the upper respiratory tract. Various investigations were carried out with negative results, and the temperature slowly settled on penicillin therapy. At this time the urine showed a trace of reducing substance on

one occasion, but not on four other occasions. The C.S.F. sugar was 80 mg./100 ml. She was discharged home five weeks later with a diagnosis of recurrent bronchitis.

She was readmitted on October 18, at the age of 11½ months, with a cough and rapid respiration and dehydration, the diagnosis being pneumonia. By next morning drowsiness had increased and a diagnosis of probable diabetic acidosis was made. Blood sugar was 400 mg./100 ml. and serum electrolytes showed a severe primary metabolic acidosis with pH 7.18; CO₂ tension, 22 mm. Hg; blood buffer base, 26 mEq/l.; bicarbonate 7.8 mEq/l.; sodium, 146 mEq/l.; potassium, 3.6 mEq/l.; chlorides, 120 mEq/l. Serum keto-acids were 180 mg./100 ml. Her weight was 18 lb. (8.1 kg.).

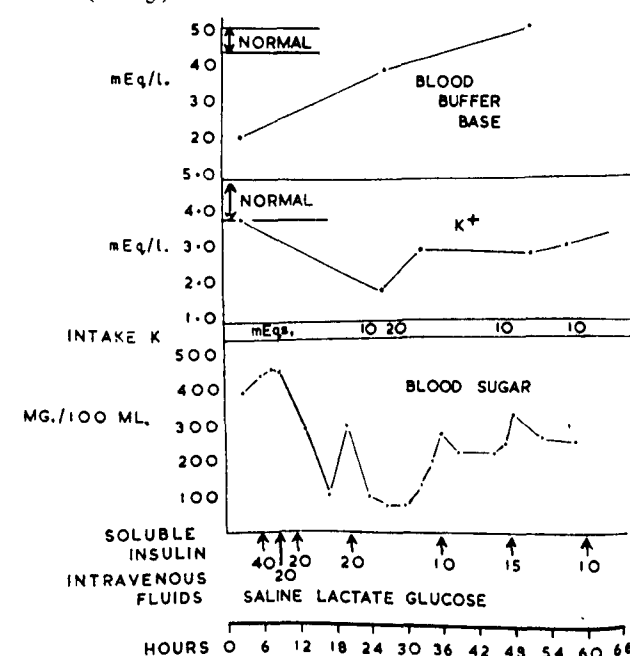


FIG. 1.—Details of treatment, showing blood-sugar levels, serum potassium levels, and improvement in acidosis in Case 1.

Soluble insulin was started at 1 p.m., and Fig. 1 shows that an initial insulin dosage of 80 units was required before some control of the blood sugar was obtained. The blood buffer base rose steadily with the correction of the acidosis and with 150 ml. of 1/6 molar sodium lactate solution given intravenously.

The initially rather low potassium fell to 1.7 mEq/l. within 24 hours of starting treatment. During this period calcium gluconate was given intravenously on two occasions for fits of a decerebrate nature with relief of twitchings. On these two occasions the blood sugar was 350 mg. and 110 mg. respectively. (The low serum potassium may have played some part in her slow recovery from drowsiness, but the irritability may have been related to the relative increase in alkalinity.) After the first 24 hours soluble insulin was given according to urine tests three times daily, the total daily dosage being 20–30 units.

Insulin zinc suspension was begun on the fourth day, when solid foods were again taken. The dosage was steadily increased, and she was finally discharged after a respiratory infection on 20 units of I.Z.S. and a 1,200 calorie diet. Before discharge the chest x-ray picture was clear and the ocular fundi were reported normal by the ophthalmologist.

Over the next year she was on a diet averaging 1,200 calories (distributed as protein 40 g., carbohydrate 160 g., and fat 40 g.) and gained 11 lb. (5 kg.), to weigh 29 lb. (13.2 kg.) and measure 34 in. (86 cm.). The height and weight are at the upper limit of normal for her age.

The insulin dosage for this age and weight was 16 units of I.Z.S., and the blood sugars two and a half and two hours after meals were 95 and 105 mg./100 ml.

Case 2

A female baby born on December 25, 1954—birth weight 8 lb. 6 oz. (3.8 kg.)—was quite well until the morning of her admission to hospital on December 10, 1955, when she was noticed to be drowsy and "off-colour," with sunken eyes. She became increasingly breathless during the day and was admitted to hospital at 6.30 p.m. with a diagnosis of pneumonia.

On admission she was a dehydrated semiconscious infant with cold extremities, rapid grunting respirations, and a few moist sounds in the left chest; respirations 64 a minute, and pulse 170 a minute. A tentative diagnosis of diabetic coma with respiratory infection was made and an intravenous drip inserted. Blood-sugar results were 1,000 and 950 mg./100 ml., and the serum electrolytes were as follows: blood pH 7.08; CO₂ tension, 19.5 mm. Hg; blood buffer base 24 mEq/l.; plasma bicarbonate, 5.6 mEq/l., which was in keeping with the marked respiratory compensation. Her plasma sodium was 140 mEq/l.; potassium, 4.6 mEq/l.; chlorides, 102 mEq/l.; proteins, 8.7 g./100 ml.; P.C.V., 43%; serum keto-acids, 100 mg./100 ml.

Soluble insulin, 10 units intravenously and 20 units intramuscularly, was given at 8 p.m., and two and a half hours later a further 50 units was given intramuscularly, when there was no fall in the blood sugar. By 4 a.m., with a falling blood sugar (700 mg.), only a further 20 units of insulin was given, and this total of 100 units was sufficient to keep the blood sugar below 200 mg. for the next 30 hours.

Fluids in the first 24 hours for this 20-lb. (9.1-kg.) baby are shown in Table I. At 18 hours these fluids had resulted in a hyponatraemia of 157 mEq/l., and the drip was discontinued at 20 hours, when adequate fluids were being taken by mouth.

TABLE I.—Fluids Given During First 24 Hours of Diabetic Coma

Case	Weight	Fluids
Case 1	8.1 kg.	255 ml. per kg. body weight
Case 2	9.1 kg.	229 " " " " "
Case not reported	10.2 kg.	250 " " " " "

Details of Fluids in Case 2 during First 24 Hours		
Type of Solution	Route	Vol. in ml.
1/6 molar sodium lactate	Intravenous	150
Isotonic saline	"	160
5% glucose solution	"	400
5% glucose with 1/5 N saline	"	250
1/2 normal saline	Subcutaneous	220
Glucose solutions	Oral	420
Total all routes		1,600

For the next week soluble insulin was given six hourly, according to urine tests, and on the eighth day I.Z.S. and a 1,100-calorie diet were started. This dosage was later reduced to 16 units, but the baby was kept in hospital for a further three months on account of a throat infection, an attack of rubella, and also home circumstances, but was finally discharged on March 22, 1956 on 30 units of I.Z.S. daily and a fairly free diet of about 1,250 calories. Capillary blood sugars morning and evening on this gave figures of 200–250 and 85–150 mg./100 ml.

At home this dosage has gradually been reduced over the past year to 24 units of I.Z.S. daily. At 22 months her weight was 28 lb. (12.9 kg.) and blood sugar 105 mg./100 ml. two and a half hours after dinner.

Discussion

Mortality.—Between 1925 and 1946 the mortality averaged 45–50% for collected cases of diabetes in infants under the age of 1 year, but in more recent series reported by Brodribb *et al.* (1952) and by Keidan (1955) the mortality is nearer 25%.

Presentation.—These two cases and our other young diabetics illustrate a point stressed in the literature—namely, that an erroneous diagnosis of respiratory infection or meningitis is often made. Where there is a relative hypo-

kalaemia with a low blood pH depression of the respiratory centre may result and the typical Kussmaul respiration may be reduced or absent. This finding has recently been reported in a number of adults by Murray (1958), and infants are particularly liable to develop a severe metabolic disturbance. The admission diagnoses in the 12 most recently reported cases of diabetes mellitus under 1 year of age were pneumonia in 4, meningitis in 4, dehydration and infection in 1, "shock" in 1, and diabetes in 1. Newcomb (1951) reported that symptoms pointing to the respiratory system (tachypnoea and fever) were present in all of their six cases in diabetic coma, and signs in the chest were found on auscultation in four of his cases.

The diagnosis may easily be missed, and diabetic acidosis should be considered in any baby with respiratory signs and symptoms and dehydration who does not improve on treatment.

Age of Onset (Table II).—Keidan (1955) has commented on the age distribution at the beginning and end of the first year of life. This may be due to selection of cases, because

TABLE II.—Age Distribution of 79 Reported Cases of Diabetic Coma Under the Age of 1 Year

0–3 Months	4–6 Months	7–9 Months	10–12 Months
29	12	10	28

of greater interest in the neonatal group or because of inclusion in the first three months of all the cases of transient diabetes.

Sex Incidence.—Of the 80-odd reported cases male babies predominate 2:1.

Influence of Heredity.—In Schwartzman's series of 57 cases and Keidan's additional collected 22 cases a positive family history of diabetes mellitus was given in 43% of cases. A history on both sides of the family may be helpful in diagnosis, but in New Zealand and Australia it is often difficult to obtain relevant data about grandparents. Fig. 2 shows the family history in Case 2, with the birth weights where known. The mothers of both these infants had a flattened type of curve on glucose-tolerance testing, suggesting an increased tolerance for glucose, but the significance of this finding is not clear.

FIG. 2.—Family history of Case 2, with birth weights where known.

The mothers of both these infants had a flattened type of curve on glucose-tolerance testing, suggesting an increased tolerance for glucose, but the significance of this finding is not clear.

Management of Coma

Both in these cases and in the older children adequate biochemical control during the first 24 hours is essential. For some time it has been the practice in this hospital for blood to be withdrawn in the casualty or admitting department in all cases of diabetic coma, and also in cases of acidosis in babies.

Correction of Acidosis.—In those cases with a severe keto-naemia the pH, even with adequate respiratory compensation, may fall below 7.2. It appears likely from the work of Kety *et al.* (1948), and also from work on anaesthetic cases by Murray (1958), that depression of medullary centres takes place with low pH figures. Murray has reported three cases in severe diabetic acidosis with absence of Kussmaul respiration because of respiratory centre depression at low pH figures. It has been our practice to use 1/6 molar sodium lactate solution or bicarbonate solution as the initial intravenous fluid whenever severe acidosis is present. Lactate

*Based on papers read before the Annual Meeting of the New Zealand Paediatric Association in 1956 and 1957.

solution offers some advantage over sodium bicarbonate solution in being more stable and also in providing a glucogenic effect (60 ml. of 1/6 molar sodium lactate per kg. body weight possesses a glucose potential of 0.9 g./kg.). Hartmann and Erganian (1947) recommend 30 ml. of sodium lactate per kg. body weight initially, but in these two cases the average figure was 20 ml./kg. In two other patients between the ages of 1 and 2 years about 15 ml./kg. body weight has been used in the initial 12-hour period. Hartmann and Erganian have also shown that, in comparison with the use of isotonic saline and insulin, sodium lactate solutions will produce a more rapid improvement and so lessen the danger to the cerebral cells of an unduly prolonged low serum pH.

Insulin Requirements.—Reports on the dosage of insulin given to infants in diabetic coma vary from the successfully treated patient of Gans (1954)—5½ lb. (2.5 kg.)—who was given 250 units of insulin in the first 24 hours, to that of Hartmann and Erganian, who recommended 1½ units/lb. (3.3 units/kg.) body weight initially to be repeated in six hours as necessary. Nelson (1954) recommends an initial dosage of 20–30 units at the age of 1 year, and thereafter about half the amount in one to two hours. The insulin dosage used in babies in diabetic coma with severe acidosis is shown in Table III. Thus on body weight an initial

TABLE III.—Insulin Dosage in First 24 Hours. Babies in Diabetic Coma

Diabetic Coma			
100 units	8.1 kg.	Case 1	11 months
100 "	9.1 "	" 2	11 "
175 "	10.2 "	"	19 "
110 "	16.0 "	"	29 "

dosage of about 3 units/kg. (or 1½ units/lb.) is advisable, with an additional dosage of 2 units/kg. (or 1 unit/lb.) where the plasma keto-acid level is over 150 mg./100 ml. (Dumm and Shipley, 1946). A gradation of this dosage should be repeated in three to four hours, when the report on further blood-sugar and keto-acid estimations come to hand. There seems to be no advantage in the common practice of hourly injection of insulin. Better control is achieved when insulin is given on the results of these four-hourly blood-sugar and keto-acid estimations.

Hypoglycaemia.—There are many references to hypoglycaemia occurring towards the end of the first 24 hours in the treatment of diabetic coma. We have noticed repeatedly that soluble insulin may have a duration of action up to 36 hours where ketonaemia persists. Even with intra-

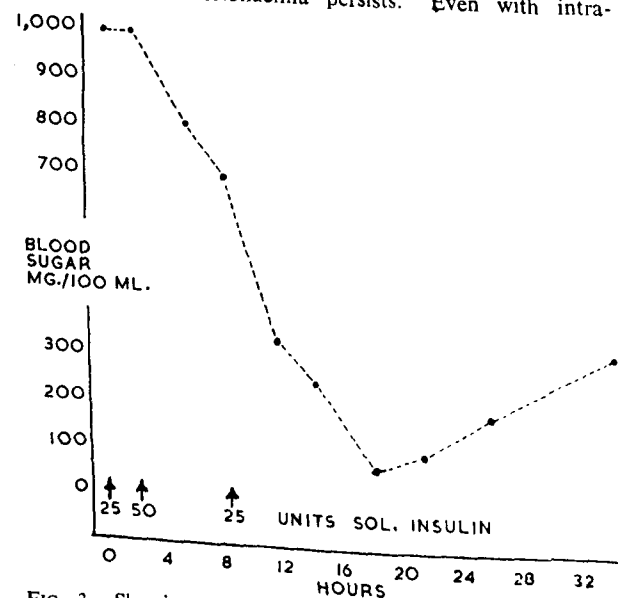


FIG. 3.—Showing prolonged action of insulin as observed in Case 2.

muscular instead of subcutaneous injections its action may still last for 24 hours. Fig. 3 shows the prolonged action of insulin in Case 2. Heberden and Friedlander (1955) have mentioned the use of cortisone, sedation, and hypothermia in the treatment of prolonged hypoglycaemic attacks unresponsive to intravenous glucose solutions. They also re-emphasize the cerebral damage which can occur with hypoglycaemic attacks in infants.

Fluids.—The intravenous fluid given initially will largely depend upon the degree of acidosis and the plasma sodium level. The use of 1/6 molar sodium lactate solutions has already been discussed in those cases where severe and dangerous acidosis is present. In one of our recent cases (10.2 kg., 19 months) hypernatraemia was present before treatment, and Case 2 became hypernatraemic during minimal sodium therapy. We believe that this hypernatraemia which occasionally occurs is due to loss of a greater amount of water than sodium and may prejudice the chances of survival in patients in severe diabetic coma. Murray and Beaven (1958) have reported 16 cases of hypernatraemia occurring in diabetic coma, and we suggest that this produces a very severe intracellular dehydration on account of the extreme plasma osmolarity. Where hypernatraemia exists only glucose-containing solutions should be given in the first few hours or until the serum sodium falls. Where initial serum sodium levels are not low, caution is necessary with sodium-containing solutions. The amount of fluid administered in the first 24 hours in three of our cases is shown in Table I, but we are guided by clinical signs of dehydration and serial estimations of packed cell volume, total N.P.N., and plasma proteins. In the treatment of one of these infants and in bigger babies we have used 1/5 or 1/2 normal saline solution with hyalase subcutaneously where the taking of oral fluids has been slow after removal of the intravenous infusion. Plasma can be used as in adults on a body-weight basis where shock does not improve with the correction of the acidosis.

Hypokalaemia.—An initially low serum potassium or an abrupt fall at the four-hour electrolyte estimation should give warning of impending hypokalaemia. In Case 1 intravenous potassium was not given early enough, and fits of a decerebrate nature occurred when the potassium level was 1.7 mEq/l. Low serum potassium levels are particularly dangerous in association with persisting acidosis, as it may further aggravate the depression of the cerebral cells.

Stabilization.—On recovery from coma, stabilization is achieved by means of a fixed calorie diet with soluble insulin given three times daily and I.Z.S. started some time in the first week. At home we have encouraged the parents to try to maintain a low-fat diet which must of necessity be fairly free in other respects. The daily insulin dosage is adjusted according to the previous day's tests.

Follow-up.—One year after discharge both babies were fully re-examined and their diet was adjusted. At the same time several capillary blood-sugar levels were taken to estimate the degree of control. With the onset of diabetes in infancy or early childhood the ultimate prognosis will depend upon a number of factors, not least of which is the intelligence of the parents and how far they are prepared to co-operate with the enthusiasm of their family doctor. Arterial changes and eye complications may develop within a shorter period than in adults, but Wilson *et al.* (1951) present evidence to suggest that good control of urine sugar may possibly delay the onset of arterial complications.

Conclusion and Summary

Two cases of diabetic coma under the age of 1 year are reported.

The comparative rarity of reported cases in this age group is noted and it is suggested that cases may masquerade as meningitis or pneumonia.

The history of familial incidence may be over 40% where accurate information is available.

Some aspects of the management of diabetic coma in small babies have been discussed. These include: the value of 1/6 molar sodium lactate solution; some suggestions on insulin dosage; frequency of hypoglycaemia due to prolonged insulin action; hypernatraemia; and hypokalaemia.

The importance of parental intelligence and co-operation in subsequent management is stressed.

I thank Dr. J. F. Landreth, senior paediatrician to the Christchurch Hospital, for permission to report these cases and for his help and encouragement; and Mr. J. T. Murray, biochemist, for his enthusiasm for electrolyte estimations at all hours and for first drawing my attention to some of the problems of acidosis and of hypernatraemia in diabetic coma.

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AETIOLOGY AND TREATMENT OF CONGENITAL DEAF-MUTISM

BY

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During an investigation into the problem of congenital abnormalities of the head it was noted that occasionally a child showing obvious maldevelopment of the first visceral arch was also deaf-mute, although the external ear and auditory meatus were normal. Attention was thereby drawn to the possibility of a close connexion between deaf-mutism and abnormal development of the first arch.

The cases described below show little or no obvious evidence of first-arch defect, and the above premise suggested the clinical experiment of determining whether their deaf-mutism was associated with middle-ear (first arch) defect.

Case 1

A boy aged 11 was suspected at the age of 2 years of having middle-ear deafness, "possibly from infection in the first few months of life." When he was first examined it was reported that he did hear—cochleo-palpebral reflex was present but weak. The surgeon had the impression when using tuning-forks that it was a conduction deafness, but was not at all certain. Although six months later (aged 2½) the child showed signs, with pure-tone bone-conduction audiometry, of a severe upper-tone loss in both ears, a tentative diagnosis of air-conduction deafness associated with mental deficiency was made.

At 3½ years co-operation was said to be non-existent during clinical examination; a muscular tic reported a year previously was more pronounced. No final diagnosis was reached, and special schooling was recommended. No other member of the family suffered from deafness or congenital

abnormality, and x-ray examination of the skull was normal. Fig. 1 shows the result of audiometry examination (May, 1957); deafness is shown to be profound, but the marked discrepancy between air-conduction and bone-conduction hearing indicates that at the lower frequencies the deafness is essentially of middle-ear origin, although the upper-tone loss suggests inner-ear deafness.

Case 2

A girl aged 9½ was found most difficult to examine at the age of 2, when the cochleo-palpebral reflex was elicited on very slight stimulus. At 5 years of age the only finding of note was a single islet of hearing at 1,024 cycles revealed by pure-tone audiometry. She was a pleasant, but very shy, timid, little girl, and of her relatives only an aunt of her mother's was reported to have been born deaf; no further information was available. The patient was consigned to a school for the deaf without further attempts to arrive at the cause or nature of the deafness. At school she was given and wore an air-conduction hearing-aid as a routine, but it was not regarded as being of much help to her. The skull was normal on x-ray examination. Audiometry (Fig. 2) revealed a deafness strikingly similar to that of Case 1.

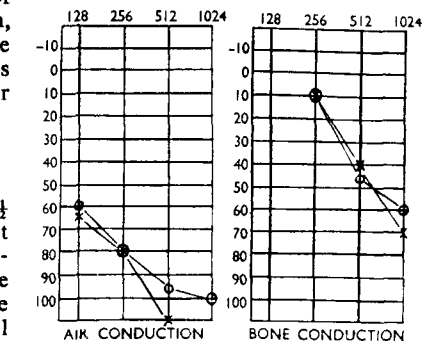


FIG. 1.—Case 1. O = Right. X = Left.

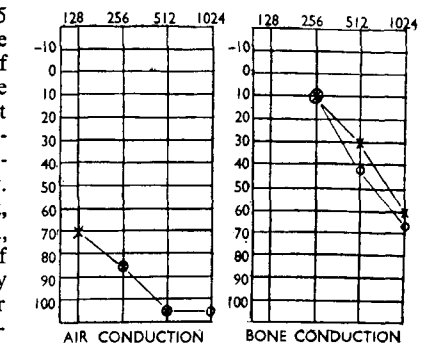


FIG. 2.—Case 2.

Cases 3, 4, and 5

Three children aged 12, 9, and 9, respectively (the latter two being twins) were all members of one family suffering from a congenital deafness, which must be hereditary. The mother was born deaf, but the trait could not be traced further back on her side of the family. The father was one of five deaf-mute sons in a family of nine; one of his affected brothers died in a mental hospital, where another was still an inmate; the others and the father of the three patients were normal apart from the deafness. X-ray

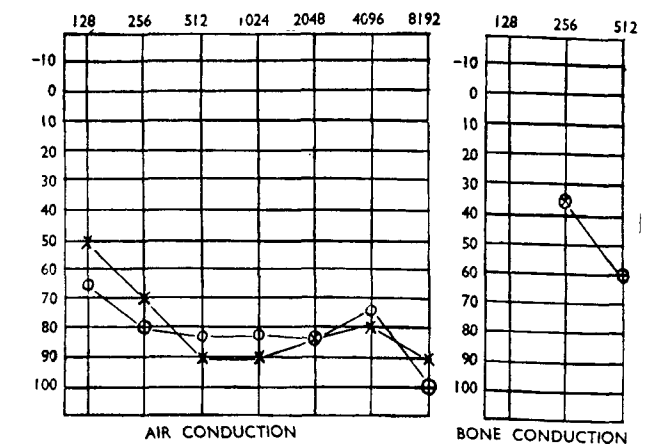


FIG. 3.—Case 3.

examination of the skull was normal in all three cases. Audiometry examination (Figs. 3, 4, and 5) was very similar in each case to those of Cases 1 and 2. There had been no previous otological or audiometry examination of these children, and all have been wearing air-conduction hearing-aids at the school for the deaf.

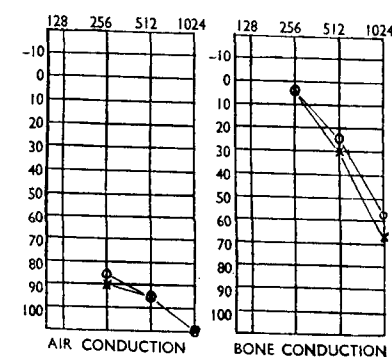


FIG. 4.—Case 4.

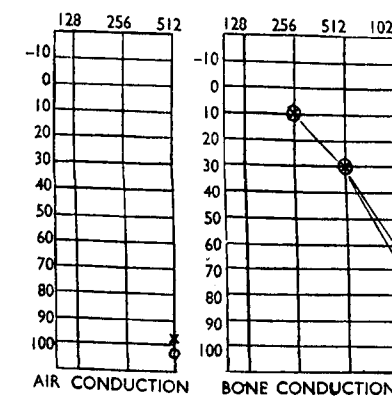


FIG. 5.—Case 5.

Careful attention was given to the possibility of the child confusing hearing with vibration during bone conduction testing, and in each case we were satisfied that the patient was able to differentiate them clearly.

Discussion

No one has ever suggested that congenital deaf-mutism may be of middle-ear origin; in fact, the condition is generally regarded as an affliction of the internal ear. Wilson (1955) deals very briefly with congenital abnormalities of the internal

ear, merely saying, "This subject is inextricably mixed up with deaf-mutism, to the chapter on which the reader is referred"; in that chapter he mentions only once the involvement of the middle ear in cases of congenital deaf-mutism—namely, as an incidental finding when the cause is syphilis, and that, he says, is infrequent.

Recently there has been an awareness that few children are completely deaf. The majority of those recognized as deaf-mutes are classified as "profoundly deaf," and schools, unfortunately with different principles of teaching, have been established for these children. Speech-training at first meant finger-spelling, but very soon attempts to teach them to speak were begun. Lip-reading was encouraged, but efforts have more recently been directed towards making the children hear as much as possible in their training. All children attending these schools use hearing-aids, either individual or group models of the air-conducting type.

The results of this investigation are surprising and unexpected. Testing by air conduction showed profound deafness, while by bone conduction there was remarkably good hearing at the lower frequencies, with no response whatsoever to the higher. There is undoubtedly a marked internal-ear or perceptive deafness, but the picture is dominated by the degree of air-conduction deafness, a feature so far unsuspected by clinician or teacher.

The full significance of this discovery is, first, that congenital deaf-mutism is not due entirely to an internal-ear or perceptive deafness, and, second, that if these children are to be expected to hear as much as possible then bone-conduction hearing-aids should be used. One great objection to this type of aid is the size and weight of the batteries supplied for the instrument, but there appear to be no technical difficulties in producing more suitable batteries. The third point also concerns the treatment. From bone-conduction audiometry it is obvious that there is an appreciable cochlear defect—almost normal hearing at the lower tones

"tailing off" to give no response at the upper tones; the loss is neither irregular nor patchy. The difference between air- and bone-conduction readings points to gross middle-ear involvement and shows that it is the more serious, although, clinically, the middle ears of such patients had been regarded as normal.

The problem being one of deciding which is the primary defect, three reasons are offered for regarding the middle ear as being initially at fault. (1) Two congenitally deaf-mute children, unfortunately too young to co-operate in the examination, showed obvious deformities of the first visceral arch, and this arch contributes to the formation of the middle-ear structures. (2) The middle-ear deafness was greater in all those examined, and it is unlikely that a less degree of perceptive deafness could cause a major degree of conduction deafness. (3) While the cochlea and middle ear are closely associated functionally, the structural association between the cochlea and vestibular apparatus is even greater; yet in children with congenital deaf-mutism it is unknown to find lack of balance due to coincident involvement of the vestibular apparatus (except in cases of syphilitic infection). If the defect were primarily labyrinthine and secondarily middle ear, then surely signs of involvement of the vestibular part would be found in at least some of the cases, especially those who are absolutely deaf.

No morphological evidence of a defect of the middle ear in these cases is available; x-ray examination with various projections has been of no assistance in identifying the presence or absence of the ossicles, far less their normality, but the difficulties of radiodiagnosis in this region are well recognized (Hodgson, 1951).

Whether the congenital abnormality of the middle ear is minimal or gross, its effect is clearly that of interrupting the transmission of vibrations to the internal ear. A developmental defect such as this, arising in the early weeks of intra-uterine life, must have an effect on the associated parts of the hearing mechanism, and it may be best expressed as a loss of stimulation to further development of the inner ear. Whether this loss takes effect during the remainder of intra-uterine life, thereby leading to structural maldevelopment, or whether the effect occurs in the equally obscure and unknown period of the development of hearing—namely, in the first few months of life—is a matter for conjecture, but it is much more likely to be after birth, when the initial abnormal changes will be functional rather than structural. Thus the pathological processes are in the nature of a disuse atrophy of the cochlea. Accordingly, not only must the training of the deaf-mute comprise the use of a bone-conducting aid, but it must also start as early as possible, at a stage when it may still be possible to retrieve leeway lost in the first few months of life.

Even if all cases of deaf-mutism do not arise from primary defects of the middle ear, the disadvantage of fitting each child with an elaborate hearing-aid and awaiting the result of audiometry examination at the age of 7 or 8 is far outweighed by the advantages which are sure to accrue from the earliest stimulation of what hearing exists. By this means it is likely that little, if any, perceptive hearing loss (except perhaps in the highest tones) will be present by the time the child is old enough to be examined properly; and in the meantime it is likely that speech will have advanced to nearly normal standards.

The interrelationship of a wide field of congenital abnormalities of the head and neck will be described in a subsequent publication, but the findings in regard to congenital deaf-mutism were considered important enough to warrant this preliminary report and a discussion on its aetiology.

Summary

The results of audiometric examination in five deaf-mute children are presented. In each case the degree of hearing by bone conduction is much greater than that by air conduction, an indication that the primary defect is

the result of congenital maldevelopment of the middle ear and not of the inner ear, as is generally supposed. In order to stimulate and improve the residual hearing in these children treatment should therefore begin at the earliest possible age with the use of a bone-conducting hearing-aid.

I am greatly indebted to Professor R. D. Lockhart for his encouragement and advice during this investigation, to Mr. I. S. D. Thomson for allowing me access to his notes on Cases 1 and 2, and to Miss J. C. Macrae for carrying out all the audiometry examinations.

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HYDATID COMPLEMENT-FIXATION TEST: INFLUENCE OF INTERMEDIATE HOST PROTEIN ON SPECIFICITY OF SHEEP HYDATID FLUID ANTIGEN

BY

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Kellaway and Fairley (1932) considered the hydatid complement-fixation test to be specific, and we (Bensted and Atkinson, 1953), reporting on the examination with standardized reagents of a small series of cases, fully supported this opinion. Since that time a further series of over 300 cases of suspected hydatid disease have been examined serologically by the same technique, and out of 70 cases, subsequently proved to be hydatid disease, significant complement-fixing antibody was demonstrated in the serum of 61 of the patients concerned. There were 240 patients in whom further investigation showed that their condition was due to some disease other than hydatid. Sera from all but one of these patients gave negative results in the hydatid complement-fixation test. It is this false-positive result—the first in our experience—that initiated the investigations recorded in this communication. The explanation proved to be simple, and once the facts were known the results of the investigations were in full accord with what was expected. Nevertheless some interesting observations were made which seemed worthy of record as they had not, so far as is known, previously been published.

During radiological examination the patient in question had been found to have a suspicious shadow in the lung, and blood serum had been forwarded for the C.F.T. to exclude hydatid disease. The Casoni test had been reported as negative, but the C.F.T. with the standardized sheep hydatid fluid antigen was positive to a titre of 1 in 16. Further clinical investigations, however, revealed that the patient had a carcinoma of the lung. The disease ended fatally in a short time and no evidence of a hydatid cyst was found.

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It was at first thought that the complement fixation might have been due to the development of some non-specific reacting substance associated with the rapidly growing neoplasm, but our records showed that 12 similar cases of carcinoma of the lung had been examined serologically for the presence of hydatid complement-fixing antibody and in all the test had been completely negative. Further inquiries, however, revealed that the patient had recently returned to this country from the Middle East, where, a few weeks before sailing, he had been bitten by a rabid dog and had been given a "full course" of a sheep-brain anti-rabies vaccine.

Some time after this incident, and additional to the series referred to above, a similar case came to light. In this case, however, the anti-rabies vaccine had been given some years previously. Two Casoni tests gave atypical delayed reactions, and the C.F.T. performed after a short interval showed partial fixation at a titre of 1 in 2 only. The case subsequently proved to be carcinoma of the lung.

Without the history of the previous case these results would doubtless have been disregarded, but now the possibility of sheep-protein sensitization from the sheep-brain anti-rabies vaccine and the boosting effect of the intradermal injections of the sheep hydatid fluid (for the Casoni tests) seemed to warrant further investigation.

Although there was little doubt that individuals recently immunized with sheep-brain anti-rabies vaccine would have some sheep-protein antibodies in their sera it would be necessary to check this. There was considerable delay before we were able to obtain material for such tests, and in the meantime we decided to try to obtain the required evidence from animal experiments.

Experimental

Rabbits

Rabbits are not suitable for immunization experiments with sheep-tissue vaccines. Friedemann (1917) had shown that rabbits possess a natural haemolysin for sheep's red blood cells, and by the use of suitable antigens it was found that other sheep antibodies, such as complement-fixing antibodies for sheep protein, could be demonstrated in the sera of a high proportion of normal rabbits. The presence of this natural complement-fixing antibody in the serum of normal rabbits suggested that further examination of this point might yield information of interest.

Hiles (1926) had noted that the sera of normal rabbits gave positive complement fixation with sheep hydatid fluid and assumed that the reaction was due to some anti-hydatid substance in the sera. We confirmed Hiles's observations, but when we tested a representative number of sera against ovine and bovine hydatid fluids† and a suspension of normal sheep's brain in parallel, we found that practically all the sera showed some degree of fixation of complement with the sheep-brain antigen, but that only those sera with a relatively high anti-sheep titre gave fixation with an ovine hydatid fluid. Reactions with the bovine hydatid fluid were only occasionally seen. When complement fixation occurred with the sheep hydatid fluid the titre was significantly lower than that against the sheep-brain antigen; the occasional reactions with the bovine fluid were incomplete. Rabbit sera did not react with pure hydatid antigen, and absorption of a serum, giving fixation with both sheep-brain and sheep hydatid antigens, with massive doses of washed scolices from a fresh hydatid cyst failed to reduce the complement-fixation titre to either antigen. The titre of a serum containing true hydatid antibody was reduced to nearly zero in a parallel absorption test.

†Diluted in accordance with assay requirements.

It seemed clear, therefore, that the reactions observed by Hiles were due to the natural sheep antibody in the rabbits' sera fixing complement with the sheep protein in the ovine hydatid fluid and not to hydatid antibody. The reactions we obtained with the bovine fluid were not unexpected, since Schiff (1937) showed that there was a partial antigenic relationship between ovine and bovine tissue extracts. The explanation for the difference in the complement-fixation titres obtained with the two types of sheep antigens is discussed below.

Guinea-pigs

Natural sheep antibodies are not found in the sera of guinea-pigs, and our previous experience in the preparation of the standard hydatid antibody suggested that the animals would be suitable for immunization with a normal sheep-tissue vaccine. After pre-inoculation test-bleeds, two guinea-pigs were given weekly intraperitoneal injections of a 5% saline suspension of fresh sheep brain which had previously been well washed to remove as much blood as possible.

The antibody response was not so good as had been expected, and the final serum pool had a homologous titre of little more than 1 in 8, but the fixation was good and the end-point clear-cut. The serum, however, showed no complement fixation with sheep hydatid fluid. It would appear that the concentration of sheep protein in this fluid, as diluted for the hydatid C.F.T. by the standard method, was too low to detect the relatively low-titre sheep antibody. (We have found that when the titre of natural sheep antibody in rabbit sera had a level of 1 in 32 or more we obtained fixation with the hydatid fluid in a serum dilution of about 1 in 8.)

In order to test the possibility of multiple Casoni tests influencing antibody production in immune animals the following experiment was done. One month after bleeding the immunized guinea-pigs, when their sheep antibody level was beginning to fall, they were given spaced doses of 0.1 ml. of sheep hydatid fluid intradermally. There were no tissue reactions to the injections, but the anti-sheep titre increased by a full step to 1 in 16. This level was apparently still too low, because no reaction was obtained with the hydatid antigen. It was not feasible, unfortunately, to continue this experiment.

Human Volunteers

"Anti-rabies treatment" with the Semple type of vaccine involves a long course of daily injections of a phenolized suspension of infected sheep brain, and it seemed reasonable to expect a long-lasting "basal immunity" to sheep protein in individuals who had received this form of treatment. One of us (H.J.B.) and four colleagues, all of whom had received one or more courses of the Semple vaccine many years previously, were given intradermal injections of sheep hydatid fluid in doses of 0.1 ml. at intervals of 7-10 days to ascertain (1) if previous exposure to sheep protein influenced the response in the local reaction to the intradermal injections, and (2) whether these injections gave rise to sheep antibody response, as in the case of the guinea-pigs. The results of this experiment are summarized in Table I.

It will be noted that three of the five subjects developed significant complement-fixing antibody to sheep protein as a result of the intradermal injections of the sheep hydatid fluid.

The result of the final C.F.T. in subject P. with the hydatid antigen is of very doubtful significance. The test was twice repeated, and on each occasion there was merely delayed haemolysis in the lowest dilution (1 in 2); higher dilutions were completely negative. Further investigations of H.J.B.'s serum were made, and these are reported below.

With the exception of H.J.B. the only one showing any local reaction to the injections was W., in whom the first injection was followed by a delayed mild erythema while the second produced a slightly more severe reaction of the same type, but both were trivial in nature and quickly

TABLE I.—Effect of Multiple Casoni Tests with Sheep Fluid on the Complement-fixation Reaction in Individuals Previously Sensitized Against Sheep Protein

Volunteer and Date of Last Anti-rabies Injection	Reaction to Casoni Test	Time of Test Bleeds Related to Casoni Tests	Complement-fixation Reaction	
			Hydatid Antigen	Sheep-protein Antigen
W. (1927)	± +	Before After 1st dose " 2nd "	Negative " "	Negative ±(2) ++(4)
L. (1938)	Negative "	Before After 1st dose " 2nd "	" " "	Negative " "
F. (1938)	Negative "	Before After 1st dose " 2nd "	" " "	" " "
P. (1939)	Negative "	Before After 1st dose " 2nd "	" " "	+(2) ++(4)
H.J.B.* (1939)	Negative ++ +++	Before After 1st dose " 2nd " " 3rd "	Not done " " ++(16)	Not done " " ++(16)

Figures in parentheses—reciprocals of complement-fixation antibody titres. Controls: Individuals not previously sensitized with sheep vaccine gave completely negative results after two weekly intradermal injections of sheep hydatid fluid.

*H.J.B. was not test-bled before he received his first intradermal injection, but the fact that his sheep protein and hydatid antibody levels both fell gradually to zero within the following 12 months indicated that, prior to the experiment, his serum also did not contain detectable antibodies to either antigen. The results have therefore been incorporated in a single table.

faded. H.J.B., on the other hand, was quite severely affected. He had a strong familial and personal history of allergic manifestations, but the reactions to the intradermal injections were much greater than had been anticipated. The first injection into the left forearm produced little or no reaction; but the second, after a week's interval, into the same forearm, although there was no immediate reaction, was followed after a delay of five to six hours by an intense erythema spreading from the site of the injection to an area of about 15 cm. across. After a week, when this reaction had almost faded, the third injection was given into the opposite forearm. The injection weal quickly spread to nearly 10 mm., but without pseudopodia. Within four hours an acute erythema was rapidly extending from the site of injection and soon covered the whole of the forearm, which became markedly oedematous and heavy. There were also mild general symptoms. At the same time the other arm flared up at the site of the second injection with a more intense reaction than previously noted. It was more than three weeks before the arms resumed their normal appearance. Blood taken shortly after this and examined with different antigens gave the following results in the C.F.T.:

Standardized sheep hydatid antigen	Positive (titre 1 in 16)
*Worm scolices antigen (specific hydatid)	Positive (titre 1 in 16)
†Beef hydatid fluid	Weak positive (titre 1 in 2)
Normal sheep-brain antigen	Positive (titre 1 in 16)

A mass of washed scolices was added to about 2 ml. of H.J.B.'s serum, and after one hour on the bench was allowed to act at 4° C. overnight. The complement-fixing antibody titre with sheep hydatid antigen was reduced by this procedure from 1 in 16 to just under 1 in 4, but the titre to the sheep-brain antigen remained unchanged at 1 in 16. The

*Fresh scolices from hydatid cyst fluid, after thorough washing to remove host protein, were ground up in saline and the supernatant assayed against standard antibody. In the optimal dilution this antigen gave standard fixation with standard antibody at the correct titre and failed to show any cross-reaction with sheep-protein antibody; it was assumed to be specific for hydatid antibody.

†This beef hydatid fluid, when examined in parallel with the standardized sheep hydatid antigen in a chessboard test against the standard hydatid antibody, proved to be a weak antigen; at its optimal dilution there was standard fixation (++) at 1 in 32 instead of 1 in 64, and, moreover, the optimal dilution was only 1 in 5, whereas the sheep hydatid antigen had an optimal dilution of 1 in 16, which gave standard fixation at a titre of 1 in 64. Weak antigens are notoriously unreliable in immunity reactions, and there seems to be little doubt that the titre recorded in the test is too low.

sheep-brain antibody level was not reduced by absorption with guinea-pig kidney tissue, and absorption with sheep brain or sheep or ox red blood cells made the serum markedly anticomplementary. In spite of these difficulties it seems clear that H.J.B.'s serum contained two distinct antibody fractions—one specific against the hydatid antigen and the other against sheep protein.

Inoculation of Individuals with Anti-rabies Vaccine

Many unsuccessful attempts had been made to obtain samples of serum before and shortly after the completion of a course of injections of sheep-brain anti-rabies vaccine, but we were eventually able to examine a number of sera from patients in Hong Kong who had just completed a course of injections of goat-brain anti-rabies vaccine. Unfortunately the majority of the sera proved to be anticomplementary, but three sera were free from this effect, and the results of the C.F.T.s with these sera and hydatid antigens of ovine origin and a normal sheep-brain antigen are set out in Table II.

TABLE II.—Effect of Recent Sheep-protein Immunization on Complement Fixation with Different Antigens

Complement-fixation Reaction—Serum Dilution Reciprocals														
Serum	Sheep Hydatid Antigen						Normal Sheep-brain Antigen							
	2	4	8	16	32	64	128	2	4	8	16	32	64	128
Anti-rabies HK 4	+	+	±	—	—	—	—	+++	+++	+++	++	+	±	—
“ HK 5	±	±	—	—	—	—	—	+	+	±	±	—	—	—
“ HK 7	+++	+++	+++	+	±	—	—	+++	+++	+++	+++	++	+	—
Standard hydatid antibody	+++	+++	+++	+++	+++	++	—	+++	+++	+++	+	—	—	—
“ sheep	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Normal human serum	—	—	—	—	—	—	—	—	—	—	—	—	—	—

It is clear from this table that the sera of recently immunized individuals (with sheep- or goat-brain anti-rabies vaccines) may give positive complement-fixation reactions with a sheep hydatid antigen. Individual response to those with a sheep hydatid antigen, as judged by the results with the three speculations, appears to vary considerably, and, as in the mens available, appears to vary considerably, it seems that it is only cases of the rabbit natural antibody, it is high enough that when the sheep-protein antibody titre is high enough that there will be any demonstrable antibody titre with the sheep hydatid antigen.

Discussion

Although the hydatid C.F.T., employing sheep hydatid fluid as the antigen, has long been regarded as a specific test it is obvious that an antigen containing a factor derived from the host's tissues in addition to the specific component is liable to yield anomalous results under certain conditions. In view of the very large numbers of individuals (living in areas where rabies is endemic and hydatid disease not a great rarity) who have received the Semple type of anti-rabies vaccine it is surprising that results of the sort reported here have not been previously encountered. At least we have been unable to find any published records, although Kellaway and Fairley (1932) mentioned the possibility of previous sheep-protein sensitization interfering with the interpretation of the Casoni test but did not mention this complication in relation to the C.F.T. In spite of the fact that the test was introduced over 50 years ago (Ghedini, 1906) it seems likely that it is not employed very widely, otherwise the hazard would have been reported earlier.

From the limited evidence available induced sheep-protein antibody appears to fall to almost zero within 12 months, so that, provided no boosting injections are given in the interval, anti-rabies vaccine given a year or more previously would probably not complicate the interpretation of a hydatid C.F.T.

It is possible to prepare an almost completely specific hydatid antigen from fresh scolices as described briefly above, but the difficulty of obtaining suitable material in this country has restricted its use to experimental testing

only, and in common with most other workers in this field we have relied on sheep fluids. By examining fluids from separate cysts it has been possible to select those very rich in antigen which can be accurately standardized and give reproducible results over periods of years. Their working dilution is generally 1 in 16 or 1 in 32: these high dilutions greatly reduce the chances of non-specific reactions. In our experience bovine fluids have not been so rich in hydatid antigen, and the results of the C.F.T. employing this antigen have been much less satisfactory.

When a rabbit serum containing high-titre natural sheep antibody was tested against sheep hydatid fluid and normal sheep-brain suspension in parallel it was found that the titre with the former was much less than with the latter. The sheep hydatid fluid had been assayed against the standard hydatid antibody for the hydatid C.F.T., and because of its richness in hydatid antibody it required dilution well beyond the optimum for maximum sensitivity for the measurement of sheep-protein antibody. The hydatid fluid, therefore, will react only at higher concentrations of sheep-protein anti-

body and fail altogether when the total amount is below a certain level. This is well illustrated in the case of HK 4 (see Table II, top line) and of the guinea-pig anti-sheep serum.

The serological results in the case of H.J.B. are clearly in a different category. The very intense tissue reactions to the intradermal injections of the sheep hydatid fluid in a sensitized allergic subject resulted in the development of true antibodies to both the hydatid and sheep factors to approximately the same titre. It is possible that Graña's (1944) observation that the injection of hydatid fluid into patients with hydatid disease resulted in the development of sheep antibodies, if the injections gave rise to tissue reactions, is an example of the same order but with a reversal of the sensitizing agent.

Summary

The occurrence of false-positive reactions in the routine hydatid complement-fixation test is described as a rare event, and evidence is produced to show how the use of an antigen containing both the host protein and the specific hydatid fractions can confuse the issue in patients previously immunized with vaccines containing the same or related host protein.

We owe thanks to Dr. P. A. Clearkin and Mr. N. S. Schizas, of Cyprus, for their kindness in sending us generous supplies of hydatid fluids; to Dr. E. F. Duck and Mr. A. E. P. Grimmo, of the Pathological Institute, Caine Road, Hong Kong, for the sera from patients immunized with goat-brain anti-rabies vaccines; to our colleagues who volunteered for the human experiments; and to Dr. Naomi Datta for her help with the animal experiments, many of which have not been described here.

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A RAPID TEST FOR THE PRESENCE OF INCREASED COLD AGGLUTININS

BY

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Increased cold agglutinins are most commonly found in patients with virus pneumonia, but the usual method of estimating them, by titration, is time-consuming, and delay in obtaining the result limits the clinical value of the test. Since, however, cold haemagglutination is sometimes seen to occur almost immediately in the barrel of the syringe or along the side of the tube or pipette into which blood is drawn, it was thought possible that a test might be devised which would indicate rapidly whether or not cold agglutinins were present in excess. The purpose of this paper is to show that the rapid chilling of a simple mixture of whole blood and citrate provides a clinically reliable indication of the presence of increased cold agglutinins.

As long ago as 1903 Landsteiner made a study of the naturally occurring cold haemagglutinating antibodies which he had discovered to be present in various animals. He separated the serum of defibrinated blood from the red cells at 38° C. and added a small quantity of a suspension of autologous red cells in serum or saline to it on a slide, which was then placed in the refrigerator. He noted that, provided the proportion of plasma to red cell suspension was 10:1 or greater, the red cells formed large clumps, readily visible to the naked eye. When, however, the proportion of plasma to red-cell suspension was 5:1 or 5:2 no agglutination occurred.

My preliminary experiments were carried out with serum, plasma, and red blood cells, both undiluted and diluted in sodium chloride (0.9%) or sodium citrate (3.8%). These were mixed in different proportions and rapidly chilled. Undiluted specimens of serum or plasma from various children not suffering from virus pneumonia often produced agglutination of autologous cells provided that the suspensions were not too dense. When strong suspensions of red cells were used, however, agglutination regularly failed to appear. The serum or plasma from patients with virus pneumonia, in striking contrast, produced marked agglutination even of concentrated red-cell suspensions. Moreover, the stronger the concentration of red cells the more rapidly did they agglutinate and the larger were the clumps formed.

Dilutions of whole blood were then made in saline and citrate, and the effect of rapid chilling was observed. Sodium citrate was preferred to saline, since it prevented clotting and was incidentally found to enhance agglutination.

The most satisfactory and clear-cut results were obtained with a mixture of whole blood and citrate in equal amounts. Such a mixture constitutes approximately a 20% suspension of red cells in a 1:3 dilution of plasma. Under these circumstances the amount of cold antibody present in the blood of healthy persons produced no agglutination on chilling, whereas the red cells in the blood of patients with virus pneumonia rapidly formed coarse clumps. In whole blood, since in a given sample the ratio of red cells to antibody

is constant however it may subsequently be diluted, it might be expected that the relative amounts of blood and citrate could be varied considerably without affecting the result. This proved to be the case within wide limits, but a gross excess of citrate to blood produced a relatively finer pattern of agglutination; a similar excess of blood to citrate resulted in a sticky mixture difficult to read.

Dilutions were initially made on slides which were placed in the refrigerator for varying periods. Mixtures, however, are easier to handle in test-tubes, and tests showed that a small volume (0.4 ml.) of fluid in a Wassermann tube surrounded by ice crystals could be brought to a temperature of 0-4°C. within 15 seconds.

The Test

The following procedure has finally been adopted as a rapid test for the presence of increased cold agglutinins.

Approximately 0.2 ml. of blood, obtained from a finger or ear prick, is allowed to run into approximately 0.2 ml. of 3.8% trisodium citrate in a thin-walled glass Wassermann tube (60 by 7 mm.). The corked tube is rapidly chilled by rubbing it on the cold tray of a refrigerator so as to cover the outside of the tube with ice crystals and is left for about 15 seconds on its side in the tray. The tube is then removed, holding it at the corked end to avoid warming, and is slowly rotated so that the blood-citrate mixture runs gently over the chilled glass surface, to which ice crystals still adhere. The presence of coarse floccular agglutination is recorded as "positive." No agglutination, or the presence of a fine granularity, is recorded as "negative" (see Fig. 1).

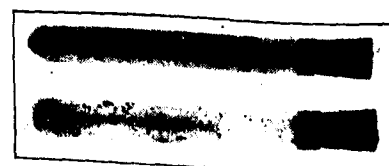


FIG. 1.—Above, negative test. Below, positive test

The tube is then warmed in the hand for a few seconds and re-examined to confirm that all agglutination has disappeared. If a negative result is obtained there is no point in repeating refrigeration, since in no instance has the delayed development of agglutination been encountered. On the contrary, floccular agglutination either appears with remarkable rapidity or not at all.

Relation of Test to Cold Agglutinin Titre

A satisfactory correlation having been demonstrated between a positive rapid test and the subsequent detection of an increased titre of cold agglutinins in a number of patients with virus pneumonia, a systematic investigation was carried out on 92 specimens of serum to determine the range of titre associated with positive and negative results respectively.

Method of Titration.—Venous blood was obtained from the patient on the same day as the screening test was performed, and was allowed to clot at room temperature. Serum was separated after incubating the clotted blood for one hour at 37° C. Samples of serum were kept frozen solid until tested, within a fortnight of bleeding. Doubling dilutions were made in plastic trays, using 0.2-ml. volumes of serum in saline (isotonic sodium chloride). To each dilution was added 0.2 ml. of a 1% suspension of group O red cells freshly prepared and washed three times in saline. The same donor (D. H. G.) was used for all estimations. The results were read after overnight refrigeration. The tray was gently tapped to suspend the red cells, and the titre recorded as the reciprocal of the final dilution of serum showing definite agglutination readily visible to the naked eye, without special lighting. Agglutination which could be detected only with the hand lens or with difficulty was ignored. Although the impression had been formed that there was a positive correlation between the height of the

cold agglutinin titre and the size of the red-cell aggregates in the screening tests, no attempt was made to grade the latter, which were simply recorded as either positive or negative.

Usually the result was unequivocal, but borderline examples were occasionally encountered. As many as possible of these were included to determine the degree of overlap. The results are shown in Fig. 2. Screening tests

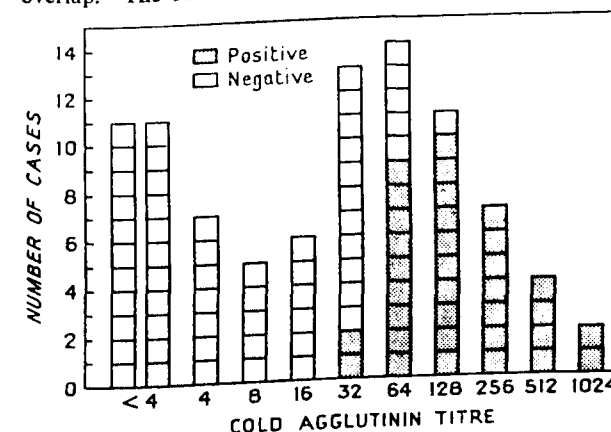


FIG. 2.—Results of rapid test compared with titre of serum obtained on the same day.

were usually negative at a titre of 32 and usually positive at a titre of 64. No negative result was recorded at a titre of 256 or higher, and no positive result at a titre of 16 or less.

Diagnostic Value of Test

This test has been found to be a convenient way of following the appearance and subsequent disappearance of increased cold agglutinins in children with virus pneumonia. With rare exceptions a positive result was found only in association with this condition. The accompanying Table

Diagnosis	Positive	Negative	Total
Virus pneumonia or bronchitis ..	56	3	59*
Bacterial or non-specific pneumonia or bronchitis ..	0	226	226†
Bronchiectasis or asthma ..	0	26	26
Pulmonary tuberculosis ..	0	17	17
Measles ..	1	19	20
Infective hepatitis ..	0	7	7
Severe anaemia and leukaemia ..	0	9	9
Nephritis ..	0	15	15
Rheumatic fever ..	1	13	14
Other miscellaneous diseases ..	1	144	145
Healthy children and adults ..	0	45	45
Total ..	59	524	583

* Including 7 adults. † Including 59 adults.

shows the results of tests performed on 583 children and adults. Of the 59 children or adults positive on one or more occasions, 56 were considered to have virus pneumonia or bronchitis. In only three children was supporting evidence for a diagnosis of virus pneumonia not obtained—one convalescent from measles, one with rheumatic fever, and one infant admitted because of failure to thrive. In each of these the test was only weakly positive.

On the other hand, 524 children or adults failed to show a positive reaction when tested on one or more occasions. From the table it can be seen that a large proportion of these had pneumonia or bronchitis, usually of undetermined aetiology. Many acute infections of the upper respiratory tract have also been included under "other miscellaneous diseases," as have examples of other virus infections such as primary herpes simplex stomatitis, vaccinia, varicella, and infectious mononucleosis. Also included under this heading are examples of whooping-cough, fibrocystic disease of the pancreas, and gastro-enteritis.

These findings suggest that a positive rapid test is of value in the diagnosis of virus pneumonia.

Discussion

Clough and Richter (1918) noticed increased cold agglutinins when they attempted to perform a routine red-blood-cell count upon a patient almost certainly suffering from virus pneumonia. Upon drawing the blood into the diluting pipette it was found that the red blood cells became agglutinated so markedly that clumps were visible macroscopically as well as microscopically. They proceeded to carry out titrations of the patient's serum and to make a detailed study of cold agglutinins, but did not appreciate their clinical significance. The frequent association of the phenomenon with virus pneumonia was first recognized by Peterson, Ham, and Finland (1943) and by Turner (1943). These reports were soon confirmed and led to the adoption of cold-agglutinin titration as a routine laboratory procedure. The importance of a carefully standardized technique, however, was not at first appreciated. Each stage is a possible source of error. The temperature at which the serum is separated, the time it is stored, the strength of the red-cell suspension, the age of the cells, the donor from whom they are obtained, and the method of reading and expressing the end-point may all influence the result to a great extent. The rapid test avoids these sources of error, and has the additional advantages of being readily repeatable.

There is, however, another aspect of the problem to be considered. Even when accurately determined, titre as the sole measure of cold-haemagglutinating antibody has certain limitations. It takes no account of avidity, the term being used here as expressing the strength of red-cell adherence produced by a serum at a given dilution, as shown by the coarseness of the red-cell aggregates and their resistance to dispersal by agitation. Two sera may be defined as differing markedly in potency because of differences in avidity. Because of this, Crookston, Dacie, and Rossi (1956) used arbitrary "units" to compare the sensitivity to cold antibody of different red cells, allotting a score for the intensity of agglutination at each dilution and multiplying the sum of the scores by the number of tubes showing agglutination.

Turner, Nisnewitz, Jackson, and Berney (1943) observed that there was a definite correlation between high avidity (the formation of a solid disk of cells) at low dilutions of serum and the height of the cold agglutinin titre. Finland and Barnes (1951) observed that fine granular agglutination might sometimes be present in a variety of clinical conditions to quite high titre, but they regarded a lower titre of value in the diagnosis of virus pneumonia provided that floccular agglutination was present at a titre of 1:10 or higher. Whether or not estimation of avidity should take precedence over titre in the diagnosis of virus pneumonia, the rapid test (which is a measure of avidity) is a convenient way of obtaining an indication of the amount of cold antibody present in the blood of a particular patient.

Various methods have been used by different workers to simplify the estimation of cold agglutinins. Shone and Passmore (1943) observed in a number of patients with virus pneumonia that their blood rapidly formed clumps of red cells when a drop was left upon a slide at room temperature. They did not study the critical temperature at which this change occurred. Young (1946) used a presumptive test which, however, involved the separation of serum, the addition of a dilute suspension of red cells, and refrigeration in the usual way. Chang and Hou (1948) described a method whereby doubling dilutions of serum were made on a specially ground slide which could be examined directly under the microscope; agglutination was usually complete within two hours. Trönnberg (1950) described a simplified method of titration, using citrated plasma and a dilute suspension of patients' unwashed cells. None of these methods, however, is as simple and rapid as the test here described.

Summary

A simple and rapid screening test for the presence of increased cold agglutinins is described. A mixture of whole blood and sodium citrate in equal parts in a small

The drug was also tried in several cases of pemphigus and papular urticaria, but it did not produce any improvement. It has been used successfully in treating infective dermatitis, furunculosis, secondary infection in widespread eczemas, and in several cases of cystitis, cellulitis, and lymphangitis. For these, quite short courses were given with satisfactory results and no toxic symptoms were noted.

COMMENT

Twelve cases of dermatitis herpetiformis were treated with sulphamethoxypyridazine; one of them was of a severe bullous type and four were of the juvenile variety. Response in all these cases was most satisfactory. Several patients who had already received the usual controls for the disease declared spontaneously that the present treatment was the most pleasant and the most effective. One adult and three juvenile patients remained well after cessation of treatment.

In view of the variable course of the disease and the possibility of spontaneous remissions, it is extremely difficult to assess the results of treatment. All cases treated had an immediate response. In two cases treatment was interrupted when supplies were temporarily held up; in each case symptoms and rash promptly recurred and rapidly disappeared when treatment was restarted.

Local treatment consisted of mild soothing applications such as lotio plumbi and crem. calamin.; topical cortisone was not employed.

Toxic Symptoms.—Surprisingly, these were almost entirely absent. One patient developed what appeared to be genuine rubella and continued treatment without ill effect. Another patient developed a peculiar syndrome of dizziness and headache, but was able to continue the necessary dosage without further reactions. One patient has been taking four tablets daily for over one year without ill effect; blood counts and urinary tests reveal no abnormality.

I thank Dr. J. R. Wilson, of Messrs. Lederle Laboratories Ltd., for supplies of lederkyn, and Dr. Reginald Hall, my senior colleague at the hospital, for his constant interest and advice.

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Culture of *Trichomonas Vaginalis*

Recently there has been an increased interest in the routine diagnosis of trichomonal vaginitis by culture rather than by direct examination. Media that are more easily prepared and are reliable have been described, giving bacteria-free cultures by the addition of antibiotics. American workers have claimed an increase up to 30% in positives by culture, and this method is often essential in diagnosis of the male carrier. Now that systemic treatments are being assessed, it is important that the most dependable methods should be used. The direct wet examination must be made shortly after collection, which precludes its use outside hospitals.

In the present investigation the value of Kupferberg's (1955) simplified "trypticase" serum (S.T.S.) medium (slightly modified) was explored (1) in increasing the number of positive results, and (2) as a transport medium.

MATERIALS AND METHODS

The patients were women with vulvovaginitis, and in some of them more than one specimen was taken during treatment. Swabs were collected by wooden applicators tipped with cotton-wool, or the discharge was pipetted off. In the hospital, specimens were brought straight to the laboratory, usually in warm saline. Swabs from outside were broken off into a bijou bottle of medium, and either reached the laboratory after some hours or were sent by post. On receipt specimens were examined in a warm preparation, and swabs in saline were transferred to S.T.S. medium. Drops were examined without coverslips, as these were found to force the organisms to the edges, thus delaying identification. Low power was used to pick up the motile trichomonads, and a higher power for checking. Cultures were made at 35 to 37° C., and were examined first after 24 hours and finally after five days, samples being taken from the bottom of the bottles, and, if negative, after centrifugation.

Kupferberg's S.T.S. Medium Modified.—Maltose, 1 g.; oxoid agar, 2 g.; trypticase (Baltimore Biological Laboratories), 20 g.; cysteine hydrochloride, 1.5 g.; distilled water to 1,000 ml. Autoclave at 10 lb. per sq. in. (0.7 kg./sq. cm.) for 10 minutes to dissolve. Adjust to pH 6 with N NaOH. Then add methylene blue 0.5%, 0.2 ml. Autoclave in 100-ml. bottles at 15 lb. per sq. in. (1 kg./sq. cm.) for 15 minutes. The medium is almost clear, is straw-coloured with a narrow blue zone at the top, and keeps three to four weeks. For use, tube in 5-ml. bijou bottles. Autoclave and add to each bottle 0.25 ml. of sterile serum containing 100,000 units of penicillin and 20 mg. of streptomycin per 5 ml. Discard after a week.

Minor modifications have been made from the original medium, as these facilitated its preparation and reduced the cost without decreasing its efficiency. pH adjustment of the serum was found to be unnecessary. The serum was taken from a pool of five bloods, as on two occasions when using individual sera from two patients no growth was obtained, even after pH adjustment. We can offer no explanation for this. Latterly tryptone ("oxoid") another pancreatic digest of casein, was used instead of trypticase, and the swabs were cultured in parallel.

RESULTS

The results of the examination of 405 specimens are shown in the Table. In no case was direct examination positive and culture negative. As an additional test of S.T.S. as a transport medium, duplicates of 20 of the swabs,

Results in 405 Specimens

	No. of Swabs	No. of Positive		% Positive	% Increase on Positive Direct by Culture
		Direct Examinations	Cultures		
Hospital ..	319	86	95	29.8	10.5
Outlying ..	86	14	23	28	

known by direct examination to be positive, were placed in it and sent by post. All gave positive cultures on arrival.

Tryptone seemed to be a satisfactory substitute for trypticase, but further investigation is being made.

COMMENT

S.T.S. appears to be a highly reliable medium for the culture of *T. vaginalis*, and, slightly modified from Kupferberg's medium, is simple to prepare. We have found culture rather superior to direct examination. Kean and Day (1954), using S.T.S., claim a 31% increase on culture, and Perl *et al.* (1956) a 10% increase. Our figure of 10.5% agrees closely with the latter. Some workers have reported no advantage on culturing (McVay *et al.*, 1951; Bernstine and Rakoff, 1953).

As a transport medium S.T.S. appears to be of considerable value. Positives sent by post survive, and from patients outside the hospital the improvement on direct examination by culture was from 14 to 23. We realize that these figures are small, but they suggest that general practitioners and outlying clinics need not forgo a satisfactory laboratory diagnosis.

We thank Messrs. Ortho Pharmaceutical Ltd. for their generous supply of trypticase.

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Reviews

NEUROPATHOLOGY

Neuropathology. By J. G. Greenfield, M.D., F.R.C.P., LL.D., W. Blackwood, M.B., Ch.B., M.R.C.P.Ed., A. Meyer, M.D., W. H. McMenemey, M.A., D.M., F.R.C.P., and R. M. Norman, M.D., M.R.C.P., D.P.M. (Pp. 640+vi; illustrated. £5 5s.) London: Edward Arnold (Publishers) Ltd. 1958.

This handsome volume is a comprehensive and fully illustrated study of all aspects of neuropathology except neoplasms. Apart from his editorship Dr. Greenfield wrote seven of the 13 chapters. These deal with the various infective and demyelinating diseases; the system degenerations of the cerebellum, brain stem, and spinal cord; trauma; diseases of the peripheral nerves; lesions associated with diseases or malformations of the cranium and spinal column; as well as a more general and introductory chapter on the pathology of the nerve cells and neuroglia. In these important sections the mature experience of the author, based on a lifetime of routine work at the National Hospital, Queen Square, is crystallized. Posterity will be grateful for those more spacious years of his retirement that enabled Dr. Greenfield to undertake this labour, and our sole regret must be that he did not live to see and handle the product of his work.

Dr. Blackwood contributes a useful chapter on the vascular diseases in relation to the central nervous system. That by Dr. Norman deals with congenital malformations, the effects of birth injury, and neonatal diseases. This is an important and particularly well illustrated section, in which is most welcome, from an acknowledged expert in this field. Professor Meyer has written on anoxia, intoxications, and metabolic diseases. He and Dr. McMenemey are separately responsible, too, for different aspects of the field has been ably supported by his team, and the synthesis collectively reflects a high order of accuracy and scholarship in which the reader is brought up to date without loss of historical perspective. Each chapter has its own list of references and separate enumeration of the illustrations, but altogether there are about 500 of the latter. The text is laid out so readably and tersely that it is easy for reference as well as more extended study. It is safe to predict that the work will prove indispensable for all specialists in this field, whether pathologists or clinicians.

DOROTHY S. RUSSELL.

THE HISTORY OF PAIN

Anatomies of Pain. By J. D. Keele, M.D., F.R.C.P. (Pp. 260+x; illustrated. 27s. 6d.) Oxford: Blackwell Scientific Publications. 1957.

This is a valuable book whose title does not sufficiently indicate the wide field it covers. Pain has always been a serious problem, and in every age observers and thinkers have tried to locate the sensorium. Dr. Keele has read very widely and pondered deeply over the views held by the philosophers and scientists, and has produced a book which should appeal to the anatomist, the physiologist, the neurologist, the neurosurgeon, the psychologist, the medical historian, and even the metaphysician.

The first four chapters outline the views of Aristotle, Plato, Galen, Descartes, and others who sought for the sensorium commune. Chapter V gives an interesting account of the growth of knowledge of the spinothalamic tract. Then follows a masterpiece of compression (in places perhaps too compressed) in which, in 40 pages, the numerous discoveries made during the last 60 years are reviewed; in this the often conflicting experiments and theories have been, so far as is possible, reconciled. A reference to Jefferson's views on consciousness might well be added here. The last chapter, dealing with the structure of pain, will be of particular interest to the physician and psychologist. We cannot forbear one short quotation: "The witch-doctor who

knew how to choose the appropriately worded curse or spell was the current specialist in the manipulation of conditioned reflexes. It is doubtful whether his techniques have been improved upon even in the societies of to-day." Dr. Keele considers that "reinterpretation of the old ideas in terms of new knowledge constitutes a fruitful form of scientific thought." His book is an excellent demonstration of that thesis.

ZACHARY COPE.

LEGAL LIABILITY OF DOCTORS

Malpractice Liability of Doctors and Hospitals (Common Law and Quebec Law). By William C. J. Meredith, Q.C. (Pp. 300+xv. \$7.75.) Foreword by J. Gilbert Turner, M.D. Toronto: The Carswell Company Ltd. 1957.

I suppose reviewers may be forgiven if they sometimes skip. I did not skip this book. Mr. Meredith has not only achieved his aim of writing his law book on a special subject of general interest in language intelligible to laymen; he has written a law book which this lawyer found it difficult to put down.

After an opening chapter setting out the relation of doctor and patient as they still know it in Canada, unaffected by the impact of the National Health Service, Mr. Meredith deals chapter by chapter with those subjects which are of burning interest in principle as well as of daily practical importance: professional secrecy, with statutory privilege for the doctor in Quebec and some State jurisdictions in America in contrast to his nakedness at Common Law; the doctor as a witness, covering everything from what to do with a subpoena to how to set out a medical report in an accident case; malpractice in diagnosis and treatment, with a comforting reminder that the standard of care the law imposes is what his colleagues would expect of the ordinary competent practitioner in the circumstances; and the vicarious liability of hospitals, over which the Canadian courts have adopted the same approach as have the English courts since the decision in *Gold v. Essex County Council* in 1942.

Mr. Meredith includes chapters on civil courts and procedure, the assessment of damages, and criminal malpractice which afford interesting comparisons and contrasts with English practice. These chapters remind the English lawyer how fortunate he is to have one law only to deal with, and to be able to treat even Scots law as foreign. Apart from the statutory differences in the law in the "Common Law" provinces, the Quebec Civil Code does not stem from the Common Law at all.

"A BARRISTER."

TREATMENT OF ALCOHOLISM

Hospital Treatment of Alcoholism: A Comparative Experimental Study. By Robert S. Wallerstein, M.D., and Associates. Introduction by Karl A. Menninger, M.D. Menninger Clinic Monograph Series No. 11. (Pp. 212+xi. 42s.) London: Imago Publishing Company Ltd. 1957.

This book from the Menninger Clinic, U.S.A., examines the response of 178 persons treated in hospital for alcoholism. Three separate groups were given respectively "antabuse" (disulfiram), conditioned aversion treatment, and hypnotherapy, while a control group had only "a dynamically geared activities program in conjunction with group psychotherapy and with opportunities for individual psychotherapy." It was interesting to find that the patients given antabuse did by far the best of all four groups. Hypnosis came next, while both the conditioned aversion treatment and the control method helped only a quarter of the patients to whom they were applied.

In Britain a prerequisite of all treatments of alcoholism is thought to be the insistence on absolute teetotalism during and after treatment. But no attempt seems to have been made in this study to emphasize the dangers of taking "the first drink," which is considered so important here in the prevention of future relapses. It is significant, however, that the only group that did well was the one in which antabuse effectively stopped all drinking because of the severe physical

reactions that followed. The poor results reported with the conditioned aversion treatment were also probably due to the fact that the method was not used primarily as a means of indoctrinating and brain-washing the patient to a greater realization of the dangers of relapse whenever the first drink is again taken.

The book confirms what has been known for a long time—namely, that ordinary forms of psychotherapy and psycho-analytically orientated treatments work very poorly indeed in alcoholism. The only hopeful treatment seems to be to produce total abstinence by “fair means or foul.” It does not seem to matter much whether this happens following sudden conversion at a revival meeting, or by attending meetings of Alcoholics Anonymous, or by the regular taking of antabuse, or by using the increased suggestibility that occurs both during conditioned aversion treatment and hypnotherapy to drive home the absolute necessity for total future abstinence. Any treatment which permits a return to moderate drinking is practically always doomed to failure, and that is why the statistics of this study may not be indicative of the full possibilities of the same treatments in other hands.

WILLIAM SARGANT.

THINKING

Thinking: An Experimental and Social Study. By Sir Frederic Bartlett, C.B.E., F.R.S. (Pp. 203. 18s.) London: George Allen and Unwin, Ltd. 1958.

To the many admirers of Sir Frederic Bartlett's earlier work this slim volume will come as a distinct disappointment. Its subtitle, “An Experimental and Social Study,” suggests a type of content which is not in fact provided. The so-called “experimental” chapters can hardly be considered to be accounts of anything but the initial searchings which normally would precede a properly set-up and decisive experiment. All the author appears to have done has been to set up certain problems and to note what proportion of some ill-defined population, whose number is not even vouchsafed the reader, adopts one or other of several different alternative solutions. As regards the “social” side, this presumably refers to Sir Frederic's accounts of a number of historical instances of fruitful scientific thinking. These are in no way different from similar accounts written for similar purposes over the last 50 years, and it is difficult to see how they can be said to throw much light on the problem of thinking.

In his introductory chapter Sir Frederic gives his reasons for considering thinking to be similar in many ways to the type of skilled performance the experimental investigation of which has received so much attention in the Cambridge laboratories. Neither in this chapter nor in the following one is the case properly argued beyond noting a few superficial similarities; no decisive hypotheses are advanced and no deductions capable of being tested are derived. A further unsatisfactory feature of this book is its almost complete lack of any reference to the growing experimental literature on the subject, or even to recent American attempts at theory-making. In this book Sir Frederic has carried to its logical conclusion the well-known tendency of Cambridge psychologists to disregard contributions from outside the walls of their own laboratory; readers who are familiar with the experimental literature would not consider that the result has justified the effort. It is very much to be hoped that Sir Frederic will carry his researches to a more definitive conclusion and present them to us in a less restricted setting.

H. J. EYSENCK.

HORMONE RESEARCH

Recent Progress in Hormone Research. Volume XIII: Proceedings of the Laurentian Hormone Conference, 1956. Edited by Gregory Pincus. (Pp. 646+vi; illustrated. \$12.80.) London: Academic Books Limited. 1957.

In these volumes, which appear annually, are reprinted the papers presented at the Laurentian Hormone Conferences together with much relevant discussion. They have now

become an established part of endocrine literature. No attempt is made to cover the whole range of endocrinology, but certain significant fields have been selected for survey which are of general importance. Fourteen reviews are contained in the present volume, and each is a detailed study by an expert in his field.

Five main sections are included. The first covers aspects of neurohumoral and endocrine relationships. Under this head appear a valuable and concise review of present knowledge of serotonin; a detailed survey of the evidence for a mid-brain centre controlling hypothalamic and pituitary mechanisms; a study of the influence of the central nervous system on anterior pituitary function; and a detailed attempt to correlate rhythmic behaviour in psychiatric patients with hormonal rhythms, supported by experiments on rats. The second section is on transport of hormones in the circulation, and singles out for special study the interaction of thyroid hormones with protein in biological fluids and the binding of steroids and steroid conjugates to human plasma proteins. Both these are thorough and valuable reviews of their respective fields. The next section deals with some hormonal aspects of reproduction, including a study of implantation of ova in the rat and a review of the effects of three new synthetic progestins, such as 17- α -ethinyl-19-nortestosterone. Here also is a most interesting survey of the metabolism of progesterone as revealed by isotope labelling, with a review of the place of some long-acting steroids on reproduction. The fourth section, on hormones and metabolism, contains a review of the role of insulinase and insulinase inhibitors in diabetes mellitus and a very comprehensive survey of glucagon. In the final section, on hormones and stress, are discussed endocrine changes after anaesthesia, surgery, and trauma. There is also a study of the influence of the adrenal gland on gastric responses to stress.

It is clear, therefore, that a very wide range of subjects are discussed in some detail. The work is a most valuable reference volume for students of endocrinology, and should most certainly be present in the libraries they use.

C. L. COPE.

ENDOCRINOLOGY WITHOUT PICTURES

Introduction to Clinical Endocrinology. By A. Stuart Mason, M.A., M.D., B.Ch.(Cantab.), M.R.C.S.(Eng.), M.R.C.P. (Lond.) (Pp. 192+vi. 22s. 6d.) Oxford: Blackwell Scientific Publications. 1957.

This introduction to endocrinology gives information on the subject midway between the short accounts found in conventional textbooks of medicine and the voluminous descriptions contained in large reference books on endocrinology, of which latter there are quite a number. It is not entirely clear for whom such introductions are intended, but the student, practitioner, or physician who is interested in the subject but who cannot spare the time to read, or the money to buy, a fuller textbook will find in this comparatively small volume an admirably clear, accurate, and up-to-date account of clinical endocrinology in terms of applied physiology. The book is exceedingly readable and interesting and is written in excellent English. It is unusual for a work on this subject to contain no illustrations, which partly accounts for this book's very modest price. The author makes a virtue of necessity by claiming that the photographs of patients which usually illustrate such volumes show the end-point of disease, yet seldom portray early clinical signs and may actually give a visual bias against early diagnosis—an ingenious argument with some point to it. Less justifiable is the omission of any account of diabetes mellitus. It is odd that some pages should be devoted to the consideration of obesity and of spontaneous hypoglycaemia, and yet the most common and important endocrine disease in which so many ductless glands are involved should not be described. It is as though an author writing on what happens in *Hamlet* should omit all reference to the Prince of Denmark.

D. M. DUNLOP.

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THE BIRMINGHAM MEETING

Every visitor to the Annual Meeting must have been stimulated by the vigorous growth of Birmingham University. If Britain needs more scientists and doctors then the bulldozers churning through the red earth of Edgbaston were outward and visible signs of the University's intention to train them. The same sense of purposeful energy that was behind all the building activity must have inspired the organizers of the Annual Meeting. Every item on the programme was designed to give the visitor the best possible value for the time he or she was prepared to spend at the meeting: no organizational detail which helped to that end was overlooked. For this excellent result the President, Professor A. P. Thomson, and his three chief lieutenants, Dr. J. W. Brown, Dr. A. C. Houghton, and Mr. A. Gourevitch, must be given the lion's share of the credit, for it was plain that they had the complex mechanism of the meeting at their fingertips. From the reception given by the Midland Branch on July 9 to the final meetings of the Sections on July 18 everything ran on the smoothest of lines.

The whole-hearted co-operation of the University was of course invaluable. Not only was the meeting admirably sited in the university buildings but the generosity of the university staff, from Dr. Robert Aitken, the vice-chancellor, downwards, went far beyond the bounds of ordinary hospitality. Even the University Staff Club, in its charmingly rural surroundings—and with its tempting billiard table—was thrown open to the visitors. The reception given by the University on July 17 was a glittering climax to a series of memorable social occasions. The fact that the Town Clerk and other senior officials of the Corporation were active members of the local executive committee showed, too, that the City was not going to be neglectful of its medical visitors. The Lord Mayor, Alderman D. Johnstone, set the pace for the City's genial welcome, and he and the Lady Mayoress were the hosts at a civic reception in the Council House. Without the power to perform miracles the Chief Constable could hardly have unravelled the tangled skein of Birmingham's traffic specially for the meeting, but more than one B.M.A.

member, disconsolately pointing his car against the flow of swiftly moving vehicles in a one-way street, found the friendly advice of a Birmingham constable most tranquillizing in emergency. The special service of buses which was arranged for the meeting helped to overcome what might have been a minor disadvantage—the distance of the university from the centre of the city.

At the Scientific Sections there was a well-adjusted mixture of “easy” and “stiff” discussions, and Mr. A. Gourevitch, the science secretary, and his helpers had every reason to be satisfied with the results of their efforts. The plenary session on “Chemotherapy of Infections” was packed, and the speakers, responding to the occasion, instructed and entertained their audience with lively and informative papers and answers to questions. A less spectacular meeting, but one at which many thought-provoking ideas were discussed, was the symposium held by the Section of Medicine on “The Physician and Hospital Planning.” The Scientific Exhibition goes from strength to strength, and this year there was not a single exhibit which did not earn its place: because so many of the exhibits admirably succeeded in achieving their purpose, the judges had great difficulty in selecting the prize-winners.

The keenest visitor to an Annual Meeting cannot possibly find time to see and hear all that is going on. At Birmingham he had to go to at least one or two of the closed-circuit telecasts and, if not to all the medical centres in Birmingham which threw their doors open to visitors, at least to the overwhelmingly impressive Queen Elizabeth Hospital. Then again there was an attractively varied programme of films (arranged by the B.M.A.'s Film Library) to be seen every day, and, in addition to the usual bright display of surgical instruments, drugs, and books, a number of special exhibitions had been arranged, notably the historical exhibition of medical books. Right on the doorstep, too, was the Barber Institute of Fine Arts, where those bemused by science could take refuge among the productions of a different type of endeavour. While the medical visitor hurried from one lecture theatre to another, attuning his ear at one moment to remarks on “girth control” and focusing his eyes at another on the elimination of a haemorrhoid in full colour, his wife and other ladies were enjoying the agreeable surroundings of the Ladies' Club at Winterbourne, which the chairman of the Ladies' Committee, Mrs. L. S. Gathergood, had made a refuge from the bustle of the meeting. From Winterbourne expeditions sallied out to Stratford, Lichfield, and to other places of interest, including the works of the Austin Motor Company at

Longbridge and Cadbury's famous factory at Bournville. As if to emphasize that Birmingham was not an exclusively industrial city, flowers in great profusion and variety gave a colourful background to what was already a colourful meeting. Private hospitality, as would be expected from Birmingham, was most generously given, not only to house guests but also to many parties of visitors who, during tours of the district, descended from their buses at the homes of Birmingham members and were sent refreshed on their way. So another Annual Meeting has come to an end—a highly successful one, conducted with admirable vigour and efficiency. As the memory of it fades, so the work for the joint meeting with the Canadian Medical Association at Edinburgh in 1959 will go ahead with increased momentum.

THE R.B. AND THE N.H.S.

Some 500 Representatives from Divisions and Branches of the B.M.A. were certainly in no mood to look back at the past ten years of the N.H.S. with satisfaction. The present discontents were emphasized by three decisions announced at the Birmingham meeting. The first was the Representative Body's approval of the action of the Council to set up, in consultation with the Royal Colleges, the Scottish Royal Corporations, the College of General Practitioners, and the Society of Medical Officers of Health, a committee to review the health services of the country. The second was the statement of the Chairman of the General Medical Services Committee, Dr. A. B. Davies, that a "non-medical expert of eminence" was to advise a special sub-committee which was studying possible alternative schemes for providing medical services to the public. The third was the announcement by the Chairman of Council, Dr. S. Wand, that the contractual validity of the general practitioner Spens Report was to be tested by Scots law.

Those who take the trouble to read the full reports of the A.R.M. proceedings in the *Supplement* of last week and this will find more than enough evidence of the present disillusionment in the profession. All the more striking because of the studied moderation of his tone was the report of the Chairman of the Central Consultants and Specialists Committee, Mr. Holmes Sellors, on the hospital and consultant services. He brought out yet once again the sad and sorry plight of the time-expired senior registrar. Some 200 and more cannot be employed as consultants "although in nearly every case they were fully equipped for consultant work." Repeated attempts

¹ *Brit. med. J., Supplement*, 1958, 1, 352.

had been made to persuade the Ministry of Health to conduct a survey of hospital establishments; but the Ministry had persistently refused to do so. It had been hoped that during such a review the Ministry might give some of the time-expired registrars some security against the risk of dismissal, or a salary increase: but that had been refused. And the Minister of Health, in flat opposition to the C.C. and S. Committee and the Joint Consultants Committee, had created a special type of post—a subgraded consultant—to be filled by regional hospital boards. In the meanwhile a working party had been set up to study hospital staffing, and it was hoped that through this some solution might be found of the problems facing the senior registrars and the senior hospital medical officers. Mr. Holmes Sellors told the meeting that when the Staff Side of Whitley Committee B put before it the cases of some 500 S.H.M.O.s as coming up to consultant standard, "it appeared that the Management Side had had no idea that the problem was so extensive." Mr. Holmes Sellors moderately called this a "disconcerting feature." The appalling thing is that there is a crying need for more hospital beds and more consultants: and yet the men who have been trained to this end are denied the opportunity to complete their careers. Dr. E. A. Gerrard gave some alarming figures in this connexion. In surgery, he said, there were four people waiting for every bed in London's teaching hospitals, and five for every surgical bed in the provinces. In his own hospital in Manchester, with just over 100 beds, there was in December, 1957, a waiting-list of 2,676: non-urgent cases had to wait as long as three to four years before being admitted. Small wonder that he burst out thus: "This in a Health Service which is claimed to be the envy of the world. What complacency! What deception! What a scandal it all is!"

The Representative Meeting's principal concern is with medical politics and problems of medical organization. Dr. R. G. Gibson, Chairman of the Organization Committee, has, with his committee, been successful in rousing interest among younger members of the B.M.A. through the Junior Members' Forum, the first meeting of which was held two months ago.¹ He has, too, been looking into ways and means of rousing the average member from an apathy and inertia which are typical of all kinds of electorates. One such move towards this came in the shape of a motion from the Winchester Division that the Council should set up an intraprofessional information service "as a matter of urgency." Those who supported this motion certainly had different ideas on how to set about this. One speaker thought that "an efficient committee clerk could probably do

all that was necessary." Another envisaged "a full-time information officer," who would work in contact with all the Association's committees and "collect, correlate, and disseminate information." It was finally resolved that the Council should look into the arrangements for improving intraprofessional relationships and solidarity "in view of the approaching medico-political storm."

The R.B. gave its attention to a great many other matters, and in particular through the report by Dr. J. B. Tilley, Chairman of the Public Health Committee, showed its concern with the health of the community. Much of the discussion on several subjects was inaudible to many owing either to defective installation of microphones and loudspeakers or to the bad acoustics of an otherwise excellent hall. Dr. A. Beauchamp, the Chairman of the R.B., had his task made trebly difficult by this great acoustic disadvantage, and on occasion he had to repeat statements two or three times. All this undoubtedly added up to a considerable loss of time over the four days of the A.R.M., but in spite of this handicap the Chairman conducted the business with exemplary fairness and patience. Those Representatives who missed much of what was said from time to time will, it is hoped, be able to fill in the gaps by reading the account of the meeting in the *Supplement*. And if other members of the B.M.A. would read the account they would then be informed of the views on a variety of important subjects held by a representative cross-section of the medical profession.

RUSSIAN VACCINE FOR MULTIPLE SCLEROSIS

An important communication from Moscow appears in the correspondence columns this week (p. 245). It is on the Russian vaccine for multiple (or disseminated) sclerosis, and is signed by Professor George Dick, of the Queen's University, Belfast, who has recently visited the Soviet Union, and Professor A. K. Shubladze, Chief of Laboratory of the Ivanovsky Institute of Virology, Moscow. Professor Shubladze is in complete agreement with the findings of Dick and his colleagues, published recently in this *Journal*,¹ that the virus which is used to make the Russian multiple sclerosis vaccine of Shubladze and Margulis is similar to rabies virus. It is possible to go further than that, for the virus of the vaccine of Shubladze and Margulis is not only similar to rabies but is antigenically indistinguishable from it. This strain of

rabies virus (which is apparently the so-called *street* virus), came from a strain of virus claimed to have been isolated from the blood of a patient with a peculiar acute encephalomyelitis syndrome.² We understand that the original isolates of this virus are to be reinvestigated, but there is no evidence that it is causally related to multiple sclerosis; indeed, there is no satisfactory evidence that any virus is. As to the vaccine, there is no significant evidence of its clinical value either in the U.S.S.R. or in other countries of Europe where it has been tried. Furthermore, as was pointed out in these columns recently,³ the administration of it may possibly be harmful.

The marketing of this vaccine without any reliable evidence of its clinical value is unfortunate. Equally so is the publicity that must have raised the hopes of many sufferers from multiple sclerosis. Patients with this disease should be informed of the nature of the virus from which the vaccine is made, that the vaccine may be dangerous, and that it has not been shown to do any good. It is satisfactory that virologists in the U.S.S.R. and in Great Britain and Northern Ireland have reached such complete agreement on this vaccine and virus, an event that illustrates the great importance of personal exchanges of information between scientists of the two countries. It should also help to remove the vaccine from the political skirmishing that has been its lot in Britain.

TREATMENT OF CERVICAL SPONDYLOSIS

Cervical spondylosis is a term which is sometimes given a restricted meaning. But it is a useful term for all those chronic lesions of the cervical spine in which compression of the spinal cord or nerve roots is brought about by medial or lateral protrusions of the intervertebral disk, or by osteophytic outgrowths from the vertebral bodies and the neighbourhood of the joints of Luschka, where they may encroach on the intervertebral foramen and so compress the nerve roots. These outgrowths probably owe their origin primarily to disk degeneration, and have been found in 75% of a sample of hospital patients.¹ Cervical disk lesions are often associated with disk degeneration in the lumbar region, as might be expected, but the incidence of acute herniation of the nucleus pulposus is very much less in the neck. Not only is the disk much smaller, but the region is subject to very different strains and stresses. Acute herniation may be independent of cervical spondylosis. Because of the proximity of the spinal cord, the symp-

¹ Pallas, C., Jones, A. M., and Spillane, J. D., *Brain*, 1954, 77, 274.

² Clarke, E. A., and Robinson, P. K., *ibid.*, 1956, 79, 483.

³ Cleveland, D. A., *Postgrad. Med.*, 1955, 18, 99.

⁴ Spurling, R. G., *Lesions of the Cervical Intervertebral Disc*, 1956. Springfield, Illinois.

⁵ Brain, W. R., *Ann. Intern. Med.*, 1954, 41, 439.

⁶ Mair, W. G. P., and Druckman, R., *Brain*, 1953, 76, 70.

⁷ Scoville, W. B., *Conn. med. J.*, 1954, 18, 894.

⁸ Odom, G. L., Finney, W., and Woodhall, B., *J. Amer. med. Ass.*, 1958, 166, 23.

⁹ Haynes, W. G., *J. med. Ass. Ala.*, 1956, 26, 261.

¹ Dick, G. W. A., McKeown, Florence, and Wilson, D. C., *Brit. med. J.*, 1958, 1, 7.

² Margulis, M. S., Soloviev, V. D., and Shubladze, A. K., *J. Neurol. Neurosurg. Psychiat.*, 1946, 9, 63.

³ *Brit. med. J.*, 1958, 1, 821.

toms are severe and sudden in onset. There is no divergence of opinion about the need for surgical treatment in such cases. It is in the relief of chronic symptoms and signs that controversy has arisen.

The conditions of cord and root compression are best considered separately; one or other usually predominates. For the treatment of cord compression, E. A. Clarke and P. K. Robinson² concluded that conservative measures should be used at first, and continued if no further progression of symptoms has taken place. Failure to arrest the progress of the condition necessitates laminectomy and division of the dentate ligaments to allow the cord to ride freely over the protrusion. There is a large measure of agreement upon these principles, though some authors advocate traction,^{3,4} while others prefer immobilization.^{2,5} However, the socially unacceptable nature of most cervical collars limits their use to some extent. The most that should be hoped for from surgical treatment is that the progress of the disease may be arrested. W. R. Brain⁵ has pointed out that arrest is often spontaneous, but with surgery it is hoped to bring this about more rapidly and also to prevent extensive cord damage.⁶ He has also drawn attention to the danger of manipulation in these cases.

Many more operations are performed for cervical root compression in North America than in this country. Of 250 patients with cervical spondylosis operated upon by W. B. Scoville⁷ in a period of eight years, all but six had lateral protrusions and osteophytes. G. L. Odom, W. Finney, and B. Woodhall⁸ have just reported a similar number of patients treated over a period of 16 years, of which 72% were of this type. Though good or excellent results are claimed for 84% of lateral disk protrusion, and for 67% of those with foraminal spurs, the length of follow-up is not stated, and—as in some other papers advocating surgery⁹—it is not clear that a later return of symptoms has been excluded. There is a far from negligible risk of producing further damage to the cervical roots and cord when attempts are made to remove osteophytes. On this side of the Atlantic, operation is generally reserved for cases on whom conservative treatment has failed; spontaneous remission is quite common, and most surgeons are cautious in recommending operation. It is essential to differentiate other causes of pain in the upper limb, such as carpal tunnel compression of the median nerve, before concluding that the source is a cervical spondylosis, which may well be present, though unrelated to the symptoms. In the future more reliable operations may be devised, or, better still, means may be found of preventing the condition from developing.

TREATMENT OF IDIOPATHIC THROMBOCYTOPENIC PURPURA

The indications for splenectomy in the treatment of patients with idiopathic thrombocytopenic purpura have never been firmly established. Since the operation was first proposed by P. Kaznelson¹ in 1916, its frequent dramatic success in raising the platelet level and arresting haemorrhage made it the sheet anchor of treatment

for many years. Cure rates of over 90% were reported in some early series of cases, but it later became clear that post-operative improvement might be transient and that relapse might occur months or even years later. A more recent review of the effects of splenectomy in 303 patients with idiopathic thrombocytopenic purpura whose subsequent progress was followed for several years showed complete and lasting remissions in 61%, partial remissions in 17%, and failure in 22%.² Attempts to select patients more likely to benefit from the operation have been made, but neither the presence of eosinophilia and megakaryocytic hyperplasia in the bone marrow nor the existence of detectable circulating antibodies active against the platelets has proved of consistent value in forecasting response.²⁻⁴ Splenectomy has generally been avoided in purpura of acute onset, particularly in children and when there is any possibility that the condition might result from a recent infection or exposure to drugs, because spontaneous improvement is likely in these circumstances. In such cases transfusion with fresh, platelet-rich blood, preferably drawn into plastic or siliconized containers to improve platelet survival, and accompanied by administration of A.C.T.H., cortisone, or prednisone, provides the most satisfactory form of treatment. When purpura continues for several months, despite medical treatment, and in patients with a past history of bleeding episodes, splenectomy is commonly advised, since A.C.T.H. and cortisone, though improving capillary fragility, often fail to increase the platelet count and afford only temporary control of haemorrhage.⁵

Certain recent observations, however, strongly suggest that splenectomy should no longer be regarded as the treatment of choice in chronic idiopathic thrombocytopenia. Disseminated lupus erythematosus has been reported to develop after splenectomy in patients who before operation showed the clinical and haematological pictures of idiopathic thrombocytopenia or acquired haemolytic anaemia, with no manifest evidence of lupus,⁶ and W. Dameshek and his colleagues⁷ now claim that approximately 25% of all patients with apparently typical idiopathic thrombocytopenic purpura in whom the spleen is removed will eventually develop systemic lupus erythematosus. They think it possible that splenectomy in some way aids dissemination of the lupus process, which they believe to be present, in occult form, in many cases of thrombocytopenia. For this reason, and because the effects of splenectomy are in any case poorly predictable, he and his associates carried out a fresh assessment of medical treatment in thrombocytopenic purpura, with particular reference to the effects of prednisone on the bleeding tendency and the platelet count. Thirty consecutive patients, 11 with "acute" and 19 with "chronic" thrombocytopenia, were treated with prednisone in initial doses of 20 to 150 mg. daily. In 22 cases the platelet count rose to normal in 6 to 150

¹ Kaznelson, P., *Wien. klin. Wschr.*, 1916, **29**, 1451.

² Lozner, E. L., *Bull. N.Y. Acad. Med.*, 1954, **30**, 184.

³ Harrington, W. J., *Sang.*, 1954, **25**, 712.

⁴ Stefanini, M., *ibid.*, 1955, **26**, 83.

⁵ Robson, H. N., and Duthie, J. J. R., *Brit. med. J.*, 1950, **2**, 971.

⁶ Dameshek, W., and Reeves, W. H., *Amer. J. Med.*, 1956, **21**, 560.

⁷ ———, Rubio, F., Mahoney, J. P., Reeves, W. H., and Burgin, L. A., *J. Amer. med. Ass.*, 1958, **168**, 1805.

days, and remained well above haemorrhagic levels on maintenance doses ranging from 2.5 to 15 mg. daily. The dosage of prednisone was frequently altered to find the lowest effective dose in each case, and the drug was withdrawn entirely from eight patients without relapse. Prednisone appeared to be much more effective in raising the platelet count than either A.C.T.H. or cortisone in comparable dosage, and the authors now regard it as the treatment to be preferred in both acute and chronic forms of the disease, splenectomy being reserved for the occasional severe cases that fail to respond. The use of prednisone and of splenectomy in the treatment of idiopathic thrombocytopenic purpura offers a close parallel with their use in idiopathic acquired haemolytic anaemia. In both diseases splenectomy is variably and unpredictably successful and has possible concealed risks, and is therefore best postponed until prednisone has proved ineffective or effective only in doses too high to be tolerated for long periods. Provided control can be achieved and maintained with doses of prednisone small enough to avoid serious drug toxicity, this approach seems eminently sensible.

BYSSINOSIS

For nearly two hundred years Lancashire has been identified with cotton manufactures. While these brought wealth and industry, now unfortunately declining, to the population of the crowded mill towns, they also caused an inordinately high morbidity and mortality from chronic respiratory disease. The whole community suffered excessively from bronchitis, which was non-occupational but due to pollution of the atmosphere by the acrid smoke of house and factory chimneys.¹ Certain groups of workers, notably those employed in the processes of preparing the cotton and in the cardrooms and blow-rooms suffered additionally from "asthma," which was occupational and popularly attributed to the irritation of cotton dust. J. Leach,² a certifying surgeon of Heywood, Lancashire, described the disorder in 1863. Since then the disease, byssinosis, has continued to occur, causing chronic ill-health, disablement, and death. In recent years byssinosis has been the subject of extensive researches—clinical, pathological, and epidemiological—by R. S. F. Schilling and his co-workers,³ who have been admirably assisted by the mill owners and by the trade unions. In seeking ways of preventing this disease, or at least of minimizing its effects, occupational health workers must first estimate its prevalence and identify its cause or causes, and this entails a critical differentiation of occupational from non-occupational cases of chronic bronchitis. Schilling and his colleagues concluded that the symptom complex of chronic bronchitis is not the same as that of byssinosis, for whereas men with chronic bronchitis develop tightness of the chest whenever they are exposed to an irritating concentration

¹ Lane, R. E., and Campbell, A. C. B., *Brit. J. industr. Med.*, 1952, **11**, 118.

² Leach, J., *Lancet*, 1863, **2**, 648.

³ Schilling, R. S. F., Hughes, J. P. W., Dingwall-Fordyce, I., and Gilson, J. C., *Brit. J. industr. Med.*, 1955, **12**, 217.

⁴ Report of the Industrial Injuries Advisory Council, *Byssinosis*, 1956, Cmd. 9673, H.M.S.O., London.

⁵ McKerrrow, C. B., McDermott, M., Gilson, J. C., and Schilling, R. S. F., *Brit. J. industr. Med.*, 1958, **15**, 75.

of any dust, in the early stages of byssinosis the workers are affected only by cotton dust and only on Mondays or on the day immediately following absence from work. They divided the disease into two stages—grade I in which chest tightness and/or breathlessness occur on Mondays only, and grade II in which chest tightness and/or breathlessness occur on Mondays and other days. But even in grade II the symptoms are worst on Mondays. This means that the occurrence of Monday symptoms,⁴ previously called "Monday feeling," is the specific characteristic in the diagnosis of byssinosis.

In 1956 the Industrial Injuries Advisory Council reported that although an experienced observer visiting the cotton mill on a Monday might be able to decide with some assurance whether a person was experiencing the symptoms of byssinosis (grade I), there was no simple objective test by which the disorder could be distinguished. C. B. McKerrrow and his colleagues⁵ have recently sought to discover such an objective test. In a carefully planned study, which is another example of the excellent scientific work initiated by Dr. R. S. F. Schilling and supplemented by the Medical Research Council's Pneumoconiosis Research Unit at Cardiff under the direction of Dr. J. C. Gilson, they measured respiratory functions by the accepted modern methods; these included indirect maximum breathing capacity (M.B.C.), maximum voluntary ventilation (M.V.V.), and peak inspiratory and expiratory flows coupled with an airways resistance (A.W.R.). The results showed distinctive specific patterns for both grades of byssinosis and for the controls. McKerrrow and his colleagues concluded that the mill dust—quantitatively as well as qualitatively—is the cause of the respiratory impairment and that it contains some pharmacologically active constituent. This work marks an important advance towards the establishment of a practical objective test for the detection of the earliest stage of the disease, especially as the specific changes in M.B.C. and A.W.R., but of less degree, were discovered among cotton workers without clinical byssinosis.

DIAGNOSIS OF ACUTE PANCREATITIS

The consensus of opinion at the present time is that operation should be avoided in acute pancreatitis.¹ Such a view presupposes a correct diagnosis. Unfortunately this is seldom easy, especially since the disease is uncommon compared with such conditions as perforated peptic ulcer, gall-bladder disease, intestinal obstruction, and myocardial infarction, from all of which it has to be differentiated. The most widely used laboratory aid in diagnosis is the level of the serum amylase, but this test has several disadvantages. Normal values do not necessarily imply the absence of acute pancreatitis, while levels above 200 Somogyi units, which can be regarded as the upper limit of normal, may occur in a variety of conditions, including those already mentioned.² Never-

¹ Richman, A., *Amer. J. Med.*, 1956, **21**, 246.

² Burnett, W., and Ness, T. D., *Brit. med. J.*, 1955, **2**, 770.

³ Cherry, I. S., and Crandall, L. A., Jr., *Amer. J. Physiol.*, 1932, **100**, 266.

⁴ Keith, L. M., Jr., Zollinger, R. M., and McCleery, R. S., *Arch. Surg.* (Chicago), 1950, **61**, 930.

⁵ Pfeffer, R. B., Mixer, G., Jr., and Hinton, J. W., *Surgery*, 1958, **43**, 550.

theless a serum amylase concentration above 400 units is strongly suggestive, especially when accompanied by hyperglycaemia (which is seen in about half the cases) and by a leucocytosis with a relative lymphopenia. The rise, however, is short-lived and seldom lasts longer than 48 hours. An increase in blood lipase occurs later and is more persistent; this enzyme is relatively simple to estimate.³

Various other tests have been used. The serum calcium concentration is said to fall, presumably owing to combination of calcium with the fatty acids liberated by hydrolysis, but this usually implies a very poor prognosis. Some help may be obtained by radiography of the abdomen, especially if dilated loops of jejunum are seen round the area of the pancreas. A procedure which has recently been used with some success is to attempt to aspirate fluid from the peritoneal cavity.⁴ For this purpose a trocar and cannula are inserted into the flank, and a fine polythene tube is threaded through the cannula as far as possible in a cephalic direction.⁵ The cannula is then removed, so that the patient can be turned into various positions while an attempt is made to aspirate fluid. A positive diagnosis depends on the withdrawal of a haemorrhagic exudate with a very high content of amylase. This method too has its drawbacks, the main one being failure to obtain a sample, but it is at least simple and free from danger. It is worth considering in any patient in whom the question of acute pancreatitis arises, but it cannot yet be said that there is a reliable way of confirming the diagnosis of this serious disease.

HORMONE-INDUCED SEX CHANGES

The theory of sex determination by hormonal control is as old as Voronoff, but direct experimental evidence of this possibility is comparatively recent. Foetal intersex of various types can now be produced relatively easily in most laboratory animals by the administration of androgens to the mother, and there is accumulating evidence that similar effects may be reproduced inadvertently in the human female. G. Nellhaus¹ reports the case of a woman who had received a total dosage of 2 g. of methyltestosterone for habitual abortion, and who subsequently delivered a typical female pseudohermaphrodite, and he cites five other cases from the literature. Similar results are described following progesterone therapy for the same condition by other authors.^{2,3}

Up to the tenth week of gestation the two sexes share the common indifferent genitalia, differentiation into male and female appendages taking place within the next six weeks. A. Jost⁴ has shown that before this stage the genitalia are particularly susceptible to hormonal influence. The normal basic neutral structure is female, as in the ovum, future differentiation being directed by the testis, acting mainly through its testosterone secretion. Androgens administered to the mother at this

crucial stage pass easily through to the foetus in rather high concentration, and any excess may cause changes in its sensitive external organs. If the genetic sex is male, the added androgen will have little effect beyond reinforcing the natural testosterone and perhaps producing temporary genital hypertrophy. If, however, the sex chromosome addition is female, such treatment may easily simulate the hormonal effects of normal testicular development, with the production of a type of intersex such as pseudohermaphroditism. The same effect may be produced with progesterone (which is used much more widely than the androgens for threatened abortion) through its partial conversion into testosterone during normal metabolism. Here, however, the total amount of androgen released is relatively small, 1 mg. of progesterone being equivalent, according to J. K. Lamar,⁵ to 0.03 mg. of testosterone, so that its administration in the usual therapeutic dosage should be fairly safe. This cannot, however, be said for testosterone itself. Experimental and clinical observation shows that pregnant women taking large amounts of the hormone, particularly during the third and fourth months, may deliver a baby with abnormal external genitalia. Such treatment is anyway of doubtful therapeutic value, and in view of the inherent dangers it is probably unwise in any circumstances during early pregnancy.

MORE POLIO VACCINE

The Medical Research Council has produced compelling evidence^{1,2} that a third, or booster, dose of poliomyelitis vaccine is needed to maintain circulating antibody at levels likely to confer protection. Its results agreed with those of several American studies, which were discussed last year in these columns,³ where the suggestion was made that children who had had two doses should be offered a booster in the spring. Unfortunately this apparently was impossible. The Government's hope that supplies for this purpose will be available in the autumn, expressed by the Minister of Health last Monday, is therefore welcome. The offer of vaccination is also to be extended to people aged up to and including 25, and to a wider range of hospital staffs and their families. The Minister and the Secretary of State for Scotland are to consult with the B.M.A. and local authority associations on the details of continuing this elaborate campaign in preventive medicine.

Whether further doses beyond the third will be needed to maintain immunity has yet to be discovered, for much mystery still surrounds the nature of immunity and the relation between level of antibody and the protection it confers.⁴ The studies that are now being carried out may throw light on that within the next year or so. But, owing to the complex administrative arrangements that must of necessity be made to give these injections, it is a possibility worth keeping in mind. If the disease is to be reduced drastically, as diphtheria has been, for instance, very large numbers of inoculations may have to be performed, at least for some years.

¹ Nellhaus, G., *New Engl. J. Med.*, 1958, 258, 935.

² Reilly, W. A., Pickering, D. E., and Crane, J. T., *Amer. J. Dis. Child.*, 1958, 96, 9.

³ Wilkins, L., and Jones, H. W., *Pediatrics*, 1958, 21, 513.

⁴ Jost, A., in *The Comparative Physiology of Reproduction and the Effects of Sex Hormones in Vertebrates*, p. 237, ed. I. C. Jones and P. Eckstein, Cambridge, 1955.

⁵ Lamar, J. K., *Anat. Rec.*, 1937, 70, Suppl. 45.

British Medical Association

ANNUAL MEETING, BIRMINGHAM, 1958

SUMMARY OF PROCEEDINGS

FIRST PLENARY SESSION—REHABILITATION

Wednesday, July 16

The chairman, Dr. DONALD STEWART (Birmingham), emphasized that rehabilitation was a subject of importance to medical practitioners in every field, and hence the wide range of interests represented by the opening speakers, who were respectively a professor of medicine, an orthopaedic surgeon, a psychiatrist, a physical medicine consultant, and an industrial medical officer.

Professor R. E. TUNBRIDGE (Leeds) said that his purpose was to show the need for the profession to apply the lessons with which it was familiar. Rehabilitation was a professional responsibility, and as a profession we should press for the provision of a more complete service, particularly for all forms of planned convalescence. The changing practice of medicine and the changing structure of society had created both new problems and new opportunities. With an increased expectancy of life at birth more people were now living long enough to contract the chronic disabilities of the second half of life, particularly heart disease, cerebrovascular and peripheral vascular disorders, arthritis, chronic chest diseases, and mental disorders. This constituted a new problem, that of medicated survival. Rehabilitation was an attitude of mind, and much of value could therefore be achieved if the medical profession was alive to its responsibility. Many doctors considered it only as a problem after trauma, but in fact disability directly attributable to trauma constituted less than 25% of total disability at the present time, while 75–80% was due to the so-called internal diseases. Official sources tended to underestimate the size of the problem. The few detailed surveys carried out in this field showed that nearly one-sixth of the patients discharged from a general hospital were unsuitable for full employment, while about one-third were still at home three months after discharge. Social factors interfering with recovery seemed to assume greater prominence between the ages of 45 and 54 years. On reaching retiring age some 25% of men and 14% of women were chronically sick and a further 25% of men and 30% of women gave ill-health as their chief reason for retirement on reaching pensionable age. There was evidence to suggest that in the interest of health every year some 40,000 men between the ages of 55 and 64 years might with benefit change their job to a more suitable form of employment. Ministry of Labour industrial rehabilitation units had been concerned chiefly with industrial problems and with late results rather than with the early stages of disability, but the B.M.A. committee had suggested that there was an unnecessary amount of ill-health and unrelied disability in the period of one to six months after the onset of disability. The report of the Ministry of Health inquiry into the reason for prolonged ill-health of three to six months' duration would be studied with great interest.

Value of Customary Activities

Mr. L. W. PLEWES (Dunstable), speaking of rehabilitation as seen by the surgeon, said that during the war the need to salvage every possible pair of hands had reawakened interest in rehabilitation, and tremendous strides had been made in Britain, which still led the world in this field. It was, however, easier to convince the general public about the need for rehabilitation in a time of full employment than when times were bad. It should never be forgotten that the best form of rehabilitation was normal activity. We should pander more to a man's belief that he was important in his work. Most difficulties could be overcome if we took the

trouble to work out a solution and persuaded the employer to apply it. For example, the man with a Colles fracture did not get a stiff wrist, wasted muscles, or a frozen shoulder if he used his hand in a normal or near normal manner while in plaster. Furthermore, he lost no morale and maintained confidence in his own usefulness to the community as well as averting financial hardship. Finally he achieved a perfect functional result. A man kept at work through the period of his disability never risked the shattering of the illusion that he was indispensable in his job. Only two types of case required admission to a rehabilitation centre. First, those with a severe fracture, say of femur or of tibia and fibula, or with multiple injuries and considerable disability. In these cases the test of fitness to return to work was the ability to get on and off a bus. Secondly, there were patients with a severe and prolonged disability such as hemiplegia, paraplegia, crippling joint disease, or progressive neurological disorder, and these had to learn how to live with their disability.

Mr. Plewes found that to provide a comprehensive rehabilitation service for a population of 250,000 the requirements were a hospital rehabilitation centre designed to cater for 50–60 people, a similar centre located in the largest local industry, an occasional place for in-patient accommodation in a regional centre, an occasional place in a regional industrial rehabilitation unit and training centre, and a sheltered workshop for the employment of at least 50 people. Ideally there should also be a unit for helping the disabled housewife. There was in his opinion a strong case for introducing an industrial medical officer into the staff of the Accident Service and rehabilitation centre so that he could follow his cases right through treatment while working in his factory.

Psychiatric Rehabilitation

Dr. MAXWELL JONES (Sutton) indicated the importance of the modern tendency to treat mental illness in the community at home rather than in hospital, and he expressed his pleasure that similar trends were becoming apparent in the field of general medicine and surgery. In psychiatry, rehabilitation and prevention were part of the same process, and the primary need for rehabilitation in this sphere was the training of doctors in social medicine. The advent of the Welfare State had solved many of the patient's worries. However, too many patients now tended to wait for something to be done to them, and the social services had taken the place that the family used to hold in after-care. The artificial separation of treatment and aftercare services made the management of preventive psychiatry difficult. This difficulty had been overcome, however, in the few instances where integration had taken place between the local authority and local mental health services.

Most mental hospitals had a static pool of aged patients occupying beds. This could often be avoided if a request for admission was met by a visit to the patient at home by the psychiatrist and the psychiatric social worker. Under these conditions it could be indicated from the start that the family must assume responsibility. It could be made clear, for example, that the patient would only be staying in hospital for a short time while receiving some physical treatment. Often the patient could go to a 'day hospital' while the relatives attended to their jobs, and similar arrangements could be made for holidays. These methods of management led to a change in the family's attitude to their problem, and the patient could often play a useful part in the life of the family.

Importance of Team Work

Dr. F. S. COOKSEY (London) traced the evolution of rehabilitation in Britain through the present century. Now, in its sixth decade, we were trying to implement the legislation made in the fifth. When one considered in detail the number of doctors and ancillaries involved in the rehabilitation of a single patient one was led to question whether it would not be wise to broaden in each case the scope of the interests involved so that there was wittingly some overlap. Although it was necessary to implement the complicated statutory

¹ Report to the Medical Research Council, *Brit. med. J.*, 1957, 2, 1207.

² — *ibid.*, 1958, 1, 1206.

³ *Ibid.*, 1957, 2, 1229.

⁴ *Ibid.*, 1958, 1, 1227.

mechanism which made rehabilitation available to all who needed it, there was no need for restrictive practices in medicine. No one doctor was ever in absolute control of a case, not even the general practitioner, and team work was therefore essential. Procedure should be simplified wherever possible. Some overlapping of the responsibilities of the ancillary workers would also be of advantage, since this would tend to relieve the shortage of such invaluable people as physiotherapists, occupational therapists, almoners, and other social workers. These aims could largely be satisfied by the extension of the use of resettlement clinics, both industrial and social, where all interested parties met to discuss the problems concerned from the earliest stages of illness right up to the time of final resettlement.

Forward planning was essential. As soon as a long-term case, such as a severe fracture or hemiplegia, was seen to be safely through the emergency period an inspection should be made of the home conditions so that an accurate assessment could be made of the physical difficulties which would face the patient on returning home. The necessary team of workers could then be mobilized and effective plans made for the home-coming of the patient long before the event. This system of forward planning had the great advantage of suggesting at the earliest possible moment to both the patient and the relatives that return home was not only desirable but inevitable, and the patient was never allowed to acquire the idea of staying permanently in bed. Dr. Cooksey agreed with Dr. Maxwell Jones that day centres were necessary, not only for psychiatric cases but also for those with physical disabilities.

Back on the Job

Dr. A. A. WHITE (Birmingham), speaking of rehabilitation from the viewpoint of the industrial medical officer, said that sooner or later after the primary treatment of illness or injury had been completed the patient had to be advised on the effect any residual disability might have on his normal activities and particularly on his job. Even when full resumption of normal activities could be legitimately anticipated it was important that the patient should be made to understand this, because unjustifiable anxiety might handicap recovery and even lead to the seeking of modified employment which was not to his ultimate advantage. The problem of advising the incompletely recovered patient was far more difficult, particularly as recovery of working capacity did not automatically proceed in step with organic recovery from illness or injury. The industrial medical officer rarely found that employees returning to work after illness or injury had any good understanding of the effects of their illness, although the majority were well informed regarding the nature of their disability and the treatment they had received.

Clinical examination procedures, however carefully performed, were designed to detect disease and did not, except at the extremes of disablement, enable accurate conclusions to be drawn about working capacity or occupational prognosis. The experience of the past ten years had led Dr. White to conclude that, at the end of treatment and convalescence as we knew them at present, insufficient evidence about residual fitness existed to allow the making of an accurate occupational assessment of the partially fit. The disablement following illness or injury consisted of three components—organic, that due to disuse, and psychological. Under existing conditions of medical aftercare all these contributed to the reduction of the patient's occupational capacity when he returned to work. The three components could be separately influenced and disablement reduced by a planned rehabilitation programme. This included a direct study of the true effects of the organic component on occupational capacity, retraining by stages to eliminate fatigue and loss of particular skills, together with careful explanation, reassurance, and encouragement to allay anxieties. A positive rehabilitation policy gave to the patient an understanding of the true limits imposed by his disability, an optimum physical and psychological adjustment to residual disability,

ment, together with a knowledge of the safe range of future activity. In addition such a policy provided physical reconditioning and recovery of work habits with restoration of self-confidence. The doctor and the employer benefited by the acquisition of reliable information in terms of the actual working capacity of the patient, his level of skill, and his attitude and adjustment to his work. A serious criticism of objectives in treatment as they existed, particularly in hospitals, at the present time was that the total well-being of the patient tended to be lost sight of through too great a preoccupation with the actual disease and its treatment as an end in itself.

In expressing the appreciation of the audience Professor P. C. P. CLOAKE (Birmingham) reiterated the fact that rehabilitation had many aspects and many concepts depending entirely on the type of case to be dealt with. Adequate medicine consisted not only in treating acute episodes and then awaiting relapse but in active prophylaxis of future breakdown by careful rehabilitation from the earliest stages.

SECOND PLENARY SESSION—CHEMOTHERAPY OF INFECTIONS

Thursday, July 17

In his opening remarks the chairman, Professor D. M. DUNLOP (Edinburgh), briefly reviewed the successes and limitations of chemotherapy for infection. Its use had in two decades changed the face of medicine, with important social consequences. Many infectious diseases, however, were still beyond its influence, and superinfection with resistant organisms, especially *Staphylococcus aureus*, presented a growing problem in hospitals. The range of available agents was increasing, but thought and restraint were essential in using them.

How the Bacteriologist Can Help

Professor J. W. HOWIE (Glasgow) discussed three questions on which the bacteriologist could help the clinician in his application of chemotherapy. (1) *Which infections should be treated with antibiotics?* Penicillin was the drug of choice for erysipelas, scarlet fever, acute pharyngitis, and acute cellulitis, which were caused (or usually caused) by *Streptococcus pyogenes*; also for lobar pneumonia, gonorrhoea, syphilis, yaws, anthrax, and actinomycosis, and often for puerperal sepsis, meningitis, antral infections, bronchopneumonia, endocarditis, and septic fingers, which might be caused by *Str. pyogenes*. Sensitivity testing of bacteria isolated from the lesion was an important guide to treatment, though penicillin might reasonably be given before the results of bacteriological tests were known. Plague and tularaemia were best treated with streptomycin, typhoid and paratyphoid fever with chloramphenicol, typhus and undulant fever with chloramphenicol or tetracycline, meningococcal meningitis with sulphonamides, malaria with quinine, mepacrine, or proguanil, and trypanosomiasis with tryparsamide, suramin, and melarsen. (2) *Why antibiotics did not always succeed.* No drug, said Professor Howie, could succeed if the infecting organism was insensitive; into this group fell the viruses, and also resistant strains of bacteria, such as the staphylococci. The anatomy of the part and the pathological nature of the lesion could defeat chemotherapy even if the causal agent was sensitive; in necrotic bone, for example, or in urinary infection complicated by retention of urine. With certain exceptions—for example, bacterial endocarditis—these problems could not be solved by massive dosage or by combined therapy, and they were aggravated by the use of weak imitators of the major antibiotics. (3) *When antibiotics should not be used.* There was a place, said Professor Howie, for chemoprophylaxis in the surgery of infected tissue, for example, and in the control of rheumatic fever; but prophylaxis was out of place for clean operations or simple wounds and for normal labour. An antibiotic must not be used when a patient gives a history of sensitivity to it, and antibiotics

should never be used as a substitute for asepsis. Finally, it was important that the doctor should understand the pathology and bacteriology of the infection he was treating.

Non-tuberculous Pulmonary Infections

Professor C. H. STUART-HARRIS (Sheffield) spoke on the chemotherapy of non-tuberculous pulmonary infections. He said that the respiratory tract was probably subject to attack by a wider range of organisms than any other. Chemotherapy had achieved great successes in this field, but also suffered from defeats, and there were no rules of treatment which could replace diagnostic acumen and vigilance. The prognosis for pneumonia had been transformed by chemotherapy; mortality had fallen (though this fall began before the sulphonamides were introduced), and lobar pneumonia had also become less common in hospital practice. It was now the pneumonias of old age and of those with diseased lungs which were predominant. The clinical presentation of pneumonia had changed, many cases with radiological changes showing no consolidation. Of cases in which consolidation was present 20 to 50% had no pathogenic organisms in the sputum, but their response to chemotherapy was no different from that of the cases which yielded pathogens; a viral aetiology was therefore not to be assumed in these cases, and chemotherapy should begin at once if there was consolidation. Pneumococci were the commonest infective agents, and clinical trials had shown that penicillin, the tetracyclines, and chloramphenicol had similar therapeutic value in pneumococcal pneumonia; penicillin, which had the least toxicity, was therefore favoured. Streptomycin was useful for pneumonia due to coliform bacilli, and nystatin possibly useful for fungal pneumonias.

Failure of chemotherapy, as shown by the 5% of patients who died, was attributable to various factors, including age, heart disease, previous lung disease, and delay in starting treatment. In the recent influenza epidemics staphylococci were the commonest organisms associated with pneumonic complications, and many were resistant to antibiotics; but patients often died from this fulminating infection even when the organism was sensitive. Early diagnosis was aided by the examination of Gram-stained films of sputum, and treatment should begin at once with penicillin, streptomycin, and (in severe cases) erythromycin, modified later if necessary.

Apart from influenza, psittacosis, and Q fever, virus pneumonias were mostly trivial. There was little evidence that antibiotics would affect their course; penicillin and tetracycline, however, were active against the virus of psittacosis and the rickettsia of Q fever, and antibiotics should not be withheld unless infection was trivial or identifiable as "atypical" or virus pneumonia. Although acute bronchitis in children was often caused by viruses, antibiotics should, in general, be used for the control of concomitant bacterial infection. Exacerbation of chronic bronchitis in adults was not associated as a rule with any change in flora, and a virus was probably responsible. The value of chemotherapy was therefore limited, but chloramphenicol or preferably oxytetracycline was worth using, as it diminished the amount of sputum and coughing. Indications for prophylactic use of antibiotics to prevent exacerbations were more doubtful.

Chemotherapy for Pulmonary Tuberculosis

Professor JOHN CROFTON (Edinburgh) spoke on chemotherapy for pulmonary tuberculosis. He said that the right use of modern methods of chemotherapy made it possible to aim at 100% success in the treatment of this disease. Deaths from tuberculosis had fallen dramatically since the introduction of chemotherapy in 1947-8, and hospital statistics showed that the incidence of new cases was also falling. Prophylactic chemotherapy might be considered (a) in children with a positive tuberculin test as the only evidence of infection, (b) in adolescents with strongly positive tuberculin tests but no detectable disease, and (c) in

patients with lung lesions of doubtful activity. As regards the first of these indications, a controlled trial in the United States had shown that 0.7% of children under 1 year of age treated with isoniazid later developed clinical tuberculosis, compared with 3.3% of untreated controls. For these, prophylaxis was probably justifiable, but for older children and for those in groups (b) and (c) treatment was best left until signs appeared.

In active tuberculosis chemotherapy was always indicated. For mild cases with negative sputum bed rest was found, by controlled trial, to be unnecessary (provided supervision was good). Infectious cases, however, should always be treated in hospital until their sputum was negative; in many cases this would take no more than three or four months. All the patients in a series studied in Edinburgh had negative sputum after 10 months of treatment, and there were no relapses in patients who had been treated for 18 months. Tubercle bacilli could not be isolated from lungs resected more than 18 months after the beginning of treatment. The situation was quite different if the organism was resistant to two or more of the standard drugs, and an effective scheme of combined therapy was essential in order to prevent the emergence of resistance during treatment—e.g., streptomycin (1 g.) daily, and P.A.S. (5 g.) and isoniazid (100 mg.) twice daily until the sensitivity pattern was known, when P.A.S. might be omitted if the other agents were active. For treatment at home the oral drugs, isoniazid and P.A.S., were more convenient. Corticosteroids given with chemotherapy might be helpful in very ill patients.

As a result of chemotherapy, collapse therapy had been largely given up and surgery was less often required. The older methods of treatment and less effective drugs (viomycin, pyrazinamide, cycloserine, and tetracycline) were necessary if the organisms were resistant to the standard drugs. Professor Crofton concluded by saying that in no disease was good doctoring more necessary than in tuberculosis.

Intestinal Infections

Professor A. C. FRAZER (Birmingham), speaking on chemotherapy against intestinal organisms, considered first the pathogens. For the treatment of dysentery, sulphonamides were effective, but should preferably not be given in the form of poorly absorbed compounds; drugs which are absorbed, such as sulphadiazine, were more capable of reaching the organisms and probably more effective. A loading dose should be given and treatment should be continued for several days after symptoms disappeared. The tetracyclines (preferably oxytetracycline) were also effective in the treatment of dysentery; for more vigorous treatment with these drugs it was better to shorten the interval between administrations than to increase the dose. For typhoid and, to a less degree, paratyphoid fever, chloramphenicol was effective; the toxic risks had been exaggerated. Food poisoning was usually due to toxins (e.g., of *Staph. aureus*), and for these chemotherapy did not help, but for salmonella infections chemotherapy—chosen by reference to sensitivity—was desirable. For infantile gastroenteritis associated with specific serological types of *E. coli* neomycin was the drug of choice.

Professor Frazer considered next the normal flora of the large intestine. *E. coli*, *Bacteroides*, and (variably) streptococci, clostridia, staphylococci, lactobacilli, *Pseudomonas*, and *Proteus* were, under normal conditions, non-pathogenic, but dangerous if allowed to invade the tissues (e.g., at operation); non-absorbed agents (e.g., neomycin with phthalyl sulphathiazole) given by mouth provided a relative freedom from bacteria within 48 hours, and were suitable for preparatory treatment before operation on the bowel. The normal flora of the gut had various effects—the production of stercobilin from bile pigments and of cholic acid from bile salts, the depolymerization of mucin, the synthesis of vitamin B complex and vitamin K, and digestion of cellulose, sugars, and other food components. These activities, which contributed nothing significant to the

normal body economy, were inhibited by antibiotics that eliminated the gut flora. It was probably desirable to administer vitamins under these conditions, and a preparation of antibiotic-resistant lactobacilli ("enpac") might be useful in preventing the replacement of the normal gut flora by potentially dangerous resistant organisms (e.g., *Staph. aureus* or *candida*). Increased activity of gut organisms and colonization of the small intestine could be seen in sprue and other forms of the malabsorption syndrome. Persistent steatorrhoea, which sometimes followed the acute phase of sprue, could be successfully combated by antibacterial therapy; in the acute phase, treatment with folic acid was usually successful and chemotherapy valueless.

In answer to questions, Professor Frazer said that nystatin might be used in prophylactic treatment of the bowel when *Candida albicans* was abundant. Professor HOWIE said that it was better to use neomycin and bacitracin than penicillin and tetracycline for local application; bacteria did not readily acquire resistance to them, and they were not likely to be given parenterally.

THE SECTIONS

SECTION OF MEDICINE

Monday, July 14

Poliomyelitis: the Present Position

At the first session of the Section of Medicine the subject discussed was "Poliomyelitis: the Present Position." The president, Professor W. MELVILLE ARNOTT (Birmingham), asked Professor MAX ROSENHEIM (London) to take the chair.

Dr. W. RITCHIE RUSSELL (Oxford) said that the sharp increase in the incidence of poliomyelitis in 1947 had offered opportunities for clinical study of the disease, of its early signs, and of the life-saving measures used in treatment, in particular those designed to overcome respiratory failure. After 1950 the separation of paralytic from non-paralytic cases for notification purposes had yielded more reliable figures, both of incidence and of mortality, and advances in treatment had been such that there was now little difference in mortality rates between epidemics. About 20-30% of paralytic cases were "life-threatening," but the actual fatality rate was now about 5%, a reduction which posed special problems in so far as the seriously handicapped survivors were concerned.

Management of Respiratory Paralysis

Centres with very experienced staff had now been established for the reception of the most dangerously ill patients. These fell into three groups. (1) Patients with simple paralysis of respiratory muscles. For these the modern tank respirators were adequate, provided they were used before breathing became seriously embarrassed. (2) Patients with the bulbar type of disease. Here paralysis of swallowing was highly dangerous and its early recognition was extremely important. Such patients were especially suitable for treatment in special units from which a team could often be sent to supervise their removal to hospital. The patients should be transported prone or semi-prone, with the feet raised; they should be under constant supervision and suction apparatus should be available. Maintenance of a good airway required postural drainage and often tracheotomy. Good recovery was possible even from a state of profound stupor. (3) Patients with both bulbar and intercostal paralysis. Here tracheotomy with a cuffed tube was best combined with intermittent positive-pressure respiration through the tube. This was efficient, eased changes of posture for physiotherapy, and enabled the patient to be transported long distances and to be nursed more satisfactorily on a tilting bed. Splints were troublesome in life-threatening cases, and, if passive movements were carried out each day for a few months from the very beginning, tight painful muscles would not develop. Though rest was important at first, it should not be carried to the extent of

allowing weak muscles to shorten. If poliomyelitis decreased in the future, similar principles would still apply to the treatment of other diseases in which respiratory failure was a feature.

Epidemiology of Poliomyelitis

Professor G. W. A. DICK (Belfast), discussing the epidemiology of poliomyelitis, pointed out that of the three types of virus type 1 was responsible for 80% of the paralytic cases. Infection with all three types of some clinical degree was very common. Spread was by person-to-person contact, and children, in whom multiplication of the virus in the alimentary tract was greatest, were an important source of infection. There was no evidence that animals or birds played any part in the spread of the disease. After infection, virus remained in the throat for a few days and in the faeces for several weeks, and it was evident that certain families ("hot" families) were particularly susceptible to the spread of the virus and particularly capable of transmitting the disease. When one member of a family was infected practically all the others became infected, even if no clinical signs appeared, but whether infection was mainly from oropharyngeal or faecal virus had not yet been fully established. The "hot" families spread the disease with ease, but parallel with these were some clinical infections among "cold" families which were capable of producing immunity. It was not possible to prevent infection, but contact with the affected child and its siblings could be limited by quarantine. Live virus vaccination was so far suitable only for experimental purposes, since there was some evidence that when given by mouth an avirulent vaccine might show increased virulence on excretion. It was still not known why an epidemic occurred, but it was not owing to change in virus strains and was probably owing to change in the host.

Diagnostic Problems

Dr. J. F. GALPINE (Coventry) discussed three diagnostic problems of poliomyelitis. The first was the recognition of non-paralytic poliomyelitis, which was an example of an aseptic meningitis of viral origin. The C.S.F. was clear and contained 10 to 500 cells, with a predominance of lymphocytes and a slight increase in protein. Similar findings might be seen in mumps, benign lymphocytic choriomeningitis, and glandular fever. If such cases occurred in epidemic form without paralysis, then the Coxsackie or ECHO viruses might be responsible. Certain non-viral diseases, such as leptospiral infection, gave a similar picture, but the E.S.R. was high, the conjunctiva inflamed, the urine contained albumin, and antibodies were demonstrable in the blood. Tuberculous meningitis was a steadily progressive disease, with later development of cranial nerve palsies and characteristic chemical changes in the C.S.F. Partially treated septic meningitis and extrameningeal infections might also be confusing.

The second diagnostic problem was benign myalgic encephalomyelitis. This was a disease of unknown cause, but had a widespread distribution. It was not a fatal disease, but it had some sequelae and was associated with severe muscle pain, muscular twitchings, paresis and spasm, and a normal C.S.F. in over 50% of cases. The electromyogram might show abnormal grouping of motor unit potentials hitherto unknown. Dr. Galpine described an outbreak at Coventry and also the Royal Free Hospital epidemic. Occurring sporadically, these cases might often be labelled "paralytic poliomyelitis" or "hysteria." The third problem was polioencephalitis. This might occur without evidence of paralysis, with symptoms such as confusion, day-dreams, flights of ideas, and the clinical picture of an encephalitic state affecting cerebrum, brain stem, or cerebellum. As these were non-paralytic cases, the problem was how they should be notified.

Poliomyelitis Vaccine

Dr. JOHN KNOWLEDEN (London) described the present situation so far as formalin-killed poliomyelitis vaccine was con-

cerned. He drew attention to the difficulties of assessing results of vaccination if a large group of patients were subjected to such a procedure without previous careful assessment. It had taken 50 years to clarify the situation regarding typhoid vaccine. Good controlled studies of the Salk vaccine showed that, among 200,000 children vaccinated in a blind trial, attack rates of paralytic poliomyelitis were only 28% of those among 200,000 children given a placebo. Investigations with British vaccine had shown that in the younger children (up to 5½) there was 80% better protection, and in the older children (5½ to 9) 84%, but the numbers were very small. Both in Britain and in America there was hardly any difference in the incidence of non-paralytic poliomyelitis in the two groups, so that with this vaccine it was unlikely that the reservoir of infection in the community would be reduced. Vaccination was now carried out in Britain with two doses, with about four weeks between them, and it had been shown that a third dose six months later gave a bigger boost to antibody response than the second dose did. There had been no major catastrophe since the Cutter incident. It was still unknown whether the higher antibody response gave greater protection against paralytic poliomyelitis, what the optimum antibody level was, and for how long the effective antibody level remained. It would be a pity to take widespread action in ignorance of these facts, because as yet no attempt had been made to find out the answers.

In the discussion which followed Professor ARNOTT raised the question whether a centre dealing with patients with respiratory paralysis was best situated in isolation or whether it should be in closer contact with a general medical unit, bearing in mind the complex physiological problems involved.

Dr. T. W. LLOYD (Malvern) asked if vaccination should be given to those in a family who had been in contact with cases, and Professor DICK thought that this should be done.

In reply to Dr. NATHAN WALDMAN (Wolverhampton), Professor DICK said that he did not think that swimming-pools should be closed if the numbers admitted were limited and supervision prevented the swimmers from becoming physically exhausted.

Dr. R. M. S. MCCONAGHEY (Dartmouth) asked if, in view of the copious discharge of sewage into rivers and the sea, bathers were not in some danger. But Professor DICK considered the dilution factor to be far too great for this to be very real.

Dr. ROSITA R. RAMIREZ (Philippines) said that antibody studies showed that in young children from 5 to 9 there had been 95% infection. Dr. J. D. COTTRELL, of the World Health Organization, felt that in view of the high incidence of poliomyelitis in certain overseas communities immunization should be advised for all young adults going abroad.

Tuesday, July 15

The Physician and Hospital Planning

In introducing the subject "The Physician and Hospital Planning," the chairman, Professor W. MELVILLE ARNOTT, said that medical men had to take an intelligent and constructive interest in the tools of their trade, the places in which they worked, and the devices which they used. There were arrears of hospital construction to be overtaken, and it would be of great interest to hear the views of the four distinguished speakers who were to discuss the subject. They were: Dr. G. E. GODBER (Ministry of Health), Mr. L. FARRER BROWN (Nuffield Foundation), Professor T. McKEOWN (Birmingham), and Dr. J. FRY (Beckenham).

Hospital Surveys

Dr. GODBER, reviewing the early planning for hospital services, said that the most significant contribution was a series of surveys of hospitals covering the whole country and sponsored jointly by the Nuffield Trust and the Ministry of Health. One general point of great importance which emerged from the independent consideration of each of ten

surveying teams was the concept of the area general hospital. This was to provide all the ordinary range of specialties for a natural group of the population and was to be linked with regional special centres. For the first time in Britain hospital planning effectively got away from the design of a hospital of some empirically determined size and was thought of as a community service. The next attempt at large-scale planning was an office study which eventually led to the publication by the Ministry of Health of the "Memorandum on the Development of Consultant Services." That was the work of a group of senior consultant advisers drawn mainly from provincial teaching centres.

Thus regional boards had two kinds of preliminary survey to help them, but it was only from 1949 onwards that they began to have reliable statistics of the work which they were already doing and which might or might not be relevant to the work that needed to be done. As soon as statistics began to be available, wide disparities between areas in numbers of beds, of patients treated, and of use of beds were seen. The beds of one teaching hospital might each be used by twice as many patients in the course of a year as those of another. Apparently comparable hospitals showed wide variations in their bed turnover and waiting-lists, often with marked differences between the specialties.

Changing Nature of Hospital Service

The National Health Service had coincided with a period of great development in some highly specialized fields of medicine and surgery. In surgery, operations on the central nervous system, heart, or lungs, and, in medicine, the special techniques of cardiology or neurology, among others, were far past the experimental stage and had to be made available in one at least of the centres in every hospital region. Between 1949 and 1956 the numbers of admissions to beds for plastic, thoracic, and neuro-surgery increased respectively by 119%, 133%, and 82%. Patients admitted for orthopaedic and traumatic surgery increased by 70% and for gynaecological operations by 53%, compared with only 20% for general surgery. In neurology and dermatology increases were just over 50%, compared with an increase of only 24% in general medicine and a fall of 11% in paediatrics.

That change in the nature of professional services required in hospital was certainly not finished. The fact that more than three-quarters of the neurologists worked in the four metropolitan regions, where only one-third of the people lived, showed that the process of distribution of specialists was not yet complete. But, aside from the process of redistribution, medical advances were still necessitating staff changes. The medical planner, therefore, had to bear in mind not only recent developments which had already become accepted medical procedures but also the new techniques which were already coming into use in the special centres. Therefore, continued Dr. Godber, it should be a general principle of the planning of any area hospital now that it must lend itself to modification, adaptation, and possibly extension at some future time. The perfect monoblock, complete in itself for the needs which could be defined now but with no point at which addition could be made, was a medical and architectural vanity which could not be afforded.

Out-patient Services

Referring to turnover and out-patient services, Dr. Godber said that for very many years hospitals had been looked upon as residential establishments in which medical and nursing care was given. The rapid growth of out-patient services during the last twenty years had arisen largely from the improvement in diagnostic techniques. The work of hospitals was now carried on to a very large extent in the out-patient and diagnostic departments. In 1956 the out-patient and casualty departments of hospitals provided more than two-thirds of the work of radiological departments and almost one-third of the work of pathological departments. Moreover, both those diagnostic departments were steadily increasing the service they provided direct to general prac-

tioners. For every patient admitted to hospital wards, excluding obstetric cases, two were seen in out-patient departments; only about half the admissions to general hospitals were from waiting-lists, and thus little more than a quarter of the out-patients might be admitted to the wards. The hospital must therefore become more—not less—closely related to all the medical work of the area it served.

Hospital Building

Dealing, finally, with the planning of buildings, Dr. Godber said that the doctor's job was to tell the architect what amount of space was essential for his work; what special relationships that must bear to the other necessary constituents of the hospital; what kind of equipment he would want; at what points and for what purpose subsequent extension was most likely to be needed; and what would constitute a reasonable pattern of phased development if building must progress by stages. But the doctor should not insist on inessential architectural extravagances.

By way of illustration, Dr. Godber referred to the shape of operating theatres. "There is a vogue at this time in some countries for operating rooms of circular or egg-shaped design, for which are claimed special advantages in lighting and ventilation," he said. "It is by no means proved, however, that these advantages cannot be obtained in other ways, particularly in regard to ventilation; and it is hardly justifiable to insist that two theatres must be provided at a cost the equivalent of five of orthodox design, as occurred in one particular case."

The more detailed study of the actual design of buildings was perhaps outside the scope of the meeting, concluded Dr. Godber, but the physician had a large part to play in the design of the buildings and in the briefing of architects, but not in drawing the lines on paper for him.

Function and Design of Hospitals

Mr. L. FARRER BROWN (Nuffield Foundation) recalled that three years ago the Nuffield Provincial Hospitals Trust and the University of Bristol published a volume called *Studies in the Functions and Design of Hospitals* which was a record of some attempts to obtain valid evidence, tested by experiment, about the work of hospitals and the planning of their buildings. There were, he said, signs that those studies were beginning to influence hospital planners throughout the country in their approach to their task.

Mr. Farrer Brown cited three examples showing the wide range of possible future study. The first was an account of practical experiments in ward building, the second dealt with an important series of surveys of the demand for hospital care, and the third was a short account of a new study into the hospital care of children.

As to the first, at Larkfield Hospital in Scotland there had been the opportunity to test out in an experimental unit of 64 beds the ideas about medical wards developed from the Nuffield Trust studies. A comparable unit at Musgrove Park Hospital would be a testing place for the ideas about surgical wards, and also about operating theatres and central sterilization. Conclusions drawn from those studies were (1) that wards should be planned as double units within which two comparatively small units shared a central unit of ancillary accommodation. (2) A much higher proportion of single rooms than hitherto provided was necessary on medical grounds (but once that provision had been made the remaining beds might be kept in fairly large open units). (3) Three-quarters of all patients were likely to be able to get out of bed to use toilet facilities, and half would probably get up for meals; hence greatly increased provision was needed for lavatories, wash-rooms, and day-spaces. (4) Important economies in building costs, reductions in heating costs, and a reduction in nurses' journeys could be achieved if ward buildings were designed as comparatively short, thick buildings.

Demand for Hospital Care

As to the demand for hospital care, the results of two exploratory surveys of the case-load of hospitals in Norwich

and Northampton had raised a doubt whether the scale of hospital provision for a given population need be as much as was popularly supposed. A pilot inquiry in the main general hospital in one area seemed to indicate that of the patients occupying medical beds during one week about a quarter could have been treated at home or in the out-patient department, and that about half were remaining in hospital longer than was necessary from the standpoint of what the hospital could do for them. There was also some indication that if the general practitioner had better opportunities for diagnosis fewer patients would have to be sent to the out-patient department.

Thirdly, on the question of what provision should be made for children in hospitals, records made in fifteen hospital groups (five of them teaching groups) over four 6-week periods during twelve consecutive months in 1956-7 showed that of nearly 5,400 children admitted to adult wards the proportions by age groups were: under 1 year, 1%; 1 to 4 years, 10%; 5 to 9 years, 33%; 10 to 16 years, 56%. Therefore, before considering what sort of children's hospitals would be needed in the future, much more precise information was required about the total number of children admitted to hospitals, their geographical distribution, and their classification by diseases. Reconnaissances in children's hospitals and units encouraged the view that, while the need to build isolated self-sufficient children's hospitals might have passed, there was a good case for separating the accommodation of children from the rest of the hospital. If a children's unit was part of a general hospital it could share many of the expensive services such as radiology and pathology; most important, the paediatricians could have contact with other medical colleagues. But the planning needs for children were so different from those for adults that they demanded a separate children's building.

As to the future, changing practice would affect hospital buildings in various ways; but probably the best answer was found by regarding the problem as one of town planning, and thinking of a hospital design from its earliest stage in terms of traffic flow and zoning. A hospital was a living, changing entity and not a static composition, and its constituent elements would change at different rates.

Unanswered Questions

Continuing the discussion, Professor T. McKEOWN (Birmingham) said that the planning of hospitals might be said to raise two questions: How to keep patients out of hospitals, and how best to provide for those who must be admitted. Concerning himself with the second of those questions, he said that in spite of the considerable amount of research and planning which had been done some of the most fundamental questions remained unanswered. Three of them seemed to be of particular importance: (1) How to provide sufficient medical and nursing staff for mental and chronic sick hospitals, (2) how to make hospitals flexible in construction, site, and design, so that they would not quickly be out of date, and (3) how to avoid mixing patients with entirely different requirements within the same unit.

He suggested that, although they might appear to be very different in kind, those three problems and some others were attributable to the same circumstances. They were (a) the separation of hospitals for the mentally ill and chronic sick from the general hospitals, and (b) the traditional concept of the hospital as a single structure of more or less uniform design, providing a full range of services for all classes of patients.

Co-ordination of Services

Dr. J. Fry (Beckenham) said that in considering hospital planning it was very necessary to realize that it must be a part of a whole, and the planning of hospitals must be closely bound up with the planning of public health and general-practitioner services. "As a general practitioner I naturally feel that the medical centre of gravity has been moved too far over to the side of the hospitals, and that insufficient attention has been paid to the development of general practice," he added.

Dr. Fry said he would like to see unified local health areas which would be based on the main local hospital. Hospital, general practitioner, and public health services would be administered from one centre, and the three branches would be able to appreciate each other's problems more readily. No changes in the law would be necessary, and that type of experiment could be attempted now. The hospital of the future would have to be more aware of the needs of family doctors, by offering full facilities for investigations, by making available more maternity beds for general practitioners, and by encouraging a more active participation of general practitioners in out-patient departments. There would also have to be a shift of emphasis towards the projection of the hospital's services into the homes of the patients.

Among those who took part in the discussion were Dr. LOGAN (Manchester), Dr. J. D. LLEWELLYN-JONES (Malaya), Dr. J. A. MOODY, Dr. W. RITCHIE RUSSELL (Oxford), and Dr. SKENE.

SECTION OF SURGERY

Monday, July 14

Advanced Carcinoma of the Breast

The president, Professor F. A. R. STAMMERS (Birmingham), welcomed the members, and with Mr. E. C. B. BUTLER (London) in the chair the Section proceeded to consider the treatment of advanced carcinoma of the breast. The opening speaker, Dr. A. C. CROOKE (Birmingham), described the various hormonal factors influencing breast development. He stressed the complexity of the subject, pointing out that most of our knowledge was derived from study of the rat. Oestrogens alone did not induce any change in breast structure, but if combined with growth hormone development of the main ducts occurred. Progesterone and pituitary of mammothrophin (prolactin) were necessary for growth of the lobular structure. At term, lactation was induced by the sudden reduction of circulating progesterone and oestrogen in the continued presence of prolactin (together with adrenal glucosteroids). There was great variation among different species, and therefore knowledge derived from the rat must be applied to man with considerable reserve. Dr. Crooke warned against uncritical interpretation of hormone assays in the human. These substances could not be detected in blood, and only urinary estimation was at present available. Biological methods of estimating urinary oestrogens were unreliable, and chemical techniques, though sound, measured only a part of the oestrogen fraction. Present methods of pregnanediol assay were also unreliable. The 17-ketosteroid fraction was such a complex mixture of substances that its determination was almost without value (though knowledge of individual constituents might be of clinical importance). Growth hormone could not be assayed as yet. Hadfield, using a biological method, claimed to have detected a mammothrophin in human urine, but his results had been challenged, and other workers had failed to confirm them. Biological methods of assay using mice were notoriously difficult and capricious, but Hadfield's work might have important consequences; further attempts at confirmation should be made.

Adrenalectomy and Hypophysectomy

Professor L. N. PYRAH (Leeds) gave a short historical review of endocrine ablation operations. In rats, removal of sources of oestrogen secretion reduced the incidence of spontaneous breast carcinoma in cancer-bearing strains. While the administration of oestrogens increased it. Beaton in 1896 first showed that oophorectomy had a beneficial effect in the course of the disease in pre-menopausal women. More recently Huggins had shown that further improvement might be obtained by removing a further source of oestrogens, the adrenal glands. Professor Pyrah then reported the

results in 76 patients with advanced breast carcinoma who had been subjected to adrenalectomy and oophorectomy. It was not possible to predict the effect of operation either by histological study of the tumour or by response to previous hormone therapy. There were nine post-operative deaths, but most of these occurred early in the series. Case reports were presented of patients with remarkable remissions of their disease: 38 patients in all had had a remission; 11 of them were still alive, but two had developed recurrence. In some patients the disease apparently disappeared from the body, no clinical or radiological evidence of malignancy being detectable. Four patients had remissions lasting for three years or more, the longest being three years and eight months. In nine the remission lasted for more than two years; 12 survived 18 months. The relief of pain and the prolongation of life achieved by this operation made it well worth while.

The results of 100 patients treated by pituitary ablation were presented by Mr. J. M. SMALL (Birmingham). The object of the operation was to remove all mammothrophic hormones and somatotrophin from the body. To do this the pituitary must be completely removed and the pituitary stalk destroyed to prevent regeneration of hypophyseal tissue. This was technically difficult in some cases. Nine patients died after the operation, and there was some morbidity including diabetes insipidus (invariably) and minor visual field defects (in 30%); but none had been blinded. Even very ill patients withstood the operation well. The patients were divided into three groups according to their response to operation: those in full remission had complete disappearance of disease; those with partial remission were objectively improved but malignancy persisted; and, thirdly, those with no response at all. Patients with a long history who had responded well to hormone therapy, and who were just past the menopause, showed the best response. Of five patients who had had previous adrenalectomy only one went into full remission; her response to adrenalectomy had also been good. In his series 25% had a full remission and all but one were still alive, the longest survival being three years; 11% had only a partial remission and 6 of these were already dead. Half the patients had no response to pituitary ablation and had not survived more than ten months. Patients with secondary deposits in skin, glands, lung, and bone appeared to respond best to the operation; results in those with liver and brain metastases were disappointing.

What to Advise

The closing speaker, Mr. H. J. B. ATKINS (London), summed up the proceedings by asking what advice a practitioner should give a patient with advanced breast cancer. It had been customary to start such a person on hormone therapy—if she were past the menopause, with oestrogens; if before, with androgens. Oestrogens produced remissions in about two-thirds of patients over 60 years of age; the proportion was much smaller under the age of 60. Hence it would seem reasonable to commence treatment with oestrogens in the older age-group. In young women the response of carcinoma to endocrine ablation was much greater than the response to hormone therapy. Furthermore, testosterone, which was the more effective hormone in this age-group, was disappointing in its results, and side-effects, such as acne and hirsutism, were very distressing. Hence in pre-menopausal women it was probably wiser and kinder to proceed straight to operation. The injection of radioactive substances into the sella turcica to destroy the pituitary had not proved satisfactory even in the hands of its principal advocates. Mr. Atkins then proceeded to discuss the relative merits of hypophysectomy and adrenalectomy, using a series of 80 cases of each performed at Guy's Hospital to illustrate his remarks. At first it had seemed that hypophysectomy was much the better, but as more patients were treated it became apparent that the difference was not great and certainly not statistically significant. Despite the fact that pituitary ablation seemed

to give slightly better results it would be unwise to over-emphasize this at the present time because of the relative shortage of expert neurosurgeons. A competent general surgeon could perform adrenalectomy with a low mortality. If hypophysectomy was attempted on a large scale by those unskilled in neurosurgical techniques the consequences might be disastrous. The difference in the results of the two methods did not justify wholesale adoption of pituitary ablation at the present time.

In answer to a question by Mr. HUGH CARSON (Birmingham), Mr. SMALL said that all patients subjected to hypophysectomy had had previous radiotherapy or hormonal treatment. He mentioned that the response of patients with pregnancy or lactation carcinoma had been very poor. Professor H. W. RODGERS said that in Belfast radioactive yttrium was inserted into the sella after hypophysectomy to destroy the last remnants of pituitary tissue. Mr. R. V. COOKE (Bristol), Mr. HERMON TAYLOR (London), and Mr. BUTLER also contributed to the discussion.

Carcinoma of the Rectum

Under the chairmanship of Mr. HUGH CARSON (Birmingham), Mr. E. C. B. BUTLER (London) then addressed the Section on restorative resection for carcinoma of the rectum and pelvi-rectal junction. He said that since the end of the last war this operation had competed with abdomino-perineal resection for neoplasms just above the peritoneal reflection. Preparation of the bowel with sulphonamides had made anastomosis at this level much safer than previously. Technically, it was necessary to mobilize the rectum and remove its middle portion. Bowel three inches (7.5 cm.) below palpable tumour was usually free of growth. Contraindications to operation were obesity, gross extrarectal spread, and an anaplastic type of tumour. The operation was a little more difficult than abdomino-perineal resection and carried a slightly higher mortality. Local recurrence at the suture line, which was a problem in the past, had now been largely overcome by clamping the bowel immediately below the tumour and irrigating the distal segment of the rectum with mercury bichloride solution (one part in 500). If there was tension on the suture line a temporary transverse colostomy was advisable; a rectal tube was passed up to but not through the anastomosis. Eighty operations for restorative resection of the rectum were performed between 1948 and 1958, with a mortality of 7%. During the same period they had done 181 abdomino-perineal resections, with a mortality of 4.5%. Restorative operation was possible more often in women than in men because of their wider pelvis. Survival rates after the two operations were similar in growths of types A and C (60% and 20% respectively). In type B cases the five-year survival after anterior resection was 69%, and after abdomino-perineal resection only 36%. This difference might be due in part to a different metastasizing potential between tumours above and below the peritoneal reflection. Below the peritoneum there was no barrier to extensive spread into the pelvic connective tissue. Recurrence had occurred at the suture line in five patients; four of them had also had generalized metastases at the same time. Mr. Butler thought that extensive operations for excision of cancer were on the decline. The lethal factor in most tumours was blood-stream spread, which at present was untreatable. He likened the situation to staphylococcal septicaemia; the burden was on research workers to produce a therapeutic weapon which would destroy metastases. Extensive dissection of lymphatic fields was of doubtful value; the surgeon's task was to remove the primary tumour as completely as possible.

In the ensuing discussion Mr. B. N. BROOKE (Birmingham) emphasized that the operation was excellent as a palliative procedure and was especially suitable for elderly patients. In America there was a tendency to use restorative resection for neoplasms of the middle third of the rectum, and he thought that we too should extend the scope of the operation. Mr. HERMON TAYLOR (London) agreed that blood-

stream spread of metastases was the most important factor in prognosis. This usually had occurred before the start of treatment, which was the main reason why extensive lymphatic dissections were of little avail. Mr. E. G. MUIR (London) commented on some technical details of the operation; in particular he advised the use of a perineal drain situated behind the anal canal.

Pilonidal Sinus

Mr. A. J. H. RAINS (Birmingham) gave a short paper on the treatment of pilonidal sinus. On the surgical professional unit at Birmingham these cases were treated by excision and primary suture. The operation was performed with the patient on his face in the "jack-knife" position. Indigo carmine was injected into the track. After complete excision the dead space was carefully obliterated with buried catgut stitches. "Nobecutane" and wool were used for dressing and the wound was sealed off from the anus with strapping. The patient remained prone for 48 hours after operation and then was allowed up. Hair in the natal cleft was kept trimmed. Four cases had broken down owing to the formation of haematomas; and there were 11 recurrences. Healing took between 10 and 14 days on the average. Mr. E. C. B. BUTLER (London) asked whether the hairs in the natal cleft should not be permanently suppressed by irradiation. In reply to a question as to how recurrences should be treated, Mr. RAINS said that he excised them again and once more sutured the skin *per primum*.

Tuesday, July 15

Hiatus Hernia

With Mr. HERMON TAYLOR (London) in the chair, Mr. R. H. FRANKLIN (London) opened a discussion on hiatus hernia. He first discussed the mechanism of the cardiac sphincter. Perhaps the most important factor in preventing reflux was the angle of entry of the oesophagus into the stomach. Free regurgitation, which was normal in infants, might persist throughout life without causing untoward symptoms. Reflux of gastric contents into the oesophagus might be caused by hiatal defects or an increase in pressure within or outside the stomach. Prolonged recumbency, tight corsets, and pregnancy caused increased pressure on the hiatus. Pylorospasm with delayed gastric emptying increased the tendency to regurgitation, and hyperacidity such as was found with duodenal ulcer increased the corrosive effect of the regurgitated fluid. There were three ill effects of regurgitation: pain due to oesophagitis, dysphagia from spasm or stricture, and haemorrhage. Oesophagitis might result in slow bleeding and a profound anaemia; frank haematemesis was caused only by an ulcer in the oesophagus or in the thoracic stomach. Symptomless patients needed no treatment, and those with mild symptoms only conservative measures. These consisted of weight reduction, prevention of gravitational regurgitation (especially at night), and a peptic ulcer regime. Operation was needed for patients with symptoms of oesophagitis uncontrolled by medical treatment. The stomach had to be brought below the diaphragm and the enlarged hiatus narrowed. This could be combined with pyloroplasty and vagotomy. Intractable stricture was best treated by partial oesophagectomy with a high anastomosis between stomach and oesophagus; a low anastomosis was likely to be followed by stricture at the suture line. If there was duodenal ulceration as well as stricture a Roux loop of jejunum should be used.

Continuing the discussion, Mr. A. M. DESMOND (London) estimated that between 3 and 14% of the adult population had symptomless hiatus hernia (these figures were obtained from radiological examination and laparotomy). He reiterated the causative factors, adding kyphoscoliosis to those already mentioned. Patients with a functional overlay to their organic condition were difficult to treat and did not get a good result after operation. Surgical treatment

was necessary if conservative measures failed or a complication developed. Treatment should consist of repair of the hernia, preferably through the abdomen to allow detection of concurrent abdominal lesions. He had recently added pylorotomy to facilitate gastric emptying. In a series of 158 patients there had been six deaths: 85 (65%) had good results; 25 (18%) needed medical treatment to keep them free of symptoms; and 22 (16%) were failures. In closing, Mr. Desmond emphasized that hiatus hernia might be a "red herring." The symptoms might be due to carcinoma of the colon, Crohn's disease, or some other abdominal lesion. He then showed a short film on the technique of operation.

Mr. J. L. COLLIS (Birmingham) said, in discussion, that associated duodenal and gastric ulceration was rare in his experience. He used the abdomino-thoracic approach and sutured the pillars of the right crus in front of the oesophagus. In this way the angulation of the oesophago-gastric junction was re-established.

Carcinoma of the Oesophagus

Mr. J. L. COLLIS (Birmingham) then addressed the meeting on the treatment of carcinoma of the oesophagus. Lesions two inches (5 cm.) above the aortic arch and below were suitable for surgical excision. In his personal series of 150 cases the mortality had been 14%; the figure was the greater for high lesions than for those situated low in the oesophagus. After two years only a third of them were alive. He emphasized the importance of relieving the distressing symptoms of this disease if at all possible. The patient must be adequately nourished before operation was attempted, and this could often be carried out effectively by persevering with a high-calorie fluid diet; if necessary the insertion of a Souttar's tube would ensure adequate intake; gastrostomy should be used only as a last resort. Age was no bar to operation, but spread into the aorta or bronchus was a definite contraindication. If possible the bronchus should be removed *en bloc* with the left gastric tumour should be removed in 75% of cases. A tube of glands (which were involved in 75% of cases). A tube of the greater curvature of the stomach was brought up into the chest to anastomose to the oesophagus. After operation gastric reflux was no great problem, provided that gravitational regurgitation was prevented. If excision was impossible the tumour might be by-passed; failing that, a large Souttar's tube should be passed through the growth: it was imperative to restore free swallowing at all cost. Gastrostomy had no place except in the pre-operative phase. Mr. Collis ended by stressing the challenge of this exceedingly difficult disease.

Sir STANFORD CADE (London) began by saying that if he had a carcinoma of the oesophagus he would want it resected. Megavoltage radiotherapy (two million volts and above), however, had been a great advance and was very different from lower voltage therapy. There were three main megavoltage methods available—the two-million-volt generator, the four-million-volt linear accelerator, and the theratron (containing the equivalent of 2,000 grammes of radium in the form of radioactive cobalt). The source must be rotatory so that only the area to be treated received radiation in any quantity. By this means skin and vital organs such as the lungs and spinal cord suffered little injury. Sir Stanford reported the results in a series of 48 patients with squamous cell carcinoma of the middle third of the oesophagus treated by megavoltage radiotherapy; 39 patients were dead; nine were alive, but three had active disease; there have been no five-year survivals. In a number of cases radiation provided excellent palliation, the patients being able to swallow normally. Dysphagia might persist, however, despite return to a normal radiological appearance. In some cases therapy caused a stricture, in others a broncho-oesophageal fistula developed. One patient whose growth was incompletely removed at operation had had radiotherapy and survived 3½ years. Sir Stanford concluded that supervoltage radiotherapy could

not as yet compete with surgery in the treatment of carcinoma of the oesophagus, but it was much better than conventional radiation methods. In reply to a question by Mr. G. W. TAYLOR (London), he said that combined operation with radiotherapy had not yet been attempted.

Cold Legs in Young People

With Mr. HUGH DONOVAN (Birmingham) in the chair, Mr. G. W. TAYLOR (London) described the pernio group of syndromes; these are conditions which give rise to one variety or another of the chilblain lesion. Local ischaemia devitalized the tissues to such an extent that an inflammatory response resulted; fat necrosis was a typical lesion. There were two main varieties of pernio, primary and secondary. The primary group included acrocyanosis, erythrocyanosis, and livedo reticularis. They were much more frequent in women, usually commencing at the end of the second decade and after a remission reappearing at the menopause. In acrocyanosis there was a cyanotic rubor of the fingers and toes; erythrocyanosis affected the back of the calf in young women. The latter was often associated with oedema, especially in warm weather. Mr. Taylor put forward the view that there was some defect in the micro-circulation of the extremities. Lymphangiography in erythrocyanosis revealed hypoplasia of the lymphatic system in the affected limbs. These conditions were often familial. Secondary pernio might be due to the late effects of poliomyelitis, a low basal metabolic rate, or occasionally to functional disease such as hysteria. Treatment consisted in avoiding local chilling and conserving body heat. Measures designed to achieve these aims cut across fashion trends, and Mr. Taylor said that he found it difficult to persuade such patients to wear woolly underwear, thick woollen socks, and long skirts. Occasionally vasodilator drugs such as phenoxybenzamine helped. Lumbar sympathectomy was often beneficial, but did not cure many patients; it was contraindicated in the presence of oedema. In reply to a question by Professor F. A. R. STAMMERS (Birmingham), Mr. TAYLOR agreed that these patients should give up smoking. Answering another speaker, he warned against sympathectomy in those with long-standing symptoms. Exercise and physiotherapy were desirable to increase the circulation to the extremities.

Fractures of the Jaw

Mr. R. O. WALKER (Birmingham) gave an interesting paper on fractures of the jaw. He first stressed the need for universal instruction in first aid to maintain an airway; patients might die from suffocation before reaching hospital. Causes of respiratory obstruction were foreign bodies, a swollen floor of the mouth, and backward displacement of the tongue. Mandibular fractures accounted for 75% of cases, the remainder being made up of the more severe fractures through the maxilla. A barrel bandage was the best emergency splint for the lower jaw. This could be followed by eyelet wiring if the teeth were in good condition or by cap splints if the dentition was inadequate for wiring. Edentulous patients should be immobilized by the use of Gunning splints. Fractures through the maxilla were more severe injuries and more difficult to treat. The lower jaw was too mobile to use as a splint. Cap splints on the upper teeth, fixed externally to a plaster head-cap, were the most satisfactory method of treatment. Nutrition should not be a problem in these patients: there was usually a gap between the teeth, but, failing that, an adequate fluid diet could be administered through the space behind the last molar tooth. Very careful attention to oral hygiene was vital. In conclusion Mr. Walker made a plea that such patients should be referred early to the dental staff so that treatment could be begun as soon as possible after injury.

Mr. E. C. B. BUTLER (London) asked how often osteomyelitis and parotitis complicated fractures of the jaw. Mr. WALKER replied that both had been rare since the introduction of antibiotics.

SECTIONS OF OBSTETRICS AND GYNAECOLOGY
AND CHILD HEALTH

Tuesday, July 15

Problems of Neonatal Period

Dr. BERYL D. CORNER (Bristol), a vice-president of the Section of Child Health, occupied the chair at the joint session with the Section of Obstetrics and Gynaecology on problems of the neonatal period.

Obstetric Responsibility for the Handicapped Child

Dr. FRANCES BRAID (Birmingham) said that the paediatrician was confronted by many children handicapped by such disabilities as blindness, deafness, congenital heart disease, cerebral palsy, or mental deficiency. In most the origin of the disability was either unknown or beyond our control, but against others good obstetric care offered a major degree of prophylaxis. The possibility of rubella in early pregnancy causing congenital abnormality in the foetus might be reduced by the use of gamma-globulin, but the place, if any, for therapeutic abortion in these cases was still uncertain. Other virus infections appeared less dangerous in this regard. How often in this country toxoplasmosis damaged the foetus, especially its central nervous system, was unknown, but in the U.S.A. 30% of affected babies were said to be born prematurely, 27% of whom died; 12% of affected mature babies also died. Toxoplasmosis was transferred to the foetus only during the active phase of the maternal infection, so that later siblings were not affected. The outstanding example of the value to the foetus of good antenatal supervision lay in haemolytic disease of the newborn. Many babies were now being saved from death, and cerebral damage rarely occurred with proper management.

The incidence of prematurity, continued Dr. Braid, was rising (e.g., in Birmingham from 7.2% in 1945 to 9.2% in 1955), but in the majority of cases the cause of the premature birth was not known. Better antenatal care might be partly responsible, by prolonging a pregnancy beyond the 28th week or by intervening to prevent stillbirth. Better paediatric care of these small babies might increase the total number of surviving handicapped children, for cerebral palsy was more common in premature babies. The question whether babies who had early survived a threatened abortion had a high rate of abnormality remained to be answered. Turning to perinatal trauma, Dr. Braid said that primary traumatic cerebral haemorrhage was now rare, but haemorrhage secondary to asphyxia from any cause was less uncommon. Less than 10% of infants with cerebral disturbance at birth later showed evidence of brain damage, but it was impossible to foretell what residual damage might occur in an individual case.

A most exhilarating discussion followed to which Professor H. C. McLAREN (Birmingham), president of the Section of Obstetrics and Gynaecology, Mr. W. G. MILLS (Birmingham), Mr. EDWARD COPE (Birmingham), Professor IAN DONALD (Glasgow), Miss ELSIE WARREN (Kensington), and Miss V. MARY CROSSE (Birmingham) contributed.

Neonatal Cold Injury

Dr. T. P. MANN (Brighton) discussed neonatal cold injury, a not uncommon disorder with a high mortality. It usually occurred after home delivery in winter when the outside air temperature was below freezing point. Deaths from this cause were almost entirely preventable, yet the yearly number of fatalities in this country might well exceed 100. The condition was often unrecognized, the causative exposure to cold being overlooked. Prematurity did not seem an important relevant factor, but predisposing factors included asphyxia at birth, birth injury, and infection. The usual presenting features were increasing apathy, refusal of food, and oliguria, but the infant, usually a male, did not look ill. Sometimes the mother had noticed that the baby had been cold to touch for several days, but in none of his cases had the severity of the hypothermia been appreciated before

the baby was admitted to hospital. There was then noted severe hypothermia, oedema of the extremities, and skin erythema. A purulent nasal discharge was common, although sometimes not seen until after rewarming. Prolonged hypoglycaemia had also been found in a few cases. In two recent cases the platelet count had been low, which might have been related to a generalized haemorrhagic tendency. The outstanding finding at necropsy was pulmonary haemorrhage, sometimes mistakenly called "haemorrhagic pneumonia."

Dr. Mann concluded that, as treatment was often difficult in well-established cases, prevention was of paramount importance. Those conducting domiciliary confinements must be alert to the danger of cold exposure. In particular routine cleansing baths could be a menace in winter. Nursery temperature should not fall below 60° F. (16° C.) night or day in the early weeks. If the baby's temperature was recorded once daily, hypothermia would be detected early, and then rewarming was relatively easy.

Dr. W. N. LEAK (Winsford), Dr. H. L. ELLIS (Oxford), Dr. FRANCES BRAID (Birmingham), Dr. V. MARY CROSSE (Birmingham), Dr. A. J. MACLEOD (Outer Isles, Scotland), Dr. G. L. DAVIES (Brighton), and Dr. B. M. LAURANCE (Derby) spoke in the subsequent general discussion.

Respiratory Distress in the Newborn

Mr. H. L. SHEPHERD (Bristol), a vice-president of the Section of Obstetrics and Gynaecology, took over the chair when Dr. R. J. K. BROWN (Cardiff) discussed respiratory distress in the newborn. He said that, although it was still uncertain what made the newborn baby take its first breath, much had been learned about the circulatory adjustments that must also occur if its survival was to be assured. Much of this knowledge had been obtained by study of the changes occurring in the newborn lamb. The ductus arteriosus contracted partially after birth, yet permitted a considerable blood flow to the lungs from the aorta for some hours. In this way the expanding lungs obtained a plentiful blood supply during the critical phase of change-over from foetal to adult condition. Conversely, it had been shown that inadequate pulmonary ventilation might ultimately lead to shunting of blood away from the lungs through this open channel with accentuation of asphyxia. Pulmonary capillary erection might also assist the proper expansion of the alveoli at birth. Many believed that the added blood volume obtained from the placenta by delayed cord ligation assisted by gravity increased the output from the right ventricle by augmenting venous return.

There was strong evidence, Dr. Brown continued, that pulmonary hyaline membrane, the cause of many neonatal deaths, especially in premature babies and those delivered abdominally, especially from diabetic mothers, was of endogenous vascular origin. He himself thought it likely that early ligation of the cord in the presence of delayed onset of breathing was an aetiological factor. As general anaesthesia contributed to depression of the foetal respiratory centre, regional anaesthesia for caesarean section might be to the baby's advantage. It had also been suggested that hypoxia and sensory stresses at and soon after birth might stimulate the liberation of noradrenaline from the organs of Zuckerkandl to the enhancement of cardiovascular tone and the assistance of circulatory readjustments. A noradrenaline drip might therefore have a place in the resuscitation of the newborn; after all, many of the features of the syndrome of respiratory distress were characteristic of shock.

Dr. Brown concluded that the newborn baby had considerable tolerance to anoxia but very little to ischaemia. Thus successful resuscitation of the asphyxiated infant depended on rapid establishment of the adult type of circulation after birth.

Changing Fashions in Neonatal Resuscitation

Professor IAN DONALD (Glasgow) reviewed the changing fashions in the resuscitation of the newborn. From the

various forms of stimulation applied to the baby fashions progressed to more or less forceful types of artificial respiration. Next came the attitude of watchful expectancy, favoured because spontaneous recovery was the rule. The results of any technique were difficult to assess because it was difficult to ascertain the exact cause of the respiratory distress in any individual baby. Intubation was valuable, but he doubted the efficacy of gastric oxygen. Professor Donald then traced the development of a respirator which automatically augmented any spontaneous breaths of the baby or made it breathe if its own respiratory efforts were absent. He concluded by demonstrating this respirator in action on a dummy.

In a discussion on the papers by Dr. Brown and Professor Donald, Dr. W. N. LEAK (Winsford), Dr. H. C. W. BAKER (Birkenhead), Professor H. C. McLAREN (Birmingham), and Dr. V. MARY CROSSE (Birmingham) participated.

SECTION OF ANAESTHETICS

Wednesday, July 16

Spinal and Epidural Analgesia To-day

With the president, Dr. B. L. S. MURTAGH (Birmingham), in the chair, Dr. J. D. ROBERTSON (Edinburgh) presented the case for spinal analgesia. After listing the advantages, it was admitted that many were no longer valid in the presence of modern methods of general anaesthesia. However, since the mortality and morbidity rates after spinal analgesia were no greater than after general anaesthesia, it was a pity that the fear of litigation had become such an important factor in choosing between these methods. In fact, by avoiding positive-pressure ventilation and consequent interference with pulmonary circulation the hazards of neostigmine-resistant curarization, and by reducing blood loss, a real claim for the benefit of spinal analgesia could be made. Dr. Robertson reviewed the neurological complications, and found that they rarely occurred in centres where spinal analgesia was common practice. Spinal analgesia was more certain and more predictable than epidural analgesia. With the ever-present risk of inadvertent dural puncture, epidural analgesia exhibited all the possible dangers of either method. On the basis of recent work it might be considered a technically more difficult and poorly controlled form of spinal analgesia.

Dr. C. J. MASSEY DAWKINS (London) then presented the case for epidural analgesia. He claimed that epidural block replaced spinal block, and did so equally efficiently without the well-known hazards of spinal analgesia. Hypotension was the only complication common to both. Technical difficulty in locating the epidural space was no longer a valid criticism of the method. This had been achieved by the introduction of the Brooks indicator, which combined the Dogliotti technique of the loss of resistance to an advancing needle with the Odom technique of recognizing the negative pressure within the space. With the Brooks indicator, which consisted of a glass balloon blown on the end of an Odom indicator, it should be possible to find the epidural space with certainty in 98% of cases.

Dr. Massey Dawkins suggested that, if unconsciousness was required, hexobarbitone and the breathing of air were less likely to interfere with respiratory physiology than the administration of gases in a doubtful mixture from an anaesthetic apparatus.

Since the vagus nerve remained intact, a block of this nerve might be necessary to avoid hiccup or coughing. With this single drawback epidural analgesia offered ideal operating conditions with benefits to patient, surgeon, nursing staff, and anaesthetist. Dr. Massey Dawkins concluded with a detailed description of his technique based on 2,000 cases, and indicated the extent of its usefulness.

Dr. J. ALFRED LEE (Southend) spoke on a critical evaluation of the methods. Such an evaluation was based on the manner in which an anaesthetic technique satisfied certain criteria. These criteria were efficiency, controllability, ease

of induction, safety, and freedom from side-effects. General anaesthesia offered greater latitude than any form of local analgesia in terms of safety. But in skilled hands, and with proper care, spinal and epidural analgesia were as safe as general anaesthesia, and carried a lower mortality rate. The particular risks were undeniable, and hypotension and toxic reactions demanded treatment by an intravenous route. Thus an open vein—using a Mitchell or Gordh needle—was an essential prerequisite. Dr. Lee said that neurological complications, although not common after spinal analgesia, were virtually unknown after epidural block. In spite of these risks, both methods must be taught, and anaesthetists must be familiar with them. Technical difficulties should present no bar to their use, but personal preference must necessarily influence the choice of method.

In the discussion which followed, Dr. R. W. COPE (London) stated that the neurological risks of spinal analgesia were unacceptable. Dr. L. T. CLARKE (Birmingham) suggested that a full neurological and serological examination should be made before embarking on spinal analgesia. Dr. G. C. STEEL (London) thought that epidural analgesia offered the best solution to many anaesthetic problems. Professor W. W. MUSHIN (Cardiff) and Mr. BRIAN WILLIAMS (Middlesbrough) also took part.

Anaesthetists' Brains Trust

Under the chairmanship of Dr. H. W. FEATHERSTONE (Birmingham), questions submitted by members of the section were discussed by a panel consisting of Professor W. W. MUSHIN (Cardiff), Drs. T. C. GRAY (Liverpool), H. H. PINKERTON (Glasgow), J. GILLIES (Edinburgh), W. D. WYLIE (London), and V. J. KEATING (West Indies).

On the question of the use of chloroform, it was felt that it still had a place as an emergency anaesthetic, although it might be replaced by halothane. The panel were unanimous in believing that the general-practitioner anaesthetist had an important part to play in the hospital service. On economic and geographical grounds he was essential, but the manner of his employment and his training must be carefully regulated.

On the grounds of economy of gases, and also convenience, the use of soda-lime in a circuit using a high flow of gases was supported. It was thought unwise to rely on theoretical calculations for flow rates to avoid rebreathing. The use of soda-lime or a non-return expiratory valve overcame the risk of carbon dioxide retention, but members of the panel felt that too much attention was being paid to the presence of minute concentrations of carbon dioxide in anaesthetic circuits.

Steroids such as hydroxydione sodium succinate ("viadril") should be considered as agents producing basal narcosis rather than anaesthesia. They were of interest, but should not be regarded as the answer to all anaesthetic problems. Their value lay in the post-operative period, and this was probably of greater interest than their anaesthetic properties. The panel expressed divided opinions on the administration of suxamethonium and D-tubocurarine to the same patient. The effect of suxamethonium on the nerve endings probably persisted for many hours, but in the present state of our knowledge it was impossible to make a dogmatic statement on this problem.

SECTION OF ANATOMY AND PHYSIOLOGY

Monday, July 14

Posture and Health

In opening, the president, Sir SOLLY ZUCKERMAN (Birmingham), commented on how suitable was the subject of posture for discussion by the laboratory worker, anatomist, and clinician.

Sir RUSSELL BRAIN (London) opened the first symposium on some of the laboratory aspects of posture. Most modern work on postural physiology had been built on foundations

laid by Sherrington in his monumental work *The Integrative Action of the Nervous System*. The muscle spindles had now been shown to be influenced by their own efferents, the gamma fibres, establishing the concept of a "servo-loop mechanism" influencing the stretch reflex as well as Sherrington's lengthening and shortening reactions. Spinal and neuronal connexions had been traced and the physiological nature of excitation and inhibition was being elucidated. The parts played by the cerebellum, vestibular nuclei, and the central reticular formation had been profitably studied. Clinical observation had led to controversy over the role of the pyramidal pathways, and neurosurgery had been attempting to control abnormal rigidity in extrapyramidal syndromes. Disease might interfere with the foundation of posture at many points. Proper understanding necessitated a knowledge of the muscle spindles and their affection by normal and abnormal muscle states, the afferent impulses from them, interneurons and spinal-cord synapses, the efferent impulses, the myoneural junction, and the physiochemistry of muscle contraction. It was through these mechanisms that bad postures tended to be perpetuated. Superimposed were complex higher circuits involving all levels of the nervous system.

Ultrastructure of Muscle

Dr. H. E. HUXLEY (London) spoke on the ultrastructure of muscle studied by electron-microscopy and other new techniques. His paper was illustrated by electron-micrographs of exceptional quality. Each myofibril inside the muscle fibres consisted of a succession of overlapping longitudinal arrays of submicroscopic filaments. There were two types of array, thicker filaments about 100 Å diameter (1 Å = 10^{-8} cm.) and 1.5 μ in length composed of myosin, and thinner filaments about 50 Å diameter and length 2.0 μ composed of actin. In each array the filaments were spaced in a regular and parallel manner, the thicker lying about 450 Å apart in hexagonal fashion, muscle sarcoplasm filling the intervening space. The two types of array alternated along the length of each fibril, and in the overlapping region the thin filament interdigitated with the thick, forming a very regular double hexagonal array.

Muscle contraction was unaccompanied by shortening of either type of filament, but by a telescoping of the thin actin filaments between the arrays of thick myosin ones; the reverse process occurred during muscle relaxation. This appeared to be produced by a system of cross-bridges arising from the thick filaments and passing to the thin ones, seemingly drawing the latter along in a centipede-like motion. This "sliding filament" mechanism fitted in well with known biochemical concepts and could reasonably account for many physiological characteristics of striated muscle.

Spindle and Synapse

Professor RUTH BOWDEN (London), in a paper on the spindle and the synapse, first gave an illustrated summary of the distribution and morphology of sensory endings, particularly of spindles in striated muscles, and of the anterior horn cells with their complex synapses. She pointed out how often as many as 2,000 boutons terminaux made synaptic connexion with a single anterior horn cell. The functional significance of the multiplicity and variety of sensory nerve endings in striated muscle was discussed in the light of recent work by Granit, Merton, Eccles, Mountcastle, and others. Experimental evidence suggested that for limb muscles there was no afferent cortical projection pathway. Tendon organs and spindles appeared to exercise their inhibitory and excitatory functions primarily at cord level. Mountcastle had shown in cat experiments that columns of cortical neurones were not driven by the large group I muscle afferents, but certain cortical neurones were driven by afferents from joint capsules, ligaments, and periosteum. Simultaneous recording from cortical units driven by joint capsule afferents had shown that they might

respond reciprocally to alternate flexion and extension of the joint. The apparent absence of cortical projection pathways from muscle spindles had posed a great problem in understanding the mechanism of cortical control of movement patterns. However, as joints were positioned by muscular activity, Mountcastle's findings in respect of afferents from joint capsules might lead to clearer understanding of postural control and movement.

Nervous Gradation of Muscle Contraction

Professor R. J. HARRISON (London), a vice-president of the Section, then took the chair and introduced Dr. PATRICK MERTON (Cambridge), who presented some aspects of the nervous gradation of muscle contraction. He reminded his audience that ideas on this subject were now undergoing revision because muscles, long believed to have given rise through their sense organs to proprioceptive sensations, were now again thought to be insentient. Helmholtz, in 1865, claimed to have proved the absence of position sense in eye muscles; but objections, irrelevant in Dr. Merton's view, were raised by William James and Sherrington, whose views had long prevailed. Many simple experiments could be performed to demonstrate the absence of position sense in skeletal muscles. For example, it was impossible for a subject to say accurately where was the tip of his anaesthetized tongue, although the tongue muscles were known to be plentifully supplied with muscle spindles. When the hand blood supply was cut off for 75 minutes by an inflated wrist cuff, the thumb became anaesthetic to touch or movement, but the terminal joint was not paralysed, for the flexor and extensor muscles of this joint lay proximal to the tourniquet. But no feelings of position or tension could be elicited by active or passive movement of the terminal joint. Hence our appreciation of thumb position and force of movement must be derived from the joints and skin, and not from the muscles.

Muscles were controlled through automatic servo mechanisms, whose feed-back elements were the muscle sense organs, thus ensuring that the muscles did what was required of them whether the instructions came from the higher postural centres or the motor cortex. Indeed, it would appear that the higher centres did not want to know what was happening in the muscles. The muscle sense organs, by feed-back action, therefore conferred special properties on the neuromuscular machinery, rather than provided data with which the higher centres elaborated the orders to that machinery.

Central Mechanisms of Balance

Dr. D. A. McDONALD (London) then gave an interesting and amusing account of his experiments on the central mechanism of balance in relation to the righting movements of the falling cat. His talk was illustrated by high-speed cinematographs, some taken at the rate of as many as 1,000 frames per second to produce a most instructive "slow-motion" record of the sequence of body contortions in the falling animals. These body movements were of especial interest, as they involved the generation of rotation in a freely falling body. This was solved in the cat by flexion of the trunk and rotation of first the fore-part in its own axis and then the hind-part. Sequential rotation of smaller body sections, such as the head, did not seem to be physically possible in terms of the counterbalance of the forces necessary.

The dominant sense organs for informing the animal of its spatial position appeared to be the eyes. Professor J. B. S. HALDANE owned a venerable female cat which he assured Dr. McDonald suffered from congenital absence of the vestibular organs. Experiments with this borrowed "Haldane cat" proved that it turned over quite normally with its eyes open, but made no effort to right itself when blindfolded. A normal animal turned over just as well with its eyes blindfolded as with them open, except that the turn was slightly delayed and less perfectly executed.

Tuesday, July 15

Posture in the Living Subject

With a vice-president, Dr. A. C. CROOKE (Birmingham), in the chair, Mr. F. G. ALLAN (Birmingham) opened the discussion. Attempts to define the meaning of "good posture" were subject to individual interpretations. It could mean, for example, a posture which imparted an impression of radiant health, alertness, a sense of physical and mental well-being and even of beauty. Goldthwaite's definition of the head being held erect, chin drawn in, shoulders back, and abdomen drawn in was not, most people would agree, a very normal posture. But there were wide variations of posture within normal limits. What he liked to term "normal," "relaxed," and "military" postures were all examples within normal limits, although the "relaxed" posture probably most nearly approached a pathological stance. The posture of individuals was affected by mood and was also partly hereditary, being related to the body-type.

Remedial exercises aimed at developing muscles whose weakness was thought to cause the poor posture often had no permanent effect, but only corrected the postural faults during the actual voluntary performance of the exercises. If, however, a corrective plaster-of-Paris splint was applied for several weeks, during which time exercises were done only to prevent muscle-wasting, permanently improved posture followed the removal of the plaster. These results of treatment emphasized the importance, mentioned by earlier speakers, of stimuli coming from the joints and not from the muscles.

Electromyographic Studies

Dr. JACK JOSEPH (London) described electromyographic studies on the thigh and leg muscles in 25 males and 21 females and the hip muscles in 18 males of ages ranging from 18 to 42 years. He pointed out that if a very high amplification was used with either surface or needle electrodes the absence of electric potentials was very suggestive that the muscle immediately deep to the surface electrodes or in which the tip of the needle was lying was not contracting. This negative finding was stressed because of the results obtained in the investigations he was discussing.

The subjects were studied standing comfortably at ease, not tense, with the weight on both lower limbs, the feet about 12-18 in. (30-45 cm.) apart, the toes turned out at an angle of about 60 degrees, the hands clasped tightly behind the back, and the head held with eyes looking straight forward. In this posture it was found that in the great majority of subjects only the superficial calf muscles (soleus and gastrocnemius) were continuously active, although to a variable extent. The tibialis anterior, quadriceps femoris, hamstrings, iliopsoas, and glutei usually showed no detectable electrical activity. In the posture described, the perpendicular through the centre of gravity passed behind the line joining the centres of the hip-joints and in front of the line joining the centres of the knee- and ankle-joints. Both the hip- and knee-joints were so constructed that stability at these joints could be maintained without muscular activity, but in the case of the ankle-joint the body was prevented from tipping forwards by the continuously contracting superficial calf muscles.

Weight of Vertebral Column

Professor A. DELMAS (Paris) presented an illustrated paper on an original line of thought concerning the weight of the vertebral column and its relation to posture. There was a relation, he claimed, between the weight of vertebrae and posture. This statement depended on researches made on 30 sorts of mammals and 90 human subjects of each sex and of various races. After classifying vertebrae according to their position in the vertebral column, the weights showed irregularities and features which had been interpreted in a functional way. These features of the vertebral weight.

raised or lowered in some vertebrae, had been studied and related to the magnitude (varying at each level) of the forces of pressure or traction.

The idea of relative weight had been introduced in this study by calculating the weight of each vertebra as a percentage of the total weight of the vertebral column. This idea had permitted the elimination of weight variation due to an increase in total body weight. This procedure enabled one to show the part played by vertebrae or by particular groups of vertebrae in maintaining the posture peculiar to the individual.

The weight of the vertebral body increased regularly from the 1st cervical vertebra to the 5th lumbar ; on the other hand the weight of the posterior arch was very variable. Thus, in the human vertebral column, the heaviest vertebra, in all its parts, was not the 5th lumbar vertebra but the 3rd. It follows that the vertebrae below the 3rd, while of primary importance in the architecture of the static column, were not of similar importance in the maintenance of posture. A very well developed posterior arch was seen in the 2nd cervical vertebra, although this feature still occurred down through the first five thoracic vertebrae. On the other hand the posterior arches of the 3rd cervical vertebra and the 12th thoracic were hardly developed at all. These observations in man and those which had been noted in other species emphasized the functional importance of vertebral weights where certain individual features can be related to variations in posture.

Posture in the Schoolchild

The chair was then taken by Professor A. ST. G. HUGGETT (London), a vice-president, when Dr. CECILE ASHER (London) discussed posture in the schoolchild. Poor general posture in a child with no recognizable local defect was an indication for thorough physical examination and an investigation into his way of life. Postural variations or defects depended on the stage of the child's development, its age, body-type, and in some on faulty attitudes. Flat and everted feet could be regarded as normal in infancy and tended to disappear during the acquisition of postural reflexes and loss of the subcutaneous fat pad. Valgus ankle was a misnomer, as the ankle-joint was not involved. Common in early walking and unassociated with knock-knee, it often went with a high arch and gave a characteristic clinical picture. Any age or type of child was affected. Knock-knee was common under 5 years and commoner in stocky and obese children, slender children being more liable to overall postural defects. It appeared to regress with or without treatment. Lordosis, like knock-knee, was common in the obese, but it was normal in infancy when the pelvic inclination was more horizontal than in adults. Mesomorphic children had less lordosis and a better prognosis than endomorphs. Postural scoliosis in adolescents was often associated with poor overall posture.

"Good" or "correct" posture varied for different individuals and could not be standardized. Treatment should not be wasted on developmental phases but directed towards a particular end. We should remember that many athletes were flat-footed and kyphotic.

Lifting Weights

Dr. P. R. DAVIS (London) spoke on the posture of the trunk during the lifting of weights. Light weights could be lifted with the trunk in any position, but with larger weights the trunk was usually held somewhere between simple flexion and erect. With the heaviest weights it was normally held as straight as possible.

In the erect position the weight was mostly transferred from the arms to cervical and upper thoracic vertebrae. When stooping, the weight was transferred to a lower spinal level, and to a greater number of vertebrae.

Weight reaching the neck and acting in the long axis of the trunk was transmitted through the chain of vertebral bodies and intervertebral disks, little contraction of the spinal muscles being required. Lifting in the stooping posi-

tion, however, produced the following effects: (1) Strong spinal muscle contractions to counterbalance the flexing force exerted on the trunk by the load. (2) Longitudinal compression of the vertebral column by these muscular contractions. (3) Abdominal muscle contraction, which raised the intra-abdominal pressure. This pneumatic mechanism might indirectly extend the spine and so help support the weight.

Weight-lifting injuries could be divided into a spinal group and an extrusive group, the latter including lesions of the pneumatic mechanism such as herniae and prolapses. Damage in both these groups was in theory less apt to occur if weights were always lifted with the trunk held erect.

Posture in Industry

Professor G. P. CROWDEN (London) discussed the practical problem of posture in industry. Posture at work, he said, was one of many factors of physiological significance in relation to the working capacity, comfort, and health. Productive muscular effort involved dynamic and static components in varying proportions according to the nature of the task, the design of machinery, or the method of work performance adopted by the individual.

Movements of the body and limbs, and in particular the alternating contraction and relaxation of muscles in dynamic work, promoted the circulation in the working muscles themselves and in other anatomical structures involved in the performance of the task. On the other hand, continuous muscular contraction, whether due to static effort in work performance or in the maintenance of a strained posture, restricted the blood flow through the structures involved, and led to the rapid onset of fatigue, reduced capacity for work, and increased accident risk.

Examples were given by slides of bad and good postures adopted by men and women in industry while standing, sitting, and handling or carrying loads. It was pointed out that the basic physiological problem of defining optimal postures for work was the detection and subsequent reduction or elimination of static effort of long duration. The value of postural change during work and of varying the task performed was emphasized. While sickness absenteeism might come to the notice of the management, and the medical officer might deal with complaints of fatigue, backache, and other disabilities which might arise from postural strain at work, it was emphasized that the vital problem—namely, prevention—should be dealt with on the shop floor by engineers and others who were in charge of men as well as machines.

In his closing remarks Professor A. ST. G. HUGGETT (London) said how pleased he was to witness the happy symbiosis between the laboratory worker, comparative anatomist, and clinician on matters relating to the important problem of posture. He thanked all those who had given papers, particularly Professor A. Delmas, who had come so far, and the University of Birmingham for their loan of such excellent facilities for the meeting.

SECTIONS OF CARDIOLOGY AND THORACIC MEDICINE AND SURGERY

Tuesday, July 15

Chest Pain

With the president of the Section of Cardiology, Dr. OSCAR BRENNER (Birmingham), in the chair, Dr. GRAHAM HAYWARD (London), a vice-president of the Section of Cardiology, opened a discussion on chest pain by describing ischaemic chest pain. It was difficult to be sure, he said, that chest pain ever arose in the absence of coronary atheroma except in paroxysmal arrhythmias and occasionally with valvular disease. Anaemia and thyrotoxicosis were aggravating factors in some patients, when treatment resulted in disappearance of the pain. The usual pathological changes in patients with ischaemic pain were narrowing of the coronary

vessels and the development of intracoronary anastomosis. These anastomoses allowed coronary occlusion to take place without the advent of myocardial infarction. Patients with angina pectoris had often sustained one or more episodes of coronary occlusion, though the history did not suggest it.

Clinically there were three varieties of pain—angina pectoris, cardiac infarction, and acute coronary insufficiency. The diagnosis rested mainly on the history; the electrocardiogram had serious limitations. The pain was constrictive, and it was localized by the patient by laying the flat of the hand across the front of the chest. Even when the pain was unusual in distribution there was almost always a chest component. In cardiac infarction the pain built up to a maximum, was accompanied by shock, and often by cardiac arrhythmia. In angina, the pain occurred during exercise, but the occurrence of pain after meals sometimes caused confusion. In coronary insufficiency the pain lasted several hours but there was no shock. Clinical signs were often absent after infarction, but triple rhythm was sometimes heard. The initial electrocardiogram was often normal; definite changes might not occur for three days. Serial changes were most diagnostic. Occasionally acute abdominal conditions causing shock could give rise to minor alterations in the ST segments. The electrocardiogram in angina usually showed changes of ischaemia or infarction. If the tracing was normal at rest, it might alter after exertion, but there still remained a small group in whom the E.C.G. remained normal. Changes in the E.C.G. did not necessarily denote that the present symptoms were cardiac in origin. About 12% of symptomless men over the age of 50 had an abnormal electrocardiogram. The clinical history was the most helpful diagnostic aid.

There was no evidence that dietary treatment could influence established coronary disease. Myocardial infarction was best treated initially by morphine or pethidine. In the treatment of angina, trinitrin was the best drug, pentaerythrityl-tetranitrate less beneficial, and "marsilid" (iproniazid) sometimes helped. Induction of therapeutic myxoedema was indicated in ischaemic pain from aortic disease. Lumbo-dorsal sympathectomy relieved pain and probably helped the development of intercoronary anastomoses.

Dr. WILLIAM EVANS (London) condemned excessive zeal in treating hypertension and cardiac pain when there was often no real evidence of disease. The diagnosis of cardiac pain was often false. Several other conditions such as fibrositis and dyspepsia could closely mimic cardiac pain. About one-fifth of patients with chest pain were suffering from dyspepsia. Triple rhythm was an important physical sign in cardiac ischaemia; it was present in 80% of patients after myocardial infarction. The electrocardiogram had become the ultimate arbiter in diagnosis, but the tracing must be reliable and the criteria of normality strict. Reliance should be placed on the standard leads, lead III after full inspiration, and three chest leads. CR leads were preferred to V leads. The lesser recognized cardiographic signs of cardiac pain were: depression of the ST segment, a low T wave in lead CR4+CR7, blunt T waves, terminal dipping of the T wave, depression of the TU segment, inversion of the U wave, notching of QRS7, and the appearance of a Q wave in lead III after deep inspiration. Adherence to these strict criteria would save unwarranted invalidism from faulty diagnosis: a patient should never be made worse for seeing his doctor.

Dr. D. EVAN BEDFORD (London) contrasted the features of neurotic chest pain with those described by previous speakers. After Heberden had identified angina pectoris, other forms of chest pain were often held in similar dread. At one time the term "pseudo-angina" had been used. During the first world war it was realized that chest pain was common in young men. Organic heart disease was absent, and the name "effort syndrome" was introduced. In functional disorders the pain was below or above the left breast or over the left scapula. Radiation of pain to the neck and arm was not uncommon. The pain was intermittent and sharp, but left a persistent ache lasting hours

or days. Areas of tenderness could be elicited over the chest wall. The pain was aggravated by fatigue and emotional stress. Victims could exercise in spite of the pain, though symptoms often occurred at an interval after exertion. Other symptoms included dyspnoea (with a curious sighing respiration), exhaustion, palpitations, giddiness, and sweating of the hands and axillae. In civil life the symptoms were usually found in young adults and in middle-aged women with hypertension and obesity.

Differentiation from angina could be made on the clinical history. Neurotic ill-health should be diagnosed positively on the history and signs and not by exclusion. Patients required assurance about their general health as well as their hearts. Hysterical angina connoted symptoms which sounded genuine through the patient's acquaintance with the real symptoms from contact with sufferers from genuine disease. Vasomotor angina was probably the same as vasovagal syncope, and was characterized by prostration, pallor, a fall in blood pressure, and a sense of impending doom. It was almost certainly neurotic. Young patients with vague symptoms should not be referred to heart specialists, but in older patients full cardiological investigation seemed advisable.

Pleural Pain

The features of pleural pain were outlined by Dr. PAUL FORGACS (London), who affirmed that, though the lungs and bronchial tree were insensitive, the parietal pleura was particularly sensitive to pain. Pain from the chest wall, like pleural pain, was aggravated by coughing and breathing. Pain from the diaphragm could be referred to the chest, abdomen, or shoulder. Pain from the mediastinal pleura was not easy to recognize, since its features were not familiar and since pleural rub was not evident. Mediastinal pain was felt over the sternum in the mid-line and radiated to the neck; it was not aggravated by coughing or breathing. It was difficult to distinguish from the pain of pericarditis or coronary disease. The pain of tuberculous pleurisy often preceded the appearance of the effusion by many weeks. This provided a clinical guide in distinguishing tuberculous from simple sterile effusions. It was also of extreme importance, suggesting that the pain arose from a source of infection near the pleura. In some cases of chronic pleurisy the cause could not be determined; pleurisy could occur in the absence of any demonstrable abnormality in the lung.

Pain following operations on the chest was discussed by Dr. B. G. B. LUCAS (London). The reason for pain after thoracotomy was not fully understood. It seemed to vary with the patient's ability to withstand pain and with the site of operation. Pain was worst after operations on the lower and posterior parts of the chest. The pain often persisted for years; it bore no relation to opening the pleura at operation; and it was aggravated by post-operative dyspnoea. There were two groups of patients. The first group, with true intercostal neuralgia, responded to intercostal block with alcohol, phenol, or 50% ammonium sulphate. In the second group the pain was more diffuse and occurred over the operation scar. These patients were often introspective and difficult to treat. Some responded to infiltration of the painful site with ammonium sulphate. Early treatment was imperative. Of drugs, opiates gave most relief and did not depress inspiration. Morphine antagonists could be given at the same time.

Oesophageal Pain

Mr. R. H. R. BELSEY (Bristol), describing oesophageal pain, said that the commoner causes were oesophageal reflux, and trauma from foreign bodies, instrumentation, and corrosives. Malignant disease of the oesophagus was usually painless. Oesophageal reflux was more common than large hiatus hernia. In this condition the pain was burning and severe, though not intense. It was situated high in the epigastrium or over the lower sternum. The pain might be referred to the back, jaws, or down the arms:

it was aggravated by stooping or lying down. True vomiting was rare and did not bring relief. Eating varied in its effect on the pain but often brought relief. Alkalis helped temporarily. The patients had good and bad periods, rather like those with peptic ulcer. Flatulence was constantly present because of the habit of constant air swallowing in an attempt to relieve the pain. The habit, and the flatulence, often persisted after operative cure. There was no satisfactory medical treatment for oesophageal reflux. Diagnosis depended partly on radiology, though barium examination did not always disclose the reflux. Oesophagoscopy was often very valuable in demonstrating the reflux. There was no correlation between the severity of the pain and the degree of oesophagitis. Sometimes intense pain was produced by oesophageal spasm when food became impacted. In childhood, oesophageal reflux caused great distress. It sometimes caused a curious exaggerated posture and crying. This sometimes led to an erroneous diagnosis of mental deficiency. The pain from large hiatus hernias was different. Here the pain was closely related to eating, unaffected by posture, and relieved by vomiting and belching. In most cases of oesophageal reflux the clinical history should lead to correct diagnosis.

Following the opening speakers, the PRESIDENT opened the discussion by commenting on the relative importance of history and cardiographic changes in the diagnosis of heart disease. It was to be remembered, he said, that an abnormal cardiogram did not necessarily denote a cardiac cause for the symptoms for which advice was sought.

Dr. W. S. HAYNES (Mombasa, Kenya) suggested the use of intravenous alcohol in the treatment of post-operative pain. Dr. G. I. WATSON (Peaslake, Surrey) gave a colourful description of the symptoms resulting from lemon drops impacted in the oesophagus and from sustained over-exertion.

Dr. M. E. CHINNER (Adelaide, South Australia) drew attention to the occasional relief of anginal pain after tying the internal mammary arteries and from inducing therapeutic pericardial adhesions.

Dr. G. S. R. LITTLE (London), Dr. MACGREGOR (Croydon), Mr. TAYLOR (Birmingham), Dr. MAX HAMILTON (Leeds), Dr. WHITFIELD (London), Dr. DAVIS (Swansea), and Dr. ARCHIBALD FULLERTON (Batley) added to the stimulating discussion.

SECTION OF CARDIOLOGY

Wednesday, July 16

Treatment of Pulmonary Heart Disease

With the president, Dr. OSCAR BRENNER (Birmingham), in the chair, Dr. K. W. DONALD (Birmingham) opened the session with a paper entitled "Treatment of Pulmonary Heart Disease." Cor pulmonale developed in those who already had considerable disability from chronic bronchitis and emphysema. Sometimes asthma was also a complicating factor. These patients, having suffered from a super-added infection such as acute bronchitis or bronchopneumonia, quickly became seriously ill and the need for skilled treatment was urgent. When admitted to hospital they looked moribund, but if the initial treatment was skilled then many lives could be saved. The administration of oxygen was life-saving. Dr. Donald advised general practitioners to carry in their cars an oxygen cylinder and a loose plastic mask so that these patients could get oxygen while awaiting admission to hospital. The dangers of carbon dioxide narcosis had to be kept in mind, and the patients allowed out of the oxygen tent for 10 minutes each hour to ensure adequate ventilation of the lungs.

Among the other remedies Dr. Donald advocated were digitalis, antibiotics given intramuscularly, and aminophylline if any bronchial spasm was present. Emergency tracheotomy should be performed if there was an accumulation of mucus in the trachea. He claimed that in Birmingham this operation frequently proved life-saving. In the

speaker's opinion the newer diuretics such as chlorothiazide were superior to intramuscular mercurial preparations for the relief of oedema.

In the discussion Professor W. MELVILLE ARNOTT (Birmingham) stressed that carbon-dioxide narcosis caused the mental confusion so often seen in these patients. Mr. A. L. D'ABREU (Birmingham) confirmed the value of tracheotomy in urgent cases.

The Thyroid and Heart Disease

Dr. S. H. COOKSON (Bournemouth) then read a paper on the thyroid and heart disease. He confined most of his remarks to the effect of myxoedema on the heart, having reached his conclusions from a study of 36 patients with this disease. The diagnosis of doubtful cases could always be made from the electrocardiographic changes. These, he said, were a slowing of the rate, a reduction of voltage, and a flat or inverted T wave. Occasionally there was a prolonged P-R interval, heart block, and depression of the ST segment. These changes could be restored to normal within eight days with correct therapy. The blood pressure was raised in hypothyroidism, especially the diastolic reading. Dr. Cookson emphasized that the heart size was normal in 14 of his patients, while in the remainder considerable enlargement was present. Severe cases always suffered from the usual symptoms of cardiac failure.

Dr. W. BRIDGEN (London) said that thyrotoxicosis in adolescence must not be treated by surgery because of the ill effects arising from the resulting general endocrinal upset. Dr. K. W. DONALD (Birmingham) urged that cardiac catheterization be done to confirm the diagnosis in all borderline cases.

Myocardial Disease of Obscure Aetiology

Dr. BRIDGEN then read his paper entitled "Myocardial Disease of Obscure Aetiology." He included in this group damage to the myocardium by congenital fibrotic conditions, infections due to bacteria, viruses, and protozoa, collagen diseases, and amyloidosis. Nutritional factors complicated by alcoholic excess, beriberi, and lack of vitamin K were also contributing factors. The signs and symptoms were identical to those of ordinary heart disease, the most prominent symptom being excessive fatigue. The radiological appearances were characteristic, there being a generalized enlargement of the heart with no pulmonary oedema. Electrocardiographic changes could not be relied upon for diagnosis: the usual changes suggested infarction. Prognosis was poor, with sudden death frequent.

Professor MELVILLE ARNOTT reported that over 50% of all cardiac diseases in the Union of South Africa fell into these categories.

Surgical Treatment of Congenital Heart Disease

The Section then heard a paper by Dr. C. G. PARSONS (Birmingham) concerned with the selection of children with congenital heart disease for surgical treatment. He dealt with persistent ductus arteriosus, coarctation of the aorta, and atrial septal defect, being mainly concerned with the advice that should be given to the parents of these children about operation. The decision to advise operation could be reached only after carefully weighing up all the evidence in each individual case. Each recommendation would depend not only on the signs and symptoms and the results of the investigations but also on the ability and experience of the surgical team. 10% of all babies admitted to the Birmingham Children's Hospital because of heart disease had persistent ductus arteriosus. Without operation half of these infants would die in the first year of life. Operation was therefore advised as early as possible. 90% of babies with coarctation of the aorta died, and operation should therefore be attempted as soon as all facilities were available. When the diagnosis was made in older children, operation must be undertaken before puberty. Atrial septal defect had a relatively good prognosis and could exist without symptoms even in the elderly. The average life

expectancy was 37 years. Operation should be advised only if symptoms developed.

Mr. I. HILL (London) described all the surgical methods which could be used to correct these congenital conditions, illustrating diagrammatically with slides the technical aspects of each operation. Later he stressed the value of hypothermia in reducing the mortality of cardiac operations. He thought that the future for cardiac surgery was bright.

Dr. E. M. M. BESTERMAN (London) stressed that when an infant suffered from persistent ductus arteriosus operation must be undertaken before cardiac enlargement had occurred even if there were no symptoms present. Dr. R. GIBSON (London) reported a series of 70 cases operated on for atrial defects with only six deaths. Those who died had other complications. Dr. J. LEIGH COLLIS (Birmingham) agreed with all the practical points raised by Dr. C. G. PARSONS.

SECTION OF GENERAL PRACTICE

Wednesday, July 16

Changes and Trends

With the president, Dr. H. W. DONOVAN (Birmingham), in the chair occasional papers were heard and discussed.

Women in General Practice

Dr. ANNIS GILLIE (London) spoke of the opportunities for women in general practice. Women had been in this field of medicine for over half a century, and there were now probably some 2,500 women general practitioners. Two types could be recognized—the "woman for women" type who had almost exclusively female patients and the real family doctor who looked after the whole families: with time this was the trend.

In general practice there was great scope for a woman to practise medicine to the full: her normal family duties as a wife and mother need not greatly interrupt her professional work. A questionnaire some years ago showed that the loss of women general practitioners from retirement was less marked than of women in other branches of medicine. The entry of women into general practice seems to be maintained and even increasing. In 1957, of all the new principals in England and Wales, 817 in all, 95 (or 12%) were women.

Changes in Paediatric Practice

Dr. A. BEAUCHAMP (Birmingham) gave a personal review of the changes in paediatric practice over the past 30 years. These changes had been notable and numerous, yet some conditions remained unaltered. The catarrhal child was still with us and the vogues of vitamins and removal of tonsils and adenoids had not solved the problem. As always, it was far more important to look at the child as a whole rather than merely at the tonsils. Acute infections of the throat and ear were still as numerous, but much less dangerous and severe. Acute chest infections, on the other hand, seemed to be much more frequent.

Whereas 30 years ago osteomyelitis was an almost weekly occurrence, now, Dr. Beauchamp said, he had not seen a case for six years. With better conditions of feeding and hygiene marasmus and rickets had been controlled, but summer diarrhoea still occurred. Infectious fevers were much altered. Scarlet fever was no longer a specific disease, diphtheria was never seen, and the complications of measles were mild and infrequent. Congenital abnormalities had increased quite significantly, and no good reasons could be given for this.

The reasons for these dramatic improvements in child health were, he considered, three: better public health measures, more enlightened teaching of medical students, and new and powerful drugs. It had always to be remembered, however, that even in the past children recovered from the majority of common and acute infections—unnecessary abuse of the specific antibiotics should be avoided.

Acute Infection of the Ear, Nose, and Throat

Mr. CHARLES GLEDHILL (Northampton), speaking as an E.N.T. consultant, discussed the common problems of aural and nasopharyngeal infections as he saw them. Otitis externa was a difficult condition to treat. Accurate diagnosis was first necessary, with swelling and inflammation of the skin lining the meatus. It was usually a bilateral skin infection caused by bacteria of the pyocyanus-coli groups. The best treatment was local cleansing followed by applications of hydrocortisone and neomycin ear-drops. In treating acute otitis media great care was necessary to follow up all cases until the drum and hearing returned to normal. Any abnormalities required expert advice. Hazardous use of broad-spectrum antibiotics was very dangerous, and penicillin was still the drug of choice.

Pansinusitis was usually caused by penicillin-sensitive organisms, and penicillin was again the first choice together with vasoconstrictive nasal drops. Allergic rhinitis was with vasoconstrictive nasal drops. Allergic rhinitis was with vasoconstrictive nasal drops. Allergic rhinitis was with vasoconstrictive nasal drops. Allergic rhinitis was with vasoconstrictive nasal drops.

Local antibiotics were dangerous in acute throat infections, as generalized moniliasis was a risk. For quinsy he used emergency tonsillectomy under penicillin cover.

Chronic Rheumatism

Dr. L. J. BARFORD (Reigate) discussed the management of the common rheumatic problems in general practice. Empirical measures were the bases of all therapy. These were relief of pain by heat and analgesics, rest, and prevention of deformities and maintenance of muscle tone. In addition to these, local injections of hydrocortisone were now extremely useful in cases of osteoarthritis of knees and hands, tennis elbow, the carpal tunnel syndrome, and subdeltoid bursitis. In spite of all that had been written of its dangers, he still found phenylbutazone a most useful drug in ankylosing spondylitis and chronic gout. Above all else, and much more important than this galaxy of therapeutic measures, was the sympathetic encouragement of the individual patient.

SECTION OF NEUROLOGY AND NEUROSURGERY

Wednesday, July 16

Neurological Disorders in Childhood

With the president, Professor BRODIE HUGHES (Birmingham), in the chair, Dr. LUDO VAN BOGAERT (Antwerp) opened a discussion on neurological disorders in childhood by a review of acute encephalitis. He defined encephalitis as "a morbid process, inflammatory in nature and occurring within the brain, and developing in the presence of a living infective agent acting locally." He stressed the importance of early recognition of encephalitis, particularly when it accompanied or followed specific fevers. If, in a patient with an exanthem, constitutional upset was unusually severe, this often indicated an incipient meningo-encephalitis.

Recognition of Encephalitis

Dr. van Bogaert went on to describe the clinical features of meningo-encephalitis and underlined the importance of obtaining specimens for virological examination. This was particularly important in the first stage (that of viraemia) before neurological symptoms developed. The second febrile phase of the illness, in which the disease process might be largely localized to the nervous system, was easier to recognize clinically. In the early stage there was a pleocytosis in the cerebrospinal fluid, but later there was cytoalbuminological dissociation. A full understanding of many clinical and pathological features was necessary for the elucidation of some of the unusual clinical and pathological entities which had been described. For instance, Dr. van Bogaert suggested that some cases of acute serous exudation within the brain represented simply an early phase of

encephalitis and should be included in this group even in the absence of "cellular" evidence of inflammation. He went on to discuss the syndromes of brain-stem encephalitis, sero-haemorrhagic encephalitis, and the various types of cerebral venous thrombosis, which may be clinically similar, in the light of the pathological changes which had been described in such cases. He closed by mentioning briefly the prognosis of childhood encephalitis and methods of treatment which could be utilized in such cases.

The Hypertonic Child

Dr. PAUL SANDIFER (London) said that the title of his communication, "The Hypertonic Child," did not adequately define what he proposed to talk about, as he intended to deal with the general problem of infantile stiffness. The stiff baby was one whose joints did not move, nor could they be moved, with normal freedom. The cause of the stiffness or deformity might be local, in or around the joints, and might then be "fixed" or structural. This type of fixed contracture of the limbs was seen in infants with arthrogryphosis, but might also occur in childhood as a result of polymyositis or myositis ossificans. Alternatively the cause of the stiffness might lie far distant from the joints where restriction of movement was most apparent; it might in fact be in the nervous system. In such cases the stiffness was generally "unfixed" or postural.

An important cause of stiffness and deformity in the lower limbs was spinal birth injury, a condition which was often difficult to recognize when present in mild degree, but more often the causal lesion was in the brain. These children were generally referred to as "spastics." However, in cases of cerebral palsy, spasticity of the limbs was not invariable; some cases were disabled by rigidity of extrapyramidal type and some by involuntary movements, while in others the diplegia was initially flaccid in type.

Dr. Sandifer went on to discuss in detail the clinical features and differential diagnosis of these conditions; he pointed out that early diagnosis was important not so much because of prospects of effective treatment but rather in order to give the parents an accurate prognosis. In cases of all types there was generally a history of cerebral insult sustained in the perinatal period, and subsequently delay in the development of motor skills became apparent. Many diverse symptoms and signs of focal cerebral and cerebellar or brain-stem lesions might be present in such cases, a fact which increased the difficulties of differential diagnosis in early life.

The Hypotonic Child

Dr. JOHN WALTON (Newcastle upon Tyne), speaking on "The Hypotonic Child," said that few problems were more difficult than the differential diagnosis between the causes of generalized hypotonia of the skeletal muscles in infancy. The diagnosis of amyotonia congenita had fallen into disrepute, since some had used this term to describe all cases with hypotonia developing at or shortly after birth, assuming concurrently that such a syndrome carried an invariably favourable prognosis, a conclusion which was far from the truth. To others this diagnosis foretold, on the contrary, a progressive downhill course, an event which was certainly the rule in progressive spinal muscular atrophy. However, this view failed to take account of that small group of hypotonic children who recover.

In fact, the syndrome of early infantile hypotonia might result from a variety of disease processes, some grave, others benign. The commonest cause was progressive infantile spinal muscular atrophy (Werdnig-Hoffmann disease), in which paralysis and hypotonia became progressively severe and death eventually ensued. In a second large group of cases the muscular hypotonia is a symptom of a variety of muscular, neuromuscular, cerebral, nutritional, metabolic, and skeletal disorders. The third and smallest group, to which the name "benign congenital hypotonia" had been applied, was one in which improvement was the rule, some patients recovering completely, while in others some degree

of muscular weakness and hypotonia persisted throughout life. Dr. Walton stressed the importance of recognizing cases in this latter group and discussed in detail differential diagnosis by clinical means and also the place of electromyography and muscle biopsy.

Hydrocephalus

Mr. G. H. MACNAB (London) read a paper on "Hydrocephalus in Infancy." He said that much had recently been learned about the natural history of hydrocephalus. His colleague Dr. K. M. Laurence had studied a series of 186 children with hydrocephalus who had been fully investigated, but had not undergone surgical treatment, during the period from 1936 to 1956. Over 40% of the children survived, with natural arrest of the hydrocephalus, and 42% were of normal intelligence, with intelligence quotients of 85 or above.

In Mr. Macnab's series of cases, one-third were found to have meningomyeloceles, and in these cases it was common for inflammatory adhesions to block the aqueduct of Sylvius or the foramina of the fourth ventricle. The Arnold-Chiari malformation also caused distortion and adhesions in the region of the cisterna magna. Dr. Laurence, in the analysis of 100 post-mortem examinations, found that only in 14% of cases was hydrocephalus due entirely to congenital malformations; infection accounted for 47%, haemorrhage for 24%, and tumour for 4%, leaving 11% unaccounted for.

Mr. Macnab then went on to show a film demonstrating the insertion of the Spitz-Holzer valve—a valve with a uni-directional flow used to drain cerebrospinal fluid from a cerebral ventricle into the superior vena cava at a set pressure of 50 mm. of water. Special silicone material which formed the valve and catheters prevented coagulation of the blood. This technique was the first successful method yet devised of carrying formed cerebrospinal fluid directly into the blood stream. Over a two-year period Dr. Spitz had now inserted 212 valves, with 96% successful results. Mr. Macnab had now personally inserted 29 successfully.

Intracranial Tumours

In the unavoidable absence of Mr. R. CAMPBELL CONNOLLY (Birmingham), Dr. H. G. MILLER (Newcastle upon Tyne) read Mr. Connolly's paper on "The Diagnosis and Management of Intracranial Tumours in Childhood." He discussed the pathology of these tumours, illustrating his talk with slides which demonstrated the macroscopic appearances seen at operation and also histological changes discovered on biopsy or at necropsy. The differences in incidence of the different types of intracranial tumour in children and in adults were stressed. In children there was a relatively high proportion of gliomas of low-grade malignancy, and benign neoplasms were uncommon. In adults, a considerable proportion of gliomas showed a high degree of malignancy, but on the other hand innocent tumours such as meningiomas and acoustic neuromas were more common.

Mr. Connolly then gave a brief description of the symptoms and signs of intracranial neoplasms, mentioning features which were characteristic of the different types of growth. In differential diagnosis, the conditions which tended to give rise to particular difficulty were otitic hydrocephalus, tuberculous meningitis, and encephalitis. In summarizing the indications for special investigations, including lumbar puncture (which had a very limited place in view of its dangers), electroencephalography, pneumoencephalography, ventriculography, and angiography, Mr. Connolly showed a number of illustrative radiographs. He concluded by considering briefly prognosis and methods of treatment, with particular attention to pre-operative management, the scope of operation and radiotherapy, and aftercare.

Mr. J. M. SMALL (Birmingham), Dr. B. S. B. WOOD (Birmingham), Dr. A. L. WOOLF (Birmingham), Dr. W. A. ZALESKI (Bromsgrove), Dr. H. L. ELLIS (Oxford), Dr. HELEN E. DIMSDALE (London), and Dr. B. M. LAURANCE (Derby) contributed to the discussion.

SECTIONS OF PSYCHIATRY AND SOCIAL AND PREVENTIVE MEDICINE

Wednesday, July 16

Care of the Mentally Ill

The two Sections held a joint meeting under the chairmanship of Dr. ELIOT SLATER, president of the Section of Psychiatry, to discuss "Home, Hostel, or Hospital? The Care of the Mentally Ill." Professor A. QUERIDO (Amsterdam) opened with an account of the Amsterdam domiciliary service, which, he said, has now been running for 25 years, and which at present cares for about 3,000 patients in their homes. These patients would to a large extent probably need hospital treatment in the next two years, if the service suddenly ceased to exist. To explain how it worked he sketched out the mental health services of Amsterdam, since the domiciliary service is only one strand in the net. Amsterdam has no mental hospital of its own, and its people requiring such treatment are dispersed among the mental hospitals of Holland, where they occupy one bed in eleven, which is nearly the ratio of the city population to the total in the country. However, the City University Hospital and the Protestant University Hospital between them have about 300 beds for psychiatric cases for observation, investigation, and brief treatment.

Psychiatric First-aid Service

The pivot of the organization is a day-and-night psychiatric first-aid service, with an experienced male nurse and a psychiatrist always available, and a staff of 10 psychiatrists and 25 social workers to draw on—the staff who also work the domiciliary service. Any patient thought by a family doctor or a specialist, or by the police or other public or social agency, to be in need of admission to hospital for psychiatric reasons is signalled to the first-aid service, and the duty psychiatrist then visits the patient on the spot, wherever he is, and decides on disposal. He may organize admission to one of the two general hospitals, or he may call in the domiciliary service, which will continue a series of home visits, giving guidance and support and sometimes material aid.

The service does not give any psychotherapy (and hence neurotics are not accepted but referred to the special centres), nor does it give drugs: medication remains the responsibility of the family doctor. What it does is show interest, practical help, and general guidance to the family. The service also accepts patients on discharge from the University Hospitals, where they may have spent up to two months, and gives them on the average two to three years' supervision. It also accepts patients discharged from the mental hospitals, where the average length of stay has been reduced to six months.

Thus two-thirds of the service's patients are schizophrenics and others are organic cases (senile, encephalitic, paralytic, feeble-minded) or "psychopaths." The aim is to teach these chronic sufferers to be aware of their disability and to learn to live with it in the community. This saves the community money, and it is an excellent vehicle for mental health education.

The Mental Hospital and the Community

Dr. T. P. REES (London) followed with a brief survey of the changes in the functions of mental hospitals since the Act of 1808 authorized the building of public asylums. In the nineteenth century the asylum was to protect the public, like the prison: to-day it was a hospital for treating mental illness. At the same time, the pattern of all disease had changed. First the diseases of malnutrition had to be conquered, then the infections; now the mental illnesses were the challenge, and rapidly becoming a preoccupation of the medical officer of health. 40% of all N.H.S. hospital beds were in mental hospitals, and 1 person in 40 dies there. One man in 19 and one woman in 14 will be an in-patient.

Dr. Rees said that the old-style asylum produced fresh illness in the patients, institutionalization, and it was not only the patients but also the medical and nursing staff who developed this form of mental rigidity. The World Health Organization had advised that the mental hospital doctor should spend one-third of his time working out in the community. He wanted to see more part-time consultant appointments to mental hospitals, more out-patient clinics, especially in the evenings, and especially clinics for treatment as opposed to diagnosis. It was often very bad for neurotics to stop work and come into hospital. They should be able to get brief psychotherapy after working hours. At the same time he hoped that the majority of the mentally ill would continue to be looked after by their family doctor.

Needs of the Mental Hospital Patient

Dr. C. R. LOWE (Birmingham), speaking on "The Needs of the Present Hospital Population," said that, even if the schemes propounded by the previous speakers were fully applied, hospital admission was still going to be needed in the future, even for social reasons (people living alone, or in slums, or with unsuitable relations). To clarify the diverse kinds of hospital services likely to be required, he, Professor T. McKeown, and Dr. F. N. Garratt had made a study of the needs of the 3,555 mental in-patients of Birmingham in January last year. They found that 45% of these people needed no medical treatment, a further 42% needed only maintenance treatment, and only 13% were having active treatment and investigation in the same way as the patients in an acute general hospital. Again, only 8% were in bed, and two-thirds needed no nursing of any type. One-quarter were capable of doing productive work, yet only 10 were leaving hospital during the day to do a job, and occupational therapy amenities were far from adequate. It was clear that 12% of these patients were in hospital for social reasons, and could just as well have been in a hostel. The exact figures would clearly change with changing circumstances, such as better out-patient services, but Dr. Lowe thought the survey showed the need for diversity. Plans of the future should envisage different kinds of unit, hostel, acute ward, geriatric centre, and so on. Should they be geographically separate or built round a general hospital?

Opening the discussion, Dr. C. A. H. WATTS (Leicester) said that his county, Leicestershire, had 12 psychiatrists, and would need 30 if a version of the Amsterdam scheme were to be started. The alternative was to give general practitioners better undergraduate and postgraduate training in psychiatry so that they could do more and do it better, and to see that they could call on all the paramedical services (social workers, etc.) for help and collaboration. The patient discharged from hospital, whether general or mental, had to be given back his self-confidence and self-esteem and brought back into the community and everyday life. He was looking in the wrong direction if the hospital doctor and the hospital psychiatric social worker managed his aftercare.

Dr. B. MANDELBROTE (Gloucester) said that in the provinces, as distinct from London, the mental hospital was the natural hub and focus of the mental health services. He criticized Dr. Lowe's analysis, as did Dr. T. P. REES later, because it had equated nursing duties in general hospitals with mental nursing, whereas the mental hospital required nurses who could live with and talk to the patients in the right way. Dr. E. S. STERN (Warwick) thought Dr. Lowe's survey completely unrepresentative of mental hospitals in general, and therefore not a basis for planning. He hoped the future was not going to be the kind of "hospital city," cut off from everyday life, a little world of its own, as Dr. Lowe had suggested.

Dr. M. J. BROOKES (Shrewsbury) wanted to know why a recent commission in Denmark had asked for more mental hospital beds. Dr. R. A. LAMBOURNE (Birmingham) put in a plea for more use of the existing political, church, tennis,

and other clubs, and collaboration with teachers and parsons in rehabilitation, rather than creating more hospital out-patient clubs and employing more paramedical workers. Dr. M. P. NELSON (Somerset) wondered whether the public were now adequately safeguarded, and what was the effect on the family of having psychiatric cases in the home. To the second point Professor QUERIDO replied that they had found that children were not upset by psychotic parents, but it was neurotic parents who did the damage. To the first, Dr. T. P. REES said it was humanly impossible to prevent all escapes, whether from prison or Broadmoor, though the latter had a good comparative record. But the vast majority of psychiatric patients were inoffensive, and we had to be careful to balance the ill effects of repression on them against the possibility that through greater freedom one or two individuals might commit crimes.

SECTION OF OCCUPATIONAL HEALTH

Wednesday, July 16

Routine Medical Examinations

The president, Dr. R. S. F. SCHILLING (London), took the chair and in his introductory remarks said that in industry in Great Britain routine examination of workmen had been accepted as essential. Experience, particularly in the U.S.A., had raised three questions in connexion with this aspect of industrial medicine: (1) Were the industrial medical officers making the best use of their time? (2) Were they using the right techniques for the assessment of disease and of skill for work? (3) Were hospital techniques suitable for the investigation of normal persons?

The Adolescent

Dr. R. E. SMITH (Rugby) then read a paper on the examination of the adolescent. This was based on his experience of 20 years as a medical officer to two large schools for boys and to a college for trainee female teachers. At Rugby School each boy was carefully examined on entry and the parents were provided with a detailed history of the boy's previous illnesses. Thereafter no routine medical examinations were carried out. Reliance was placed entirely on getting every boy really well after an illness. Any boy who had been ill during the vacation was examined on return to school to ensure that recovery was complete. At Laurence Sheriff School the procedure was different. There entry examinations were carried out, followed by periodical examinations at two-yearly intervals. He described poor eyesight and dental caries as the main bug-bear, and these required special arrangements. Among the subjects which he had specially investigated were tuberculous infection, otitis media, and undescended testicles. He preferred Mantoux testing and B.C.G. vaccination to mass miniature radiography. The stethoscope, he thought, was outmoded. He was convinced from careful observation that the testicle often descended spontaneously at puberty and that interference by surgeons or endocrinologists before puberty was usually meddling. As to the discharging ear (which was one of the main problems), he had found that practically every case could be cleared up by drying with pledgets of sterile cotton-wool. At the onset this toilet was sometimes necessary every hour. Persistence of discharge was usually due to infected tonsils or maxillary sinuses. His conclusion was that effective treatment of illness when it occurred was superior to routine examinations.

Transport Drivers

Dr. P. A. B. RAFFLE (London) read a paper on the medical aspects of the selection and supervision of persons whose work involved public safety as exemplified by London Transport bus drivers. As an indication of the importance of the subject he recalled that the British Medical Association and the World Health Organization during the past five years published memoranda on medical standards for

such transport drivers, and these standards adequately covered most situations which involved public safety. He stated that the main criteria of fitness to drive a passenger vehicle were: physical capability for handling controls, good visual acuity and colour vision, and absence of all diagnosable conditions apt to cause sudden collapse or excessive fatigue. Careful progressive recording and assessment of the medical history of individual drivers were important. Dr. Raffle enumerated 12 causes of loss of consciousness in drivers, and among these he emphasized idiopathic epilepsy, because it might not appear until middle life, epileptiform seizures due to cerebral metastases complicating bronchial carcinoma, and laryngeal vertigo (cough syncope) in cases of chronic bronchitis. He outlined the scheme of selection and examinations for drivers in London Transport. Analysis of 18,003 pre-employment medical examinations showed that 5.5% of candidates were rejected on general medical grounds and a further 13.3% by reason of substandard vision or colour vision. He commented that patients and private doctors did not regard with due seriousness such conditions as cardiovascular disease and chronic otitis media, which was always a potential cause of aural vertigo. Continuous medical supervision was achieved by periodical examinations at certain ages, following absence on account of certain specific illnesses, and in cases of absence of 28 days or more.

Dr. Raffle focused attention on coronary artery disease. Because of considerable liability to recurrence, this was an absolute contraindication to the continued employment of a driver in this capacity. Coronary disease was usually discovered through sickness absence: electrocardiographic examination did not, at present, enable examiners to detect those who would develop this condition. He referred to a matter of great public interest—namely, diseases which might be suddenly disabling or fatal. During the quinquennium 1953 to 1957, 89 drivers were suddenly stricken and died on the day of the episode. Of these 11 were actually at the wheel at the moment of crisis: six accidents followed, but none involved personal injury. In conclusion he was of opinion that assessment of fitness for particular occupations after sickness was probably more important than routine examination.

Industrial Executives

Dr. O. B. SCHREUDER (Pan American World Airways System, New York) discussed the place of routine examinations in the promotion of health among industrial executives. He stressed that the employee was one of the most valuable assets in any company, and, of the employees, the management group or executives were particularly valuable because of their training, motivation, and high degree of technical and administrative skill. Accordingly the conservation of the health of the executives was an essential part of any occupational health service. He stated that the objective was best achieved through periodical examinations preferably carried out by the industrial medical officer. The main purpose of these examinations was the detection of disease in the early stages while the possibility of remedy existed. To succeed the scheme must have the full support of management. As to the content of the periodical examination, Dr. Schreuder listed these items: a comprehensive history; thorough physical examination, including detailed examination of vision, inspection of the fundi, and determination of ocular tension; palpation of the peripheral blood vessels; and rectal examination. Laboratory investigations should include urinalysis, haemoglobin estimation, E.S.R., blood sugar in persons over 40 years of age, radiographic examination of the lungs, and electrocardiographic examination if over the age of 40 years; other more specialized tests according to indication. In a recent consecutive series of 120 periodical examinations in the management group of Pan American Airways significant defects were discovered in approximately 50% of examinees. The most common ailments were metabolic diseases, including obesity and diabetes, cardiovascular conditions, such as hypertension and gastro-intestinal diseases, including para-

sitic infestations (due to visits to the tropics) and peptic ulcers. Dr. Schreuder directed special attention to the problems of stress and strain. In conclusion he underlined the supreme importance of careful, frank discussion of findings and counselling of each examinee.

A lively discussion, in which many members participated, followed the papers. The main subject of this was the ethical considerations which attach to examination of executives.

COMBINED MEETING OF SECTIONS OF SURGERY, MEDICINE, AND GASTRO-ENTEROLOGY

Wednesday, July 16

Peptic Ulcer

Making some opening remarks from the chair, Dr. E. BULMER (Birmingham), a vice-president of the Section of Medicine, said that as no important advances in the medical treatment of peptic ulcer had been made in the last 35 years it was unlikely that much time would have to be devoted to that aspect of the problem.

Dr. F. AVERY JONES (London) introduced the subject, and pointed out that peptic ulcer, though a common illness, was one which varied tremendously in its severity. Many patients had relatively little trouble from their ulcers, with only a bout of indigestion once or twice a year which quickly responded to routine treatment. In his experience about 25% of cases fell into this category. Diagnosis was usually easy, but there were many pitfalls. Importance should be attached to the periodic and recurring nature of the pain, which might be experienced only in the back, subternally, in the right iliac fossa, or in the suprapubic region.

Duodenal ulcers differed from gastric ulcers in many important respects. For example, in gastric ulcer the incidence was excessive in the labouring classes and low in the professional classes. As to causation, Dr. Avery Jones thought that so far as gastric ulcer was concerned ordinary wear and tear of the gastric mucosa might be important. In contrast, in duodenal ulcer there was the factor of high acid output and hypertrophy of the parietal cells, the latter feature being in part of a hereditary nature. The food habits, and in particular the type of food the patient ate, were of importance, and alcohol was well known to be an aggravating factor also.

Smoking and Ulcers

In a personal series of cases he had been able to show that tobacco-smoking delayed the healing of ulcers. If the patients were to stop smoking 83% of the ulcers showed significant healing by two-thirds or more in extent within one month. Certain drugs also aggravated peptic ulcer, including aspirin, steroids, and phenylbutazone. There was an unduly high incidence of chronic bronchitis among ulcer patients. Finally, emotional factors were well known to be important, and unless attention was paid to these the results of treatment might be poor. Rest in bed was an important part of treatment, for this increased the likelihood of the ulcer healing. Alkalis should be given for the relief of pain, but it was the speaker's impression that these and other drugs were not essential when the patient was free from symptoms, and indeed a complicated treatment regime for ulcers could be positively harmful, particularly when the patient had obsessional tendencies.

Dr. C. N. PULVERTAFT (York) drew attention to the striking geographical differences in the incidence of peptic ulcer which had been reported in several countries, notably India and Nigeria. In this country it had been found for some time that duodenal ulcer was more common in Scotland and the north of England than it was in the south of England, and that the disease was more prevalent in towns and cities than in country areas. He had made a study of peptic ulcer as it occurred in York and the surrounding

country between 1952 and 1957, each new patient being recorded. It emerged that the mean annual incidence per population at risk for the whole area was, for men: gastric ulcer: 0.58, duodenal ulcer 2.25; for women the corresponding figures were 0.32 and 0.66. Perforations occurred in only 7% of the women patients as opposed to 13% of men patients, and in the case of the latter both gastric and duodenal ulcers were found to be more frequent in the town than the surrounding country. It was calculated that the expectation of developing a peptic ulcer in males over the age of 10 was 0.258% per year. A comparison was made between his series and a recent analysis of post-mortem records of peptic ulcer made in Leeds, and a good correlation for duodenal ulcer especially was observed, though it was also noted that the gastric ulcer rate was higher in Leeds than in York. The speaker also pointed out that there had been a recent slight fall in incidence of duodenal ulcer in York, and this trend had also been noted by other observers in London and Aberdeen. The cause of the higher incidence in town than in country was obscure, but it was thought to be unlikely to be due to the higher tempo of urban life.

Role of Gastrectomy

Mr. HERMON TAYLOR (London) spoke of the role of gastrectomy in the treatment of peptic ulcer. He stressed that the loss of the greater part of the stomach was a serious blow to general well-being and digestive efficiency. It was justified by its curative effect upon the ulcer and freedom from subsequent anastomotic ulcer. In contrast, in his experience gastro-enterostomy was associated ultimately with a 30% incidence of recurrent peptic ulcer. This had only become evident over fifteen years, and it would not be revealed if the follow-up period was brief. The results of the addition of vagotomy must have regard to this.

Partial gastrectomy was not associated with recurrent ulcer, but a price had to be paid in the occurrence in some patients of post-operative symptoms of which dumping was the best known. This was due to the loss of the pylorus and could therefore follow any form of gastrectomy. The symptoms of fullness, faintness, and weakness were due to the sudden distension of the small intestine with food: they could always be avoided, therefore, by not taking large meals, with restriction of fluids during a meal. Symptoms that did not respond to simple rules at mealtime were not due to dumping: they were due to obstruction at the anastomosis, with distension of the afferent loop with bile. This was brought about by sharp angulation at the junction of the afferent loop and the gastric remnant. Acute distension of the afferent loop in the immediate post-operative period was the cause of rupture of the duodenal stump, which could be fatal: later, it was the cause of vomiting of bile which troubled many gastrectomy patients. The antecolic anastomosis added a special obstructive effect of its own in some cases owing to the liability of small gut to slip behind the anastomosis.

There was a variety of operations which could be used to correct afferent loop obstruction. However, it need not occur. Mr. Taylor described a retrocolic type of gastrectomy with a gastropasty procedure designed to avoid the obstructing angle. In his hands there had been no deaths with this operation, and no patients subsequently complained of bile vomiting or any serious degree of dumping.

Mr. R. L. HOLT (Manchester) briefly reviewed the various operations which could be performed for chronic peptic ulceration. The chronic gastric ulcer could often be handled well by performing the Billroth I type of procedure. In his opinion, for chronic duodenal ulcer, gastro-enterostomy combined with vagotomy was as good as partial gastrectomy. Indeed, in some respects it might be the better operation of the two, as digestion was relatively good and weight and energy were more likely to be maintained. The operation was successful in 89% of his cases by Visick's grading. Both operations, however, were followed by similar side-effects—for example, diarrhoea.

"dumping," anaemia, loss of weight, and lack of energy. These were mostly due to undigested food passing quickly from the stomach to the jejunum, and there undergoing incomplete digestion from faulty mixing with digestive secretions. To overcome this difficulty Mr. Holt had combined vagotomy with partial excision of the pyloric sphincter (anterior pyloroplasty). The incision was made in the pyloric region at right angles to the long axis of the gut, and about two-thirds of the pyloric sphincter and any anterior ulcer were excised. If a posterior ulcer was present, the edges were approximated by sutures. The early results had been excellent. The mortality rate had been 1% only, and this death was due to pulmonary embolism. Side-effects were infrequent and there had been no case of recurrent ulceration and only occasional bilious vomiting. Female patients had done particularly well. The speaker criticized the combination of vagotomy with a limited gastrectomy of the Billroth I type. The aim of this procedure had been to obtain achlorhydria, but in his opinion this was unnecessary and must inevitably be accompanied by a definite even if small mortality.

Professor F. A. R. STAMMERS (Birmingham) commented on the gradual diminution in popularity of partial gastrectomy in the treatment of chronic duodenal ulcer. Follow-up studies had revealed failure to gain weight and an increased incidence of pulmonary tuberculosis associated with poor nutrition. The overall failure rate was in the region of 10-12%. Not every patient was psychologically suited to this operation, and the "dumping" syndrome, stomal ulceration, and absorptive failure from mechanical causes were all recognized hazards. The precise aetiology of the "dumping" syndrome had not yet been clearly defined, but distension of the afferent loop, hypovolaemia, hypokalaemia, and hypoglycaemia had all been incriminated. Occasionally there was also a mechanical effect when an over-long afferent loop connected as a sump. He had observed cases in which adhesions had formed between the jejunum and the spleen and liver, and the sharp angulation of the bowel so caused had given rise to obstructive features. It was important always to ensure that the afferent loop was short. When a partial gastrectomy was carried out, it was possible to leave a hiatus between the anastomosis and the transverse colon through which either jejunum or omentum might prolapse, with resulting acute intestinal obstruction. The surgeon should ensure that this gap was closed at the original operation.

Opening the discussion, the chairman, Dr. E. BULMER (Birmingham), indicated that in his experience definitive surgery for duodenal ulcer would be necessary in about 5% of cases, but when a partial gastrectomy was performed the long-term results were poor in 10% of patients. In reply to Dr. E. H. L. HARRIES (Birmingham) and Dr. G. WATKINSON (Leeds), Mr. HOLT stressed that all his cases were tested for the effectiveness of vagotomy with the insulin hypoglycaemia test, and that a careful search was made to ensure that all branches of the vagus nerve had been cut. He had found his operations satisfactory in the treatment of manifest bleeding from a chronic duodenal ulcer, but did not advise vagotomy when haemorrhage was thought to originate from multiple gastric erosions.

ROUND-TABLE CONFERENCES

SMOKING AS A CAUSE OF DISEASE

The contrast in thought on smoking between the sixteenth century and to-day—in the light of the contemporary association of tobacco with lung cancer—was commented on by Professor H. SCARBOROUGH, professor of medicine at the Welsh National School of Medicine, at the Round-table Conference on the subject of smoking, held at Birmingham University.

In the sixteenth century, he said, tobacco had been regarded as a panacea for almost all ills. Tobacco leaves

were applied to wounds and tobacco smoke to the rectum. Later, in 1665, the boys of Eton had been encouraged to smoke as a prophylactic against the plague, and those who did not do so were severely beaten.

Professor Scarborough was presiding over a panel consisting of Dr. ERNEST BULMER (senior physician, United Birmingham Hospitals), Mr. W. H. BOND (radiotherapist, United Birmingham Hospitals), Dr. C. R. LOWE (lecturer in social medicine, University of Birmingham), and Professor W. MELVILLE ARNOTT (professor of medicine, University of Birmingham).

The CHAIRMAN, having introduced the members of the panel, asked them to state their own smoking habits. Professor ARNOTT said he smoked a pipe—and a cigar when he was given one. Dr. LOWE described himself as a “converted character”; he had smoked when he had been a “wealthy general practitioner” but could not afford to do so since becoming an “impoverished university lecturer.” Dr. BULMER said he had given up smoking three or four weeks ago, when he had been asked to become a member of the panel. Mr. BOND said he had been a pipe-smoker for two or three years. The CHAIRMAN described himself as “a moderate smoker of cigarettes.”

The proceedings consisted of answers by individual members of the panel to a series of written questions sent up from the audience, the first of which was: “How do you regard the evidence which has been produced about the dangers of smoking in regard to tuberculosis and chronic bronchitis?”

Dr. LOWE said he regarded it with horror. It was that sort of evidence that had put him off cigarettes. He accepted without any reservation that there was a proved association between cigarette-smoking and cancer of the lung, chronic bronchitis, tuberculosis, peptic ulcer, coronary thrombosis in middle life, and certain forms of cancer of the bladder—the sort of association that indicated that, if people did not smoke, a substantial proportion of deaths from those causes would not occur.

Dr. BULMER agreed. He regarded the evidence as overwhelmingly in favour of causal relationship between smoking and, pre-eminently, cancer of the lung, constituting a danger such that, if it were associated with an occupation, would make it virtually impossible to secure any employees unless they were paid princely danger money. Mr. BOND, “in defence of pipe-smoking,” said that emphasis in that connexion must be placed on cigarette-smoking.

Summarizing the views of the panel, the CHAIRMAN said there appeared to be evidence of causal relationship between smoking and carcinoma of the lungs and bladder but no connexion with any other form of malignant disease.

Efficiency of Smokers

To the question, “Does smoking interfere with mental and/or physical efficiency?” Dr. LOWE said he knew of no statistical evidence on the point. Some people became depressed when not smoking and smoked to bring themselves up to the mean; it was thus an addiction rather than a habit. Dr. BULMER had a strong feeling that smoking diminished intellectual and mental energy; on the other hand, increasing age could also account for that. Mr. BOND considered that mental and physical efficiency depended first on the physical effects of continuous irritation of the conjunctivae and throat. An addict had got to have a cigarette before he was up to what he recognized as his mental efficiency. The CHAIRMAN said that an American survey on that aspect had disclosed no difference between the mental efficiency of smokers and non-smokers.

Professor ARNOTT said it could be demonstrated that respiratory efficiency was not the same in smokers as opposed to non-smokers; in the case of smokers the lungs had a lower capacity with higher residual volume; the amount of work which a smoker performed in breathing was significantly higher because smoking was an irritant, causing some swelling of the bronchial lining and narrowing of the bronchial tubes, and therefore an increase in the

resistance to the passage of air. On the other hand, many people employed smoking as a trigger device to stimulate the emptying of the rectum at a time convenient to themselves.

The panel was next asked to explain why asthma sufferers claimed that smoking eased their attacks. Dr. LOWE said he had not heard that claimed, but bronchitics did say that a cigarette helped to cut the phlegm, “and if you live in a semi-detached house next to an addict there is no doubt about it.” Dr. BULMER doubted whether such a claim in relation to asthma had been proved.

Turning to the question of whether any kind of smoking was harmful to non-smokers close by, Dr. LOWE said he was unaware of any such evidence, while Dr. BULMER thought the question was a very wide one because the degree of proximity had not been specified. Pungent pipe smoke could be very annoying, and it might be asked whether it was good thing to be in the atmosphere of a cinema when the air was blue with smoke when the lights came on. Mr. BOND said it depended on which of two factors involved was regarded as the most important—the chronic bronchitic-producing effects of cigarette smoke or the carcinogenic content. If chronic bronchitis was accepted as a factor in the production of lung carcinoma, then the person next to the smoker was in fact suffering. He thought that probably the carcinogenic content might be too low to be significant. The smoker was getting the carcinoma and the person next door was getting the bronchitis.

The panel was next asked whether, in view of the infrequency of lung cancer 25 years ago—before the days of motor- and diesel-fumes—it did not appear probable that the causal relationship was between smoking and the total amount of noxious particles inhaled, smoking being perhaps the most important. Mr. BOND said that the evidence of lung carcinoma was not higher among those working continually in petrol fumes.

Dealing with the question of whether cigarette-smoking could cause amblyopia, Mr. BOND said that the high incidence of that complaint which the Belgians had experienced after the war had been associated with the use of home-grown tobacco containing the central stem of the leaf; this was not present in the imported, prepared product.

The question, “Is there any evidence of a connexion between smoking and coronary thrombosis?” was first dealt with by Dr. LOWE, who described the findings of a questionnaire filled in by 12 Birmingham general practitioners on the subject in relation to male patients of 60 and over. This showed that the evidence of chronic bronchitis and peptic ulcers was appreciably higher among cigarette-smokers than non-smokers or those using pipes. Coronary thrombosis also was higher among cigarette-smokers, but it was interesting to note that the blood pressure of smokers was consistently lower than that of non-smokers.

How Can Doctors Help?

The CHAIRMAN said that the panel's next task would be to consider how people could be discouraged from smoking, if it was considered to be a bad thing, particularly young folk.

Professor ARNOTT said that the doctor's most effective means of helping his patients was by example. It was wrong for any practising physician to smoke in the presence of his patients. It was up to every doctor who was a cigarette-smoker seriously to consider whether, in the interests of his profession and his duty to humanity at large, he should either give up smoking them or do so only in private. Dr. BULMER thought that that was putting it a little strongly; it would convert doctors into “secret smokers.” Certainly every doctor should seriously consider whether he should not refrain from smoking in public; what he did in his private life was nothing to do with his patients. Mr. BOND said the “attack” should be made from childhood, by giving the right example to children.

Dr. LOWE thought there should be some positive action by the Government as well as at personal level. The

important thing was that people should be given the facts—then they could make themselves sick if they wanted to—but so far the facts had not been given.

“I think the Government should come out from behind the ‘smoke-screen’ that tobacco addicts have put up, and be honest about it,” he said. It was quite wrong that smoking should be permitted in public places such as cinemas and restaurants or on public transport. Furthermore, the tobacco industry was not blameless. “We are submitted to a constant barrage from television, the cinema, and advertisements to smoke.” “There should be some control over advertising,” he said. It was also very bad that people in the Forces, at a young and impressionable age, should be encouraged to smoke by being given cheaper cigarettes to smoke when they were hanging around bored.

Professor ARNOTT reminded the conference that the Government raised between six and seven hundred million pounds a year through tobacco revenue and that there was no alternative commodity which could supply such a sum through taxation. Salt—a popular fiscal weapon in India—was impossible for such a purpose in an island so rich in salt deposits as Britain. All sensible people must be extremely sorry for the tobacco manufacturers and their associates and agencies throughout the world. As great industrial concerns, the tobacco industries had a splendid record of bringing prosperity to many areas which now depended heavily on them.

Mr. BOND said there were all sorts of preparations to help people stop smoking, from tablets to silver nitrate mouthwashes, but the best means of discouragement was the whispering campaign—“You are a fool,” sort of thing. To call people “addicts” was also a good thing; equally effective was the term “cigarette drunkard.” Another way of looking at it was to point to the surgery door and reflect that once a year it opened to admit somebody who would be dead in a month of lung cancer, but that if nobody smoked it would open only once every ten years to admit such a person. Dr. BULMER thought that the only hope was for a process which would remove the carcinogenic substance from tobacco.

Professor ARNOTT said he had the feeling that tobacco did not contain any carcinogenic agent at all but that the carcinogenic effect was caused by prolonged and sustained irritation, just as light would cause irritation of the skin, or as a varicose ulcer, prolonged and sustained over the years, would become malignant. The dream of getting a specific compound which could eliminate the carcinogenic element and render the whole process entirely free from risk did not seem biologically credible.

“What, if any, are the ill effects of stopping smoking?” was the last question before the panel. Dr. BULMER thought that the chief ill effect was “a most horrible, self-righteous priggishness.” (Laughter.) Mr. BOND said that was the only real effect that did arise.

The CHAIRMAN said that many who gave up smoking suddenly in middle age ate a great deal more as a result and put on weight; he sometimes wondered whether they were not going from Scylla to Charybdis. Dr. BULMER thought that such an effect was only temporary. Dr. LOWE said there was some evidence that people did put on weight when they stopped smoking. Weight was also related to evidence of coronary disease and one or two other complaints. It was possible that by stopping smoking a person laid himself open to coronary disease, but there were no data on this.

THE RIGHT AGE FOR PLANNED SURGERY

Dr. D. V. HUBBLE (Derby), a vice-president of the Section of Child Health, took the chair at this conference, in which members of the audience proposed questions to a panel comprising a thoracic surgeon, Mr. A. L. D'ABREU (Birmingham), a genito-urinary surgeon, Mr. INNES WILLIAMS

(London), a paediatrician, Dr. J. APLEY (Bristol), a general surgeon, Mr. A. GOUREVITCH (Birmingham), and a plastic surgeon, Mr. O. MANSFIELD (Birmingham).

Dr. H. M. COHEN (Birmingham) asked what was the right age for operating on undescended testes. Mr. WILLIAMS said that it must be done before puberty if full function of the testis was to be obtained. There was histological evidence of abnormality in undescended testes from the age of 6 years; in infancy there might be difficulty in diagnosis and danger of damage to the vas during operation, and his practice was to defer it until 8 or 9 years. Mr. GOUREVITCH preferred to say 6 to 8 years, despite Dr. Apley's opinion that in many cases descent would occur at puberty and that one might doubt whether surgery left testes undamaged. Mr. WILLIAMS thought that the ones which came down at puberty were the high retractile testes which could be difficult to distinguish from those which were undescended and which then provided almost the only indication for the use of gonadotrophins as an aid to diagnosis.

This controversial topic was changed for another when Dr. J. W. LITCHFIELD (London) inquired about the right age for operation in coarctation of the aorta. Mr. D'ABREU said that the real problem arose in the infantile cases presenting with heart failure and often accompanied by ventricular septal defects. He favoured medical treatment if possible until the age of 1 year, when surgery might be undertaken with good results. In cases without obvious symptoms he thought 7 years was a good age for operation. In replying to a question about the urgency of operation for persistent ductus arteriosus he again mentioned 7 as the age preferred by many surgeons: 7 was a magical number, a Biblical number, and it appealed to him, as he was the seventh child of a seventh child, but it really had nothing to do with persistent ductus arteriosus, which he preferred to treat at 3. He had seen no operative deaths at this age, and at 7 children were busy preparing for the 11+ examination. Where heart failure occurred, the ductus might be closed at any age, after medical preparation. Their youngest patient was 6 weeks old. Dr. Apley remarked that the ductus operations one regretted were those that had not been done.

Dr. BERYL CORNER (Bristol) and Dr. G. S. R. LITTLE (Greenwich and Deptford) asked about naevi, hairy moles, cervical sinuses, and fistulae. Mr. MANSFIELD thought that the surgeon must ask himself several questions in such cases: Were they technically operable at this age? Could a better result be obtained by deferring operation? If so, should one operate early to ease the mother's social life, remembering that except with some defects of the hand children were not conscious of their outward blemishes until the age of 6 or 7 years? The degree of blemish would affect one's decision: a hairy mole on the forehead which made a baby look like a Lakeland terrier needed earlier removal than a pale, hairless mole. With regard to facial palsy, which Dr. B. M. LAURANCE (Derby) asked about, he thought that nothing could be done during infancy anyway, and in older patients the plastic surgeon had little to offer except when facial deformity was grotesque.

Circumcision

In reply to a question about the indications for circumcision, Mr. WILLIAMS said that in childhood phimosis was the only medical indication, but phimosis was an uncommon congenital deformity which was most difficult to diagnose in the first two weeks of life, the age when circumcision was most easily performed. Mr. GOUREVITCH said that the crux was whether the meatus was rigid or not; what was called balanitis in infants was napkin rash.

Replying to the chairman, Mr. WILLIAMS agreed that circumcision gave almost complete immunity to penile cancer, but this might be because it occurred in men who either could not (because of phimosis) or would not (because of social circumstances) retract the prepuce and clean the glans. There was evidence of diminished cancer of the cervix among communities practising male circumcision, but it did not establish a causative relationship.

There was considerable discussion about the attitude of parents to circumcision—was it right to circumcise when the indications were social? Mr. Williams thought that in such cases the child was going to be circumcised by someone in any case, so it might be best to ensure that it was done properly; Dr. APLEY and Mr. MANSFIELD thought that one could often get the father on one's side in opposing operation; Mr. GOUREVITCH thought that too many general practitioners encouraged the parents to think circumcision was needed when it was not. A member of the audience asked whether it was agreed that stretching of the foreskin was the most unsuitable way of dealing with the problem, and the panel suddenly fused together in unanimous agreement.

Questioned about the use of "the pump" in the surgery of congenital heart disease, Mr. D'ABREU indicated his own group's concentration on the treatment of large ventricular septal defects with enormous blood flow through the lungs before pulmonary hypertension had set in. He stressed the much greater importance of people than of pumps—if you had £20,000 to buy a pump, it was better to spend £700 on tubing, etc., and use the rest to train four people to work it. Dr. APLEY agreed: "Too often someone has gone abroad to buy a pump and returned to find he's bought a pup."

Abdominal Pain

Mr. R. P. M. MILES (Chichester) wanted to know what should be done when, as so often happened, the surgeon saw a child, usually a girl, who had right-sided abdominal pain and whose doctor wanted the appendix removed. Mr. GOUREVITCH said he more often had to deal with cases of central abdominal pain; his job was to eliminate appendicitis or other organic disease, and when he had done that to say that the child would grow out of it. Dr. APLEY did not think this often happened; there was a family pattern which led to abdominal pain.

Finally the chairman asked Mr. MANSFIELD for his opinion about the age for operation on cleft lip and palate. He replied that he thought that if there was bony deformity a cleft lip should be dealt with at 3 months; if there was not it could be done at any time. A simple cleft of the palate too could be done at 3 months, and combined cleft lip and palate at 4 months if there was no deformity. The important thing was to close the nose off from the mouth—nowadays they seldom encountered deafness in patients with cleft palates.

MEDICAL RESEARCH COUNCIL ANNUAL REPORT

The Medical Research Council's 43rd annual report,* just published, covers the Council's activities during the year ended September 30, 1957. It records that during the last financial year (1957-8) Parliament provided the Council with £2,813,000. The previous year the sum was slightly less than £2,593,000. On this the Council maintained the National Institute for Medical Research, the M.R.C. Laboratories in the Gambia, 44 research units and 21 research groups, and various external scientific staff; provided numerous research grants and training awards; and supported financially in varying degree the Institute of Cancer Research, London, the research department of the Royal Beatson Memorial Hospital, Glasgow, and the research programme of the Christie Hospital and Holt Radium Institute, Manchester. The Council also administered the Public Health Laboratory Service, and the Blood Products Laboratory (Lister Institute), on behalf of the Ministry of Health. The Council's whole-time scientific and medical staff (excluding technicians, etc.) numbered 648 and there were a further 146 employed in the P.H.L.S.

The Council

The scientific members of the Council during the year covered by the report were Professor Robert Platt, P.R.C.P., and Professor E. T. C. Spooner (until April, 1957); Sir

*Report of the Medical Research Council for the Year 1956-1957, 1958. H.M.S.O., London.

George Pickering, Professor A. Bradford Hill, F.R.S., Professor G. F. Marrian, F.R.S., Professor R. C. Garry, Mr. H. J. Seddon, and Dr. J. D. N. Hill; and Professor C. H. Stuart Harris and Professor A. A. Miles (since April, 1957). The lay members were the Earl of Limerick, chairman; Sir Geoffrey Vickers, V.C., treasurer; and Mr. Richard Fort, M.P. The chairman of the Council's Clinical Research Board was Sir Geoffrey Jefferson, F.R.S.

The principal permanent officials are Sir Harold Himsworth, F.R.S., secretary of the Council; Sir Charles Harington, F.R.S., director of the National Institute for Medical Research; and Dr. G. S. Wilson, director of the P.H.L.S. In October, 1957, Sir Landsborough Thomson, second secretary, retired after almost 40 years with the Council, having served as deputy to each in turn of its three secretaries—Sir Walter Fletcher, Sir Edward Mellanby, and Sir Harold Himsworth. The Council records its great indebtedness, and that of medical research generally, to his rare combination of high administrative skill and scientific understanding.

New Research Units

During the year the Council set up four new units, and a fifth one just after the period. They were the unit at Leeds for research on metabolic disturbances of surgery (Professor L. N. Pyrah), groups at Exeter and the Western General Hospital, Edinburgh, respectively for research on carcinogenic substances (Dr. J. W. Cook, F.R.S.) and the general effects of radiation (Dr. W. M. Court Brown), and at Carshalton the virus culture laboratory (Dr. P. D. Cooper). The fifth unit was the microbial genetics research unit (Dr. W. Hayes) at the Postgraduate Medical School of London. In addition the Council on the advice of the Clinical Research Board took on four research projects formerly financed and administered through the Ministry of Health, and established them as Council units. They are now the clinical genetics research unit (Dr. J. A. Fraser Roberts) at the Institute of Child Health, the neuropsychiatric research unit (Dr. D. Richter) at Whitchurch Hospital, Cardiff, and the research group on juvenile rheumatism (Professor E. G. L. Bywaters) at the Canadian Memorial Hospital, Taplow.

ASPECTS OF RESEARCH

A Special Correspondent writes: Each year now the Medical Research Council's annual report contains a review of recent advances in some of those selected fields of scientific medicine in which work supported by M.R.C. funds is going on. This review increasingly attempts a popular presentation. The present report presents a summary of 15 separate fields in 50 pages. It might have been wiser to have covered fewer subjects and given each a little more space. This year, too, a great deal of space is given to matters of applied science and public health—the development of respirators, improved serological diagnosis of syphilis, poisoning by radioactive strontium, for instance—and by contrast rather too little to the fundamental science on which in the end all progress is based. Perhaps this shift of balance away from the laboratory sciences towards more practical and clinical problems reflects the greatly increased awareness of the value of applied science and technology in all fields of Government and administration to-day.

Respirators

Poliomyelitis and Asian influenza, and the recognition of certain other respiratory and gastro-intestinal viruses, account for a quarter of the whole review. The most interesting section of this is the account of how the "iron lung" and other respirators have been developed by organized exploitation of physiological and engineering knowledge. Poliomyelitis was the spur to the invention of these breathing-machines, the first by Drinker in the U.S.A. in 1929. This was a negative pressure machine, and experience with it suggested it might have been responsible for some deaths and for a certain amount of permanent crippling. So the M.R.C. set up a committee in 1938 to consider the whole problem, the different kinds of machines possible, and the physiological factors at work. Informa-

tion was needed on the relation between the machine's working and the patient's tidal air, vital capacity, and tendency to acidosis or alkalosis. About the same time, Lord Nuffield generously presented nearly 1,000 machines to hospitals throughout the Commonwealth. These were a modified Drinker machine, devised by Both of Australia. Then came the war of 1939-45, and interest lapsed.

Interest revived with the big poliomyelitis epidemic of 1947 in Britain. The crisis showed up the inadequacies of the situation. Many of the respirators had not been well maintained over the years, and spare parts were difficult to come by. Power failures showed that hand-pumping was ineffective, and the rubber bellows sometimes ruptured after several weeks' continuous use. The Ministry of Health called on the M.R.C. to come to the rescue.

The first step was the physiological assessment of the problem, to define the precise aid the patient needed at different stages of his illness, and the use of the spirometer as part of routine clinical study of cases. The second was consideration of two practical problems: how to keep the airway clear, and how to keep the machine working reliably. This led to a special report in 1950, and the drafting of a standard performance specification for cabinet respirators for the manufacture of these machines. A special kit was invented so that hospitals could modernize their Both



Spiral shell cuirass respirator. Reproduced by courtesy of the Medical Supply Association, London.

respirators. New patterns of cabinet machine facilitated nursing attention, while portable cuirass respirators (see Fig.) meant that patients could be weaned from dependence on cabinet and nurses, lead an independent life, and go home. Special instruments needed for proper treatment were also invented, such as the electronic stethoscope for examining the patient inside the working cabinet. These successful developments were the work of many people—motor engineers, industrial firms who voluntarily col-

Viruses and Interferon

laborated, the R.A.F., and so on, as well as medical workers—reminiscent of the way some of the big problems of the war such as radar and the atom bomb were solved through the collaboration of many skills.

Another aspect of the poliomyelitis problem, culture of the causative virus in cells in tissue culture, has led to the discovery of a number of new viruses, particularly the adenovirus group responsible for various infections such as "febrile catarrh" and some atypical pneumonias, through study of tissue cultures made from infected tonsils and adenoids. Complement-fixing antigens from these viruses appear in the fluid of such cultures and this has opened the way to the study of antibody titres in the sera of normal people and those suffering acute infections. By the tissue-culture method a number of viruses have also been isolated from intestinal contents and human faeces—poliomyelitis and Coxsackie viruses, but also some known as ECHO (enteric, cytopathogenic, human, orphan) in which the word "orphan" implied that they were not known to

cause human disease. However, one has since been implicated in benign aseptic meningitis, and it seems likely that some viruses which are normal inhabitants of the gastro-intestinal tract may on occasion produce disease epidemics.

In the field of pure science the discovery of interferon is one of the most interesting advances in virology for some time. It is well known that one virus growing in tissue culture cells prevents another unrelated virus from infecting the cells at the same time, and M.R.C. workers have discovered that this interference is brought about through a chemical substance, a product of the activity of the first virus and its cell host. This substance is now being purified, and it is thought to act by interfering with nucleic acid metabolism. So its discovery may shed new light on the biochemistry of normal and cancer cells.

A field where virology and cancer research meet is the study of leukaemia. It seems that the natural disease in mice is probably due to a virus, and the question was asked whether radiation-induced leukaemia in mice is also infective. This appeared not to be so. The precise dose and time relations for inducing leukaemia have been investigated, and it is interesting to find that something from the thymus predisposes an individual animal to get leukaemia. The thymectomized mouse is protected from this form of physical breakdown. Here then is another strange chemical substance controlling the fate of cells.

Mechanism of Fever; Arthritis

A third substance with an important physiological effect emerges from recent studies of the mechanism of fever. That bacteria which cause fever contain extractable fever-producing substances (lipopolysaccharide, usually) is an old observation. What is new is that these substances probably do not act directly on the temperature-regulating centres of the brain but act instead on the white blood corpuscles, which thereupon liberate a new hitherto unidentified substance which is the true brain agent. This agent does not paralyse temperature control but holds the thermostat at a new level.

The last few years have seen important advances in the diagnosis of rheumatoid arthritis. The Rose serological agglutination test is a positive way of distinguishing this disorder from other confusingly alike conditions. Also x-ray pictures can be used to differentiate a common form of generalized osteoarthritis from true rheumatoid arthritis. Though clinically similar, osteophytes at joint margins, and bony sclerosis, are seen in the former condition, erosion of joint surfaces and osteoporosis in the latter. Using these tests various populations have been surveyed and some interesting results have emerged. For both Wales and Lancashire true rheumatoid arthritis has been found equally common in both men and women. Clinically, and almost traditionally, women were supposed to be the major sufferers—but the excess of polyarthritis in middle-aged women is now found to be osteoarthritis and not the rheumatic condition. Also it seems that in men rheumatoid arthritis may in some way predispose to both pulmonary tuberculosis and pulmonary nodular fibrosis.

X-ray Crystallography

Finally, some progress in pure science—the structure of protein molecules. All crystals scatter x rays, and from a photograph of the scatter spots something can be deduced about the shape of molecules which form the crystal. Each atom in the molecule is responsible for a bit of the scatter. It was study of suitable crystals in this way which helped to settle the formula of penicillin, for instance. Crystalline proteins and viruses can also be studied by x rays, but since they contain a very large number of atoms and these are rather small the resultant scatter photograph is poor and difficult to interpret. The situation has been improved by introducing "marker" atoms, such as mercury, into the crystals. They combine at certain special points (where there is sulphur in the amino-acid cysteine, for example),

and the scatter to which they individually give rise can be picked out. Applying this method to a rather simple protein, myoglobin, the haemoglobin inside the fibres of red muscles, it has been possible to deduce its molecular shape and to make a model of it.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION

EIGHTH CONGRESS IN LONDON

On July 16 the COUNTESS MOUNTBATTEN OF BURMA opened the Eighth Congress of the Medical Women's International Association. The Congress was held from July 15 to 21 at Bedford College, London, under the presidency of Dr. M. YOLANDA TOSONI-DALAI, of Milan. The British Medical Women's Federation, under its president Dr. KATHARINE LLOYD-WILLIAMS, acted as the host organization. The theme of the Congress was "The Adolescent," and during the scientific sessions the physical, endocrinological, psychiatric, and social aspects of that period of life were considered.

The Medical Women's International Association was founded in 1919 in New York at a meeting at which Dr. ESTHER POHL LOVEJOY, who attended the present Congress, was elected as the association's first president. It has the distinction of being the oldest international medical association in the world.

Lady Mountbatten's Address

LADY MOUNTBATTEN said that she came to the Congress as one who for many years had taken the greatest interest in health and welfare. For a long time she had been fortunate to work closely with the medical and nursing professions in Britain and in many other parts of the world, and that close association had been an inspiration to her. Their work was often hard and testing. But it derived its inspiration from women with the highest of qualifications who desired to render a service, the finest of all services, regardless of any restrictions which a question of politics, economy, race, or religion might seek to impose. All of them as doctors were united in the unceasing fight against disease and human suffering; they were united in that fellowship which transcends the barriers of nationality, caste, or creed.

As superintendent in chief of the St. John Ambulance Brigade and president of the Save the Children Fund she had worked with people of all nationalities, with widely differing problems and points of view. That had brought home to her very vividly the vital necessity for the fullest possible understanding between nations; and in the achievement of that understanding she was certain that the medical profession, because of its great humanitarian tradition and motive, had a unique mission to fulfil. For that caring for the sick and suffering, that deep concern for the welfare of the human being anywhere and everywhere which animated the work of the medical profession throughout the world, made it, more than any other human activity, a powerful factor for international understanding, co-operation, and toleration.

It was most inspiring to know that the Medical Women's International Association insisted that the constitution of affiliated societies must include a clause admitting to membership all duly qualified medical women, irrespective of race, religion, or political belief. "I find in the present gathering together of women doctors a most heartening example of professional co-operation at an international level. And I can think of no other group of women in a position to make such a vital contribution to the welfare of the whole world, not only as doctors but as ambassadors for peace and friendship, justice and understanding."

Special Contribution of Women Doctors

The work of women pioneers in the medical field had always had a special interest and indeed fascination. For

it was only through their courage and devotion that women doctors had to-day achieved such recognition and in most parts of the world had so consistently held a position of recognized professional equality with their colleagues. Since those early days experience had abundantly proved that women doctors had made a very special contribution to medicine and medical studies in that, being women as well as doctors, they had helped to focus attention on certain topics of special interest to women, notably gynaecological disorders, the health of mothers and children, and paediatrics generally.

That a more enlightened attitude to problems particularly affecting women was gaining ground was due in no small part to the influence and the devoted and outstanding work of women doctors in this country and abroad, and of the various national associations of medical women which were brought together in this international association. One had only to look at some of the subjects which had been discussed at past congresses—"The Problems of the Married Woman Working Outside the Home," "The Pathology and Hygiene of Housework," "Anaemia in Women," among others—to realize how much attention had been given to the special problems of women. These and the theme for the 1960 Congress, which was "The Old Woman," could only really be thoroughly and authoritatively discussed by a gathering of this kind.

This year the theme would be "The Adolescent." "I am quite certain," went on Lady Mountbatten, "that your scientific, unbiased, and womanly approach to the subject will make an extremely important contribution to a better understanding of the problems involved, and will help to clear away a lot of the muddled thinking which has obscured the whole subject."

Pioneers in India

In her travels she had had a wonderful opportunity of seeing and assessing the contribution made by women doctors in the medical field, especially in India, which she knew so well and for which she had the deepest affection. One always remembered the women pioneers who went to India in the 'seventies and 'eighties and who overcame almost insurmountable obstacles in order to lay the foundation of the Zenana hospitals, teaching institutes for midwives, and medical schools for women. She had visited those hospitals, institutes, and schools and no praise could be too high for those who were responsible for starting them.

In India she had heard on every side the names of Dame Mary Scharlieb, Dr. Margaret Balfour, and Dr. Ruth Young spoken of with the deepest gratitude. Also Dr. Clara Swain, of the Women's Foreign Missionary Society of the Methodist Episcopal Church, who was the first qualified medical woman to land in India. She came from New York in 1870 and started the first women's college in India. The courage and devotion of these women amongst others to whom India owed the medical relief given to-day to her women and children were something which could never be forgotten.

While speaking of India, it would be impossible not to make a special mention of one of the world's great international medical centres, founded at Vellore by Dr. Ida Scudder in 1902. To-day Indian women themselves were playing a vital part in the medical field and also in the organization of voluntary bodies such as the Red Cross Society and the extension of the St. John Ambulance Brigade.

All over the world medical women, because of their splendid achievements, had a higher reputation in their profession than any other professional women. And in all this they had had the tireless support of their national associations and of the Medical Women's International Association to which these were affiliated. Their association was fully equipped not only to promote the interests of medical women but to make a wonderful contribution to the welfare of other women too.

Lady Mountbatten then declared the Congress open.

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Trypure Novo Stabilized (Evans Medical Supplies Ltd.).—Pure crystalline trypsin stabilized with a calcium salt in vials of 50 mg. or 1 g. and as a dispersible powder in an inert base.

The idea of using substances which would bring about the dissolution of necrosed tissues and of blood and lymph clot in order to facilitate drainage and debridement is by no means new. Over thirty years ago Dakin's solution was thus employed, especially in thoracic surgery, but its effect remained doubtful. In 1933 Tillett and Garner (*J. exp. Med.*, **58**, 485) showed that the filtrate of a broth culture of certain haemolytic streptococci had the power of lysing the viscous elements of pus and fibrin clots, and they isolated two enzymes—streptokinase and streptodornase—which have since been used in a wide range of conditions. The earlier name of these enzymes, fibrinolysin, should not be confused with "fibrinolysin" (thiosinamine sodium salicylate), which has been used to soften fibrous tissues and scars.

Trypure is another enzyme which can be used in the debridement of necrotic tissue and the liquefaction of purulent viscid accumulations and clots. The powder, which should not be taken internally, can be applied as such, but as it is readily soluble in water the enzyme can also be administered by local instillation or injection, or inhaled as an atomized solution. The dry powder is stable at room temperature for long periods; the solution remains active at this temperature for about 48 hours, but at 5° C. (41° F.) it can be stored for 2–3 months. Like many other enzymes it is quickly destroyed by heat above 55° C. (131° F.). It is particularly applicable in thoracic surgery—haemothorax, empyema, exudative pleurisy, lung abscess—but other closed-space suppurations such as sinusitis and subphrenic and liver abscesses can also be so treated. Among the many surface conditions which are suitable are infected necrotic wounds and burns, gangrene, and ulcers, and it may be used in the preparation of infected surfaces for skin grafting.

N.H.S. basic price: dual pack of 50 mg. stabilized trypsin and 15 ml. sterile saline, 13s. 3d.; 2 g. of 2.5% trypsin powder, 13s. 3d.

Irgapyrin (Geigy Pharmaceutical Co.).—Put up in ampoules of 5 ml. containing 30% solution for intramuscular injection, and as tablets of 250 mg., this substance contains equal quantities of amidopyrine and phenylbutazone. When first introduced in the treatment of the rheumatic disorders amidopyrine was considered the more important constituent, but because of its reputation as a cause of agranulocytosis phenylbutazone was later used alone and proved effective. Both constituents may, though rarely, cause agranulocytosis; phenylbutazone may cause gastro-intestinal disturbances, including peptic ulceration and bleeding, nausea, oedema, and drug rashes. One tablet twice or thrice daily, or one injection every 1–4 days, relieves pain in many conditions, including osteoarthritis, ankylospondylitis, rheumatoid arthritis, osteitis deformans, and metastatic malignant disease. It should be used with extreme caution if at all in patients with co-existing peptic ulceration, congestive cardiac failure, or conditions of renal or hepatic insufficiency.

N.H.S. basic price: 5 ampoules, 8s. 5d.; 50 tabs., 18s.

A *Supplement on Cancer* has been issued by the Registrar-General for England and Wales for the year 1953 (H.M.S.O., 7s. 6d.). It gives statistics derived from about 35,000 cases for cancer of the uterus, ovary, testis, penis, lip, tongue, mouth, pharynx, and oesophagus. Records for previous years are in some cases given for comparison.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Russian Vaccine for Multiple Sclerosis

SIR,—During the past few days we have had an opportunity of discussing the multiple sclerosis vaccine ("vaccine of Shubladze and Margulis") and the S.V. strain of acute encephalomyelitis virus of man from which this vaccine is prepared. We think it is clearly necessary to reinvestigate and characterize the original isolates of this virus, for recent experiments have shown that the S.V. strain in current use is similar to rabies virus.

As far as treatment with the "vaccine of Shubladze and Margulis" is concerned, it is not possible to make any further recommendation until reinvestigations have been made.—We are, etc.,

A. K. SHUBLADZE,
Moscow. Chief of Laboratory, Ivanovsky Institute of Virology,
Moscow, U.S.S.R.
G. W. A. DICK,
Professor of Microbiology,
The Queen's University, Belfast, Northern Ireland.

Imbecile Children

SIR,—I hope that your readers will not be misled by Dr. J. Burkinshaw's letter (*Journal*, June 28, p. 543) into thinking that the Fountain Hospital alone provides temporary admission for imbecile children. In 1956, 2,020 such children were admitted for temporary periods to 99 mental deficiency hospitals in this country. Only 602 were found alternative placement, and the local health authorities, in my opinion, could assist greatly in keeping children out of hospital by providing short-stay homes themselves.

I do not agree entirely with Dr. Burkinshaw's suggestions for their eventual admission. In actual fact many ineducable children do better in a hospital with a properly equipped and staffed school than they do at home, where no, or an inadequate, occupation centre is available. Our problem is not only to admit, but to discharge, children who could well live at home. Their parents, however, are delighted with their progress, take them home each weekend, but refuse, quite rightly, to take them out of hospital entirely because the community, so far, provides no comparable training. A five-day residential school centrally situated to deal with urban or county areas could obviate this.

If we are to introduce ineducable children gently to our hospitals and admit them as soon as they are too big to be the "family pet" they will be with us, in this antibiotic era, for the next fifty years at least. How are we to provide beds for that? I should rather catch them young, if they have to come to hospital, and try to train them for sheltered work, either going daily from their home circle or living in hostels. We could then give the holidays in hospital at that stage if required to do so.—I am, etc.,

Botleys Park Hospital,
Chertsey.

J. M. CRAWFORD.

Cardiac Arrest

SIR,—Dr. D. W. Blair and his colleagues (*Journal*, June 28, p. 1521) report a case of recovery from neurological sequelae after cardiac arrest. They are to be congratulated on their prompt diagnosis and the early institution of cardiac massage, which resulted in a return to a good general condition in their patient. In spite of this the patient obviously suffered severe cerebral damage and, even with cooling to reduce the metabolism of the damaged nerve cells, consciousness was not regained until the third post-operative day, and final recovery was not achieved for two months.

The knowledge that cardiac arrest, especially in the operating theatre, need not inevitably be fatal has resulted in

was the help given. This the latest German statement² shows to be an average payment of 5.860 DM. (£500) to those granted any compensation. (This sum, curiously enough, is almost exactly that granted automatically, together with other benefits, as "compensation" to most released war criminals—including Drs. Oberheuser and Hans Eisele.)³ Moreover, Germany has categorically refused to pay these victims a pension, although the International Refugee Organization stated that "the experiments left the victims with permanently impaired health."⁴—I am, etc.,

FRANCES BLACKETT,
Honorary Secretary,
British League for European Freedom.

London, S.W.1.

REFERENCES

- ¹ United Nations Economic and Social Council, 2nd Progress Report by the Secretary-General, 1951, p. 31.
- ² Ibid., 5th Progress Report, 1958, p. 5.
- ³ Ibid., 1st Progress Report, 1951, p. 4.
- ⁴ See *Manchester Guardian*, July 10, 1958, p. 1.
- ⁵ United Nations Economic and Social Council, 1st Progress Report, 1951, p. 29.

Rh Blood Groups and Sex Ratio at Birth

SIR,—In a series of babies born in Aberdeen Maternity Hospital, and blood-grouped as part of a research programme supported by a grant from the Scottish Hospital Endowments Research Trust, the ratio of male to female Rh(D)-positive babies is significantly higher than that of the Rh(D)-negative babies. The sex ratio of the Rh-positive babies (Table I) is 1.12 (1,964:1,754), while that of the Rh-negative babies is 0.93 (440:473), the probability of obtaining such a difference by chance being 1.3%.¹

TABLE I.—Sex-ratio of White (Aberdeen) Newborn Babies

Rh(D)-positive Babies				Rh(D)-negative Babies			
Group	Male	Female	M./F.	Group	Male	Female	M./F.
AB	52	51	1.02	AB	19	14	1.36
B	222	192	1.16	B	53	49	1.08
O	1,023	906	1.13	O	229	230	1.00
A	667	605	1.10	A	139	180	0.77
Aggregate	1,964	1,754	1.12	Aggregate	440	473	0.93

TABLE II.—Sex-ratio of White (Aberdeen) Newborn Babies

Babies ex Mothers	Number of Babies				
	Male	Female	Male	Female	M./F.
O Positive ex O Positive ...	579	520	677	609	1.11
O Positive ex O Negative ...	98	89			
A Positive ex A Positive ...	322	299			
A Positive ex A Negative ...	43	51	365	350	1.04
O Negative ex O Positive ...	93	93			
O Negative ex O Negative ...	55	62	148	155	0.95
A Negative ex A Positive ...	40	59			
A Negative ex A Negative ...	33	54	73	113	0.65

In view of Sanghvi's² finding of a significantly higher sex-ratio for O babies of O mothers than for A babies of A mothers it is interesting that in the Aberdeen series so far the O Rh-negative babies of O mothers have a lower sex-ratio than the A Rh-positive babies of A mothers (Table II). Thus, despite the high sex-ratio, so far, of the Rh-negative AB's the balance of evidence to date suggests that the Rh sex-ratio difference shown above would, if confirmed, prove independent of any ABO sex-ratio differences.¹ A detailed account of these findings, with acknowledgments, will appear elsewhere.—I am, etc.,

Aberdeen.

T. M. ALLAN.

REFERENCES

- ¹ Brays, W., personal communication, 1958.
- ² Sanghvi, L. D., *Nature (Lond.)*, 1951, 168, 1077.

Suffocation in Infancy

SIR,—With reference to Dr. J. Shackleton Bailey's letter (*Journal*, July 12, p. 104), when I was coroner of Birmingham I carried out an investigation as he has suggested into sudden and unexpected deaths of infants reported to me and extending over the seven years 1938–44, and the findings were published in an article in the *Journal*¹ relating to 318 deaths so reported in which asphyxia was considered a possible cause by a general practitioner. Of these, 38 were shown to be so caused; 18 of them resulted from mechanical suffocation while in bed with some other person, and 6 from mechanical suffocation while sleeping alone. The remaining 280 deaths were definitely ascribed to natural causes, and these causes with the age of the infant were set out in detail in the report, supported in every instance by the post-mortem findings of a skilled pathologist.

In all such cases a necropsy is absolutely necessary in order to avoid mistaken diagnosis and to avoid the distress of a mother that she may have been responsible for her infant's death. The Coroners Amendment Act, 1926, gives coroners power to order a post-mortem examination, with or without the necessity of an inquest, and in my opinion no medical man is justified in hazarding a cause of death in such circumstances without a necropsy.—I am, etc.,

Birmingham.

W. H. DAVISON.

REFERENCE

- ¹ Davison, W. H., *Brit. med. J.*, 1945, 2, 251.

Pilot Ampoules

SIR,—Sensitivity towards horse serum is found in an increasing number of patients, so that it is necessary to test their sensitivity before curative or even prophylactic doses of sera like anti-diphtheria and anti-tetanus sera, etc., are administered. At present, to conduct this test a little of the serum from the big ampoule is taken and diluted. This process of dilution, apart from being cumbersome, leaves the opened ampoule liable to bacterial contamination if left unprotected; and if the patient is found to be sensitive the ampoule may have to be thrown away and thus wasted. Hence it would be very convenient and advantageous if the manufacturers of these sera would provide diluted serum in 0.5 or 1 ml. ampoules. These could either be sold separately or, better still, be packed as pilot ampoules with the usual serum ampoules.—I am, etc.,

Mangalore, South India.

V. R. BHAT.

Lung Cancer and Tuberculosis

SIR,—My attention has been called to a letter by Dr. T. G. Paxon (*Journal*, April 12, p. 887) containing the sentence, "It has been maintained before and also hotly contested [reference] that tuberculosis has some relation to cancer." The reference is to an article of mine¹ and reflects a misunderstanding. So far from having contested in that article that there may be a relation between these two diseases, I quoted from Pearl,² and commented favourably with regard to its consideration as follows:

"Another quotation from Pearl (1929) is pertinent to the subject under present discussion: '... it is of interest to note that as the frequency of incidence of fatal tuberculosis of the lungs has declined in recent years there has occurred a marked increase in lung cancer, which has been so notable as to attract the attention of pathologists generally.'"

"In considering the significance of the putatively real increase of the rate at which lung cancer is developing in the population ... individuals reaching the adult cancer ages in current times are, in respect to their constitutional resistance to disease, greatly different from individuals formerly attaining these ages. The marked lowering of death rates in the early ages of life that characterizes the hygiene of the present era has resulted in having in the adult population individuals who in former years would have died in infancy or youth. It is likely that they carry with them a measure of the lower resistance to disease which was the constitutional basis of their former early death."

That statement was made apropos of the subject of smoking and lung cancer. In much of the literature on smoking and lung cancer the impression is easily gained that the increase in reported mortality from lung cancer is a very recent observation, and that smoking is virtually the only explanation that has been advanced for it. The quoted remark of Pearl reflects that an increased incidence of lung cancer was the subject of general comment even before 1929. As to the novelty and uniqueness of the cigarette-smoking theory, it is, in point of fact, Johnny-come-lately. From the time when a significant increase in cancer deaths began to be evidenced in mortality statistics, it was noted that this increase followed, and was probably related to, a decrease of tuberculosis. We find this idea clearly set forth as early as 1902 by Sir T. Cogan³ in a paper read before the Australasian Medical Congress of that year, in which he said:

"I desire now to place before you certain statistics which seem to connect, in some way, the increase of cancer with the decrease of tuberculosis. I have taken out the deaths from cancer and tuberculosis for each year of life during the last 25 years. It will be apparent that the resultant rates in each group have strikingly constant values. ... The question therefore naturally presents itself, whether persons who under the conditions of life and of medical science in 1876 would have fallen a prey to tuberculosis, but did not, have not at a later period provided some of the material from which our cancer rate has been recruited. I believe it is a medical axiom that 'morbid diathesis is necessary for the disease weeds to spread.' Then, may not the morbid condition under which in former years phthisis was produced have supplied the conditions under which cancer might, and does, flourish. In other words, are cancer and tuberculosis to be considered as complementary diseases?"

I hope it will not be concluded from my present letter that I now "hotly" advocate the theory that the increase in deaths from lung cancer which has been noted in mortality statistics is due to the concomitant decrease in deaths from tuberculosis. What I do advocate is that, in considering the theory that smoking causes lung cancer and that this explains the recent rise in its reported incidence, available data and opinion which bear against that theory be considered, as well as evidence which bears in its favour. Elsewhere I⁴ have presented, in some detail, how this principle should be applied also to some published "prospective" studies. What I do oppose—and with considerable warmth—is the issuance of pronouncements, authoritarian and intimidating, that the theory that smoking causes lung cancer is already conclusively established. What has been "proved" by the accumulated statistical data bearing on the problem is not that smoking causes lung cancer, but that it is merited to set up an investigative programme to ascertain, in a manner convincing to the general scientific community, whether smoking does cause lung cancer. Such a programme will necessarily involve many biological specialties and should be of a scope and intensity commensurate with the awesome importance and complexity of the question with which it is concerned. More important, actually, than just the fact of whether smoking can or cannot cause cancer is a knowledge of the physiobiological factors which are involved and how these operate. Only with a gain of such knowledge will scientific understanding of the disease be advanced, and, through this, the possibility of its effective control and amelioration.—I am, etc.,

Rochester, Minnesota.

JOSEPH BERKSON.

REFERENCES

- ¹ Berkson, J., *Proc. Mayo Clin.*, 1955, 30, 319.
- ² Pearl, R., *Amer. J. Hyg.*, 1929, 9, 97.
- ³ Cogan, T., quoted by Cherry, T., *Med. J. Austr.*, 1925, 1, 581.
- ⁴ Berkson, J., *J. Amer. statist. Ass.*, 1958, 53, 28.

Prevention of Lung Cancer

SIR,—Dr. A. C. Woodmansey (*Journal*, July 5, p. 46) may be right in calling smoking one of the less important of our psychological problems, but its sequel in lung cancer is an unpleasant way of dying for the patient in the prime of life, and a time of great stress for his wife who has to bear the brunt of the illness, and for the G.P. who has to pay numerous morale-raising visits.

Dr. Woodmansey says, "It is essential to protect young children from fire and other dangers by external means over which ... they have no control." This must continue until they are mature enough "to assess the dangers realistically for themselves." Surely it is at this time that they should be given the unpleasant facts about smoking, clearly and bluntly. But is it necessarily too late to do anything about it after that? While agreeing that deliberately frightening children is undesirable, is this true of adults? Is it not an even greater stress to learn that your husband (or yourself, or your father) has inoperable lung cancer?

Dr. Woodmansey goes on to say, "Perhaps the resistance of some smokers to repeated warnings is due ... to a compulsive need for reassurance that the danger is not after all as serious as the warnings assert," and that "rational therapy demands an understanding of underlying processes and is not achieved by merely trying to abolish symptoms." On this tenuous basis he appears ready to give up any attempt to deal with the problem in adults (and children) who already smoke, and to concentrate on adequate physical and psychological care of children in order to produce healthy adults. This is excellent in theory, but what chance have the children got when so often they see one or both parents smoking, their school teachers smoking, and even their family doctor smoking, not to mention the constant barrage of advertising? Who is going to be responsible for raising these "healthy adults" who presumably do not need the "benefits" of smoking? Surely this is an accepted practice in medicine to treat symptoms until the underlying processes can be got at. Nitrites are withheld just because the underlying cause of atheroma is unknown. In this case smoking may be a symptom like pain, but because of its unpleasant effects it should be removed.—I am, etc.,

London, S.W.12.

D. CONNAN.

Halothane Concentration

SIR,—The ether bottle from a Walton gas machine has wider gas passages and lower flow resistance than the Rowbotham bottle and on this account is more suitable for use in the closed circuit. I described this method using "V.A.M." (1 vol. vinyl ether and 3 vols. ethyl ether) in the *Journal* of August 20, 1949 (p. 436), and in practice still find it giving good results.

It was pleasant to read Dr. C. J. Massey Dawkins drawing attention to the virtues of vinyl ether in the *Journal* (May 10, p. 1116), but halothane has not yet proved itself so safe and the above method is not to be recommended for its administration. Halothane requires accurately controlled dosage, and this is best achieved with reasonable economy by passing a flow rate of two litres per minute through the "fluotec" vaporizer into a leaking closed circuit.—I am, etc.,

Bradford.

C. G. BLAKELEY.

Do Sebaceous Cysts Exist?

SIR,—

May we revive the "Wen"
Now that some clever men
Say the Sebaceous Cyst
Really does not exist?

—I am, etc.,

Epping, Essex.

PELHAM WARREN.

Tetanus Immunization

SIR,—I have recently completed a six-months appointment in the casualty department of a children's hospital where there was an average of one hundred attendances each day. In those cases of injury in which the risk of infection by tetanus bacilli was considered sufficient to warrant prophylaxis, inquiry was made as to whether the child had already been immunized against tetanus, with the intention of giving such children tetanus toxoid. (In those cases where the child was unaccompanied by a parent, the injection was withheld until the parent could be questioned about this.)

In no single case was the answer given that the child had been immunized against tetanus. There would seem to be little doubt that some parents are not aware of what their child has been immunized against.—I am, etc.,

Liverpool, 12.

P. JACKSON.

Unexpected Babies

SIR.—The report from your obstetric correspondent in your medico-legal column (*Journal*, July 5, p. 54) prompts me to record a recent case of interest.

I was called to see a multiparous woman who it was said had had twins. On arrival I learned that the 25-year-old patient had felt the need to go to stool and having gone had become aware for the first time that she was about to deliver a child. On retiring to bed she had with her husband's assistance delivered herself of a 6½ lb. (3 kg.) girl who was very shortly followed by a 5½ lb. (2.5 kg.) boy. The cords had been successfully tied by her husband. All that remained was to await the spontaneous delivery of a large placenta and to repair the lacerated perineum.

The patient had had irregular periods for three years since the birth of a previous child and had thought nothing of her amenorrhoea for four months prior to delivery. She strenuously denied having felt any movements or having noted any increase of girth. She had no pain throughout the confinement. Neither her husband (not unintelligent in these matters, to judge from his efficient conduct of the delivery) nor her neighbours admitted to having any idea of the state of affairs. The patient had had no decided views on having more children but is delighted with her twins, both of whom are thriving three months later.

—I am, etc.,

Bathgate.

DAVID M. MCCURRACH.

Compulsory Crash-helmets

SIR.—Time and again one sees the terrible havoc caused by motor-cycle accidents. Time and again the story is the same—boys and young men brought into hospital with head injuries so severe that it seems impossible that they will ever recover; in fact many do not; and all this very largely because they were not wearing crash-helmets. Surely, Sir, to make a motor-cyclist wear a crash-helmet is no more of an infringement of his personal liberty than it is to make an industrial worker wear protective clothing or to make a ship's passengers do boat-drill.

Looking at the problem from a more practical and possibly rather cynical point of view, the amount of time and money spent on the nursing and rehabilitation of these patients is enormous, and at a time when our Health Service already costs £750m. a year this extra and "unnecessary" expenditure is an outlay we cannot afford. If these young men will not take reasonable precaution to protect themselves of their own accord they must be made to do so by the community. The law would be easy to enforce—one warning and then a summons.—I am, etc.,

Worthing, Sussex.

P. J. G. SIMONS.

London Medical Orchestra

SIR.—I would crave the courtesy of your columns to bring to the notice of the musically minded the London Medical Orchestra, who are anxious to recruit players for the coming season starting in October.

There is something particularly enjoyable in the amateur orchestra, and some great figures in our profession have found it a refreshing distraction; two who come readily to mind were His and Billroth (the friend of Brahms). Moreover, the present President of the College of Physicians is at times observed performing valiantly in our ranks under the proficient conductorship of Dr. Ucko.

With the help of distinguished soloists this orchestra has raised over £400 this year for the Imperial Cancer Research Fund by public concerts, and will continue to help medical charities. Dr. E. V. Slaughter of 6, Oxford Court, London, W.3, would be glad to hear from any who are interested.—I am, etc.,

London, W.1.

A. DICKSON WRIGHT,
President,
London Medical Orchestra.

Obituary

Sir VICTOR HURLEY, K.B.E., C.B., C.M.G.
M.D., M.S., F.R.C.S., F.R.A.C.S.

Sir Victor Hurley, consulting surgeon to the Royal Melbourne Hospital and chairman of the board of the Walter and Eliza Hall Research Institute, died on July 17. He was 70 years of age.

We are indebted to Sir GORDON GORDON-TAYLOR for the following tribute: To-day Australia and especially Melbourne mourn the death of a prominent Australian surgeon. Born in 1888, Sir Victor Hurley had reached the Biblical threescore years and ten and had crowded much into his active life. Educated at Wesley College, Melbourne, and at "Queen's," "Vic" Hurley qualified in 1909 and obtained his M.S. of Melbourne University in 1913. He was a member of a most distinguished year at the university, which included men like the late Sir Alan Newton and Sir William Upjohn: with any reference to the Royal Melbourne Hospital the names of Hurley, Newton, and Upjohn come automatically to one's lips. He was a first-class surgeon in whom all reposed the greatest confidence: he was not of the "daimonic" type, sweeping aside former well-tried methods and promulgating new ones, not the pioneer, but the man whose care of his patient was a sacred trust, even if it involved repeated telephone messages from Melbourne to London over a member of the nursing profession who had been his patient. I met him first in the casualty clearing zone in France in 1917, and subsequently examined him in the anatomy part of the Primary Fellowship examination, along with a particularly able group of young Australians who had remained on in Europe after the 1918 armistice.

"Vic" Hurley was essentially a man of affairs, and from the time of the 1914-18 war, when he became Assistant Director Medical Services, Australian Imperial Forces, his administrative flair placed him in a succession of responsible offices, which included the presidencies of the Royal Australasian College of Surgeons and of the Federal Council of the British Medical Association. During the 1939-45 war he was Director-General of Medical Services of the Royal Australian Air Force and for a time was chairman of the Australian Red Cross Society. He was knighted in 1950, the year in which he was president of the British Commonwealth Medical Conference.

His connexion with the Royal Melbourne Hospital was a long and honourable one, and finally he became its president. Like Hugh Devine, Harold Dew, Henry Newland, and Henry Searby, he was elected an Honorary Fellow of the Association of Surgeons of Great Britain and Ireland. He probably lacked the Roman *gravitas* which so distinguished his friend and contemporary Alan Newton, but he was a man of transparent honesty of purpose, readily approachable, and of extreme courtesy. In the words of Horace, he was *vir tenax propositi*, and with the loyal help of the Chief Censor, Henry Searby, the Royal Australasian College of Surgeons prospered in his term of presidency.

He was married to a charming lady, who survives him, and he leaves four sons and two daughters, some of whom are in the medical profession.

F. M. B. writes: Victor Hurley was one of a famous group of young Australian surgeons who came to prominence in the first world war. My first contact with him was when I was a student in the early 1920's. That was in the Melbourne Hospital, now the Royal Melbourne, an institution with which Hurley's name will always be associated. He saw at first hand every aspect of its activity and development from his student days right up to his period of service as president of the hospital in recent years. Hurley was not only a highly competent surgeon but had a real flair for

administration, and throughout his career he carried administrative responsibilities in a variety of fields with success. His work as head of the R.A.A.F. medical services during the war and his unceasing concern for the progressive development of the new Royal Melbourne Hospital in its relation to the medical school in the post-war years were the most important. My own association with him was closest during the last five years, when he was chairman of the board of the Walter and Eliza Hall Institute. He was not directly interested in research, but he had a full realization of its importance as a leaven to the hospital's direct responsibilities for effective patient care and teaching, with which he was primarily concerned. Under his leadership the board meetings were happy and uneventful. Perhaps that was Victor's greatest gift—of preventing situations from developing. He was an immensely likable person, very good-looking, and retaining a deceptively youthful appearance right up to his last year of partial incapacitation, and with a friendly approach that always seemed to strike the right note. He was a good citizen in every sense of the word, and he was happy in the community's recognition of his work.

A. MEARNS FRASER, M.D., D.P.H.

Dr. A. Mearns Fraser, a former medical officer of health for Portsmouth, a post he held for 38 years, died in the Royal Portsmouth Hospital on July 8. He was 90 years of age.

Born at Reading on January 5, 1868, Andrew Mearns Fraser was educated at the City of London School, where he played in the school XV and was five times champion. From school he went to Edinburgh University, where he graduated M.B., C.M. in 1893, proceeding to the M.D. in 1902. At the University he was lightweight boxing champion. After experience which included that of assistant to Dr. Thresh, county medical officer for Essex, he took the D.P.H. at Cambridge in 1895. In 1896 he was appointed medical officer of health to the Borough of Portsmouth, where he remained until 1934. He acted as secretary to the Section of Public Medicine when the Association held its Annual Meeting at Portsmouth in 1899, and when the Annual Meeting was again held there in 1923 he was appointed president of the Section of Public Health. He was chairman of the Portsmouth Division of the B.M.A. from 1925 to 1927. He was also an active member of the Society of Medical Officers of Health, of which he was Fellow and at one time a member of its council.

T. E. R. writes: When appointed medical officer of health to the Borough of Portsmouth—as it then was—Dr. Fraser was the youngest of 32 doctors who applied for the position. He held office for 38 years, during which period Portsmouth more than doubled in size, the population increased by over 70,000, and in 1926 achieved the status of a city. Soon after his appointment a new era in public health began with the turn of the century, the work of the public health department, which had hitherto been concerned mainly with sanitation and environmental hygiene, was gradually extended to include not only the prevention of disease but those personal health services with which most people are to-day familiar. Fraser quickly became a pioneer in the campaign against tuberculosis, and in June, 1911, there was opened, in a gardener's cottage that happened to be empty in the Victoria Park, the first municipal tuberculosis dispensary in the country. A more permanent building was subsequently provided on an adjoining site, at a contract price of £296, as tuberculosis was then considered "the most effectual remedy for tuberculosis."

In 1912 Fraser was appointed a member of the Departmental Committee on Tuberculosis. Later, in 1925, he was associated with the late Sir John Rowland's scheme to provide treatment for children crippled by tuberculosis and other diseases at the Lord Mayor Treloar Hospital, Alton.

His campaign against venereal diseases is still remembered, mainly because his advocacy of immediate self-disinfection brought him into conflict with those who felt such preventive measures might encourage immorality. At a public conference people who had attended to demonstrate their hostility went away satisfied about the wisdom of the measures which he proposed. His recommendation of a public abattoir was one of the few which were not adopted during his period of office, but this has now come to fulfilment.

Fraser soon pressed for the purification of the city's water supply by filtration, and under a Parliamentary Bill in 1906 the present eight filter-beds on Portsdown Hill at Farlington were constructed, since when the water supply of Portsmouth has been above reproach. On many occasions he issued warnings against eating sewage-polluted shellfish. Nevertheless, 85 persons attending the mayoral banquet in 1922 suffered from illness through eating oysters. Following outbreaks of diarrhoea amongst schoolchildren in 1902 the uncontrolled tipping of refuse was discontinued. Maternity and child welfare services were established, and under slum clearance orders over 1,000 houses were demolished as unfit for habitation. During the whole period while he held office there was no great epidemic of disease, except for the outbreak of influenza in 1918, from which the whole world suffered, causing 713 deaths in Portsmouth. The decline in the death rate from infectious disease during his period of office resulted in a saving of nearly 500 lives a year, a large proportion of these being infants and young children.

Mearns Fraser was a handsome man of great personal charm and courtesy, well liked by his staff and esteemed by all with whom he associated. While he was most meticulous in his work and always expected the best, he was scrupulously fair and ever ready to give help or guidance to those who sought it. Always a keen golfer, he moved on retirement to Hayling Island near the golf course, where he spent much of his leisure. During the war years he was captain of the club and, until a year ago, its president. Carpentry was another of his hobbies, and he made a large number of artistic pieces of furniture. He married, in 1896, Freda Mary, daughter of E. W. Phibbs, and they celebrated their diamond wedding two years ago. They had two daughters.

J. WHITE, B.Sc., M.B., Ch.B., D.M.R.E.

Dr. J. White, consultant radiologist to the Stracathro and Brechin Hospital Group, died suddenly at his home in Edzell on June 1. He was 44 years of age.

James White was born at Aberfeldy on October 29, 1913. He was the son of a schoolmaster who later became rector of Bellshill Academy. He received his education at Hamilton Academy, where he was considered to be one of the finest mathematicians that had passed through the school. He then went to Glasgow University, where he graduated B.Sc. in 1934 and M.B., Ch.B. in 1938. Following a hospital resident post, he became interested in radiology and took the D.M.R.E. of Liverpool University in 1941, and worked in Liverpool Royal Infirmary and in Alder Hey Hospital until 1943. From 1943 to 1946 he worked in Stockport Infirmary and Salford. This was then followed by two years as a specialist in radiology in the Army with the rank of major. 1948 saw him back in Stockport Infirmary, and in 1950, he became consultant radiologist at the City General Hospital, Stoke. In 1956 he became full-time consultant radiologist to the Stracathro and Brechin group of hospitals, and finally made his home in Edzell.

James White was a hard worker and a keen student of his specialty, but he was interested in all other departments. He set himself high standards, and this was reflected both in the films he produced and in his reports. The limited construction of buildings during the war, with the inevitable cramped quarters and overlapping of departments, left a

post-war need for expansion and reconstruction. When Jimmy White arrived this expansion programme began to come on the horizon, and with characteristic zeal he set to, in consultation with others, making plans for a totally new radiological department; and now others will build on his foundations.

Beyond all the material things was his personal interest in his patients. He would go out of his way to explain to them what he intended doing, and would visit them afterwards to ask their reactions. Patients appreciated these things. His death in the prime of life came as a profound shock to us all. He is survived by his widow and two children. His brother, W. F. White, is a consultant orthopaedic surgeon at Law Hospital, Carlisle.—R. L.

C. J. MORGAN, B.Sc., M.B., B.Ch., D.P.M.

Dr. C. J. Morgan, consultant psychiatrist and medical superintendent of Morgannwg Hospital, Bridgend, Glamorgan, died on June 26. He was 43 years of age.

Cyril John Morgan was born at Penyarden, Merthyr Tydfil, Glamorgan, on December 22, 1914. He was educated at Cyfartha Grammar School, Merthyr, and thence he went to the Welsh National School of Medicine, Cardiff, where he graduated M.B., B.Ch. in 1939. He had obtained the B.Sc. with honours in anatomy in 1936. In 1947 he obtained the D.P.M. of University of London. Following qualification, he became R.M.D. at the Pontypool Hospital from June until September, 1947, when he joined the R.A.M.C. on the outbreak of war. After service as a regimental medical officer, he was appointed a psychiatric specialist, and served in this country and in West Africa until he was demobilized in December, 1945. He next joined the staff at Rainhill Hospital, Liverpool, where he became first senior assistant. In addition, he was lecturer in psychiatry to the Liverpool School of Occupational Therapy, and examiner in psychopathology to the Society of Occupational Therapists. In December, 1949, he was appointed deputy medical superintendent to Morgannwg Hospital, Bridgend, and in November, 1954, he became medical superintendent.

Morgan was a truly dynamic personality, and he will ever live in the memory of all who knew him for his innate kindness, his ever-ready help, his seemingly tireless energy, and his infectious enthusiasm. He was a brilliant and stimulating conversationalist, and had an exceedingly wide range of interests. His patients and staff, as well as his colleagues, had a deep and abiding affection for him, and his untimely death at the early age of 43 years is a most tragic loss to Morgannwg Hospital. Our heartfelt sympathy goes out to his widow and three young sons.

ISIDOR C. RUBIN, M.D., F.A.C.S.
Hon.F.R.C.O.G.

The obituary of Dr. Isidor C. Rubin was printed in the *Journal* of July 19 (p. 168).

Dr. BETHEL SOLOMONS writes: Isidor Rubin was indeed a beloved physician. Among his numerous attributes he was an essential humanist and had a delightful sense of humour. In the last 50 years he has been a pioneer investigator in his efforts to improve the lot of childless women, and he never ceased trying out new methods. His *Collected Papers, 1910-1954*, were published during the latter year and these 132 communications will be a lasting monument to his memory. He had resigned from the Mount Sinai Hospital, for which he had done so much, but was still in private practice. His experimental work was his chief joy. He was one of my oldest and dearest friends, and when he entertained me in New York about six weeks ago he seemed to be in splendid health and was as enthusiastic as ever. I know how lucky I was to be with him on this last occasion, for he was leaving two days later for meetings in Mexico and London. He will be sadly missed by his devoted wife and by colleagues and friends in every part of the world.

Medical Notes in Parliament

DOCTORS IN PARKING METER AREAS

Earl HOWE asked in the Lords on July 15 whether, in the rules governing the operation of parking meters in areas where they were installed, the Government intended to make any special regulations to meet the needs of professional men, their clients, or their patients.

Lord MANCROFT, Minister without Portfolio, said that no special provision for professional men, their clients, or patients was proposed by the local authority or included in the only parking meter Order so far made—the Parking Places (Westminster) (No. 1) Order, 1958, which was operating in North-west Mayfair. Any local authority proposing such an Order might include in it such exemptions under Section 21(4) of the Road Traffic Act, 1956, as they wished, but he could not anticipate the Minister of Transport's decisions on such applications.

Earl HOWE asked if Lord Mancroft did not think that in the case of people, perhaps suffering from grave injuries, who were going to see their medical advisers some relaxation of the parking meter regulations should be incorporated in any further Orders made for the same purpose. Lord MANCROFT said that what mattered was what representations were made by the local authorities to the Minister when he had heard all the interests concerned. In the particular case to which he had referred he understood that no representations were made, and on the only other Order before the Minister representations along the lines which Earl Howe suggested had been made. The matter was still under consideration. Earl HOWE said that, in common humanity, something ought to be insisted on by the Minister of Transport in any further Orders which were made on the subject. Lord MANCROFT replied that, if in common humanity the Minister was asked to do so, indeed he would consider it; but in the only case so far put into practice he had not been asked.

Lord DERWENT asked if this meant that it was impossible for the Minister to draw the attention of the local authority to the question and ask them to consider it. Lord MANCROFT said that the local authority principally concerned in the matter—namely, the St. Marylebone Borough Council, in whose area Harley Street was—did not need to have this matter drawn to their attention. They were powerfully aware of it, and they had made representations to the Minister and he was considering them.

Earl HOWE suggested that there were a number of professional men, doctors and others, living in Westminster No. 1 area. Surely the Minister could have taken action on his own account in a case like that. Lord MANCROFT agreed that the Minister could have taken action, but he did not think from the facts before him that it was necessary.

QUESTIONS IN THE COMMONS

Delays in Obtaining Treatment

Mr. W. OWEN (Morpeth, Lab.) asked the Minister of Health on July 14 if he was aware that the payment of a specialist fee by mineworkers in the Ashington area of Northumberland determined the speed of the treatment needed. Mineworkers scheduled for specialist advice, medical treatment, or surgical treatment under the Health Service were subject to unusually long waiting periods. Mr. D. WALKER-SMITH said that he knew the waiting periods for treatment at the Ashington Hospital were sometimes long and the facilities there were to be extended. He was not quite sure what Mr. Owen had in mind regarding specialists' fees: there were no pay beds in this hospital.

Mr. OWEN explained that two brothers had waited for nine weeks for an appointment for diagnosis. One paid a specialist fee of £3 and got an appointment within four days, and the other continued to wait. Mr. WALKER-SMITH said that in view of these allegations Mr. Owen had better

send him the particulars. Mr. F. POPPLEWELL (Newcastle upon Tyne, West, Lab.) said quite a lot of this sort of thing was taking place in the north-east. A miner had been waiting 14 weeks for an operation for double hernia, and was then told he would have to wait another six weeks, but that if he paid three guineas to a specialist he would be taken in at once. Mr. WALKER-SMITH undertook to look at any case sent to him.

Dr. EDITH SUMMERSKILL asked for the Speaker's guidance on the point of privilege. If a Member wrote to the Minister he would have to give the name of the physician and the details. Should he respond to the Minister's request and send the letter, which might mean defaming the consultant? The Speaker said this matter had started with a question in Parliament, of which the Member had given notice. There was no doubt that this question was a proceeding in Parliament.

Poliomyelitis Vaccine for Travellers

Mrs. EIRENE WHITE (Flint, East, Lab.) asked what arrangements were made to supply poliomyelitis vaccine to adults travelling to parts of the world where danger of infection is high. Mr. WALKER-SMITH replied that there were at present no comprehensive arrangements for this under the Health Service, but certain classes of travellers were covered by arrangements made by the Foreign Office, Commonwealth Relations Office, Colonial Office, and the Service Departments.

Mrs. WHITE suggested that something much more specific was required. There had been cases in Pakistan, Indonesia, and elsewhere where British women had gone without protection and had died, sometimes after an illness of only two days. Adequate arrangements should be made to protect people before they went to places where polio was endemic, and these should be publicized to travel agencies. Mr. WALKER-SMITH pointed out that in approaching vaccinations on a priority basis he had acted on the advice of the committee under the chairmanship of Lord Cohen of Birkenhead. He was prepared to take this point to the committee and take their advice on it.

Registrations for Polio Vaccination

Sir LEONARD ROPNER (Barkston Ash, Con.) asked the Minister what was the approximate number of children who had been registered for injections against poliomyelitis since January 1 and June 1, 1958; and what would be the total cost of these inoculations. Mr. WALKER-SMITH told him that information for these periods was not available, but the number of children who were registered between January 1 and April 30, 1958, was approximately 1½ million, and figures for the period May 1 to June 30 would be available shortly. He could not give any precise estimate of cost, including that incurred by the local health authorities, but the cost of the vaccine for two injections each for the 1½ million children was likely to be rather over £500,000.

Out-patient E.C.T.

Dr. DONALD JOHNSON (Carlisle, Con.) asked if the Minister of Health would increase the facilities for the administration of electric convulsion therapy in the out-patient departments of general hospitals. Mr. WALKER-SMITH said that these facilities were being provided by the responsible hospital authorities as their resources permitted.

Dr. JOHNSON asked the Minister to further this type of treatment. There would be an obvious saving of hospital beds if it were successful. On occasion there were complaints from people who suffered from after-effects which they attributed to rather intensive courses of treatment in hospitals—sometimes against their own will—and out-patient treatment would allow them to consult their family doctors from time to time and thus obtain an independent opinion. Mr. WALKER-SMITH said there was an increasing tendency for patients suffering from mental illness to be treated in out-patient departments. The logical corollary was that there should be more facilities for electric convulsion therapy.

Alcohol and Road Accidents

The MINISTER OF HEALTH explained in answer to Mr. SOMERVILLE HASTINGS (Barking, Lab.) and Sir FRANK MEDLICOTT (Norfolk, Central, Ind.) that the Medical Research Council report on the effect of alcohol on driving capacity was being revised by the author on the advice of the scientific panel under whose auspices the research was carried out. The object of the revision was to correct minor errors and simplify the presentation of the statistics. There was every intention of publishing the report. It might be possible to have a preliminary publication of the main findings in a form suitable for scientific journals.

Health Centres

Mr. A. BLENKINSOP (Newcastle upon Tyne, East, Lab.) asked what was the total number of health centres in operation, under construction, and planned respectively; and what action was being taken to encourage their further development. Mr. R. THOMPSON, Parliamentary Secretary, Ministry of Health, informed him that nine health centres established by local health authorities since the appointed day were in operation. Three were under construction, and another would be started this year. Nine other schemes had been proposed, and three at least of these were likely to be started in 1959-60. The Minister was always prepared to consider proposals for more of these centres within the limitations on capital expenditure, but it was right that the initiative should be taken locally.

Registration of Chiropodists

Dr. DONALD JOHNSON asked the Minister when he expected to introduce new legislation with a view to the regularizing of the present position in the chiropody profession; and if he would include in such legislation provisions to safeguard the position of those who had been earning their living as practising chiropodists and could produce satisfactory medical evidence to that effect. Mr. WALKER-SMITH said that the Secretary of State for Scotland and he had recently drawn up a revised scheme for the statutory registration of professions supplementary to medicine, which would require legislation to bring it into effect. It had recently been considered at a conference of all the bodies concerned and they were now considering the views then expressed.

Safety Branch of A.E.A.

Mr. R. MASON (Barnsley, Lab.) asked the Paymaster-General to what extent a safety inspectorate had now been formed to examine periodically and keep under review safety conditions within the atomic power stations and allied establishments; and whether he was satisfied that sufficient emphasis was being placed on this development. Sir I. HOROBIN said he was. The Safety Branch of the Atomic Energy Authority was being strengthened in accordance with the recommendations of the Fleck Committee, and the Government were preparing legislation to implement the policy of licensing and inspection already outlined.

Detergents in Sewage

Mrs. H. SLATER (Stoke-on-Trent, North, Lab.) asked the Minister of Housing and Local Government on July 15 what results there were from his examination of the new washing powder which ceases to foam once it gets into the sewage. Mr. J. R. BEVINS, Parliamentary Secretary, said that the foam problem was being studied by the standing technical committee on synthetic detergents. The committee was aware of recent reports that new materials had been discovered, and, in co-operation with the manufacturers and the Department of Scientific and Industrial Research, was investigating the claims made for these materials. The committee was not yet ready to make a further report. He hoped they would have the report before the end of the year.

Meat Inspection

Sir FRANK MEDLICOTT (Norfolk, Central, Ind.) asked the Minister of Agriculture, Fisheries, and Food on July 17 if he was satisfied with the progress of the efforts to ensure that 100% of the meat passing through slaughterhouses was inspected. Mr. J. B. GODBER, Parliamentary Secretary, stated that the replies to a questionnaire recently issued by the Ministry indicated that local authorities had made considerable progress during the last 18 months, and that as much as 90% of the meat passing through slaughterhouses was now inspected. Local authorities were to be congratulated on this encouraging rate of progress, and the Minister was satisfied that they were doing their best to maintain this progress and to raise the standard of inspection despite the great pressure on inspecting staff in many areas.

Scottish Medical Students

Mr. MALCOLM MACPHERSON (Stirling and Falkirk, Lab.) asked the Secretary of State for Scotland how many medical students in Scotland satisfactorily completed their courses at the recent final examinations; how many of these he estimated were likely to take pre-registration posts in Scottish hospitals; and how far this estimate corresponded to the number of vacancies in such posts. Mr. J. S. MACLAY said he was informed that 354 medical students in Scotland successfully completed their courses at the recent final examinations. No information was available of where these graduates would take their pre-registration training. There were some 600 house-officer posts in Scottish hospitals approved for pre-registration service. There was, however, no direct relationship between this number and the number of recent passes. Some Scottish graduates went to England and abroad for their pre-registration training, and similarly graduates from other countries came to Scottish hospitals; moreover, some of the posts were filled by graduates who qualified earlier.

New Measures at Broadmoor

The MINISTER OF HEALTH announced on July 21 that, although he had not yet received the full report of the Board of Control inquiry into the escape of Frank Mitchell from Broadmoor, he had received a summary of their main findings. They confirmed that the method of escape was as he had said, and they found that the saw used by the patient had been introduced into the institution from outside. He continued that they recommend that: (1) Search of patients after visiting-days should be intensified. (2) There should be no exception to the rule that the siren was to be sounded immediately the escape of a dangerous patient was known. (3) The strength of the night staff on duty in the block from which Mitchell escaped should be increased at once. (4) Alterations to the walls of the institution to increase their security at strategic points should be begun immediately. They had already given instructions for the implementation of these recommendations.

Mr. A. R. HURD (Newbury, Con.) said that local authorities and residents, who had been reasonable and understanding, would welcome these practical measures. He asked the Minister to see that the further suggestions they had made in their petition were fully considered by the Board of Control, and if need be have an independent inquiry. Mr. WALKER-SMITH replied that he would certainly study with sympathy and attention any constructive proposals put forward by the local authorities and residents. He doubted whether an independent inquiry could add anything material.

Psychopathic Patients

Mr. HURD asked how many of the patients at Broadmoor were classified as psychopaths with homicidal tendencies; and if further consideration would now be given to detaining them in an institution inside a prison rather than at Broadmoor, where their presence might be inimical to the cure of the majority of the patients. Mr. WALKER-SMITH replied that a psychopathic state might be associated with

mental illness or mental deficiency, and, as homicidal tendencies might arise from the associated illness, information in the form asked for was not available. The classification and disposal of patients requiring treatment in a State mental institution would be considered in the context of the promised legislation following the report of the Royal Commission. Mr. HURD asked if he would consult the Home Secretary to see whether it would not be better if the 50 or so psychopaths were put in prison where security could be the first consideration. Mr. WALKER-SMITH pointed out that the matter was not susceptible of the neat classification Mr. Hurd seemed to have in mind. He was advised that the right place for patients who had been sent to Broadmoor from prisons was in Broadmoor. Mrs. BRADDOCK (Liverpool, Exchange, Lab.) said that this type of patient was the one giving the Royal Commission the most difficult task of definition. Would it not be better to look at the recommendations of the Royal Commission and put them into operation? Mr. WALKER-SMITH agreed that this problem did cause considerable difficulty to the Royal Commission. He had been carefully studying their recommendations on the psychopathic state, in the light of the observations that had been made.

Polio Vaccination Extended

Mr. WALKER-SMITH also announced on July 21 that, having reviewed the progress that had been made in the existing programme of vaccination against poliomyelitis, the Government considered that the stage would soon be reached when it could be extended. Accordingly, they proposed that eligibility for vaccination should be extended to persons born in the years 1933 to 1942, inclusive, thus raising the upper age limit from 15 to 25; that a wider range of hospital staff and their families should be brought within the programme; and that a start should be made with third injections for persons already vaccinated with two. The Secretary of State for Scotland and he proposed to consult the local authority associations and the British Medical Association on the details of these extensions, and then to issue all necessary information about them to local health authorities, hospital authorities, and general practitioners. They hoped it would be possible for a start to be made on the new vaccinations by the autumn. Persons affected by the extension of the programme should watch for local announcements telling them when and how to apply.

Mr. A. BLENKINSOP (Newcastle upon Tyne, East, Lab.) asked if it was now possible to increase the amount of vaccine in this country. Mr. WALKER-SMITH stated that there were some supplies of British vaccine likely to be forthcoming in the near future, but still not in any great quantity for the time being. It was therefore wise for parents who wanted immediate protection for their children to opt for the available vaccine.

Medical Staffing of Hospitals

Mr. BLENKINSOP asked the Minister of Health what representations he had had from professional and other bodies regarding the composition of the working party on medical staffing of hospitals. Mr. WALKER-SMITH replied that he had had representations from the Medical Practitioners' Union, the Royal Medico-Psychological Association, and the National Council of Women. Mr. BLENKINSOP asked if the Minister was going to pay any attention to the representations that had been made, in view of the real anxiety among the large number of consultants and specialists who did their work in general hospitals that they had no representation at all on this committee, which consisted entirely of men—no doubt eminent—from teaching hospitals. Mr. WALKER-SMITH replied that all the representations he had received dealt with rather different points, and pointed to the omission of desirable membership as they saw it. If effect were to be given to all these suggestions there would be a danger of having a large and unwieldy committee.

The committee could get information from any source it wanted. Mr. BLENKINSOP said it was essential to carry the medical profession in any recommendations the committee made. How could the Minister expect to do that when it represented only one narrow section of the profession? Mr. WALKER-SMITH pointed out that this working party was a joint body, half appointed by the Minister and the other half by the Joint Consultants Committee. He could not go behind the membership they put forward.

Consultants Strength.—At the end of September, 1957, there were 3,192 whole-time consultants and senior hospital medical officers, compared with 3,170 in June, 1956. The part-time numbers were 5,813 and 5,708.

S.E. Metropolitan Hospitals.—Two hundred and thirty beds in mental deficiency units are out of commission in the South-east Metropolitan Region because of shortage of nursing staff.

Orthodontic Treatment.—During 1957 about 56,000 children received orthodontic treatment through the School Dental Service. In about 27,000 of these cases the treatment began in the year.

Medico-Legal

INQUEST QUASHED

INFANT NOT SUFFOCATED

[FROM OUR LEGAL CORRESPONDENT]

Two weeks ago (*Journal*, July 12, p. 111) we printed a note in this column to the effect that when infants are found dead in their cots their death is less often due to suffocation than is generally supposed. A good illustration is to be found in the case of *Ex parte Groome*, decided in the Divisional Court of the Queen's Bench Division on July 15 (*The Times*, July 16).

In that case a 5-months-old girl was found dead in her cot, and at the inquest evidence was given that death was due to suffocation and a verdict of accidental death was recorded. A post-mortem examination was subsequently held and this showed that the cause of death was not suffocation but toxæmia due to respiratory infection. The deputy coroner for Northampton applied to the Divisional Court for an order to quash the inquisition on the ground that the new evidence showed that the verdict was wrong and that the verdict should have been death from natural causes. The Court quashed the inquisition and ordered that a new inquest should be held. The second inquest was held on July 21 and the verdict of death from natural causes was returned (*Manchester Guardian*, July 22).

Procedure for Quashing Coroner's Inquisition

At Common Law the Court of Queen's Bench has always had the power to quash a coroner's inquisition, and its jurisdiction to do so can be brought into play on the application of anyone who is aggrieved by the verdict. The grounds on which the jurisdiction has been exercised vary from technical shortcomings in the verdict to misconduct by the coroner. It is not usual for an inquisition to be quashed on grounds of insufficiency of evidence to support the verdict or misdirection of the jury by the coroner. The Court will, however, quash in cases of evidential defects if it is satisfied that injustice has been done. The procedure is by motion before the Divisional Court supported by affidavit evidence.

In *Ex parte Groome* the verdict of accidental death due to suffocation, when in fact death was due to respiratory infection, could plainly work precisely the injustice envisaged in our recent note on suffocation in infancy. The deputy coroner's application to the Divisional Court gave the opportunity for the wrong to be put right.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending July 5 (No. 27) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	3	0	3	0		3	0	2	0	1
Dysentery	919	119	125	11	16	462	42	165	15	3
Encephalitis, acute	4	0		0		2	0		0	
Enteric fever:										
Typhoid	1	0	4	1	2	2	0	0	0	1
Paratyphoid	4	1	2 (B)	0	1 (B)	3	0	2	0	
Food-poisoning	342	29	17	0		327	74	43	0	
Infective enteritis or diarrhoea under 2 years				14	24				20	23
Measles*	6,438	483	62	54	15	15,510	427	67	105	156
Meningococcal infection	21	0	16	1	1	3	2	13	4	
Ophthalmia neonatorum	17	0	6	0		42	5	10	0	
Pneumonia†	232	9	126	6		156	15	115	4	
Poliomyelitis, acute:										
Paralytic	30	2	12	1	8	68	4	9	8	2
Non-paralytic	18	0				65	6			
Puerperal fever‡	183	31	11	0		201	29	6	0	
Scarlet fever	663	54	57	17	33	400	25	51	22	4
Tuberculosis:										
Respiratory	534	61	117	18		550	48	142	30	
Non-respiratory	60	5	11	4		60	8	15	2	
Whooping-cough	820	33	60	47	41	1,631	60	99	4	40

DEATHS	1958					1957				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0		0	0	0	0
Dysentery	0	0		0		2			0	
Encephalitis, acute		0			0	0				0
Enteric fever	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years	4	0	0	0	0	1	1	0	0	
Influenza	14	1	0	0	0	2	0	0	0	
Measles		0	0	0	0	0	0	0	0	
Meningococcal infection		0	0			0	1			
Pneumonia	324	24	16	11	5	25	14	12	4	
Poliomyelitis, acute	2	0		0	0	0		1	0	
Scarlet fever		0	0	0	0	0	0	0	0	
Tuberculosis:										
Respiratory	75	2	5	1	2	7	1	0	3	
Non-respiratory		0	0	0	0	1		0	0	
Whooping-cough	1	0	0	0	0	0	0	0	0	
Deaths 0-1 year	290	22	27	5	10	31	27	4	6	
Deaths (excluding stillbirths)	8,569	682	535	110	137	746	507	93	143	
LIVE BIRTHS	14,196	1251	882	204	416	1198	1068	225	396	
STILLBIRTHS	285	23	26			19	18			

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

Vital Statistics

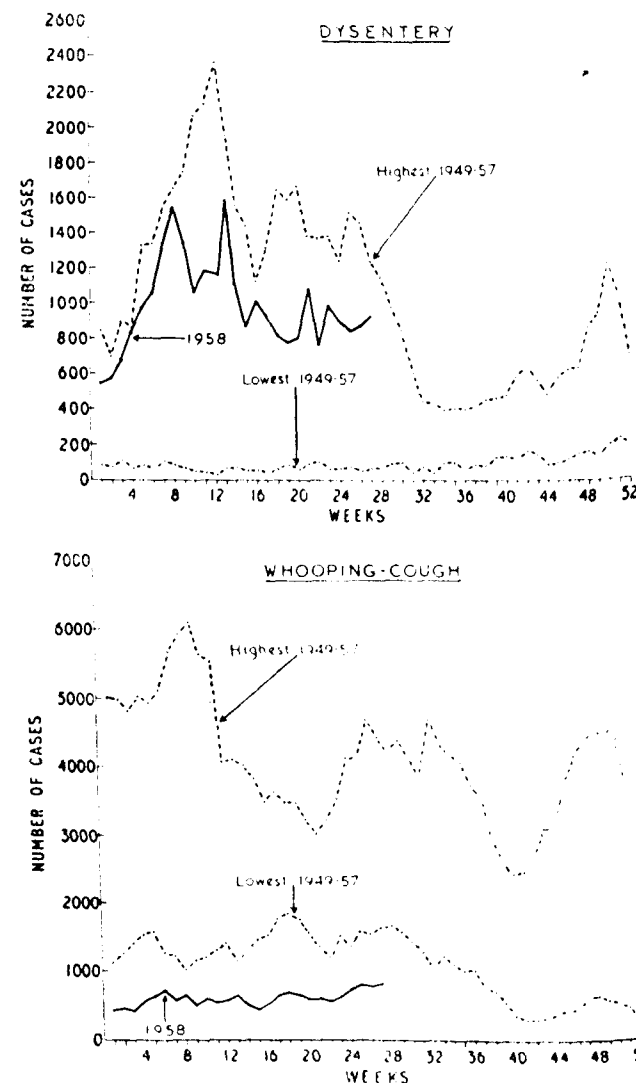
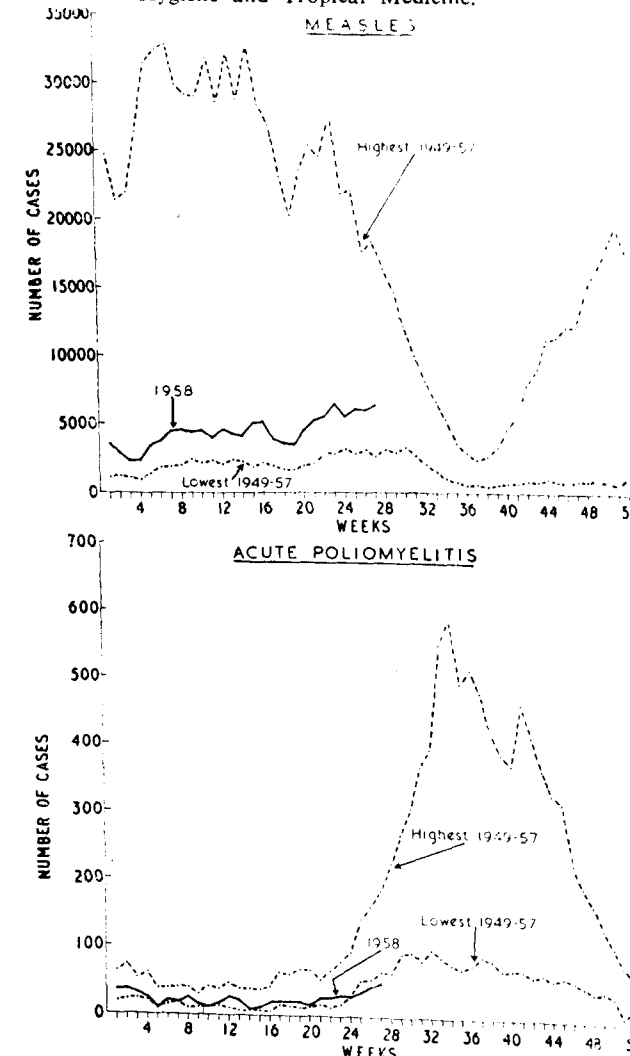
Scotland in First Quarter

The birth rate for the first quarter of 1958 was 19.7 per 1,000 population and was 1.0 above the average of the five preceding first quarters. The infant mortality rate was 32 per 1,000 registered births, which was the same as in the preceding first quarter. The death rate was 14.6 per 1,000 of the population, being 1.9 higher than in the corresponding quarter of 1957 and 0.4 above the five years' average.

Deaths attributed to the principal epidemic diseases numbered 89 and included 79 from influenza, 7 from meningococcal infections, and 3 from whooping-cough. There were 219 deaths from respiratory tuberculosis and 10 from other forms; these deaths were, respectively, 16 more and 5 fewer than in the first quarter of 1957. Deaths from violence numbered 746 and were 52 more than in the preceding first quarter. 159 of these deaths were due to road transport accidents compared with 103 in the first quarter of 1957.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus -----, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending July 12

The largest falls in the numbers of notifications of infectious diseases in England and Wales during the week ending July 12 were 179 for dysentery, from 919 to 740, and 115 for food-poisoning, from 342 to 227; the only large rise was 640 for measles, from 6,438 to 7,078.

The largest rises in the incidence of measles were 135 in Derbyshire, from 152 to 287 (Ripley U.D. 109, Derby C.B. 80), 111 in Sussex, from 162 to 273 (Littlehampton U.D. 87), and 110 in Staffordshire, from 137 to 247 (Walsall C.B. 81); the largest falls were 77 in Cornwall, from 226 to 149, and 73 in Somersetshire, from 210 to 137. 625 cases of scarlet fever were notified, being a decrease of 38 compared with the preceding week; there were no large fluctuations in the local returns. The notifications of whooping-cough, 816, were 4 fewer than in the preceding week, and the largest fluctuation in the local returns was a rise of 29 in Sussex, from 42 to 71. No case of diphtheria was notified; in the preceding week there were 3.

Of the 18 cases of typhoid fever 7 were notified in Dorsetshire, Melcombe Regis M.B., and 6 in Wiltshire, Warminster U.D.

The notifications of acute poliomyelitis numbered 59, and these were 5 more for paralytic and 6 more for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 22 (Bradford C.B. 4, Leeds C.B. 3, Selby U.D. 3, Huddersfield C.B. 2, Moseley M.B. 2, Pontefract M.B. 2), London 4 (Kensington 2), Essex 4 (Rochford R.D. 3), Warwickshire 4 (Birmingham C.B. 4).

The largest centres of dysentery were Yorkshire West Riding 155 (Bradford C.B. 26, Leeds C.B. 20, Barnsley C.B.

19, Sheffield C.B. 18, Thorne R.D. 12, York C.B. 11), Lancashire 143 (Liverpool C.B. 34, Manchester C.B. 29), London 91 (Bermondsey 29, Islington 10), Durham 35 (Darlington C.B. 9), Staffordshire 34 (Rugeley U.D. 13), Warwickshire 33 (Birmingham C.B. 18), Middlesex 30, Surrey 22, Yorkshire North Riding 22 (Middlesbrough C.B. 21), Gloucestershire 20 (Bristol C.B. 19), and Hampshire 20.

Medical News

International Federation of Surgical Colleges.—The Federation was formally inaugurated in Stockholm on July 4. It is representative of surgical colleges, academies, and surgical institutions throughout the world, but not of individual persons. The foremost of its stated objects are: (1) The establishment and maintenance of close relations among approved surgical colleges and kindred institutions; and (2) encouragement of the maintenance of high standards of education, training, and research in surgery and its allied sciences. At the meeting in Stockholm Sir HARRY PLATT was elected president for the ensuing three years, and Dr. I. S. RAVDIN (U.S.A.) and Dr. E. DAHL-IVERSEN (Denmark) were elected vice-presidents. The executive committee in the first instance will consist of representatives from Holland, France, Sweden, Norway, Belgium, and Australasia, in addition to the president and vice-presidents. The member institutions are as follows: Academy of Surgery of Paris, American College of Surgeons, Belgian Surgical Society, College of Physicians, Surgeons, and Gynaecologists of South Africa, Danish College of University Surgeons, Dutch Association of Surgeons, Italian Surgical Society, Norwegian Surgical Association, Royal Australasian College of Surgeons, Royal College of Physicians and Surgeons of Canada, Royal College of Surgeons of Edinburgh, Royal College of Surgeons of England, Royal College of Surgeons in Ireland, Royal Faculty of Physicians and Surgeons of Glasgow, and the Swedish Surgical Society. The secretary of the Federation is Mr. KENNEDY CASSELS, of the Royal College of Surgeons of England.

Polio Vaccination.—The following information on the vaccination state against poliomyelitis in Great Britain, as at June 30, was released by the Ministry of Health this week: (1) Total registered all groups, 6,570,157 (children up to 15 years, 5,613,602); (2) total vaccinated with two doses, 4,481,937 (children, 4,396,382); (3) total vaccinated with one dose, 856,388 (children, 813,569); (4) awaiting vaccination, 1,231,932 (children, 1,217,220); (5) number of doses needed to complete registrations at June 30, 3,320,252; (6) number of doses held by local authorities at June 30, 3,766,651; (7) number of doses distributed since June 30, 500,000; (8) the registration rate for children under 15 June 30 was 53.6% (England and Wales 53.3%; Scotland 55.6%); (9) registration by persons in the existing priority groups are still being made; (10) estimated numbers in new groups: age 15-24, 6,250,000; hospital staffs and families, 500,000; (11) those eligible up to March 31, 1959, for a third injection may total 6,500,000; (12) it is proposed to ask local health authorities to make, so far as is practicable, an early offer of third injections to children who were vaccinated in 1956, about 200,000; (13) it is proposed that third injections should generally be offered not less than seven months after the second; (14) total number of doses of vaccine issued from May, 1956, up to July 20, 1958: British, 5,258,568; Salk, 10,452,417; totals, 15,710,985; (15) in-cluded in the total of Salk vaccine are 5,637,717 doses tested and licensed for use in America but not further tested by the Medical Research Council.

Ciba Laboratories Ltd.—On July 16 the MINISTER OF HEALTH, Mr. DEREK WALKER-SMITH, opened an extension to Ciba Laboratories' pharmaceutical factory at Horsham in Sussex. As part of the proceedings the Minister inaugurated production of a new drug against leprosy, Ciba 1905 (4-butoxy-4'-dimethylaminodiphenyl thiourea), which has been undergoing clinical trials for the last 3½ years, mainly in Nigeria. At the subsequent luncheon Sir ARTHUR VERE HARVEY, chairman of the Company, announced the setting up of a new Trust Fund, to be known as the Ciba Fellowship Trust. Its object is to help graduates and undergraduates from the United Kingdom and Eire to continue their scientific studies at Continental centres. The Trust will provide for 10-12 fellowships a year in chemistry, physics, or an allied subject, starting next year. The trustees are LORD HIVES, C.H., the former chairman of Rolls Royce, Ltd., Sir ALEXANDER TODD, F.R.S., and Sir ARTHUR VERE HARVEY. Congratulating the company on the extensive and protracted clinical trials to which their new product had been subjected, Mr. WALKER-SMITH said: "In my view, this sort of approach is the essence of reputable pharmaceutical endeavour." In reply, Mr. PHILIP MAIR, the managing director, said that Ciba spent nearly £3m. last year on research towards the discovery of new drugs, twice what they were spending seven years ago.

Chair of Medicine at Edinburgh.—Dr. K. W. DONALD, reader in medicine at Birmingham University, is to succeed Sir STANLEY DAVIDSON when he retires from the chair of medicine at Edinburgh University on March 31. Dr. Donald was educated at Cambridge and St. Bartholomew's Hospital, qualifying in medicine in 1936. After graduating M.B., B.Chir. (Cambridge) in 1938 he obtained the M.D. in 1945 and the D.Sc. (Birmingham) in 1954. He was admitted M.R.C.P. in 1946 and elected F.R.C.P. in 1952. During the second world war he served with the Royal Navy as senior medical officer to the Second Destroyer Flotilla, winning the D.S.C. at Narvik. In 1942 he was transferred to the Admiralty experimental diving unit which co-operated with the Medical Research Council's Royal Naval Personnel Research Committee in studies of under-water physiology. After the war Dr. Donald returned to St. Bartholomew's Hospital, where he was chief assistant on the professorial unit, and in 1948 he went with a Rockefeller fellowship to the United States. His next appointment was as senior lecturer at the Institute of Diseases of the Chest, London. In 1950 he became reader in medicine at Birmingham, and in 1954 was given the title of first assistant in the department of medicine there. Dr. Donald's publications have been on cardio-respiratory function, caisson disease, and resuscitation of the drowned and asphyxiated; a number of his papers have appeared in this Journal.

Peckham Diagnostic Centre.—Brigadier H. L. GLYN HUGHES, formerly senior administrative medical officer of the S.E. Metropolitan Board, has been appointed director of the proposed diagnostic medical centre at the Queen's Road Centre, Peckham. The diagnostic centre, besides being used for teaching general practice to senior students, will provide local general practitioners with facilities for radiological and pathological examinations, physiotherapy, minor operations, etc. The Nuffield Foundation is making a grant of £12,000 towards the capital cost of adapting the accommodation (estimated at £16,500), the S.E. Metropolitan Board is providing some staff and equipment, and the London County Council will meet the running costs—about £6,250 a year.

School for Educationally Subnormal.—On July 12 Dr. L. T. HILLIARD, physician superintendent of the Fountain Hospital, opened the London County Council's Rose Cottage School, Woolwich. This is stated to be only the second new school for educationally subnormal children to be built in London since the second world war. It is a day school for 150 boys and girls aged 5 to 16 years. Pupils are drawn from south-east London and north-west Kent, transport where necessary being provided by local education authorities. A speech therapist attends regularly. The school is in Welton Road, London, S.E.18, and the nearest station is Welling Station.

Royal Society of Medicine.—At a general meeting of fellows held on July 15 the following were elected honorary fellows of the Society: Mr. L. R. Broster, Dr. M. G. Candau, Professor William B. Castle, Professor Andre F.

At the subsequent luncheon Sir ARTHUR VERE HARVEY, chairman of the Company, announced the setting up of a new Trust Fund, to be known as the Ciba Fellowship Trust. Its object is to help graduates and undergraduates from the United Kingdom and Eire to continue their scientific studies at Continental centres. The Trust will provide for 10-12 fellowships a year in chemistry, physics, or an allied subject, starting next year. The trustees are LORD HIVES, C.H., the former chairman of Rolls Royce, Ltd., Sir ALEXANDER TODD, F.R.S., and Sir ARTHUR VERE HARVEY. Congratulating the company on the extensive and protracted clinical trials to which their new product had been subjected, Mr. WALKER-SMITH said: "In my view, this sort of approach is the essence of reputable pharmaceutical endeavour." In reply, Mr. PHILIP MAIR, the managing director, said that Ciba spent nearly £3m. last year on research towards the discovery of new drugs, twice what they were spending seven years ago.

Cournand, Professor D. Denny-Brown, Professor F. de G. d'Allaines, Professor Herwig Hamperl, Professor G. Miescher, Professor Newell Philpott, Professor Georges Portmann, and Dr. F. Parkes Weber.

Faculty of Ophthalmologists.—At the council meeting on July 11, the following were elected officers for 1958-9: *President*, Mr. L. H. SAVIN; *vice-presidents*, Mr. E. G. MACKIE and Professor G. I. SCOTT; *hon. treasurer*, Mr. A. MCKIE REID; and *hon. secretary*, Mr. E. F. KING.

Royal College of Surgeons of Edinburgh.—At a meeting of the College on July 15 the honorary fellowship was conferred on Dr. WARREN H. COLE, professor of surgery at Illinois University, and on Dr. I. S. RAYDIN, Barton professor of surgery at Pennsylvania University. The following were admitted F.R.C.S.Ed.:

S. M. S. Ashraf, D. W. Blair, R. C. Buchanan, P. Burgess, B. N. Chatterjee, M. C. Chenoy, J. S. G. Clark, J. T. F. de Graft-Johnson, E. J. England, D. S. Grewal, W. F. Hasan, G. Kerr, G. C. Liggins, J. McLennan, P. S. Mathur, G. Muttuhamy, K. N. Nambudripad, K. J. O'Connor, S. L. Paton, G. R. A. Raad, E. F. Reye, M. C. R. Solling, J. W. W. Thomson, M. A. T. Tolley, M. P. Trivedi, D. D. Verma, R. E. D. Williams, J. S. Winter, and N. K. Yong.

Public Welfare Foundation Prize.—The College of General Practitioners is awarding this year six prizes of £40 each to senior medical students in the United Kingdom and Eire for the best case history, with suitable commentary, of one or more patients seen in general practice. Further information about the competition may be obtained from deans of medical schools, to whom details have been sent, or from the College of General Practitioners, 41, Cadogan Gardens, London, S.W.3. The closing date for entries is August 1.

Purchase Tax on Crash-helmets.—The Finance Bill has been amended so as to make helmets designed to protect the head from injury not chargeable under Group 3 (Headgear) of the Purchase Tax Schedule as from July 17. This relief applies to protective helmets fitted with an inner cradle (e.g., crash-helmets and firemen's helmets), and also to other kinds of protective helmets (e.g., for policemen). It does not extend to specially reinforced headgear other than helmets (e.g., huntsmen's bowlers); nor does it cover helmets suitable for use only in sports.

Procedure in Criminal Courts.—Dr. T. C. N. GIBBENS, senior lecturer in forensic psychiatry at the Institute of Psychiatry, is the sole medical member of the interdepartmental committee, under Mr. Justice STREATFIELD'S chairmanship, recently appointed by the Home Secretary to review the business of the criminal courts. One of the committee's tasks will be to advise on existing arrangements for providing the courts with the information necessary to enable them to select the most appropriate treatment for offenders.

London University.—The title of emeritus professor of physiology has been conferred on Professor K. J. FRANKLIN, F.R.S., on his retirement from the chair of physiology at St. Bartholomew's Hospital Medical College. The title of professor of pharmacology and therapeutics has been conferred on Dr. R. S. STACEY in respect of his post at St. Thomas's Hospital Medical School, and the title of professor of pharmacology on Dr. ELEANOR ZAIMIS in respect of her post at the Royal Free School of Medicine.

Leeds University.—Mr. F. W. SHEA has been appointed tutor in orthopaedic surgery for an initial period starting on August 16.

N.W. Metropolitan Board.—Dr. F. J. FOWLER is to succeed Dr. H. M. C. MACAULAY as senior administrative medical officer. Dr. Macaulay retires on July 31.

Queen's Commendation.—Dr. N. J. JACKSON, of the Minehead and West Somerset Hospital, has received the Queen's Commendation for Brave Conduct for services when a youth fell down a cliff.

COMING EVENTS

Rheumatic Fever and Rheumatic Heart Disease.—Symposia for 30 consultant physicians, September 22-25 at the Postgraduate Medical School and the Canadian Memorial Hospital, Taplow. The fee is four guineas. Further details are given at p. 46 of the advertisements.

Société Française d'Otorhinolaryngologie.—Annual congress in Paris, October 20-23. Main subjects will be cancer of the tongue, and cortisone and corticotrophin. Details from the secretary-general, 6, Avenue MacMahon, Paris.

American Public Health Association.—36th annual meeting, October 27-31, in St. Louis. Details from the association, 1790, Broadway, New York, 19, N.Y.

Artificial Limbs and Appliances Centre, Roehampton.—Courses for orthopaedic consultants from October 13 to 17, and for physical medicine consultants October 29 and 30. Details from the Centre, Roehampton House, London, S.W.15.

NEW ISSUES

SPECIALIST JOURNALS AND ABSTRACTS

British Heart Journal.—Issued quarterly (£3 annually). The new issue, Vol. 20, No. 3, includes:

HEART: 1909-1958. LOUIS GALLAVARDIN. HAEMODYNAMIC CONSEQUENCES OF CORONARY HEART DISEASE. Othar Muller and Karl Rorvik. THE DIAGNOSTIC USE OF AN EAR OXIMETER IN CONGENITAL HEART DISEASE. C. R. Woolf, W. Paul, and R. W. Gunton. THE DIAGNOSIS OF MITRAL INCOMPETENCE FROM LEFT ATRIAL PRESSURE CURVES. Bertrand G. Wells. CLINICAL AND RADIOLOGICAL ASPECTS OF CALCIFICATION OF THE MITRAL RING. Eino Linko and Erkki Sysimetsä. ATRIAL DISSOCIATION. Mario Gomes Marques. DIRECT LEFT ATRIAL PRESSURE TRACINGS AND THE DEGREE OF MITRAL OBSTRUCTION. Stanley R. McCampbell. EVIDENCE FOR PULMONARY VASOCONSTRICTION IN MAN. Richard Gorlin, Frank B. Clare, and Joseph J. Zuska. A SURGICAL STUDY OF COARCTATION OF THE AORTA. Rowan Nick. ELECTROCARDIOGRAMS WITH SHORT P-R INTERVAL AND ABERRANT QRS COMPLEX. L. M. Santhvi and S. N. Misra. VENTRICULAR SEPTAL DEFECT WITH PULMONARY STENOSIS AND AORTIC REGURGITATION. D. M. Collins, T. East, M. P. Godfrey, P. Harris, and S. Oram. THE AORTIC SYSTOLIC MURMUR DEVELOPING WITH INCREASING AGE. D. L. Bruns and L. G. Van Der Hauwaert. VENTRICULAR SEPTAL DEFECT WITH PULMONARY STENOSIS. L. Brotmischer and Maurice Campbell. THE ROLE OF VENOUS CONSTRICTION IN CIRCULATORY DISORDERS. János P. Radó, Endre Gonda, and Erwin Kovács. PULMONARY FUNCTION IN PULMONARY HYPERTENSION. M. B. McIlroy and G. H. Adgey. THE RIGHT VENTRICLE AND THE SMALL PULMONARY ARTERIES IN COAL-WORKERS. Arthur J. Thomas and W. R. L. James. CORONARY ARTERY CATHETERIZATION DURING THORACIC AORTOGRAPHY. A. M. Johnson and William D. Logan. THE ELECTROCARDIOGRAM IN PROGRESSIVE MUSCULAR DYSTROPHY. G. W. Manning and G. J. Clodd. CASE REPORTS: PATENT DUCTUS ARTERIOSUS WITH VENTRICULAR SEPTAL DEFECT. G. L. Higgins. PATENT DUCTUS ARTERIOSUS WITH MITRAL STENOSIS. J. Mackinnon and R. M. Briggs. INCOMPLETE RUPTURE OF THE ASCENDING AORTA WITH SECONDARY ANEURYSM. John Wedgewood. INCOMPLETE CONGENITAL BICUSPID RIGHT ATRIO-VENTRICULAR VALVE. N. Coulshed.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Persey.—On July 11, 1958, to Mrs. Joyce and Alex. Persey, of Nottingham Road, Long Eaton, a sister for Nicola—Janet Celia Sinclair. —On May 23, 1958, at Zomba, Nsaland, to Mrs. Olive and Wilfred Sinclair, a son—Richard William Fleming. **Wolffson.**—On July 1, 1958, at Dudley Road Hospital, Birmingham, to Nancy, wife of L. J. Wolffson, F.F.A.R.C.S., a daughter.

DEATHS

Brathwaite.—On July 5, 1958, at his home, Daisy Bank, Woolfold, Bury, Lancs., Percy Frank Brathwaite, M.B., aged 81. **Chitty.**—On July 9, 1958, at his home, Eastcote, Chaddesley Corbett, near Kidderminster, Worcs., Keith Chitty, F.R.C.S., aged 38. **Fraser.**—On July 8, 1958, as the result of an accident, Andrew Mearns Fraser, M.D., D.P.H., of Curra, Hayling Island, Hants, aged 90. **Murley.**—On July 6, 1958, David Ronald Murley, M.R.C.S., L.R.C.P., D.R.C.O.G., of Mullion, Cornwall, aged 35. **Sharpe.**—On July 9, 1958, Edward Stevenson Sharpe, M.B., Ch.B., of 227, Shipley Road, Shipley, Yorks, aged 79. **Wishart.**—On July 18, 1958, George Macleat Wishart, M.D., F.R.E.P.S., of Glasgow, aged 62.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Analgesics for Incurable Carcinoma

Q.—What combinations of analgesic drugs have been found to be most useful in the relief of pain in cases of incurable carcinoma?

A.—A combination of morphine 15 mg. (gr. $\frac{1}{2}$) with chlorpromazine (25 mg.) is often very valuable. The latter, besides alleviating any nauseating effect produced by morphine, also potentiates its sedative action. The following prescription is often remarkably effective in relieving pain and raising the morale: morphine, 15 mg. (gr. $\frac{1}{2}$); cocaine hydrochloride, 10 mg. (gr. $\frac{1}{4}$); sodium phenobarbitone, 30 mg. (gr. $\frac{1}{2}$); gin, 16 ml.

"Sarkomycin"

Q.—What is sarkomycin?

A.—Sarkomycin is one of several extracts made from *Streptomyces erythromyces* that have antibacterial properties and are also active against certain experimental tumours. Umezawa *et al.*¹ reported temporary regressions in cases of carcinoma of the stomach, thyroid, and oesophagus. Magill *et al.*² at the Sloan Kettering Institute, New York, tested sarkomycin in 26 patients suffering from advanced malignant disease. They gave the maximum tolerated dose in every case. Anorexia, nausea, and vomiting were severe and all patients complained of pain at the injection site. Sarkomycin was given intravenously, and spasm of the vein and thrombosis or thrombophlebitis were common. Five patients showed minor subjective improvement difficult to assess, but in no instance was objective benefit recorded. The series was small and the disease extensive in all cases, but in view of the severity of the side-effects and the poor therapeutic results sarkomycin does not seem a promising agent in the treatment of malignant disease.

Hooper *et al.*³ attempted to purify sarkomycin. They obtained samples of which the active biological constituent was 2-methylene-3-oxo-cyclopentane carboxylic acid. This substance was antibacterial and also inhibited the growth of the Ehrlich ascites tumour in mice. The reduced form of the compound lacked antibacterial activity, but retained its action against the tumour. The purified samples were considerably more active in experimental conditions than the preparations that had been used in clinical trials. The pure substance does not yet appear to have been tested clinically.

REFERENCES

- 1 Umezawa, H., Yamamoto, T., Takeuchi, T., Osato, T., Okami, Y., Yamaoka, S., Okuda, T., Nitta, K., Yagishita, K., Utahara, R., and Umezawa, S., *Antibiot. and Chemother.*, 1954, 4, 514.
- 2 Magill, G. B., Golbey, R. B., Karnofsky, D. A., Burchenal, J. H., Stock, C. C., and Rhoads, C. P., *Cancer Res.*, 1956, 16, 960.
- 3 Hooper, I. R., Cheney, L. C., Cron, M. J., Fardig, O. B., Johnson, D. A., Johnson, D. L., Palermi, F. M., Schmitz, H., and Wheatley, W. B., *Antibiot. and Chemother.*, 1955, 5, 585.

Barrier Creams

Q.—What is the best barrier cream against chemicals such as phenylbenzolate, benzoylchloride, and various aldehydes used in scent-making, particularly one which would be proof against the various aldehydes?

A.—This is a difficult question. There are two main types of barriers, one water-soluble and the other water-repellent, and it is among the various examples of the former type that one might be found to give some protection against the risk of dermatitis principally from organic solvents and aldehydes. However, in the work indicated—which does carry a risk of dermatitis—it would be

better to rely on minimum (or no) skin contact than to pin any great faith on any barrier, however cunningly compounded. Careful washing after work combined with the principle of minimum contact is the best safeguard, and in addition the use after work of a skin-conditioning cream will probably prove effective for all but the especially susceptible worker. Ideally, medical supervision should be added to fit the cloak of protection.

Carpal Tunnel Syndrome

Q.—Is hydrocortisone injection advised for the carpal tunnel syndrome?

A.—Injection of hydrocortisone for the carpal tunnel syndrome is not advised. The results of operative treatment are so good, and the operation itself so trivial, that conservative treatment is probably never in the patient's best interests. It is difficult to see what hydrocortisone could do to relieve compression of the median nerve in the carpal tunnel, and the indiscriminate and unscientific use of hydrocortisone in conditions for which it is clearly not indicated is to be deplored.

Hepatitis and Plasma Transfusion

Q.—What is the average incidence of hepatitis due to the icterogenic virus following the intravenous administration of plasma? Why is human serum albumin not used more in Britain?

A.—The incidence of hepatitis attributed to the transfusion of plasma has usually been based upon the occurrence of jaundice in the recipients 40 to 50, occasionally 200, days after transfusion. The incidence can be ascertained with reasonable accuracy only by follow-up surveys of recipients six months after transfusion; however, it is often difficult or impossible to decide whether the disease is to be attributed to other parenteral injections or to infection with the virus of infectious hepatitis. The association of several cases of jaundice with one batch of plasma may assist in making the decision.

Since 1945 all the plasma made for distribution in England and Wales has been dried small-pool plasma, which is prepared from not more than ten donations of blood; each pool yields four to five bottles of dried plasma, so that a pool cannot be given to more than this number of individuals and will very often be given to a smaller number or to only one individual. It is frequently, therefore, impossible to investigate more than a few patients associated with any given batch; the differentiation between homologous serum jaundice and hepatitis due to other causes is thus rendered more difficult. Most patients also receive, in addition to plasma, whole blood which may itself transmit the causative agent. In the most recent survey¹ the incidence of jaundice after transfusion of dried small-pool plasma with or without blood was found to be little different from that after whole blood alone—slightly less than 2 per 1,000 patients followed up.

Human albumin was first made in the U.S.A. during the second world war for the United States Navy for the treatment of casualties suffering from wound shock, because it could be prepared as a concentrated solution and its containers therefore occupied relatively less space than an equal number of bottles of plasma or dried serum. While it could be used with good results instead of plasma for the restoration of plasma volume, it was found desirable to give fluids such as glucose-saline simultaneously, especially in the presence of dehydration. It was first prepared in Britain after the war.² Its preparation is expensive, and about 60-70% of the theoretical yield is obtained. The expectation that albumin would be of especial value in the treatment of nephrosis has not been fulfilled. Its value in treatment of cirrhosis of the liver is still being investigated.

REFERENCES

- 1 Ministry of Health, Medical Research Council and Department of Health for Scotland, *Lancet*, 1954, I, 1328.
- 2 Kekwick, R. A., and Mackay, M. E., *Spec. Rep. Ser. med. Res. Coun.*, 1954 No. 286. London.

Brucella Abortus in Milk

Q.—What should be done when samples of tuberculin-tested, unpasteurized milk are found to contain *Brucella abortus*?

A.—There is no obligation on local authorities to take any action when milk is shown to contain *Br. abortus*, although they are obliged to do so if the organism found is *Br. melitensis*: the usual course in that uncommon event is to prohibit marketing of the milk pending further investigation.

A proceeding which safeguards the consumer, and should involve no hardship to producer or retailer, is to require that milk from the infected source be pasteurized. Investigations can then be made to trace the exact source of the infection. The "ring" test, an extremely simple test for *Brucella* agglutinin in milk, will serve to identify first the herd and then the individual animal(s) responsible. Final results may be verified by the whey agglutination test and culture or guinea-pig inoculation. If only one or two animals are affected, and the herd is a good one and well protected against reinfection, the elimination of these animals is in the farmer's interests as well as in those of the public health.

Resistance to Insecticides

Q.—What is the difference between a mosquito's "tolerance" and "resistance" to an insecticide? How can mosquitoes be controlled if they develop tolerance or resistance?

A.—There is no universally accepted terminology for resistance to insecticides, but certain facts are generally agreed. As is the case with other insects, some kinds of mosquito in their natural state are found to be more difficult to kill with insecticides than others; so that one can say that one species is more susceptible and another more tolerant. There is evidence that natural tolerance can be augmented, to some degree, by breeding from the strongest individuals; this produces a race showing "vigour tolerance" towards all kinds of poison.

The word "resistance" is now usually employed to describe a rather high degree of specific immunity to a particular type of insecticide. In several instances it has been shown to be due to a single gene, inherited in a normal Mendelian way. Whereas vigour tolerance can often be overcome by increased dosage, true physiological resistance generally protects the insect from poisons of a particular kind, so that an entirely new sort of insecticide must be employed. Thus, D.D.T.-resistance generally involves resistance to similar compounds, such as methoxychlor, etc. B.H.C.-resistance protects insects from chlordane, dieldrin, and other cyclodiene insecticides. A third type of resistance, to the organo-phosphorus compounds, is less well understood, but appears to involve a number of insecticides of this kind. Apart from changing to a different class of insecticide, there is nothing that can be done about resistance at present other than to revert to control methods in vogue before the introduction of the new synthetic insecticides.

Treatment for Roundworms

Q.—What is the most effective treatment for roundworms?

A.—In eradicating roundworm infections there is little to choose between hexylresorcinol and piperazine adipate or hydrate. Both are administered in a single dose, but hexylresorcinol must be given in a cachet, otherwise it would cause irritation of the buccal mucous membrane. It is therefore unsuitable for administration to children who are too young to swallow a cachet. It is also important that the cachet should be made of rice paper or other readily dissolved medium, for the drug would not otherwise be liberated until it had possibly passed so far down the

intestine that it had passed some of the worms and was therefore unable to act upon them. Piperazine salts are more expensive than hexylresorcinol. The adipate is dispensed in tablets and is therefore suitable for administration to adults; piperazine hydrate is dispensed in the form of an elixir and is therefore a convenient preparation for administration to children.

Tetrachlorethylene is also effective against roundworms, but stimulates them to considerable activity, and in heavy infections damage and possibly even perforation of the intestinal wall could occur.

Dosages suitable for the treatment of adults suffering from roundworm infections are hexylresorcinol 1 g.; piperazine adipate 25 mg. per kg. and piperazine hydrate 50–75 mg. per kg. of the patient's body weight; and tetrachlorethylene 4 ml. emulsified in mucilage. All are given in the morning, the patient having had nothing to eat since approximately 4 p.m. on the previous day. One hour after the administration of the anthelmintic a saline purge should be given.

NOTES AND COMMENTS

Thin and Greasy Hair.—Dr. AGNES SAVILL (London, W.1) writes: For the treatment of early baldness in young men ("Any Questions?" June 7, p. 1365), rubbing and massage must be clearly distinguished. Correct massage does not involve "friction between the fingers, the hair, and the scalp" ("Notes and Comments," July 5, p. 62). For correct massage the tissues over the skull must be lifted and given rapid vibration. In my book¹ I give records of successful cases. On page 91 the method of correct massage and vibration is described. The treatment must be followed every day for 15–20 minutes. A downy regrowth results, but falls again when treatment is arrested. Naturally, few have the perseverance to continue this treatment for long periods. Supplementary treatment at intervals with ultra-violet light and a small high-frequency glass electrode also promotes a downy regrowth. Many years ago this was so promising that my patients believed the problem had been solved, but in the majority of cases the down again fell away.

REFERENCE

¹ Savill, A., *The Hair and Scalp*, 1952. London.

Corrections.—In our report of Dr. N. W. HORNE's remarks at the meeting of the Section of Thoracic Medicine and Surgery at Birmingham (July 19, p. 154), the word "helpful" in the third line should have been "harmful," and "renal" in the last line should have been "adrenal."

In the report of Dr. GWEN HILTON's contribution to the Seventh International Cancer Congress (*Journal*, July 19, p. 161) it was stated that, of 38 patients treated by radical radiotherapy alone, 8 had lived for 15 years without recurrence. This should have been 5 years, not 15 years.

Collected Articles from the "British Medical Journal"

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Any Questions?, Volumes 2 and 3 (8s. 3d. each).

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BRITISH MEDICAL JOURNAL

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DEPRESSIVE STATES: THEIR AETIOLOGY AND TREATMENT*

BY

GERALD GARMANY, M.B., B.Sc., F.R.C.P., D.P.M.

From the Psychiatric Department of Westminster Hospital

Depression is a large subject, and the purpose of this paper is to discuss merely a few aspects of it. Some years ago a front page to the out-patient notes of psychiatric patients attending Westminster Hospital was devised which was intended to give the essential facts of the case when the patient came up on subsequent occasions. It was envisaged, of course, that the data collected might be examined, for the hospital is fortunate in having a records officer and a Powers-Samas machine; but no particular piece of research was in mind at the time. These points are mentioned since it is relevant to notice that the original observations were made without any motive save of a very general kind, and the results, being computed by a machine, should be free from the unconscious distortion that can sometimes mar such retrospective studies. Data of this kind could be produced for any psychiatric syndrome, and a study of anxiety states on somewhat similar lines has already been published (Garmany, 1956).

A group of 525 consecutive cases has been chosen, comprising depressive states of all kinds. In each of these an effect of sadness would be both dominant and primary, and the series should not include, for example, anxiety states with depressive features or schizophrenia presenting with depression. At the time each patient was seen the depressive was classified as endogenous, reactive, or involutional, and this classification is preserved in the data which follow. In considering, as we must, how the vast distinction was made, it may be noted that the majority of the assessments were made by me. It is not suggested that this fact confers upon them any quality save a relative uniformity of approach.

Classification of Depression

Endogenous depression, as its name suggests, is a depression coming from within, which means much the same as idiopathic and essential in other contexts—namely, that we do not know why it happens at all. Coming without apparent cause, it usually runs a self-limited course of six to nine months, and this period can be greatly shortened in the large majority of cases by electroplexy. The family history is often positive, and there is some correlation between the tendency to develop this form of depression and the possession of a pyknic habitus, of which the familiar picture of John Bull is a typical example. The well-known work of Kretschmer in this context has not been an unmixed blessing to psychiatrists, many of whom have a strong

resistance to the recognition of endogenous depression in those of asthenic habitus. Sometimes these patients are suspected quite unjustly of concealing important psychopathological data, or, alternatively, much time may be spent in working on material which is present but irrelevant.

In making a diagnosis of endogenous depression I have been influenced by many factors. An absence of precipitating causes is clearly *prima facie* it is implicit in the definition of the disease. A history of periodic attacks with recovery in between, either in the patient or in members of his family, is important. Equally so is the presence of a temperament known to predispose to the disease, whether it be depressive, hypomanic, or cycloid—moving between the two extremes. Finally, I have been influenced by the cross-sectional picture which has been regarded as typical of endogenous depression. Such a picture would include remorse and self-blame about the past, hopelessness about the prospects of future recovery, and psychomotor retardation. In very few cases would all these things be present, but enough would usually be there for a confident diagnosis to be made. To what extent such confidence was justified is one of the questions to be considered.

Reactive depression is regarded as a progressive reaction to events, in the Meyerian sense, and not as a disease entity, as is endogenous depression. It is therefore in theory traumatic, and, as was noted during the war, trauma is more effective in producing the illness when it is slight but sustained than when it is acute but short-lived. The diagnosis is therefore made when a depressive illness follows upon sustained trauma, and it is particularly liable to follow a long period of tension (Curran and Garmany, 1944). The cross-sectional picture is traditionally a different one from that presented by an endogenous depression.

Psychomotor retardation is not present, and blame of others for his plight is more usual than remorse. Hopelessness about recovery is uncommon, and so, for the same reason, is suicidal preoccupation. The diagnosis is sometimes influenced by the probable or known results of treating the patient with electroplexy, on the basis that if the patient responds his illness could not have been psychogenic, a conclusion which is neither logical nor true.

In making a diagnosis of *involutional depression* I have used far stricter criteria of a classical kind. To fall within this group the patient had to be of an age ranging from one corresponding with that of the menopause in women and extending up to old age. The

*A shortened version of an address to the Folkestone Medical Society on April 24, 1958.

pre-morbid personality had to be of a rigid and rather obsessional kind, quite dissimilar from the likable pyknic of tradition. There should have been no previous attacks, and the clinical picture should show both agitation and hypochondriasis. I think it is true to say that these five criteria have been accepted in psychiatry for a long time, though in clinical practice they are seldom followed strictly. I have followed them myself, however, largely in order that I should know in the future what I meant when I saw the patient. The comparatively small number of involutional depressions in the series is probably to be attributed to this rather purist approach, and illustrates very well the difficulties in making comparisons in psychiatry when the criteria of diagnosis can vary so much.

Distribution between Endogenous and Reactive Depression

There has for many years been dissension among psychiatrists regarding the reality of the distinction between endogenous depression and reactive depression, and regarding the existence of involutional depression as an entity at all. Lewis (1934) in a paper which is now securely ensconced among the classics of psychiatry, attempted to answer the first of these problems. In a very careful study he was unable to satisfy himself that there was any real difference between reactive and endogenous depression, at least in terms of symptoms. Mayer-Gross *et al.* (1954), on the other hand, take the opposite view, and feel that, though the distinction may be difficult to make in many cases, it can and should be made. The problem is one of exceptional difficulty because of the universal human tendency to seek causes for the effects it witnesses. Thus it happens that both the patient with the endogenous depression and his relatives may produce all kinds of apparent aetiological factors, many of which are really the results or content of the illness rather than its cause.

Life is full of troubles, and it is statistically not unlikely that, whenever an endogenous depression begins, some traumatic incident will have preceded it, so that the one is regarded as the result of the other. The psychiatrist himself may be in a dilemma too, for if, as is usual, he regards a certain clinical syndrome as being typical of a constitutional illness—namely, endogenous depression—he may disregard dynamic external factors which are important. Thus I feel no doubt at all that influenza frequently precipitates a depression which is clinically of an endogenous type, and yet that fact should not be so if our description is correct.

A similar problem arises in the case of reactive depression. Traumatic events may precede the illness and yet we may be dealing with a temporal coincidence. A notable example is the prolonged grief reaction following death in the family circle. Depressive manifestations occur physiologically for about three months, and yet the same picture may be evident perhaps five years after the death. While on the face of it such a depressive is reactive, it is noteworthy that a considerable proportion will respond to electroplexy.

The distinction, if any, between endogenous and reactive depression is often posed as a problem which seems only verbal. Nevertheless there are certain very real questions to be answered. Firstly, we ought to know whether depressions generally can be divided into those in which constitutional factors are all-important and environmental factors of little account, and others in which the reverse applies. Secondly, and supposing the first question is answered affirmatively, we must know whether it is true that endogenous depression should be treated by E.C.T. and reactive depression by psychotherapy; for that is the usual assumption. Everyone would agree that a few cases fall clearly into one group or the other, but we must know whether the distinction is a valid one for the group as a whole. The results which are here reported bear principally upon these two questions of aetiology and treatment.

In some respects, and particularly when considering treatment, the results reported have certain limitations. They are derived from the out-patient population of a London teaching hospital and cannot be representative of the population as a whole. Many general-practitioner colleagues recognize and treat depressions on conservative lines without referring them for an opinion. Many potential patients do not become actually so because they cope with their own affective disturbances. For these reasons the patients seen probably exclude many minor cases, but, as will be apparent, this lends greater point to some of the inferences made. In London the urgent disposal of acutely suicidal patients is facilitated by the highly organized public health service, so that with such patients the doctor may often send for a duly authorized officer himself. I am inclined to think that the deviation of patients in this way is probably small in the case of depression, while it might be quite considerable in the case, say, of acute schizophrenic episodes.

Aetiology

Table I shows the incidence of constitutional loading in 525 consecutive cases of depression seen at Westminster Hospital. The cases are broken down into three

TABLE I.—Incidence of Constitutional Loading in 525 Cases of Depression

	Endogenous Depression	Reactive Depression	Involutional Depression	Anxiety States
No. of Cases	295	194	36	
Notable	98	40	5	61%
Possible	107	67	12	
Unlikely	85	70	13	38%
Not stated	5	17	6	3%

categories, and for interest the corresponding percentages are shown for anxiety states and taken from the paper to which reference has been made. Constitution means the general mental and physical make-up of the patient, and "loading" has been inferred from a number of factors. Thus a pyknic habitus, a positive family history, and a history in the patient of previous unprovoked attacks were taken as indications of constitutional predisposition. The word "notable" means that such indications have been marked and unmistakable. The word "possible" has not in fact been used in the sense I originally intended—namely, to indicate a state of doubt. In practice it has meant "likely," and so in assessing the results I have added these two columns together. It will be seen that, although the loading is greater in the endogenous cases, it is nevertheless very high in all three categories. Bearing in mind that the presence of such loading has to some extent influenced me in diagnosing endogenous depression at all, I do not feel that the difference between 70% and 55% is enough to warrant much support for a clear differentiation between the two types of depression.

Table II shows a list of stress factors enumerated at the time the cases were first seen. They were present at the time the illness developed and were considered to be aetio-

TABLE II.—Stress Factors

	Endogenous Depression	Reactive Depression	Involutional Depression	Anxiety States
No. of Cases	295	194	36	
Personal	170 (58%)	115 (59%)	24 (66.6%)	70%
Domestic	83 (28%)	94 (48%)	3 (8.3%)	35%
Work	38 (13%)	35 (18%)	8 (22.2%)	20%
Other social	15 (5%)	17 (9%)	0	10%
Financial	13 (4.3%)	20 (10%)	1 (3%)	9%
Housing	11 (3.6%)	8 (4%)	0	9%
Physical	51 (17%)	80 (41%)	3 (8.3%)	27%
None found	64 (21%)	11 (5.5%)	8 (22.2%)	9%

logically important in its development and perpetuation. Thus if after influenza a depression developed with a typical "endogenous" appearance, I would mark the illness as being associated with a physical stress factor, since to do

otherwise seems against reason and good sense. Similarly, if a man developed an endogenous depression with motor retardation and told me that the illness arose after his wife had left him, then I would mark this as a domestic stress factor rather than dismiss it as mere content of his illness. The personal stress factor requires some explanation, since it has been used in a special sense, and it must be distinguished from constitution.

Constitution refers in this context to an inborn loading which predisposes to depression. Personal stress factors mean those facets of personality structure which make living less easy, but do not of themselves predispose to depression. Thus an overactive conscience may be acquired in a strictly religious family, and would make life in a stockbroker's office more of an exercise than it would be in a vicarage. This would be recorded as a personal stress factor. The meticulous obsessional character creates what to others may seem to be unnecessary burdens for itself. It delegates badly, it concerns itself overmuch with trivia, and it sets out to live up to standards of performance which are abnormally high. This is not depressive loading, but it certainly constitutes a stress factor of some magnitude. These then are the senses in which I have used these two expressions, and it is because others might use them differently that I feel I should describe them.

It will be noted in Table II that the percentages add up to more than 100 because, of course, several factors might be operative in one particular patient. There is no doubt that the incidence of stress factors, other than personal ones, is higher in the reactive group than in the endogenous group. Nevertheless it is high in both columns, and the group. Intrapersonality stresses were the same in both. I was extremely surprised to find that domestic stresses had been thought to be important in almost one-third of the cases of endogenous depression seen and in nearly half of the cases of reactive depression. Had I been given these figures before they were computed I would have thought them exaggerated. This is perhaps an interesting example of how superior old traditions can be when contrasted with the newer psychiatry. Most women regard development of depression in a husband as a serious personal reflection, and it would appear that in a large proportion of cases they are right. Because of a rather unhappy oversight when the transcriptions were drawn up, the machine has proved incapable of sex differentiation, and I cannot therefore give figures which would inculcate husbands.

The important role of physical factors in reactive depression is noteworthy, though this must, in some measure at least, be the result of work done in a general hospital, since nearly half the patients seen come from colleagues who may have been dealing with associated physical anomalies. In the Financial difficulties and the housing shortage, as in the case of anxiety states, appear to play little part in aetiology. It is interesting to note that in only 20% of cases did endogenous depression seem to come "out of the blue"—that is to say, without external factors, and, interestingly enough, this is almost exactly what Rennie (1942) found. It may, of course, be said that I have mistaken content for cause, for this criticism was made of Rennie's figures. I cannot for this criticism was made of Rennie's figures. I cannot prove that this is not so, but can only emphasize that I counted these stress factors only in those instances where temporal coincidence suggested that I must. To have done otherwise would have been to assume the truth of a proposition that I hoped to investigate.

Although diagnosis was made largely on the cross-sectional picture, it is likely that it was influenced in some measure by the presence or absence of stress factors. Thus here, as with constitutional loading, the assessments are in some degree biased. There is no way of measuring this bias, but, making allowance for it as fairly as I can, there does not seem to be any gross dissimilarity among the three groups.

Table III shows the age distribution of the three groups compared with that of anxiety states. The figures are much the same as those given by others. It will be seen that the

TABLE III.—Age Distribution on 10-Year Groups

	0-21	21-30	31-40	41-50	51-60	61-70	71-
Endogenous depression	—	51	73	76	57	35	3
Reactive depression	5	52	42	38	32	21	4
Involutional depression	—	36	66	8	17	9	2
Anxiety states	8	—	—	28	15	4	1

risk from depression extends over a much longer period of life than does that from tension, which is at its peak in the fourth decade.

Treatment

The treatment set out in Table IV represents what was decided at the first interview. Subsequent experience of the patient may in some instances have required modification of the course first chosen. Thus a patient selected for

TABLE IV.—Treatment

	Endogenous Depression	Reactive Depression	Involutional Depression	Anxiety States
Consultation	15	28	3	
Counsel	10	18	1	50%
Support	42	55	6	
Intensive	7 (2.3%)	17 (9%)	1	11%
Group	6 (2%)	2 (1%)	0	3%
Relaxation	12 (4%)	14 (7%)	3	33%
Environmental adjustment	1	5	1	2%
Mental hospital	—	—	—	—
urgently	16 (5.3%)	4 (2%)	3 (9%)	—
Hospital otherwise	47 (15.6%)	20 (10.5%)	3 (9%)	3 cases
E.C.T.	109 (36.3%)	9 (4.5%)	4 (39%)	—
Drugs	57 (19%)	59 (29.5%)	1 (1%)	33%
Other	—	2	1	4 cases
Total	322 (295)	233 (194)	45 (36)	

psychotherapy may have deteriorated later and required E.C.T. I venture to hope that usually the course chosen will have been proved by events to have been correct, but with the figures available to me I cannot prove that this is so. Even if others, as is possible, have less confidence in this than I have myself, then at least clear information is given about the advice tendered at the first interview. It will be noticed that the totals at the foot of each column do not quite correspond with the total number of cases seen, which is shown in brackets. The intention was that only the major treatment should be indicated, but in some instances I forgot this and ticked two.

It is interesting to note that electroplexy was selected for immediate use in out-patients in only just over one-third of the cases of endogenous depression. If all cases of depression are taken together, then about 25% were given this treatment. If it is assumed that all cases severe enough to be sent to hospital were given E.C.T., then I believe that about 50% of all cases of depression referred to our out-patient department received this treatment. I am sure this is a clinical finding without bias, for I have no conscious revulsion against E.C.T. comparable, for example, with my dislike of leucotomy. It will be seen that E.C.T. was employed relatively rarely in those cases called reactive depression. The disparity is so great that I think it can be explained in only one way—namely, that the diagnosis was materially affected by the clinical judgment of probable response to E.C.T.

It is important to be clear what this means. It proves nothing about the constitutional loading present or about the incidence of stress factors. It merely indicates that there is a group of depressions rarely requiring E.C.T., and another group (described here as endogenous and involutional) where E.C.T. is required in something between one-third and one-half of the cases. If there is a fundamental distinction between the groups it is to be found in the quality which is considered in the difficult or borderline case. This quality is, I am sure, *reactivity* or the readiness with which the patient will respond emphatically to changes of mood in the examiner. This quality is used to determine the need for E.C.T., the risk of suicide, and, as has been indicated, the diagnosis. Yet if we describe some depressions

as showing less reactivity than others, we mean much the same as when we say the depression is deeper. This is quite different from saying that the depression is more endogenous.

Only a very small number of patients (4.5%) were sent to mental hospitals urgently because of acute depression. A larger number (about 13.5%) were admitted, mainly to Westminster Hospital, for a variety of reasons. Elderly patients and those with certain associated physical diseases would be admitted, particularly if they had long distances to travel or lived alone. Patients showing severe associated tension or depersonalization are much better treated as in-patients, so that E.C.T. may be given under a heavy blanket of sedative. Those who have lost much weight will not usually do well with out-patient E.C.T. and should be admitted so that modified insulin can be given as well. Nevertheless a patient referred to hospital with depression can be assured, as these figures show, that he has four chances in five of being treated as an out-patient.

The figures given for treatment by drugs are misleading in that, rather arbitrarily, they were regarded as subsidiary forms of treatment when associated with E.C.T. or with psychotherapy. As a result they would often be omitted from the transcription sheet. The incidence of associated pharmacological therapy must in fact have been very high.

Summary

A study has been made of 525 patients suffering from depression divided into the three traditional categories of reactive, endogenous, and involutional depression.

The constitutional loading in patients developing these illnesses is in all cases high, but the incidence does not suggest any qualitative difference among the three types.

Stress factors are important in all groups, and stresses produced by abnormal personalities are especially so. Again, a study of these stress factors does not suggest a distinction worth making among the three groups.

Domestic stresses appear to be highly important in the genesis of reactive depression, of considerable importance in endogenous depression, and of small importance in involutional depression.

Endogenous depression, despite its name, appears to come "out of the blue" in only 20% of cases.

Of all cases of depression referred to hospital, 25% need E.C.T. straight away, and a further 25% after admission to hospital.

Very few cases of reactive depression received E.C.T., and it is believed that these patients were characterized above all by their "reactivity" to outside stimuli.

It is concluded that the distinction between these three forms of depression, and particularly between the reactive and endogenous varieties, is an unreal one. Constitutional predisposition and the incidence of stress factors appears to be much the same in these groups.

The distinction traditionally made appears to be a distinction between those depressions which show more reactivity, are less severe, and infrequently require E.C.T. and those depressions showing the reverse features.

It is believed that this resolves itself into a distinction between mild and severe depression.

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PROGNOSIS OF TROPICAL SPRUE

BY

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There has long been doubt regarding the prognosis of tropical sprue, some regarding it as a seriously chronic disorder in which those affected suffer severe and protracted disablement, remain continually susceptible to relapses, and seldom recover completely (Low, 1928). Stitt (1945) gives a typical opinion in stating of sprue: "Unless adequately treated, however, severe cases are ultimately fatal within a period varying from about one to fifteen years." A further relatively unfavourable prognosis is expressed in a recent textbook (Mackie *et al.*, 1954), where of sprue it is written that "more commonly fats in the diet must be restricted permanently and parenteral injections of liver continued at intervals of one to two weeks." Others (Rodriguez-Molina, 1943; Woodruff, 1949) have produced evidence that the disease has a more favourable prognosis.

The reason for this apparent divergence of views may well be that in different studies different types of cases have been followed, that those with a poor prognosis have been patients affected with idiopathic steatorrhoea or non-tropical sprue, and that those with a satisfactory prognosis have been suffering from tropical sprue. The question might, it was thought, be resolved by ascertaining the ultimate outcome of the disease in patients affected with tropical sprue during the last war. If these patients are still suffering from symptoms of sprue, then the tropical variety of this disease must indeed be one with a protracted course and may well have much in common with idiopathic steatorrhoea, which is generally held to be a chronic disorder. If, on the other hand, tropical sprue is followed by only a short period of disability, then a point of difference of considerable diagnostic and aetiological importance would be established. The point is also of importance in the management and disposal of patients suffering from the disease and concerning the advice to be given them regarding diet and consumption of fats.

A Previous Study

Woodruff (1949) carried out a study in which patients invalided from India to Britain with tropical sprue were followed for 2½ to 3 years. Ten years have elapsed since that study was carried out, and it is therefore possible to review the prognosis of some of those patients, using a longer time scale than was possible in 1949.

The patients were originally diagnosed, treated, and invalided from a mobile R.A.F. field hospital in the Arakan; they have now become widely dispersed throughout Britain, the United States, and a number of Commonwealth countries, and therefore it has not been possible to examine them personally. A detailed questionnaire has accordingly been sent to them, and this report is based upon the answers given in it. Of the 47 patients reported in 1949 (Woodruff, 1949) it had been possible to follow up 34 at that time. Further letters were recently written to these patients and 17 replies were received.

Original Condition of the Patients

The clinical features of the 47 patients with sprue have previously been described (Woodruff, 1949). The records of the 17 patients who replied to the recently issued

questionnaire have been reviewed and their original symptoms have been found not to differ notably from those of the remainder of the series. Thus among the original 47 patients diarrhoea had been present for a mean duration of 3½ months; among the 17 whom it has been possible now to trace, diarrhoea had originally been present for a mean duration of three months. Tongue lesions, including glossitis, with inflamed and atrophic mucosa and ulceration, were present in 12 of the 17 now followed up, as compared with 39 of the 47 in the complete series. The average amount of weight lost among the 17 now followed up was 21 lb. (9.5 kg.), as compared with 28 lb. (12.7 kg.) for the complete series. The mean haemoglobin values of the original 47 patients and of the 17 now followed up were respectively 12.2 and 11.9 g. per 100 ml. The faecal fat in those now followed up averaged 32.6 g.% of the faecal dry weight, compared with 37.1 g.% among the original 47 patients.

Present Condition of the Patients now Followed Up

Capacity for Work.—All 17 patients reported that they were able to carry on their full work. Their employment varied widely; nine were doing sedentary work, four were on moderately heavy work, and four were employed on heavy manual labour.

Weight.—Since returning to the United Kingdom in 1944–5, 15 of the 17 had gained in weight, the average gain being 11 lb. (5.0 kg.); the remaining two had each lost 1½ lb. (680 g.).

Diarrhoea.—Since their condition was reviewed 10 years ago, 11 of the 17 patients had been completely free from diarrhoea, three have had single attacks lasting 48 hours during these 10 years, another has had a single attack lasting 96 hours, one has had occasional attacks lasting 24 to 48 hours, and one states that he has had many attacks lasting 48 to 72 hours. All state that normally they pass one to two stools a day and that the faeces are formed, inoffensive, and of normal colour and size.

Glossal Ulceration.—Three of the 17 had had some glossal ulceration during the past 10 years. Two had had one or more ulcers of the tongue present for 2 to 10 days and associated with attacks of diarrhoea; the third patient had had a buccal ulcer lasting for two to three days on one or two occasions during this period.

Appetite.—Three patients reported that they still have a disinclination to eat fatty or fried foods, but the remaining 14 stated that their appetite was normal and good.

Abdominal Discomfort, Distension, and Flatulence.—Two patients stated that a minor degree of these symptoms has been present almost continuously throughout the past 10 years, and a third stated that they occurred after ingestion of fatty and fried foods. These symptoms, however, have not been severe enough to limit the patients' activity in any way, and in view of their subjective nature their connexion with the original sprue is doubtful. Similar considerations also applied to two patients who still complained of lassitude after undue exertion but who nevertheless were able to carry out their full work. No patient now complains of cramps.

Discussion

If the 17 patients recently followed up are representative of the whole series—and there is no reason to believe that they are not—then it appears that the long-term prognosis in tropical sprue is good and that after treatment with a high-protein, low-fat diet a patient may be expected to be restored to full health. Alimentary symptoms, except possibly glossal ulceration, in such patients appear to be no more frequent than is to be expected among persons who have not had sprue. Those followed up in this study have been living on a normal diet without any restriction on consumption of fats, so that in tropical sprue protracted dietary limitation appears to be unnecessary.

All the 17 patients were treated before the introduction of folic acid or vitamin B₁₂, and thus their satisfactory return to health demonstrates that, at most, administration of large amounts of these substances shortens the illness but that they

are not essential to recovery. This observation emphasizes a difference between sprue as encountered in the East and that reported in the Caribbean region, where folic acid and/or vitamin B₁₂ have been used extensively for treatment and they or liver extract may be essential for it. Woodruff (1952) drew attention to these differences, particularly to the severe degree of anaemia usual in Caribbean cases and to the common absence of reference to steatorrhoea in reports on sprue from this region. He suggested that the condition commonly described there as "sprue" is nutritional megaloblastic anaemia, with which some alimentary symptoms may be associated and thus be a source of confusion. The satisfactory recovery without the aid of specific haematinics of the patients here followed up further supports this view.

The chronicity of idiopathic steatorrhoea or non-tropical sprue and its failure to be influenced other than temporarily by treatment indicate, firstly, that assessment of the history and/or observation following a period of treatment afford valuable means of differentiating between tropical sprue and idiopathic steatorrhoea, for patients with the former will recover and remain well, while those with the latter will not. Secondly, the difference in course between the two conditions suggests that they are separate aetiological entities; tropical sprue being characterized by a temporary upset in bowel function and in fat absorption, whereas in idiopathic steatorrhoea or non-tropical sprue this upset is permanent. By means of jejunal biopsy, Shiner (1956, 1957), Doniach and Shiner (1957), and Sakula and Shiner (1957) have demonstrated that in idiopathic steatorrhoea mucosal atrophy is present, and a permanent change of this kind with loss of enzyme function in the tissues affected and a similar temporary disturbance in tropical sprue, perhaps secondary to changes in the intestinal bacterial flora, might well account for the difference in course and in prognosis of these two conditions.

Summary

Doubt concerning the prognosis of tropical sprue has arisen probably through confusion between it and idiopathic steatorrhoea or non-tropical sprue, which, it is generally agreed, is a relatively chronic disorder. The prognosis of tropical sprue has therefore been studied by following up patients who contracted it in India and Burma during the 1939–45 war and who were invalided to Britain. It has been difficult to contact the patients because so many of them have changed their residence several times or have emigrated since 1945. Of 34 patients followed up, however, three years after invaliding, it has now been possible to contact 17. It is appreciated that there are pitfalls in drawing conclusions from so small a proportion of the original number of patients, but they are believed to be representative: it is known, for example, that several emigrated in good health.

Those contacted have all been found to be in good health, to be carrying on their full work, and to have gained an average of 9½ lb. (4.3 kg.) in weight. Attacks of diarrhoea, glossal ulceration, abdominal discomfort, and distension have been infrequent.

The long-term prognosis of tropical sprue appears to be good and to contrast favourably with that of idiopathic steatorrhoea. This contrast in course affords one means of differentiating the two disorders and suggests that they are separate aetiological entities.

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CONTROLLED HYPOTHERMIA

RECENT DEVELOPMENTS IN THE USE OF
HYPOTHERMIA IN NEUROSURGERY

BY

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Hypothermia is a technique of comparatively recent application, and may be described as a method of reducing the normal body temperature of the whole patient. The method was first practised by Smith and Fay (1939) in the attempted treatment of neoplasms, with a view to slowing the rate of tumour growth at lowered temperatures.

More recently McQuiston (1949) used hypothermia during cardiac surgery carried out on hypoxaemic children. Further interest was taken in this when Bigelow *et al.* (1950) suggested that the lowered oxygen demand of the brain during hypothermia would protect it against ischaemia during intracardiac operations. Since then the method has been used extensively as an aid to cardiac surgery.

The application of hypothermia to neurosurgical conditions is of more recent origin. Rosomoff and Gilbert (1955) noted a reduced brain volume when experimenting with dogs under hypothermia, and accordingly recommended its use in neurosurgery. Loughheed *et al.* (1955) followed with a report on two cases in which hypothermia had been used for the surgical treatment of vascular lesions, and Botterell *et al.* (1956) reported on the use of hypothermia in the management of 22 cases of intracranial aneurysms.

The Investigation

Thus the value of hypothermia in the treatment of neurosurgical conditions had been established on a broad basis by the end of 1956, when work was begun with a view to developing a practical and routine method for use with a busy neurosurgical unit.

From November, 1956, until December, 1957, 123 patients whose ages ranged from 6 to 78 years were treated under hypothermia. This paper shows how the routine method was evolved and established.

At the outset an unselected series of ruptured intracranial aneurysms and angiomas were treated surgically under hypothermia; later, when it became evident that the method was safe and the value of the improved operating conditions was appreciated, confidence grew, and the method was used

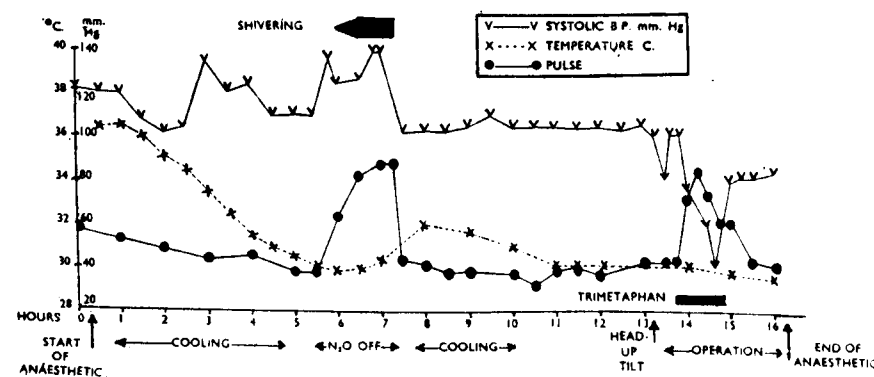


FIG. 1.—Chart of Case 6.

during other intracranial procedures, particularly for meningiomas.

The danger of repeated subarachnoid haemorrhage in cases of ruptured intracranial aneurysms is well known. Thus to avoid a further bleed before operative treatment could be carried out, and also in the hope that the patient's condition might improve, the first five cases in this series were cooled over a period of 5 to 19 hours, using the "lytic cocktail" combined with sodium amylobarbitone to prevent shivering. Fans played upon the patient continuously and body surfaces were kept constantly moist with a dilute solution of cetrimide in water, the former being added to reduce surface tension, thus allowing a film of moisture to remain on the skin for a longer period than would water alone. At the time chosen for operation the temperature lay between 30 and 31° C., and a general anaesthetic was then given. This was discontinued at the end of the operation, when warming was begun with electrically heated blankets. This method has the following disadvantages:

1. Shivering occurred even though large amounts of drugs were administered. In one case 180 mg. of chlorpromazine, 100 mg. of promethazine hydrochloride, 190 mg. of pethidine, and 900 mg. of sodium amylobarbitone were given and slight shivering was still present, which increased if the patient was moved or disturbed in any way. Rosomoff and Gilbert (1955) pointed out the need for adequate anaesthesia in these cases because of the rise in C.S.F. pressure which occurs with shivering.

2. As a result of the large quantities of drugs administered the blood pressure was not easy to control. A steep drop in blood pressure was apt to occur on moving the patient, on tilting to a head-up position, and again after only a small blood loss. This fall was not compensated for immediately, and the blood pressure tended to remain low for long periods. This reduced blood flow to the already damaged brain, which, even though the temperature was low and the tissue oxygen requirements were diminished, might well have proved to be insufficient. There was also considerable danger of cerebral thrombosis if the blood pressure remained low for any length of time.

3. The fall in temperature was difficult to control, and a further fall tended to occur after induction of general anaesthesia.

In view of the foregoing difficulties it was decided to take advantage of the strong anti-shivering action of nitrous oxide, as described subsequently by Parkhouse (1957).

Accordingly the sixth case in the series—a ruptured intracranial aneurysm—was treated by hypothermia under prolonged general anaesthesia. When the temperature had reached the required level the nitrous oxide was discontinued, and the effect of this, together with its reintroduction, is illustrated in Fig. 1. The pulse rate rose, and the blood pressure rose steeply as shivering became more marked, and both settled dramatically to their former level when the nitrous oxide was reintroduced. A slow rise in temperature occurred later as a result of the increased heat production on shivering, and further cooling was necessary to reduce the temperature to the required level again. Intravenous drugs were given during the initial cooling process—thiopentone 250 mg., pethidine 60 mg., "tubarine" 30 mg., sodium amylobarbitone 500 mg. in all were given. No further drugs were needed to prevent shivering after reintroducing nitrous oxide.

This case was of interest because the patient had undergone haemorrhage from a ruptured posterior cerebral aneurysm on four separate occasions during the three weeks prior to admission to hospital, the last haemorrhage

occurring within the 24 hours before admission. Further rupture was prevented by ligation of the neck of the aneurysm at operation, and the patient eventually made a complete recovery.

occurring within the 24 hours before admission. Further rupture was prevented by ligation of the neck of the aneurysm at operation, and the patient eventually made a complete recovery.

It became evident that the advantage of prolonged hypothermia, preventing further haemorrhage, did not outweigh the disadvantages of prolonged anaesthesia, and therefore the remaining cases were operated upon as soon as the temperature had been reduced to the required level under general anaesthesia.

The following method of producing a state of hypothermia at a temperature level between 31 and 30° C. was used for the remaining 117 cases.

Procedure

Anaesthesia

The patient was given promethazine, pethidine, and atropine as premedication. One hour later anaesthesia was induced with thiopentone, suxamethonium, and pethidine, and was maintained with nitrous oxide and oxygen, together with additional doses of pethidine and thiopentone. If this proved insufficient to prevent shivering, suxamethonium was given in repeated intravenous injections, or, alternatively, tubarine was given in small doses until shivering was controlled. Respirations were aided or controlled as required.

Hypothermia

Hypothermia was effected by means of surface cooling, using ice, after the induction of anaesthesia. Ice packs were placed above and below the trunk of the patient, and also

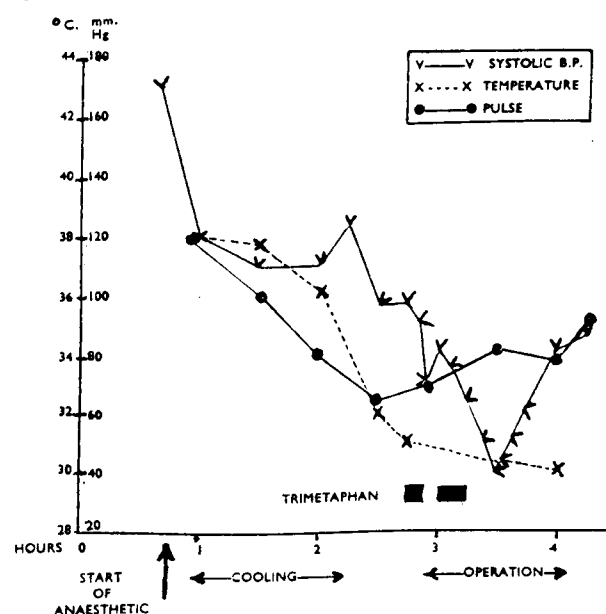


FIG. 2.—Chart of a thin patient (approximate weight, 57 kg.).

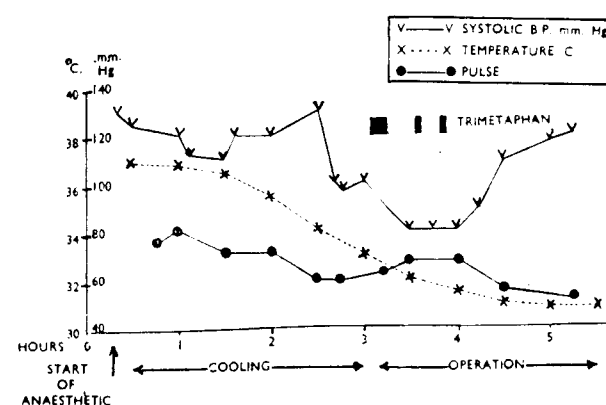


FIG. 3.—Chart of an obese patient (approximate weight, 73 kg.).

over the large arteries which run near the surface of the skin—that is, the carotid, femoral, and axillary arteries. In order to avoid too great a drop in their temperature the limbs were not cooled directly. The skin in contact with the ice packs was massaged at frequent intervals to assist the circulation of the cooled blood; this was of particular value in the case of the obese patient, as it reduced the temperature gradient between the centre and the surface of the body.

The main difficulty was to obtain toleration of the cold applied without depressing the vital centres or producing apnoea by giving large doses of relaxants: the temperature of the surroundings was found to be of little importance when ice was used, provided the ice was replaced as it melted. As the blood supply to the damaged brain had already been reduced by spasm of the supplying vessels, and would be further reduced by hypotension, care was taken not to depress the blood pressure until this was required during operation. Apnoea was produced during the process of cooling in those cases where relaxants were necessary to control shivering, but it was essential to ensure that respirations were present during the neurosurgical procedure, as a guide to the surgeon.

The ice packs were removed at 33–32° C., and the patient was then ready for operation. Before the main part of the operation had been completed the temperature had continued to fall to 31–30° C., 30° C. being the lowest temperature level required.

This further drop in temperature after the removal of the ice occurred more quickly and to a lower degree in the thin patient than in the obese, because of the insulating effect of fat against cold. Hence the steeper the fall in temperature during cooling the greater the "after-drop" expected. Thus when a thin patient was cooled rapidly the ice had to be removed at between 34 and 33° C. to avoid too profound a final drop in temperature. This point is illustrated in Figs. 2 and 3.

Temperatures

Rate of Temperature Fall.—When hypothermia was produced by the method described, the time taken for the temperature to fall was proportional to the weight and surface area of the patient. As a rough guide, the time taken for the temperature to fall from normal to 33° C. (when the ice was removed) was calculated on the basis of one hour per 6 stone (38 kg.) weight. Thus a 12-stone (76 kg.) patient would take approximately two hours, the time varying slightly according to the patient's surface area—that is, the tall and thin would take a relatively shorter period than shorter patients of the same weight.

Temperatures were recorded from the rectum and from the nasopharynx, using glass alcohol thermometers. In 28 cases the brain temperature was also recorded during operation, and Table I shows the variable degree of correlation of the rectal temperature compared with the brain temperature.

Nasopharyngeal temperatures were not recorded during operation, as access to the nose, using glass thermometers, was impossible.

TABLE I

Case No.	Weight in Kg.	Temperature (°C.)		Case No.	Weight in Kg.	Temperature (°C.)	
		Rectal	Brain			Rectal	Brain
1	63	32	32.2	15	67	31.4	29.4
2	94	31.6	30.7	16	82	31.4	29.4
3	63	29.5	30.1	17	63	31.2	29.8
4	63	32	29.8	18	57	31	28.9
5	63	31.5	29.6	19	57	30.4	31.2
6	70	29.4	29.2	20	60	31.2	30
7	50	30.5	28.9	21	82	32	30
8	60	31.2	30.9	22	70	30.5	29.5
9	111	35.2	33.1	23	63	29	28.9
10	63	31	29.2	24	50	30.9	29.1
11	79	31	30.9	25	63	33	30.4
12	94	32.5	31.4	26	63	34.3	33.1
13	57	30.7	30	27	63	30.8	30.4
14	63	30.5	30.2	28	57	30.4	29.8

Warming

At the end of the operation anaesthesia was discontinued, and no active attempts were made to rewarm the patient unless the temperature tended to drop post-operatively. Normal temperatures were usually regained within eight hours of the operation. Promethazine was given to reduce shivering, and, if the patient was conscious and complaining of cold, pethidine was given. Consciousness was regained at low temperature in cases where brain damage had been minimal and anaesthesia had been light; one patient was capable of answering questions at 29.5° C.

The rate of temperature rise post-operatively gave an indication of the neurosurgical state of the patient. If brain damage had been slight there was a rapid rise within a period of three to five hours, but when brain damage had been severe the temperature would take as long as two to three days to reach normal, with little or no shivering occurring. This slow rise in temperature in the very sick was of definite advantage, as the oxygen requirements of the brain remained low for a long period.

Blood Pressure

The common pattern of the blood pressure is illustrated in Fig. 4. The initial fall after induction of anaesthesia was followed by a rise due to vasoconstriction of the peripheral vessels, as a result of cooling. This was followed by a gradual fall due to diminished cardiac output, which was

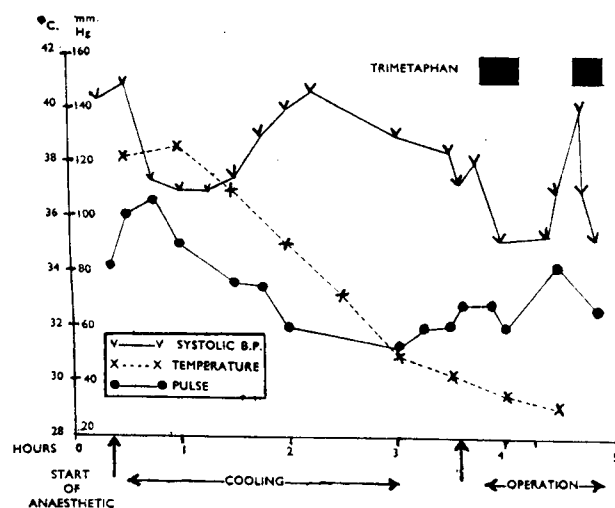


FIG. 4.—Pattern of blood pressure on cooling.

not profound if temperatures were not taken below 30° C. Bigelow *et al.* (1950), experimenting with dogs, found a similar pattern in blood pressure on cooling.

With this method of hypothermia, the blood pressure was little disturbed on moving the patient. All operations were carried out with the patient lying with a head-up tilt.

In the first six cases described, this tilting produced falls in blood pressure of between 20 and 80 mm. Hg, whereas using the second method the fall was rarely more than 10 mm. Hg, thus giving greater control over the blood pressure.

This was an advantage, because, although it is safer at low temperatures to lower the pressure due to diminished oxygen requirements (Dundee *et al.*, 1954), it was considered advisable in these cases of brain damage with spasm of the cerebral vessels to limit this low pressure to the shortest time possible.

Thus the blood pressure was lowered only when necessary by using trimetaphan camphorsulphonate ("arfonad").

Trimetaphan Camphorsulphonate

Operations were performed in nearly all cases at a blood-pressure level of 70–80 mm. Hg. Trimetaphan was given by

intravenous infusion at a concentration of 1 mg./ml. normal saline. In common with other drugs trimetaphan takes longer to act at low temperatures. The sensitivity of patients to this drug varied at low temperatures as at normal temperatures, and consequently time had to be allowed to assess the sensitivity of the patient to the drug by giving it at a very slow drip-rate for three to five minutes. If this was not done a profound drop in blood pressure would occur when the trimetaphan took effect on a sensitive patient. This profound drop in pressure might be prolonged because the compensatory mechanisms for hypotension do not act normally at low temperatures. Prolonged diminished blood supply to the damaged brain might thus occur.

The total amount required to maintain hypotension was found to vary as much in cold patients as in patients at normal temperatures, and large amounts of trimetaphan



FIG. 5.—Showing effect of trimetaphan. (1) Lead II. Temperature, 30.8° C.; blood pressure, 95 mm. Hg. (2) Lead II. Temperature, 30.8° C.; blood pressure, 60 mm. Hg with trimetaphan. (3) Lead II. Temperature 30.8° C.; blood pressure, 60 mm. Hg; trimetaphan discontinued.

(200 mg. or more for a period of one to two hours during operation) might be necessary.

Trimetaphan was given in 74 of the 123 cases, and was effective in all but one of them. In every case there was a slight rise in the pulse rate, usually 10 to 20 per minute, even at temperatures just below 30° C. In the one resistant case a drop of only 5 mm. Hg could be obtained at a temperature of 29° C; whereas the pulse rate rose from 48 to 130 a minute and returned to 80 a minute a quarter of an hour after trimetaphan had been discontinued.

It was observed that a fall in blood pressure was difficult to obtain when the brain underwent retraction, and at low temperatures retraction of the brain caused a marked rise in blood pressure when trimetaphan was not being given.

Fig. 5 shows the electrocardiogram at a temperature of 30.8° C. when trimetaphan was given to lower the blood pressure from 95 to 60 mm. Hg.

Some Findings

Blood Loss.—At low temperatures patients did not compensate well or quickly for loss of blood. This was shown by the almost immediate drop in pressure, while there was little or no rise in pulse rate. A loss of only 250 ml. of blood could cause a severe drop in blood pressure, which did not return to the original level even when blood was replaced. If flattening of the operating table was not effective, small intermittent intravenous injections of nor-adrenaline, combined with blood replacement, were given to raise the blood pressure.

Pulse.—Increasing bradycardia occurred as the temperature fell; usually the rate was below 60 a minute at 30° C. The lowest value obtained was 36 a minute. Atropine, 0.3–0.4 mg., was given intravenously if the rate dropped below 50 a minute. This usually, but not always, caused

an increase in the pulse rate, which gradually fell again. The cases which did not respond by an increased pulse rate were those in which the sino-auricular node was directly depressed by the effect of cold (Cookson and Di Palma, 1955). Irregularities of the pulse were encountered during cooling, but these remained for only short periods. Moving the patient was the most common cause of these irregularities, which often appeared when transferring the patient from the operating table after anaesthesia had been discontinued: the pulse became regular again after a rise in temperature of a few degrees. Thus moving the patient under light anaesthesia should be avoided. Auscultation of the blood pressure always became difficult as the temperature fell, owing to vasoconstriction of the vessels. The radial pulse could be palpated throughout hypothermia in all but three cases. To reduce the vasospasm in these three cases, a stellate ganglion block was performed at the beginning of the operation, which proved effective in each case. Thus it was possible to keep a record of the systolic blood pressure by palpation of the radial pulse in every case.

Electrocardiographic Control.—The one almost constant finding, apart from lengthening of the whole complex, was the appearance of the "Osborn effect" (Osborn, 1953). This is a secondary wave closely following the S wave—so closely that it appears to be part of the QRS complex. Osborn looked upon this finding as a bad prognostic sign, as it usually preceded fibrillation by about half an hour. G. R. Graham (1957) pointed out that this change in the electrocardiogram under hypothermia is almost constant, and of no serious significance. This was found to be true in this series of cases.

Respirations.—Respirations were controlled, or aided as necessary, with a high flow of gases (4 litres of oxygen to 6 litres of nitrous oxide) without absorption of carbon dioxide. Respirations could not be controlled during operation because their presence and character were a valuable guide to the surgeon. Thus large doses of relaxants for abolishing shivering could not be used. The respiratory rate fell with the temperature in every case. The operation of clipping the anterior cerebral artery in the treatment of anterior cerebral aneurysm at normal temperatures sometimes produces apnoea which appears almost immediately the artery has been occluded. This apnoea was also produced at low temperatures, but might take five to six minutes to appear after the artery had been clipped. One case remained apnoeic for 30 minutes, after which time breathing restarted. Neither this case nor other cases of apnoea from the same cause under hypothermia suffered any lasting ill effect.

Operating Conditions and Selection of Cases

Haemorrhage from the scalp was usually reduced, but in 5 of the 123 cases haemorrhage was greater than at normal temperatures, and it was concluded that the process of cooling had probably interfered with the effective clotting of blood in these cases. Haemorrhage inside the dura was reduced in all cases, including the five which had increased scalp bleeding.

Intracranial tension was lower than normal in 97 of the cases operated upon, normal in 15, and raised in 8. Some of the 97 cases had large intracranial clots, and the tension was low only after these had been removed.

Vascular spasm of the cerebral vessels was present in many of these ruptured intracranial aneurysms at normal temperatures, as demonstrated by the arteriogram. This condition was not abolished by hypothermia, as spasm of these vessels could also be demonstrated at temperatures of 30–31° C.

Selection of Cases.—Operation took place as soon after admission as possible, and no patient was considered too ill for surgery. Many were already dying from the effects of the haemorrhage they had recently suffered; such cases were classified as category A, and the remaining cases were

divided into categories B and C according to the length of time since the last bleed from the aneurysm. There were 29 moribund patients, of whom 16 died in spite of treatment. These cases were unselected both from the neurosurgical and the general condition. Among this series were many chronic hypertensive patients and many with left ventricular hypertrophy and coronary disease. There were two cases of diabetes mellitus and two cases of syphilitic aortitis, one of which had a ruptured aortic valve and was at the time under treatment for cardiac failure.

Post-operative Complications

Bronchopneumonia was a problem in all cases of continued coma or drowsiness, and particularly if there had been pre-operative signs of chest infection. Antibiotics were given to all cases undergoing hypothermia.

Tracheotomy was performed in every case of continued coma to facilitate suction of secretions from the trachea and bronchi.

There was one case of pulmonary embolus, one of deep calf-vein thrombosis, and one of thrombosis of the long saphenous vein as a result of the intravenous infusion.

Seven cases were reopened post-operatively. In five of these only cerebral oedema was found, and the remaining two cases had subdural haematomata.

Ice was used in packs directly in contact with the skin in 117 cases, and no post-operative damage to the skin occurred in any of these cases.

Summary of Results

The results obtained are shown in Table II.

TABLE II

Category	No.	Died
Category A aneurysms	29	16
Categories B and C aneurysms	60	12
Angiomas	10	2
Meningiomas	13	None
Primary intracerebral haemorrhage	2	2
Head injuries	3	2
Pituitary tumours	2	1
Gliomas	2	None
Acute subdural	1	None
Excision of abscess capsule	1	None

No deaths occurred during the process of hypothermia or during operation. Many of the deaths occurred weeks or even months after operation.

Summary and Conclusions

The method of producing hypothermia described was evolved from the treatment of 123 cases, 117 of which were treated by surface cooling, using ice, which has the following advantages: (1) it is simple to operate in so far as the minimum of assistance and of complicated equipment are required; (2) control is good, because the time to cool can be predicted; and (3) only a limited number of drugs are necessary.

During the whole of the series no death occurred that was directly attributable to the use of hypothermia, and it is therefore concluded with some certainty that, provided the body temperature is not lowered below 30° C., the improved operating conditions produced by hypothermia may be obtained at a small increased risk, when compared with the use of a general anaesthetic alone.

In view of this, hypothermia was later used successfully for other intracranial procedures, such as angiomas and meningiomas, where the improved operating conditions were considered to be of value.

This procedure has become routine for all such cases at the Atkinson Morley's Hospital, where this work was undertaken.

I thank the consultants and all members of the staff of the Atkinson Morley's Hospital for their help and co-operation in conducting this research work, which was made possible by a Research Fellowship awarded by St. George's Hospital.

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PREVENTION OF RHEUMATIC FEVER RECURRENCES

BY

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Sulphonamides were first used in the prevention of rheumatic fever recurrences nearly 20 years ago (Coburn and Moore, 1939; Thomas and France, 1939). In 1941, Thomas, France, and Reichman published their results in a controlled series that had been followed for four years. They found that the frequency of throat cultures positive for Group A haemolytic streptococci was less in a group of 55 patients protected by daily sulphanilamide and that none in this group had had acute streptococcal throat infections or further attacks of rheumatic fever. In the control group (67 patients) there were 15 major attacks of rheumatic fever and four deaths. Rosenberg and Hench (1946) summarized the results of 10 controlled series published between 1939 and 1946, involving over 1,000 person-seasons in each of the two groups: the recurrence rate in the protected series was 2.2% per patient-season and in the unprotected 13.7%.

In 1947 Burke published the first results with penicillin. One group of 10 patients had been given 1,500 Oxford units by mouth daily, and another group of 10 were studied as controls: both had been followed for one year after discharge from hospital. There was a higher incidence of infection of the upper respiratory tract in the unprotected group, and one relapse occurred in this group but none in the protected. There have been many American studies in the past 10 years (summarized by Stollerman, 1954), but only few from this country. Pitt Evans (1950) gave 100,000 units of penicillin daily by mouth to one group of 155 children in a convalescent home; another 145 children were studied as controls. Both groups were followed as in-patients for an average period of 22 weeks. The incidence and duration of the Group A haemolytic streptococcal carrier state was approximately four times greater in the unprotected than in the protected group, and clinical pharyngitis and tonsillitis was over seven times more frequent. There were no relapses of rheumatic fever in the 155 protected patients and four in

the 145 unprotected. Gale *et al.* (1952) observed 73 patients for eight months after discharge from hospital: 41 were given 200,000 units of penicillin daily: the remaining 32 received lactose and glucose. Throat swabs were taken every two weeks. There was a lower incidence of positive throat cultures in the treated group, and, whereas two rheumatic relapses occurred in the 32 controls, there were none in the 41 treated.

Prophylaxis was not used on any large scale in this unit until 1951. We relied instead on isolation (and, if necessary, treatment) of all new admissions until their throat cultures were known to be negative for haemolytic streptococci, and on weekly throat-and-nose swabbing of all patients and staff; anyone with a positive throat swab was isolated and given intramuscular penicillin. In this way the number of streptococcal infections was kept at a very low level and the recurrences in hospital were few. Experience in this country indicated that recurrences of rheumatic fever after discharge from hospital were much less frequent than had been reported in the U.S.A., where estimates ranging from 40% per year (Wilson and Lubschez, 1944) down had been reported. Up to 1951, therefore, in view of possible toxic effects from long-continued administration and of the low recurrence risk, our patients had not been put on to prophylaxis on discharge from hospital.

Present Investigation

In the years 1949 and 1950 there were 96 patients in this unit who were diagnosed as having rheumatic fever: none were put on to prophylaxis in hospital. All fulfilled the criteria for diagnosis of rheumatic fever as defined by Duckett Jones and modified by the American Heart Association (1955). They had, therefore, either two major and one minor, or one major and two minor, criteria (major criteria: polyarthritides, chorea, nodules, erythema marginatum, and carditis; minor criteria: fever, arthralgia, prolonged P-R interval, raised sedimentation rate, evidence of preceding haemolytic streptococcal infection or previous history of rheumatic fever or rheumatic heart disease). Four patients died in hospital. The remaining 92 were not put on to prophylaxis at the time of discharge from hospital. They were seen for follow-up examination at three-monthly intervals for the first year, and thereafter once each year. At each examination a careful history was taken, with special reference to sore throats and limb or joint pains; a complete physical examination was carried out; and blood was taken for sedimentation rate. All 92 were seen at one year, 91 at two years (1 defaulter), 89 at three years (3 defaulters), 87 at four years (4 defaulters) and 1 patient who had died in a recurrence at three years, and 85 at five years (2 more defaulters). Thus there were six defaulters by the fifth year and one had died at three years.

In view of the mounting evidence of the efficacy of prophylaxis and the low incidence of toxic reactions, we started to use prophylaxis as a routine measure for both in-patients and out-patients in 1951 as stipulated in the U.S.-U.K. treatment trial in which we were participants (Co-operative

TABLE I.—Comparison Between Protected and Unprotected Groups on First Admission into Hospital

Group	Total No.	Sex		Age in Years on Admission		Degree of Carditis on Admission			Duration of Disease Activity on Admission in Days		
		M	F	0-10	11-16	None	Pres. 1st Attack	Pres. 2nd or Later	0-14	15-43	43+
1949-50 (unprotected)	96	53	43	46	50	28	42	26	50	22	24
1951-52 (protected)	88	44	44	38	50	13	49	26	30	32	26

Clinical Trial, 1955). In the years 1951 and 1952, 88 patients were admitted with rheumatic fever, all of whom fulfilled the same diagnostic criteria as the previous group. The two groups were also similar as regards age and sex incidence, degree of heart involvement, and duration of disease before admission (Table I).

All 88 patients admitted in 1951 and 1952 were given prophylaxis in hospital (tablets containing sulphathiazole, sulphadiazine, and sulphamerazine ("sulphatriad"), 1 g. daily). Two patients died in hospital. In the remaining 86 prophylaxis was continued after discharge. These 86 patients were seen for follow-up examination at six-monthly intervals for the first two years and thereafter once each year. They were interrogated and examined in the same way as the previous group, and blood samples were taken for packed cell volume, sedimentation rates, and anti-streptolysin O titres. Urines were also tested for sulphonamide (La Rosa, 1945). 85 were seen at one and two years (1 defaulter), 81 at three years (5 defaulters), 79 at four years (6 defaulters), and 71 at five years (6 defaulters and 9 not yet due for follow-up).

Results

Recurrences were defined as further episodes of rheumatic activity after discharge from hospital in which the criteria for diagnosis were again fulfilled—that is, there were two major or one major and two minor criteria. None had more than one recurrence in any 12-months period.

In the unprotected group of 92 patients admitted between 1949 and 1950, 18 patients had recurrences during the first five years of follow-up. 17 of them had further attacks of rheumatic fever: 14 had one such attack, 2 had two, and 1 had three. Thus the 17 patients had a total of 21 recurrences. The remaining patient had three attacks of chorea. There were therefore 24 episodes of fresh rheumatic activity. Of the 86 in the protected group, 5 had further attacks of rheumatic fever.

Table II shows the number of recurrences in the two groups at or before each annual follow-up. In the unprotected group, 9 of the 17 with recurrences of rheumatic

TABLE II.—Number of Recurrences Per Year at Annual Intervals in Cases that Survived

Years from Admission:	0	1	2	3	4	5
Unprotected group:						
No. at risk	92	92	90	86	81	77
% of recurrences	—	5.4	6.7	5.8	4.9	5.2
Protected group:						
No. at risk	86	85	85	81	79	71
% of recurrences	—	1.2	1.2	0	2.5	1.4

fever were put on to prophylaxis during their readmission to hospital; none of them had further attacks. These cases have therefore been excluded from the "number at risk" after their discharge from hospital, as they were then receiving prophylaxis. At one year there were 92 unprotected "at risk"; at two years 90 (1 defaulter and 1 on prophylaxis); at three years 86 (3 defaulters and 3 on prophylaxis); at four years 81 (4 defaulters, 1 dead at three years in a recurrence, and 6 on prophylaxis); and at five years, 77 (6 defaulters, 1 dead, and 8 on prophylaxis). In the protected group, 85 were seen at one and two years (1 defaulter at each); 82 at three years (5 defaulters); 79 at four years (6 defaulters); and 71 at five years (6 defaulters and 9 not due for follow-up).

The mean incidence of recurrences per patient-year was 5.6% in the unprotected and 1.2 in the protected.

Discussion

Whilst the number of recurrences during the 12-months period after discharge from hospital was consistently and considerably less in the protected group, the reduction is less than reported in American series. This is because the recurrence rate in the unprotected was much lower than seems to be the usual experience in the United States. The

total mean incidence of recurrences per patient-year in our unprotected group was only 5.6%. Wilson and Lubschez (1944), in New York, found an overall recurrence rate of 25% in children aged between 4 and 13, and Fischel's unpublished figures from another hospital in New York (quoted by Stollerman, 1954) showed that of 239 unprotected patients 43 (18%) had recurrences during the first year.

Such large differences in recurrence rate in unprotected populations may depend on different criteria for recurrences or on other factors. Thus, out-patient prophylaxis is less stringent and effective than in-patient prophylaxis. In our protected group, of the five that had recurrences, one was known to have stopped taking sulphonamide two months previously and in another it was probable that the drug had been discontinued. Under barrack conditions (and some of the American figures come from Service camps) the risk of contracting streptococcal infection is greater than in the home, and the attendance of patients for illness may be different in different countries. However, most of the American series seem to agree on a high incidence of recurrences in unprotected series of whatever age, while in the few series reported in this country the incidence has been low (Pitt Evans, 1950; Gale *et al.*, 1952; present series). This difference may account in part for prophylaxis being taken up less enthusiastically in this country than in America.

Although the two groups of cases in this series were not run concurrently, the five-year period of study overlapped by two to four years in the two groups. In both groups the recurrence rate was similar during each of the five years of follow-up. This is of considerable interest, for Wilson and Lubschez reported that the risk of recurrences in the year following an attack was 38.7%, whereas the risk after one year's freedom from attacks was only 11.7%. In our series the recurrence rate has remained at a similar level throughout the five-year period despite the fact that the children were getting older and were further from their initial attack. Furthermore, Wilson and Lubschez found an overall recurrence rate of 25% in children aged 4 to 13, and only 9% in those aged 14 to 16. In our unprotected cases the age distribution on admission to hospital was 46 patients up to and including the age of 10, and 50 between 11 and 16. Of the 46 up to and including the age of 10, 7 had recurrences; of the 50 aged between 11 and 16, 10 had recurrences. There is manifestly no great falling off of recurrence rates after puberty.

Objections that have been raised to prophylaxis have been discussed in a previous publication (Bywaters *et al.*, 1957). Among these have been the fear of toxic reactions (agranulocytosis, drug rashes, and renal damage) and of streptococcal resistance to sulphonamide. In this series, though patients were given sulphonamide over periods of four and five years, such reactions were few. Two in the protected group complained of lassitude during the first year after discharge. One, a girl of 12, was found to have a white blood cell count of 3,850 per c.mm. with 25% polymorphs. She was admitted to hospital and sulphonamide prophylaxis was changed to penicillin. One week later she had recovered: the white-cell count was 7,450 per c.mm. with 70% polymorphs. The other, a boy of 5, had a white-cell count of 2,000 per c.mm. with 20% polymorphs at the sixth month follow-up. Penicillin prophylaxis was substituted, and, although the white-cell count remained low for some months before returning to normal, prophylaxis continued uneventfully.

No patient in this series developed agranulocytosis, although another of our patients (not included in this series because she was over the age of 16 on first admission) developed agranulocytosis at the eighth week; she responded satisfactorily to intramuscular penicillin. One patient in the series developed urticaria after 10 weeks on sulphonamide. The drug was stopped after four days and penicillin prophylaxis substituted. The rash persisted for another four days and then subsided. No instance of streptococcal resistance to sulphonamide was encountered,

though in another patient (not included in this series because he had chorea only) haemolytic streptococci resistant to sulphonamide were found in routine weekly throat swabs after eight weeks of treatment. The patient was treated with bactericidal doses of intramuscular penicillin, a tonsillectomy was performed, and prophylaxis was then continued with oral penicillin.

Since that time, all patients with rheumatic fever or chorea have been given sulphonamide or penicillin prophylaxis in hospital, and this has been continued after discharge (sulphatriad, 1 g. daily, or penicillin G, 200,000 units twice daily). Our original impression of the efficacy of this prophylaxis has been confirmed, and toxic reactions have been few in number and harmless. Most have occurred within a few weeks of starting treatment—that is, whilst the patients were still in hospital. Prophylaxis has then been changed from one drug to the other and there has been no further trouble.

We have no data available on differences in the recurrence rate between cases treated with sulphonamide and penicillin. Assuming both drugs to be equally effective, penicillin would be the one of choice, for there is the possible though small danger of agranulocytosis with sulphonamide. The slight extra cost of penicillin (3.6d. a day as compared with 1.6d. a day for sulphonamide) does not seem important, and storage of penicillin presents no problems, for the tablets retain their potency for three months if kept in an airtight tin in the cool. Injections of benzathine penicillin have been advocated by some as preferable to penicillin by mouth. Though this method ensures that prophylaxis is carried out, it is difficult to impose a regime of weekly injections on children in the knowledge that this must be continued for years. The Rheumatic Fever Committee of the Royal College of Physicians (1957) recommends 200,000 units of penicillin G twice daily, or 120 mg. of penicillin V twice daily, and that benzathine penicillin should be used if for any reason oral prophylaxis cannot be given. With this we concur.

Finally, for how long should prophylaxis be continued? This is a matter for individual judgment, taking into account parental attitudes and circumstances. It is our belief, based on these figures for recurrence rates, that prophylaxis should continue for at least five years after the last attack or until the child has left school, whichever period is the longer (Rheumatic Fever Committee of the Royal College of Physicians, 1957). If, after leaving school, patients are exposed to an increased risk of streptococcal infection—that is, should they enter a university or one of the Services—then prophylaxis should be continued for a further period. If liability to reinfection is based on M antibody level, it may be that even more prolonged prophylaxis will be necessary.

Summary

Two comparable groups of patients with rheumatic fever were followed for a period of five years. One group of 96, admitted in 1949–50, were given no prophylaxis either in hospital or after discharge. The other, comprising 88 patients admitted in 1951–2, were given 1 g. of sulphonamide daily in hospital and after discharge. The period of follow-up in the two groups overlapped by two to four years.

The mean incidence of recurrences per patient-year was 5.6% in the unprotected and 1.2% in the protected. There was only small variation from year to year in each group, and no tendency for the recurrence rate to decrease with time. The reasons for the relatively low incidence of recurrences in the unprotected group and other differences between this and American series are discussed. Toxic reactions were few: none were serious. The duration, dosage, and merits of various forms of prophylaxis (sulphonamide, oral penicillin, and long-acting penicillin by intramuscular injection) are discussed.

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DESENSITIZATION TO BEE STINGS
BY INTRACUTANEOUS INJECTIONS
OF WHOLE-BEE EXTRACT

BY

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Reports of more or less severe reactions to bee stings are not infrequent in South Africa, and deaths therefrom are occasionally reported in the lay press. Our own information about bee-sting sensitivity and the effects of bee stings derives largely from many physicians in various parts of the country who, describing more or less severe reactions in their patients, inquire about the possibility of prophylactic desensitization.

Persons sensitive to bee stings commonly manifest local reactions in redness and swelling at the site of the sting and general reactions in rash, urticaria, oedema of face and glottis, and often anaphylactic shock, with collapse, unconsciousness, and even death. There may also be malaise, vomiting, dyspnoea, or bronchospasm. These effects appear within minutes after the sting or reach their climax some hours later.

The majority of patients who show a high degree of sensitivity to bee stings have suffered symptoms of progressively increasing severity after each sting, following a longer or shorter period of freedom from significant reactions after the initial sensitizing sting, which may have been many years ago. The following examples are given in illustration:

A farmer 44 years old had frequently been stung, as a boy and young man, with more or less severe local reactions after each sting. When he was stung again in 1952 there was little local reaction, but within three minutes he became unconscious and remained so for two hours. On recovery he had a "choking" sensation, with headache and malaise continuing for a day or two.

A medical man with no family history of allergy was stung at the age of 3½ years by about a hundred bees. The stings were removed and he suffered no ill effects. When he was 12 years old he was stung on the hand and developed a swollen face. Two years later he was stung between the toes. This resulted in swollen eyes, oedema of the glottis, and extreme dyspnoea requiring urgent medical attention. At the age of 29 he was stung once on the forearm, and, although he was injected with adrenaline within 20 minutes and with three further injections at hourly intervals, he had to have treatment at hospital, where he was detained for some time. He was stung again 10 years later, and, although adrenaline was administered within 10 minutes, he developed alarming swelling of the face.

A physician wrote from the Transvaal: "A patient of mine was stung by a bee in the soft tissue around his eye and had a severe systemic reaction. He became semiconscious and vomited profusely; rapid heart, with fall of blood pressure. He had never been affected by a bee sting previously although stung many times."

As a result of our advice and recommendations concerning the possibility of desensitization, however, patients are

Details of 24 Persons Sensitive to Bee Stings Submitted to Desensitization.

Case No.	Sex and Age	Otherwise Allergic	Reactions from Bee Stings	Whole-bee Extract Skin Sensitivity and Treatment Series	After Desensitization	
					Reactions from Bee Stings	Outcome
1	M 6	Urticaria from insect bites	Progressively more severe reactions from stings. Was stung recently and had to be treated with corticotrophin	1 unit 0.5–250 units	Stung twice during course of desensitization with hardly any effect from second sting	Successful
2	M 48	Migraine	For the past 2 years had developed palpitations, pallor, faintness, and prostration with every sting	50 units 25–500 units	Stung on finger: local oedema lasting only a few hours	"
3	M 36	Vasomotor rhinitis from inhalation of mohair dust	Local swelling and severe itching, worse with each successive sting. General reaction not marked except slight swelling of eyelids and listlessness	500 units 250–2,000 units	Local spot only. No general reaction	"
4	M 9	Not	Had become increasingly sensitive to stings. Last sting produced a marked local reaction and a very severe general reaction, including urticaria with oedema of glottis	1,000 units 500–3,000 units	Recently stung repeatedly with, at most, a slight local reaction. "This has been a most gratifying result"	"
5	F 56	"	Severe urticaria and palpitations	250 units 100–1,500 units	"Only mild reactions"	"
6	M 5	"	At age of 2 years was stung on face, gross oedema developing there. At age 4 was stung on left thumb and within a minute there was oedema of face with gross tachycardia, oedema of the larynx occurring 5 minutes later	250 units 100–1,000 units	After three separate stings on the one leg the only reaction was a local swelling	"
7	M 32	"	Stung at age 6 years and again at 13: no serious local reaction and no general effect. Recently stung by 5–6 bees on hands, with slight local swelling and itching of whole body 15 minutes later. Stung again 2 weeks later by 4–6 bees with slight local swelling but marked general itching and marked swelling of loose tissues of throat, eyelids, and armpits, with generalized urticaria and vomiting. "I firmly believe that I would have died from oedema of the throat and glottis if I did not inject myself with 1 ml. adrenaline immediately I realized that my tongue was getting thick." The patient is a physician	1 unit 0.5–25 units	Stung 6 months later on finger with only slight local swelling and itching	"
8	M ?	"	When stung on neck or face became pulseless, icy cold, and collapsed. Often found on ground by his family deathly pale after a single sting	500 units 250–1,500 units	Sting on arm: no untoward reactions	"
9	F 41	"	Always very sensitive to stings. Marked shock, breathlessness, fainting, and palpitations. The patient, a trained nurse living on a farm, gives herself adrenaline after a sting	250 units 100–1,500 units	Discontinued injections after 100 units owing to distance from doctor. Stung 9 months later, with only mild local erythema and no general reaction	"
10	F 60	"	Both grandmother and grandson reacted similarly to stings, with rash, tachycardia, and oedema of glottis. A sting in either patient meant an emergency call to the doctor	1,000 units 500–2,000 units	Only 6 injections of 500-unit extract. Stung 2 months later: no bad reaction	"
11	M 3			1 unit 0.5–25 units	No reaction after sting 2 months later or after sting one year later	"
12	M 7	"	Several episodes of anaphylactic shock with patient in very critical condition	50 units 25–3,000 units	No shock at all after recent sting	"
13	M 50	"	Severe anaphylactic type of reaction, with vomiting, urticaria, and collapse	500 units 250–2,000 units	After two recent stings only slight swellings. One sting on neck resulted in only mild flushing. "No doubt this man has benefited very considerably from desensitization. He is extremely happy at result"	"
14	M ?	"	Increasing sensitivity to stings. On last occasion, acute oedema of glottis and unconsciousness. The oedema developed so rapidly that he was unable to give himself an injection of adrenaline	5 units 2.5–3,000 units	Small urticarial weal at site of sting. No general reaction. "Naturally the patient is delighted"	"
15	F ?	"	The physician provided a general account of five cases under his care. "Same history in each case: Patient feels unusually bad after first sting; after second sting, urticaria with slight oedema of glottis. One patient became unconscious by the time he reached hospital. Another was laying out a golf course and was seriously thinking of giving up his job owing to the increasingly severe reactions from bee stings"	50 units 25–500 units	"The injections were given according to the suggested dosages in the pamphlet accompanying the treatment extracts. Since desensitization all the patients can walk among bees with impunity"	"
16	F ?			500 units		"
17	M ?			250–1,500 units		"
18	M ?			500		"
19	M ?	"	Stung from childhood onwards with no effect at first, but later with progressively severe reactions. Recent stings resulted in swollen face, body rash, and "feeling of pins-and-needles in body"	250–1,500 "	Swelling of hands and arms continue, but no longer that "queer feeling" Patient feels that he is better after stings now	Some improvement
20	M ?			1,000 "		
21	F 21	Not	Large areas of local erythema with massive swelling as well as general malaise and urticaria	10 units 5–100 units	Moderately severe local reaction with weal, urticaria, and swelling	Not successful

Continued overleaf

Details of 24 Persons Sensitive to Bee Stings Submitted to Desensitization—Contd.

Case No.	Sex and Age	Otherwise Allergic	Reactions from Bee Stings	Whole-bee Extract Skin Sensitivity and Treatment Series	After Desensitization	
					Reactions from Bee Stings	Outcome
22	M 43	Not	Twice stung in the past, with severe anaphylactic reaction each time	10 units 5 and 10 units only	Desensitization in June and July, 1953. Stung again in May, 1956, with bronchospasm and severe anaphylactic shock	Not successful
23	F 48	..	Tachycardia, vomiting, and mental confusion within 2 minutes after a sting	10 units 5-100 units	Stung some months later; had nausea, vomiting, tachycardia, and body pains	..
24	M 52	..	After a sting he became mentally confused, dyspnoeic, intensely red in the face, and developed tachycardia and unconsciousness	1,000 units 500-1,500 units	A sting received 4 months later produced tachycardia, mental confusion, and collapse	..

ordered for that purpose by physicians and are issued in a series of graded strengths referred to as "treatment sets." In this way, 50-60 treatment sets for desensitization purposes were issued annually in 1951-5, 86 sets in 1956, and 115 in 1957. These figures do not, of course, indicate the incidence of serious reactions to bee stings in the country, but merely reflect the spread of knowledge regarding prophylactic desensitization.

In our experimental and clinical studies extracts of whole bees have been employed instead of material from the sting apparatus, because our earlier investigations had shown that in persons sensitive to bee stings intracutaneous testing with extract of whole bee and with extract of sting-venom sac produced similar reactions, indicating, at least, the presence of a common antigen. From a practical point of view, in the large-scale preparation of extracts the removal of venom sacs with stings from large numbers of bees does not seem warranted when the preparation of the equally useful whole-bee extract is so simple.

Progressive skin tolerance to the injection of gradually increasing strengths of whole-bee extracts is the rule, and, as shown below, a parallel state of clinical hyposensitization is similarly attained.

Preparation of Whole-bee Extract

In the preparation of whole-bee extract many hundreds of bees are removed from the hive into a closed container, where they are killed with chloroform. The dead bees are washed in a colander under a flow of cold running water for the removal of honey and debris, and spread out on sheets of blotting-paper for superficial drying. The bodies are weighed and ground in a mortar to a thick paste, which is extracted with a moderate excess of Coca's fluid in the cold for 48 hours, with frequent stirring. The mass is squeezed through a clean, fine double-muslin bag, and the filtrate, collected and preserved with 0.5% phenol, is submitted to paper filtration followed by Seitz filtration. The clear straw-coloured fluid is controlled for sterility, and constitutes the "whole bee" extract.

Standardization of Whole-bee Extract

The "standardization" of the whole-bee extract is arbitrarily based on the total protein nitrogen content of the fluid. The figure thus obtained, and referred to as the "unitage," is taken as the basic "strength" of the particular batch of extract. It is of course no criterion of the allergenic value of the extract, and merely serves as a convenient guide to dilutions which may later have to be made.

Preliminary Skin-testing of the Patient

Skin-testing is regarded as a necessary preliminary to the desensitization process that is to follow. The object is to determine the degree of the patient's sensitivity in "units" to the particular batch of bee-protein extract in use. A "bee-venom skin-test outfit" is issued to physicians, consisting of a series of capillary tubes containing the whole-bee extract in the following graded strengths: 1, 10, 50, 100, 200, 500, 1,000, and 2,000 units per ml.

The skin tests are carried out as follows. With a tuberculin-type syringe, 0.02 ml. of the lowest-strength

extract (1 unit) is injected into the skin of the volar surface of the forearm. Injections are continued in this way with the stronger extracts in the skin test outfit until the occurrence of a local reaction is just apparent—a weal about 1 cm. in diameter with a surrounding area of erythema. No further skin tests are done, but the "unitage" of the extract producing this reaction is noted. All test injections are given by the intracutaneous route in a fresh area of skin each time at intervals of 10 to 15 minutes to allow for the development of any reaction that might occur. In our experience, skin sensitivity is variously shown by sensitive patients to 1-250 units per ml. of fresh whole-bee extract.

A suitable treatment set for desensitization purposes is now prepared on the basis of the skin-test reaction.

Desensitization with Whole-bee Extract

Desensitization is carried out with injections of whole-bee extract by the intracutaneous route. This route is advised because the reactions are plainly visible and easily gauged, and dosage can accordingly be suitably regulated. Further, as the amount injected each time is relatively small there is a local reaction only, and, in our experience, no constitutional or other untoward reactions need be anticipated.

The treatment set provided for desensitization purposes consists of a series of dilutions of whole-bee extract of the same batch used for the skin testing in 2-ml. rubber-capped bottles in increasing strengths and commencing at a dilution somewhat less than the reaction-strength noted in the preliminary test.

The intracutaneous injections of each extract dilution are given in doses of 0.05-0.25 ml. at intervals of 2-4 days, with dose increments, when indicated, of 0.05 ml. It is desirable to obtain a weal 1-2 cm. in diameter after each injection. Increase of dosage or use of higher-strength extracts is indicated only when the weal reaction is beginning to diminish in size. It may happen that five, six, or more injections are given from the same extract before proceeding to higher strength.

Example: A positive reaction was obtained in the preliminary skin test with the 10-unit extract. The treatment set is prepared with a series of extracts containing 5, 10, 25, 50, 100, and 250 units per ml. When this course is completed a further series of stronger extracts from 250 units per ml. upwards is issued as indicated. It is desirable to continue desensitization with gradually increasing doses of extract until the patient is receiving injections of extracts of about 1,000 units strength with a local reaction only after each injection. When this final "unitage" of extract is readily tolerated, with the production only of a local weal of 1-2 cm. diameter, maintenance doses of 0.25 ml. each are injected thereafter at gradually increasing intervals until the patient is receiving such an injection once every three to four months. It has not been found necessary to use strengths of extracts higher than 2,000-3,000 units per ml. for effective desensitization. In highly sensitive persons—that is, those reacting to 1-10 units by skin test—it suffices to use a desensitizing extract not stronger than about 1,000 units (corresponding to 1,000-100 times the original skin reaction strength). This final

dosage is reached as a rule in 2-3 months. As in all "desensitization" procedures, it is inevitable that the state of hyposensitization attained will in due course be lowered if not lost. It is for this reason that maintenance doses as described should be continued for as long as thought necessary, especially in bee-keepers and others who cannot avoid contact with bees.

Results of Desensitization

A description has been given (Ordman, 1951) of three persons sensitive to bee stings in whom effective desensitization had been achieved with the use of whole-bee extract administered intracutaneously. Since that time 19 further instances of successful desensitization by this method have come to notice, bringing the total to 22. These 19 cases have emerged from a study of 47 satisfactorily completed reports by physicians who had submitted their bee-sting-sensitive patients to adequate desensitization. In 23 instances the patients had not been further stung by bees, and it is in the remaining 24, where stinging had followed desensitization, that these 19 persons were found to be fully protected (see Table).

It may seem surprising that only 22 authenticated instances of successful desensitization can be quoted when material for prophylactic desensitization had been supplied over the years for some hundreds of persons. The explanation is, firstly, that most people subjected to bee stings in South Africa live in the rural areas and information about them must be obtained by correspondence with their doctors, leading all too often to little or no details about patients in spite of follow-up letters. Secondly, in the bulk of the replies that do become available the information is vouchsafed that, although the patients had been properly desensitized according to our instructions, they had not subsequently been stung by bees.

Details are given in the Table of the 24 cases which had been submitted to desensitization and about which full reports were obtained. Effects of bee stings before and after such desensitization, results of skin-sensitivity tests, and the desensitization procedure itself are described for each case.

It will be observed that in 19 of these cases (1-19) the results were highly satisfactory, as no reactions, or very mild reactions only, were now occurring in persons who were originally very severely affected by bee stings. In Case 20 "some improvement" only was claimed. In Cases 21, 22, 23, and 24 it was reported that desensitization procedures had produced no benefit at all—that is, reactions after bee stings were now as severe as they had been previously.

Cases 21, 22, 23.—These patients were highly sensitive by skin test to whole-bee extract (10 units). Desensitization was carried out to only 100 units or less instead of to the required 3,000-4,000 units. Desensitization in each of these cases was obviously inadequate, and satisfactory results could not be expected.

Case 24.—For some reason this patient does not appear to have been highly skin-sensitive to whole-bee extract (1,000 units) by test, and desensitization should have gone on with strengths up to 4,000 units or even higher.

It becomes clear from the study of the Table that desensitization with whole-bee extract by the intracutaneous method is a very satisfactory procedure if properly carried out.

Summary and Conclusions

A procedure is described for the prophylactic desensitization of persons sensitive to bee stings by the use of increasing strengths of whole-bee extract administered intracutaneously.

A preliminary intracutaneous skin test is performed to determine the degree of the patient's sensitivity to the extract that is to be used for subsequent desensitization.

Successful desensitization is reported of 19 persons originally highly sensitive to bee stings.

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THE POLYSACCHARIDE BEHAVIOUR OF CANCER ANTIGENS

BY

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The high degree of accuracy in the detection of antigens in the sera of patients with carcinoma obtained by use of the Schultz-Dale method has already been reported (Makari, 1955a, 1955b). Recently Burrows (1958) confirmed these results in a thorough investigation of the test. The chemical nature of cancer antigens remains an unsolved problem. However, in studying host-tumour relationships it is extremely important to know the exact nature of these cancer antigens. In an effort to elucidate this problem, Burrows and Neill (1958) have investigated the nature of the immunologically active constituent of serum of patients with carcinoma. They attribute the antigenic activity of such sera in the Schultz-Dale test to the presence of a polypeptide.

The following application of the Schultz-Dale method leads us to believe that cancer antigens behave like polysaccharides and that the activity observed by Burrows and Neill in the polypeptide of the serum is probably due to an associated polysaccharide antigen.

Methods

Details of the Schultz-Dale method, the preparation of antigens, and the testing procedure have been described (Makari, 1955b). Tumour and normal tissues are homogenized in 0.2N saline solution (one part of tissue plus four parts of saline) with a Sorvall homogenizer immersed in cracked ice. This procedure is allowed to continue for 10 minutes with the rheostat set at 115. The homogenate is then centrifuged twice at 3,000 r.p.m. at 5°C. for 10 minutes. The sediment is discarded and the supernatant is further centrifuged for 30 minutes at 10,000 r.p.m. at the same temperature. This sediment is separated and resuspended up to volume with normal saline solution. It is to be noted that this sediment differs from that used in my earlier work (Makari, 1955a, 1955b) in that the latter was obtained between 3,200 and 4,000 r.p.m. The sediment used in the present study—that is, that obtained between 3,000 and 10,000 r.p.m.—was chosen because it was found to have antigens in common with various tumours (Makari, 1958a).

The resuspended sediment and its supernatant comprise the antigens used in this study. They are used both in this form and after treatment by a procedure described by Chang (1953) and Chang, Snyder, and Murray (1953) in their preparation of an erythrocyte-sensitizing substance from rickettsial antigen which was thought to be polysaccharide in nature. In this procedure an equal volume of ether is added, with vigorous shaking for five minutes. It is then left undisturbed, to allow separation into ether and aqueous phases. The aqueous phase is mixed with alkali in the following proportion: nine volumes of the aqueous phase to one volume of 2N NaOH. The mixture is kept in a water-bath at 100°C. for 30 minutes. It is cooled and dialysed for two hours at 0 to 4°C. against several changes of isotonic phosphate saline solution (Na_2HPO_4 , 0.81 g.; KH_2PO_4 , 1.04 g.; NaCl, 6.8 g.; distilled H_2O , 1,000 ml.; pH=6.8). The active material found inside the dialysis bag is then shaken with an equal volume of chloroform for 20 minutes and centrifuged at 2,000 r.p.m. for 15 minutes. In this study the chloroform layer is discarded and the clear aqueous phase containing the sensitizing substances (which are referred to as S.S.) is used. These behave as polysaccharides, being non-dialysable, resistant to boiling and alkalis, and giving a positive Molisch test.

In an effort further to evaluate the polysaccharide nature of cancer antigens another method was used which is very similar to that described for the preparation of pneumococcal polysaccharides (Whistler and Smart, 1953).

In this method, melanoma antigen (fraction O), in equal amounts, is added to 95% ethanol chilled at 0° C. This is centrifuged and the supernatant discarded. The sediment is suspended in 80 ml. of acetate buffer (157.5 g. of NaC₂H₃O₂·3H₂O in three litres of distilled water and the pH adjusted to 6.05 with glacial acetic acid). This is then ground slowly at 0° C. and centrifuged.

From the supernatant, the polysaccharide (fraction A) is precipitated by the addition of 5 volumes of cold isopropyl alcohol. The residue from the first grinding is again suspended in 80 ml. of acetate buffer and ground at 0° C. The suspension is centrifuged and the supernatant precipitated with isopropyl alcohol (fraction B).

Fraction A is removed by centrifugation and dissolved in 100 ml. of cold distilled water. The resulting turbid greenish solution is deproteinized by the Sevag method in which 50 ml. of chloroform is added in 10 ml. of butyl alcohol for each 150 ml. of solution, and agitated from time to time in a homogenizer at 3° C.

The resulting emulsion is centrifuged, and the aqueous layer containing polysaccharide is separated. The aqueous layer is then adjusted to a concentration of 3% sodium acetate with saturated sodium acetate solution brought to pH 6 with acetic acid.

One half-volume of cold isopropyl alcohol is added to precipitate the polysaccharide, and the suspension is left overnight. The Sevag procedure is repeated until the material is completely deproteinized, after which the polysaccharide is centrifuged. This polysaccharide-like substance is referred to as P.L.S.

TABLE I.—Parallel Behaviour by the Schultz-Dale Method, of Guinea-pig Uterine Horns Immunized Against Tissue Antigens and Their Corresponding Polysaccharide S.S.

Reaction No.	Reaction Released By		Guinea-pigs Immunized With S.S.		Reaction No.	Releasing Antigen		Guinea-pigs Immunized With Antigen	
	Type	Amount	Normal Colon, Handy-Ag.194 S.S.	Ca. Colon, Handy-Ag.195 S.S.		Type	Amount	Normal Colon, Handy-Ag.194 S.S.	Ca. Colon, Handy-Ag.195 S.S.
(A) 1	Normal serum (10 additions)	0.3 ml.	(2) 1	(15) 1	(B) 1	Normal colon, Handy-Ag.194	0.1 ml.	0	(6) 1*
11	" " " "	0.3 "	0	(5) 1	2	" " " "	0.1 "	0	(3) 2*
14	" " " "	0.1 "	0	(3) 1	3	" " " "	0.1 "	0	(2) 2
15	Ca. vulva, Oliver serum (18053)	0.1 "	0	(10) 1*	4	Normal colon, Handy-supernatant after 10,000 r.p.m. (9 additions)	0.1 "	(20) 1*	(10) 1*
16	Normal serum	0.1 "	0	0	13	Normal colon, Handy-Ag.194	0.1 "	0	0
17	Ca. lung, Brunson serum 18077	0.1 "	0	(6) 1	14	" " " "	0.3 "	0	0
18	Normal serum	0.1 "	0	0	15	" " " " (ether extracted)	0.3 "	(2) 1*	(7) 1*
19	Ca. vulva, Oliver serum (18053)	0.3 "	0	0	16	Ca. colon, Handy-Ag.195	0.3 "	0	0
20	Normal serum S.S.	0.3 "	0	0	17	" " " " (ether extracted)	0.3 "	0	(5) 1
21	Histamine	10 µg.	(7) 1*	(15) 1*	18	Handy-Ag.195 (supernatant)	0.2 "	0	(8) 1
					19	Briggs-S.S. Fibrosarcoma	0.2 "	0	(7) 1
					20	Ca. breast, S.S.	0.2 "	0	0
					21	Histamine	10 µg.	(15) 1*	(12) 1*

Figures in parentheses represent the height of uterine contractions in mm. Figures 1 and 2 outside parentheses refer to the reaction taking place at the first or second half of the tracing. The asterisk designates a strong maintained reaction.

TABLE II.—Behaviour of Homologous and Autologous Tissue Antigens and Their Polysaccharide S.S. by the Schultz-Dale Method

Reaction No.	Reaction Released by		Guinea-pigs Immunized with S.S.		Reaction No.	Reaction Released by		Guinea-pigs Immunized with Antigen	
	Type	Amount	Normal Colon, Handy-Ag.194 S.S.	Ca. Colon, Handy-Ag.195 S.S.		Type	Amount	Normal Kidney, Ag.128	Acute Leukaemic Kidney, Ag.208
(A) 1	Normal serum donor	0.2 ml.	0	(2) 1	(B) 1	Normal plasma	0.5 ml.	(18) 1*	(27) 1*
2	" " " "	0.2 "	0	(1) 1	2	" " " "	0.5 "	(13) 1	(22) 1*
3	Ca. stomach (18385)	0.2 "	(1) 1	(5) 1*	3	" " " "	0.5 "	0	(22) 1
4	Ca. breast (18537)	0.2 "	0	(18) 1*	to 6	" " " "	0.5 "	0	(22) 1
5	Normal serum donor	0.2 "	0	(2) 1	7	Normal kidney, Ag.128	0.1 "	0	(18) 1
6	Ca. lung (18245)	0.2 "	(24) 1*	(16) 2*	8	Normal serum	0.3 "	0	0
7	Normal serum donor	0.2 "	(2) 1	(5) 1	9	Hodgkins (18386)	0.3 "	0	(15) 2*
8	Melanoma (18370)	0.2 "	(18) 2*	(20) 1*	10	Normal serum	0.3 "	0	0
9	Normal serum donor	0.2 "	0	(5) 1	11	Carcinoma (18248)	0.3 "	0	(31) 1*
10	Histamine	10 µg.	(26) 1*	(20) 1*	12	Histamine	10 µg.	(25) 1*	(31) 1*

Reaction	Reaction Released by		Guinea-pigs Immunized with Antigens		Reaction	Reaction Released by		Guinea-pigs Immunized with Ether-Extracted Antigens	
	Type	Amount	Normal Colon, Handy-Ag.194	Ca. Colon, Handy-Ag.195		Type	Amount	Normal Colon, Handy-Ag.194	Ca. Colon, Handy-Ag.195
(C) 1	Normal colon, Handy-Ag.194	0.1 ml.	(10) 1*	(18) 1*	(D) 1	S.S. normal donor	0.5 ml.	(14) 1*	(4) 1
2	Ca. colon, Handy-Ag.195	0.1 "	0	0	10	" " " "	0.1 "	(10) 1*	(3) 1
3	Normal colon, Handy-Ag.194	0.1 "	(1) 1*	(11) 1*	11	Normal donor serum	0.3 "	(13) 1*	(15) 1*
4	Ca. colon, Handy-Ag.194-SS	0.05 "	0	0	12	" " " "	0.3 "	(5) 1	0
5	Ca. colon, Handy-Ag.195-SS	0.05 "	(2) 1	(8) 1	13	S.S. ca. colon, Handy-Ag.195-SS	0.05 "	(1) 2	(10) 1*
6	" " " "	0.05 "	0	0	14	Histamine	10 µg.	(14) 1*	(15) 1*
7	Histamine	10 µg.	(23) 1*	(21) 1*					

Immunization of guinea-pigs is passive with rabbit antiserum (I.V.) in Section A, and is active in others.

Virgin female guinea-pigs are immunized, by the help of Freund's adjuvants, either with S.S. or with the original antigens obtained from neoplastic tissues. Control antigens and their corresponding S.S. are prepared from "normal" sections of the same organ from which the cancer tissue is obtained, and also from similar organs of a young healthy adult.

In three to four weeks the guinea-pigs are sacrificed and their uterine horns are used in a Schultz-Dale bath. Rabbits similarly immunized are bled and their sera used for passive *in vitro* or *in vivo* (intravenous) sensitization. To release the local *in vitro* anaphylactic reaction of the uterine muscle, various tissue antigens, their S.S. and P.L.S., are used, as well as sera from normal blood donors and from patients with cancer.

These reactions are recorded in mm. in Tables I and II. In Table III results are shown in terms of contraction index (C.I.). This is the ratio of the specific contraction in mm. to that resulting from 10 µg. of histamine base.

TABLE III.—Immunological Activity by the Schultz-Dale Method of a Polysaccharide-like Substance (P.L.S.) and Its Two Fractions A and B Prepared from Melanoma Antigen. (Results are Recorded in Terms of Contraction Index (C.I.). 0.1 ml. was Used to Release the Reaction)

Reaction No.	Reaction Released by	Pigs Immunized with Melanoma Ag., Sed. IIIB (3,000–10,000 r.p.m.)	
		Horn A	Horn B
1	Normal serum	0	0
2	Normal Ag.	0	0
3	Melanoma Ag. Sed. IIIB	(0.10) 2*	(0.12) 2*
4	Fraction O	(1.0) 1*	(0.87) 1*
5	Melanoma Ag. Sed. IIIB	(0.73) 1*	(0.87) 1*
6	Fraction A		
7	Melanoma Ag. Sed. IIIB	(0.25) 2*	(0.36) 2*
8	Fraction B		
9	Melanoma Ag. Supernatant 10,000 r.p.m. Histamine (10 r)	(0.87) 2*	(0.91) 2*
		(1.0) 1*	(1.0) 1*

Results

In general, the same result is obtained from guinea-pigs immunized with both S.S. and the original antigens. Furthermore, S.S., P.L.S., and original antigens release the Schultz-Dale reactions equally well.

In fact, the polysaccharide-like fractions, A and B, give a higher contraction index than does the original melanoma antigen (fraction O), fraction A giving the highest figures (see Table III). Desensitization is possible with these reactions.

Some typical reactions are shown in Tables I and II. After desensitization to normal serum and normal tissue antigens, the uterine horns from the cancer-immunized guinea-pigs still react positively in response to sera or tissue antigens from carcinoma or related tumours. Table I shows this phenomenon clearly. Thus, in Table I.A the uterine horns of guinea-pigs immunized to S.S. carcinoma of the colon (Ag.-SS.195 (Handy)) reacted specifically (after desensitization to normal serum in reactions A1 to A14) with sera from carcinoma patients (reactions A15 and A17), but not with sera from normal donors (reactions A16 and A18). On the other hand, control uterine horns of guinea-pigs immunized to S.S. "normal" colon (Ag.-SS.194 (Handy)) did not react to these same sera from carcinoma patients or from normal donors (after desensitization to normal serum).

The immunological specificity of these positive reactions is strongly suggested by desensitization procedures in which the sensitized uterine horns initially exposed to a positive reacting serum or a tissue antigen fail to react to the same antigen after these horns are washed and exposed again. This indicates specific neutralization of antibodies fixed to

the horn by their specific antigens and excludes the possibility of a non-specific pressor effect. For example, Table I shows a marked reaction to serum from carcinoma case 18053 in A15; a weaker reaction to serum from another carcinoma, 18077, in A17; and no reaction at all on second contact with carcinoma serum, 18053, in A19.

Table I.B shows a similar behaviour of the uterine muscles from guinea-pigs immunized to the native original antigens—that is, carcinoma of the colon (Ag.195 (Handy)) and "normal" colon (Ag.194 (Handy)), as was shown for their S.S. counterpart. In addition, the comparative strength of various antigens in releasing the reaction is shown. Ether extraction of antigens 194 and 195, for example, improved their antigenicity, as shown by their ability to release the reaction in the Schultz-Dale bath (Table I.B, 14, 15, 16, and 17). Furthermore, the capacity of these antigens to immunize guinea-pigs was well preserved even after their ether extraction (Table II.D). It is also apparent that after centrifuging at 10,000 r.p.m. the supernatant fraction of the antigen is much more effective in releasing the reaction than the sediment even when the latter is ether extracted (see Table I.B: 3, 4, 16, 17, and 18).

Table II further reveals the parallel behaviour of S.S. and of original antigen. It also shows the behaviour of autologous antigens (wherein neoplastic and "normal" tissues are taken from the same patient) as, compared with homologous antigens (wherein the neoplastic and the control normal tissues are taken from a carcinoma patient and from a healthy accident victim respectively). In the case of autologous antigens the so-called "normal" tissue is not altogether normal immunologically. Although it shows mostly normal tissue components for the most part when the full antigen is used for immunization of guinea-pigs (Table II.C, 1 and 5; D, 1 to 12), it does show carcinoma components when S.S. is used for immunization (Table II.A, 6 and 8) and for releasing the reaction (Table II.C, 5 and 6). In the latter case both "normal" colon (Ag.194-S.S. (Handy)) and carcinoma of the colon (Ag.195-S.S. (Handy)) possess the same abnormal components although they are present to a lesser degree in the "normal" tissue. Furthermore, desensitization indicates that these abnormal components are antigenically similar to the carcinoma antigen. Thus we see that prior addition of "normal" colon (Ag.194-S.S. (Handy)) to the carcinoma horn (Table II.C, 5) desensitized it completely to further addition of carcinoma of the colon (Ag.195-S.S. (Handy)). However, the same amount of Ag.195-S.S. did react specifically with another similarly sensitized horn (Table II.D, 13). This was not the case, however, when autologous tissue antigens were used from a healthy person. This is shown by Table II.B, in which tissue antigens are prepared from the kidney of a patient with acute leukaemia and control antigens are prepared from the kidney of a young victim of a car accident. Only normal tissue antigens were found in the healthy kidney.

The common antigenicity between various types of malignant tumours is shown in Table I.A, 15 and 17; between fibrosarcoma and carcinoma in Table I.B, 19 and 20; between various types of carcinomas and melanomas in Table II.A, 3, 4, 6, and 8; and between leukaemia, Hodgkin's disease, and carcinoma in Table II.B, 9 and 10. This aspect will be studied in other articles (Makari, 1958a, 1958b).

Discussion

The immunologically active substances in the serum and tissues of cancer patients behave like polysaccharides when studied by the Schultz-Dale test. They are precipitated by isopropyl alcohol, and their activity is maintained, and even improved, after deproteinization with chloroform and butyl alcohol. Burrows and Neill (1958) showed that acid hydrolysis resulted in complete loss of activity. This does not contradict the polysaccharide nature of these antigens, since acid hydrolysis of polysaccharides is known to destroy their antigenicity. Extraction with 2N NaOH, however, hydrolyses

the bonds between carbohydrates and proteins (Meyer and Rapport, 1951), while heat to 100° C. denatures the proteins. This probably explains why treatment with heat and alkalis does not destroy their ability to immunize guinea-pigs or to release the Schultz-Dale reaction. The fact that such activity persists after ether extraction tends to refute the lipid nature of cancer antigens. The slight improvement in antigenicity resulting from ether extraction is again consistent with a polysaccharide nature, since polysaccharides have a great affinity for lipids.

Moreover, the polysaccharide nature of the antigen explains the greater activity of the supernatant, as compared with the sediment, in releasing the Schultz-Dale reaction. The less soluble and less active components are probably the result of gradual drying of tissues. This, according to Whistler and Smart (1953), occurs when highly hydrated polysaccharide material is air-dried. The gradual removal of water molecules allows neighbouring polysaccharide molecules to come together and establish strong bonds which later restrain the separation of molecules. This reduction in surface area and in the number of active available sites on the polysaccharide molecules could be regarded as a form of polymerization, and would account for the *in vitro* reduction of antigenic activity—that is, its capacity to release the reaction in the Schultz-Dale bath—of the sediment as compared with the supernatant.

These studies also raise the question of the relatively "normal" nature of the healthy colon tissue obtained from the patient Handy, who did have a carcinoma of the colon. Is pathologically "normal" tissue necessarily immunologically "normal"? Is the better control tissue to use in this case "normal" colon from the same patient or from a young healthy accident case?

The above findings indicate the presence of the specific carcinoma polysaccharide-like antigens in these so-called "normal" portions from the carcinoma patients, although to a less extent than in the neighbouring neoplastic tissue. They also indicate that this soluble polysaccharide-like antigen is present not only in the cancerous tissue but also in the blood and other tissues, even those that appear pathologically "normal." This was the reason for the use in later studies of homologous tissues from a healthy individual rather than from the cancer patient himself.

The polysaccharide nature of cancer antigens could easily explain why mast cells and tissue polysaccharides are the predominating elements in the development and growth of connective-tissue tumours as shown by Sylvén (1945), Holmgren and Wohlfart (1947), and Gersh and Catchpole (1949). It could also explain the greatly increased amounts of polysaccharides always found in the serum of cancer patients. Furthermore, it throws new light on the finding of high levels of hyaluronidase inhibitors in the blood of patients with disseminated cancer by Kiriluk *et al.* (1950) and with certain leukaemias and lymphomas by Hentstell and Freedman (1951).

The association of polysaccharides with polypeptides is well known. Morgan (1941) and Partridge and Morgan (1942), for example, were able to make artificial complexes using "polypeptide-like" substances isolated from Shiga, and carbohydrates such as group A substance from commercial pepsin. It was found that these "polypeptide-like" substances appear to have a special power to form antigenic complexes with polysaccharides.

It is our belief that the activity of the polypeptide found by Burrows and Neill (1958) in the serum of cancer patients is due to an associated polysaccharide antigen. The finding by Winzler (1953), referred to by Burrows and Neill, of an increase in polypeptides in the serum in carcinoma, and specifically of mucopolypeptides, strengthens this possibility.

Polysaccharides are less complex to study immunologically than are proteins. This finding, therefore, of the polysaccharide nature of cancer antigens should give us a little more reason for optimism in our attempts to understand the cancer problem and a greater hope of its solution.

These results are preliminary in nature, and work along these lines is being continued at the Muhlenberg Hospital. Further evidence for the polysaccharide nature of cancer antigens, using another immunological technique, will be published elsewhere.

Summary

Substances distinctly polysaccharide-like in nature have been prepared from cancer and normal tissue antigens by two procedures: (1) by precipitation with isopropyl alcohol and deproteinization with chloroform and butyl alcohol (P.L.S.); and (2) by heat and alkali treatment (S.S.).

The specific immunological activity of cancer antigens seems to reside in these polysaccharide-like substances.

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DETECTION OF ANTIGENS IN SERA OF PATIENTS WITH NEOPLASTIC DISEASE BY SCHULTZ-DALE TEST

ITS POSSIBLE USE AS A SCREENING PROCEDURE FOR TUMOURS

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In search of a specific diagnostic serological test in cancer we have looked for a high degree of positive results in known cancer cases and a high degree of negative results in non-cancerous disease. Dunn and Greenhouse (1951) tentatively set limits of 90% accuracy in cases of cancer and 95% accuracy for patients with non-cancerous disease.

Makari (1955) described the use of the Schultz-Dale test for the detection of carcinoma antigen in the serum of patients with carcinoma. It was shown that, when the carcinoma antigen used for immunization of guinea-pigs was the sediment obtained between 3,200 and 4,000 r.p.m., this test would conform to the criteria set up by Dunn and Greenhouse—that is, it was positive in 96.8% of proved carcinoma cases and negative in 95.2% of non-cancerous lesions.

Recently Burrows (1958) was able to confirm our results in a large series of 508 patients, and recorded an accuracy of 96.7% in proved carcinoma cases and of 96.7% in non-cancerous lesions. This establishes the

use of such a procedure as a *diagnostic* test, but the need still remains for a *screening* test which would detect not only carcinomas but other tumours as well. Such a screening test, however, should not be subject to some of the criteria established by Dunn and Greenhouse for a diagnostic test—for example, the requirement that there be not more than 5% of "false-positive tests" (a test which is positive, although the patient does not have a clinically apparent cancer). The principal aim of such a screening test would be the detection of tumours in this preclinical stage. In fact, a good screening test should show more of these so-called "false positives," and, to be a practical test, it should detect not only carcinomas but all tumours.

Working on the hypothesis that the change from a state of carcinogenesis to pre-tumour, tumour, and tumour differentiation is associated with a gradual increase in the size of the antigenic particles (as these particles become incorporated with certain components of the host), and that such a change is accompanied by an increase in specificity, one would expect that, by using antigenic particles smaller than those used in our previous work, components which are less group-specific and which have a wider antigenic spectrum would be found.

In fact, by the use of carcinogens as immunizing antigens to guinea-pigs, it should ultimately be possible to reach the lowest common denominator of all tumours, and to detect in the serum of patients carcinogen-like substances in the early stage of carcinogenesis before clinical cancer develops. In this and in another paper, evidence is presented in support of this hypothesis. The purpose here is to show that, by using for immunization of guinea-pigs antigens with smaller particles than those I previously used, it is possible to detect antigenic components in the serum which are common to patients with various types of neoplastic disease, and to show that such a procedure might be utilized as a screening test for tumours.

Some aspects of immunological relationships between various tumours are also referred to.

Method

The technique employed is essentially the same as that used by Makari (1955), except that an antigenic fraction with smaller particles is used for immunization of guinea-pigs.

A 20% aqueous emulsion of a tumour is made in 0.2N saline solution. The sediment II previously used was obtained by centrifugation at 3,200 r.p.m., equivalent to an R.C.F. of 1.5 kg./g., and recentrifugation at 4,000 r.p.m., equivalent to an R.C.F. of 2.3 kg./g. Sediment III (also used before) was obtained by centrifugation between 4,000 and 10,000 r.p.m., equivalent to an R.C.F. of 10.3 kg./g. In this study a modified sediment III, to be referred to as sediment IIIB, is used. This is the sediment obtained by centrifugation at 3,000 r.p.m., discarding the sediment, and recentrifugation at 10,000 r.p.m.—that is, between 3,000 and 10,000 r.p.m. This sediment (IIIB) is suspended in normal saline solution (to original volume) and is injected subcutaneously with Freund's adjuvants into young virgin female guinea-pigs. These guinea-pigs are sacrificed after one month and used in a Schultz-Dale bath. For passive sensitization, rabbits are similarly immunized but are given a second dose two weeks later. This is followed by a third dose a week afterwards. They are bled 7 to 10 days after the last injection. The rabbit antisera are adsorbed with guinea-pig kidney (to remove Forssman antibody) and are then either injected intravenously or diluted (1 part to 250) with Tyrode's solution, and allowed to come in contact with

a uterine horn from a non-immunized guinea-pig for one hour at 5° C. and with air bubbled into the mixture.

Carcinomas of varying types were used for immunization of guinea-pigs. These were carcinomas of the breast, rectum, colon, and stomach, and squamous carcinomas of lung and oesophagus. Other tumours were also used: fibrosarcoma, melanoma, acute leukaemia, and lymphoma.

One further modification was introduced for the evaluation of these reactions. For a test to be regarded as a true positive, evidence of desensitization was required—that is, it should be possible to obtain decreasing reactions or no reactions at all to the same serum when the uterine horn is washed and re-exposed to it at the same dose level. Those cases which did not fulfil this criterion were included with the questionable group. Uterine horns not adequately sensitized and not reacting with a known positive serum were discarded. Sera added to the horn at the end of the run and not followed by a known positive reaction could not be evaluated and are not included in this series.

For certain studies of antigenic relationships between tumours, two experiments are reported. In one, segments from the ileum of one guinea-pig were used instead of the uterine horns, and Tyrode's solution with full-strength calcium was used instead of the half-strength we use with uterine horns. Passive sensitization *in vitro* was done with antisera from rabbits immunized with various types of tumours. The reactions were triggered by the addition of supernatants—that is, where sediment at 10,000 r.p.m. was removed. In another study the uterine horns from guinea-pig 415 actively immunized against carcinoma of the colon (antigen 70) were used. The two horns from the same guinea-pig were divided into four segments, which were used in separate baths. To release the reactions, various dilutions of carcinoma and sarcoma supernatants were used, one horn receiving carcinoma supernatant, another carcinoma sediment, the third sarcoma supernatant, and the fourth sarcoma sediment. Each horn was then completely desensitized to the antigen added to it, and the releasing antigens were reversed so that sarcoma was added to the horn receiving carcinoma, and vice versa. This experiment was carried out in collaboration with Dr. P. Krag, of the State Serum Institute in Copenhagen, while he was visiting our laboratories.

Results

By the use of a modified Schultz-Dale test for tumour screening—that is, where carcinoma sediment IIIB (between 3,000 and 10,000 r.p.m.) was used as immunizing antigen—the following positive results were obtained in 444 individuals (Table I): 90.2% of 215 proved carcinomas; 62.0%

TABLE I.—Schultz-Dale Reactions in 444 Individuals and in 704 Normal Serum Specimens Using a Modified Test for Tumour Screening with Carcinoma Sediment IIIB as the Immunizing Antigen for Guinea-pigs

Cases Studied	Result of Test			Total
	Negative	Questionable	Positive	
Carcinoma	8 (3.7%)	13 (6.1%)	194 (90.2%)	215
Other malignant tumours	12 (21.8%)	9 (16.2%)	34 (62.0%)	55
Benign tumours	2 (5.8%)	0 (0%)	33 (94.2%)	35
Suspected cancer cases referred to tumour institute, and precancerous lesions	9 (15.2%)	4 (6.9%)	46 (77.9%)	59
Healthy donors	60 (75%)	10 (12.5%)	10 (12.5%)	80
Normal serum specimens from blood bank (other than those above)	568 (80.6%)	37 (6.8%)	99 (12.6%)	704

of 55 proved malignant tumours other than carcinoma; 94.2% of 35 patients with benign tumours; 77.9% of 59 suspected tumours and early pre-cancerous lesions; and 12.5% of 80 blood donors. Similarly, of 704 normal serum specimens from the blood bank (other than the 80 donors reported earlier), 12.6% were positive.

When fibrosarcoma sediment IIIB (between 3,000 and 10,000 r.p.m.) was used as the immunizing antigen the following positive results were obtained in 61 cases: 88% of

TABLE II.—Results in 122 Cases of Proved Cancer

Cases Studied	Antigen Used for Immunization of Guinea-pigs for Schultz-Dale Test							
	Fibrosarcoma Sediment IIIB		Melanoma Sediment IIIB (Amelanotic)		Melanoma 158 Sediment IIIB (Melanotic)		Melanoma 80 Sediment (Melanotic) IIIB	
	Positive	Total	Positive	Total	Positive	Total	Positive	Total
Malignant melanoma	6 (75%)	8	12 (75%)	16	6 (86%)	7	13 (87%)	15
Carcinoma	28 (85%)	33	8 (80%)	10	1	3	0	1
Breast	2	2	1	1				
Cervix	1	1						
Oesophagus	1	1	2	4				
Larynx	1	1	1	1				
Pancreas	1	1						
Parotid	0	1						
Pharynx	1	2						
Prostate	4	5						
Rectum	1	1					0	
Skin	1	1	2	2	1	3	0	1
Stomach	6	6	1	1				
Tongue	2	2	1	1				
? Origin	7	7	1	1				
Sarcoma	15 (88%)	17	4 (80%)	5				
Fibrosarcoma	9	9	2	2				
Lymphosarcoma	2	3	2	2				
Osteogenesis sarcoma	4	5						
Lymphoma-Leukaemia	2 (66%)	3	2 (50%)	4				
Leukaemia			2	3				
Lymphoma	2	2						
Hodgkin's	0	1	0	1				
Total	51 (83.6%)	61	26 (74.3%)	35	7 (70%)	10	13 (81.3%)	16

TABLE III.—Antigenicity of Tumours as Shown by the Schultz-Dale Test

Releasing Antigens* (Supernatant) Used	Antibodies Fixed to Ileal Segments from Rabbit Antisera Diluted to 1:250 Against								Mean Cont. Index for Supernatant
	Ca. Lung (Ag. 87) Rab. 417	Ca. Parotid (Ag. 140) Pool 15	Lymph. Mel. (Ag. 152) Pool 10	Ca. Breast (Ag. 176) Pool 17	F.S. (Ag. 14) Rab. 410	L.S. (Ag. 165) Pool 11	Lymph. (Ag. 81) Rab. 412	Ca. Liver (Breast) Ag. 51 Pool 8	
F.S. 2 Ag. 217	0	0	0	0	0	0	(0.08) 2	0	0.01
Adenocarc. liver from rectum Ag. 203	0	0	0	0	(0.08) 1	0	(0.20) 1*	(0.28) 2*	0.070
L.S. Ag. 65	0	(0.08) 1	0	(0.08) 1*	(0.11) 1	(0.16) 2	(0.16) 1	0	0.072
Mel. Ag. 192	0	0	0	0	(0.18) 1	(0.06) 1	(0.20) 1*	(0.23) 2	0.08
Mel. Ag. 152	(0.16) 1	(0.11) 1	(0.30) 1	(0.08) 1	0	(0.22) 1	0	(0.41) 1	0.16
Ca. oesoph. Ag. 220	(0.16) 1*	(0.20) 1*	(0.30) 1*	(0.44) 1*	(0.40) 1*	(0.37) 1*	(0.80) 1*	(0.90) 1*	0.44
Ca. lung Ag. 233	(0.22) 1*	(0.32) 1*	(0.35) 1*	(0.60) 1*	(0.36) 1*	(0.56) 1*	(1.04)	(1.14) 1*	0.57
	0	0	0	0	0	0	(0.70)	(1.0) 1*	
Mean C.I.—Sed.	0.08	0.10	0.13	0.17	0.18	0.196	0.34	0.42	

Antigens for rabbits with the exception of Ag. 51 are made up of sediment III B. Ag. 51 has in addition sediment at 3,000 r.p.m. included. Figures in parentheses represent contraction indices (ratio of specific contraction to histamine contraction). Figures 1 and 2 outside parentheses indicate whether contraction occurred in the first or second half of the run. * Strong maintained reaction. † Desensitization with normal serum and normal tissue antigens was done before the addition of cancer antigens, but is not reported in this table.

17 sarcomas, 85% of 33 carcinomas, and 75% of 8 melanomas. Two cases of lymphoma were positive, but one case of Hodgkin's disease was negative (see Table II). When three melanoma sediments IIIB (between 3,000 and 10,000 r.p.m.) were similarly used as immunizing antigens, the following results were obtained in 61 cases: 75% of 16 cases of melanoma were positive with the amelanotic Ag., 86% of 7 cases of melanoma with melanotic Ag. 158, and 87% of 15 cases of melanoma with melanotic Ag. 80. Eight out of 10 cases of carcinoma were positive and four out of five cases of sarcoma were positive. Two out of three cases of leukaemia were positive, but one case of Hodgkin's disease was negative. In other studies Hodgkin's disease was shown to have common antigenicity with leukaemia. The overall percentages of positive reactions were as follows: 89% of 262 carcinomas, 73% of 130 malignant tumours other than carcinomas, 94.2% of 35 benign tumours, 77.9% of 59 cases with pre-cancerous lesions and suspected tumours, 12.5% of 80 healthy donors, and 12.6% of 704 serum specimens from the blood bank.

Some studies on antigenic relationships among tumours are shown in Tables III and IV. The results indicate a spectrum of common antigenicity which is narrowest in carcinoma of the breast and widest in lymphoma (see Table III). Results of the second experiment (shown in Table IV) demonstrate some antigenic relationships between carcinoma of the colon and sarcoma. It was found that the supernatants gave a reaction in a higher dilution than the sediment. Furthermore, desensitization was easier to perform with the sediment than with the supernatant. Desensitiza-

TABLE IV.—Cumulative Additions of Increasing Concentrations of Antigen 61 to Segments of Horns from Guinea-pig 415 Sensitized Actively to Carcinoma of Colon (Ag. 70)

Reaction Released by 1 ml. Dilutions	Ca. Super- natant (10,000 r.p.m.)	Sa. Super- natant (10,000 r.p.m.)	Ca. Sed. IIIB	Sa. Sed. IIIB
1/64	0	(6) 1	0	0
+1/32	(7) 1	(9) 1	0	0
+1/16	(10) 1	(12) 1	0	0
+1/8	(43) 1*	(17) 1	0	0
+1/4		(26) 1*	(10) 1	(46) 2*
+1/2			(58) 1*	(8) 2*
1/2	0	(5) 1	(2) 2	0
	Sa. Supt.	Ca. Supt.	Sa. Sed.	Ca. Sed.
1/2	0	(32) 1*	0	(49) 1*
1/2		(12) 1		0
Histamine (10r.)	(47) 1*	(34) 1*	(59) 1*	(51) 1*

Complete desensitization to normal serum and normal tissue antigens was done before addition of cancer antigens. Figures in parentheses indicate height of contraction of uterine horn. Figures 1 and 2 outside parentheses indicate time of contraction whether in the first or second half of the run. Asterisk indicates a strong maintained contraction.

tion to carcinoma reaction prevented the appearance of a sarcoma reaction, while desensitization to sarcoma allowed the later appearance of a carcinoma reaction.

Discussion

It is apparent that by the proper choice of the immunizing antigen one can utilize the Schultz-Dale test both as a type-specific diagnostic serological test for carcinoma, or also, as shown in these studies, as a serological screening

test for all kinds of tumours. The finding that benign tumours and pre-cancerous lesions (such as hyperkeratosis, hyperplasias, etc.) give as high a percentage as malignant tumours indicates the further usefulness of this procedure as an early screening test for tumours.

A negative test would mean that the presence of a tumour is unlikely, while a positive test is a signal indicating the presence of a benign or malignant growth, or even a pre-cancerous lesion which should be further investigated. Therefore the significance of such a test from the point of view of early detection is much greater than the test we described earlier, but is less useful for establishing a definite diagnosis. It is of interest to note that malignant tumours other than carcinoma gave fewer positive results than benign tumours, including even early hyperplasias or suspected tumours. This finding by itself suggests the usefulness of such a test for early detection of tumours and for screening purposes.

It is of interest to note that, although this screening procedure detects common antigens in various tumours, it still detects its own type of tumour to a greater extent—that is, type-specificity is not completely lost. Thus when sarcoma sediment IIIB is used, the highest percentage of positives (88%) is still in sarcomas as compared with carcinomas and melanomas. When melanoma sediment IIIB is used (from melanoma 158 and 80), 86% and 87% positive results are obtained with melanomas. The persistence of type specificity is due in part to the inclusion of cancer-specific antigens sedimented at 3,200 to 4,000 r.p.m.—that is, sediment IIIB from carcinoma, sarcoma, and melanoma, this test could possibly detect all these tumours equally well and to a greater degree of accuracy than 90%.

It also seems feasible that by further fractionation of sediment IIIB one could hope to obtain a fraction which would distinguish malignant tumours from benign tumours. This, too, would be of great clinical usefulness. Sediment IIIB from an amelanotic melanoma with metastasis to the omentum was an exception; with this antigen both carcinomas and sarcomas were detected to a greater extent (80%) than were melanomas (75%). Could this observed difference in antigenic specificity be related to metastasis?

Studies with polysaccharide-like sensitizing substances (S.S.)—prepared from carcinoma sediments IIIB and used for immunization of guinea-pigs—show a broad antigenicity similar to that of its parent antigen. For example, a polysaccharide-like S.S. prepared from adenocarcinoma of the colon (sediment IIIB) shows common antigenicity with adenocarcinomas of the colon, breast, lung, and stomach, squamous carcinomas, melanomas, and fibrosarcoma. These studies are reported in the accompanying article (Makari, 1958).

The study of antigenic relationships between tumours is very fascinating but is still in its infancy. Two examples are given here to show how the Schultz-Dale test could be most helpful in such studies. In the guinea-pig immunized with carcinoma of the colon sediment IIIB (see Table IV) it was found that desensitization to carcinoma antigen prevented the sarcoma reaction, but that desensitization to sarcoma antigen allowed the later appearance of carcinoma reaction. We may assume that the two antigens have components in common, and that the horns immunized actively with carcinoma also contained, besides this antibody in common with sarcoma, another antibody or group of antibodies reacting only with carcinoma antigens.

In the second example (Table III) a few observations are of interest. Listing the tumours studied in order of their immunizing capacity, we find the spectrum of antigenic composition increasing in the following order: melanoma, carcinoma of the breast, carcinoma of the lung, squamous-cell carcinoma of the mouth, lymphosarcoma, fibrosarcoma, and, finally, recurrent lymphoma. If the supernatants are studied for antigenicity, however, we see a reversal of the order shown above, with the antigenic spectrum widening as

we go from fibrosarcoma to lymphosarcoma and then to carcinoma of the lung and oesophagus. Melanoma of the skin is an exception. The sediment from carcinoma of the liver (secondary from breast) was prepared differently from the others by including the sediment at 3,000 r.p.m. to that at 10,000 r.p.m. It is surprising, however, that, despite this addition, there seems to be some loss of antigenicity of the sediment as compared with the other carcinomas tested. Again one wonders whether this difference may be due to the fact that the carcinoma of the liver is a metastatic lesion compared with carcinoma of the lung and carcinoma of the oesophagus, which are primary.

One more question: What should be the management of an individual with a positive tumour-screening test with no localizing symptoms or signs and in whom a thorough check-up is negative? One could still follow a "wait and see" policy and keep such a person under strict surveillance until the first signs and symptoms appear. This would necessarily mean a loss of both precious time and an excellent opportunity for cure. There is, in my opinion, another alternative—namely, the detection of circulating antigens from tumour-damaged organs by use of the Schultz-Dale test.

In preliminary experiments we have found it possible to detect liver antigen, kidney antigen, etc., in the serum by the use of normal liver and kidney antigen for immunization of guinea-pigs. On finding evidence of circulating kidney antigen—for example, in conjunction with a positive tumour-screening test or a positive diagnostic test—it becomes possible to diagnose not only the presence of a tumour and its type but also its location. In this way, despite the limitations of our present surgical techniques, operative intervention at such an early phase would result in much better chances of a cure.

Summary

The Schultz-Dale test described earlier (Makari, 1955) has been modified by immunizing guinea-pigs with carcinoma sediment obtained between 3,000 and 10,000 r.p.m. instead of 3,200 to 4,000 r.p.m. This modification has been studied in 566 individuals and 704 serum specimens obtained from blood-bank sera.

89% of 262 carcinomas, 73% of 130 malignant tumours other than carcinoma, and 94.2% of 35 benign tumours were accurately diagnosed. 77.9% of 59 pre-cancerous lesions and suspected tumour cases were positive, while only 12.5% of 80 healthy donors and 12.6% of 704 serum specimens obtained from the blood bank were positive.

This modification can be useful as a tumour-screening procedure, while the original method described by Makari and confirmed by Burrows would serve as a specific diagnostic test for carcinoma.

Some antigenic relationships between various tumours are also discussed.

I thank Dr. Peter Krag, of the State Serum Institute, Copenhagen, for his collaboration in the experiment shown in Table IV, and Mr. H. D. Hamilton, of the Muhlenberg Hospital, for his help in editing the manuscript. This work was done at the University of Texas.

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The Residential Care of Disturbed Children contains the introductory papers read at this year's annual conference for staffs of child guidance clinics sponsored by the National Association for Mental Health. The booklet is obtainable from the association at 39, Queen Anne Street, London, W.1. (43 pp.; 3s. 6d.)

COMPLICATIONS OF CANDIDA ALBICANS INFECTION IN INFANCY

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Thrush was first described in 1764 by Rosén von Rosenstein, who mentions a disease of the mouth, more severe if it spreads into the lungs. Thrush infections were later described by Langenbeck in 1839, Berg (1841), and Robin (1853). Robin called the organism *Oidium albicans*, and in 1890 Zopf renamed it *Monilia albicans*. From then until the present time the organism, now known as *Candida albicans*, has been adjudged to be responsible for disease in man. During recent years, since the discovery of broad-spectrum antibiotics, increased interest has been paid to the severe effects which may be produced. In infancy, thrush has long been known as a common disease occurring especially in sickly and undersized children. The majority of cases present an oral disease of varying severity, but many reports have been written of far more serious consequences of invasion by the fungus. These usually involve local spread to the gastro-intestinal or respiratory systems, but monilial septicaemia with metastatic disease is also described.

The purpose of this paper is to present four cases of thrush oesophagitis and to review previous writings on the complications and treatment of *Candida albicans* infections. Three of the cases present a very definite syndrome which is due to thrush, though the oesophagitis cannot be proved with certainty, and the fourth is a fatal case of thrush oesophagitis proved at necropsy.

Case 1

A male infant aged 26 days was admitted to hospital on November 10, 1956, with a history of cyanotic attacks and difficult breathing for five days. He had a full-term normal delivery but difficulty in sucking from birth. On the day of admission severe thrush was noted.

On admission he was a well-nourished infant weighing 7 lb. 2 oz. (3.2 kg.). He was very dyspnoeic (rate 60 a minute), was cyanosed, and had marked stridor and intercostal recession. His temperature was 98.4° F. (36.9° C.). There were rhonchi throughout both lung fields. He had a grade III systolic murmur in the fourth left interspace suggestive of a ventricular septal defect, but no signs of congestive cardiac failure.

He was nursed in an oxygen tent moistened with "alev-aire" and given penicillin, 250,000 units six-hourly, streptomycin, 75 mg. twice daily, nystatin, 100,000 units six-hourly, and 0.5 ml. injections of vitamin B complex on alternate days. He was offered feeds of expressed breast milk.

X-ray examination of the chest (Fig. 1) revealed bilateral bronchopneumonia. A blood count showed a haemoglobin of 15.3 g. per 100 ml. and 11,700 white cells (polymorphs 47.5%, monocytes 0.5%, lymphocytes 51%, eosinophils 1%). An oral swab grew candida.

For a few days the child improved generally, though the thrush remained obvious. He then deteriorated rapidly, was cyanosed outside the oxygen tent, and had very pronounced blue attacks, mainly during feeding.

A "lipiodol" swallow examination on November 21 (Fig. 2) showed pooling of the oil in the pharynx with spill-over into the lungs. An aspiration pneumonia affected the major

portion of the right lung and the mid-portion of the left. It was then decided to take him off all oral feeds and medicines and to give him an intravenous drip. This treatment was continued for 10 days—the fluid containing appropriate electrolytes and vitamins, and plasma was given daily. His condition improved, his colour became pink, and all chest signs disappeared. On one occasion—three days after this treatment was started—he was fed and became extremely cyanosed. On November 30 a repeat lipiodol swallow (Fig. 3) showed easy passage from pharynx to oesophagus with no spill-over. The lung fields had almost cleared.

From December 1 slow oral feeding was resumed and he made an uninterrupted recovery (Fig. 4).

Case 2

A male infant aged 15 days was admitted to hospital on March 17, 1956. He had been quite well until he was 8 days old, when he developed thrush. This became worse in spite of treatment, and for a few days before admission he had been breathless and had vomited some of his feeds.



FIG. 1.—Case 1. Chest radiograph before treatment.

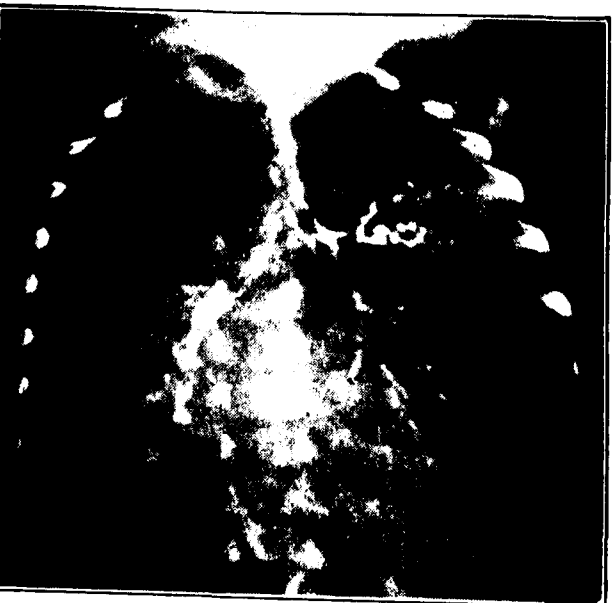


FIG. 2.—Case 1. Radiograph of lipiodol swallow before treatment.

On examination he was apyrexial but extremely ill, cyanosed, and dyspnoeic, and frothy mucus was bubbling from his mouth. His mouth was swollen and showed severe thrush with some ulceration. Chest examination revealed recession, and on auscultation rales and rhonchi were heard throughout both lung fields. On attempting to swallow he became very blue and regurgitated most of what was taken. A lipiodol-swallow examination showed a spill-over into the trachea and that some of the oil would not enter the stomach through the cardiac sphincter. This was thought to be due to reflex cardiospasm due to oesophagitis. Treatment was instituted immediately; oral feeding was entirely stopped and intravenous drip, penicillin, streptomycin, and nystatin (100,000 units, four-hourly) were given.

Two days later the child was a little better but still extremely ill, and hydroxystilbamidine, 10 mg. intravenously daily, was started. On March 24 oral feeding was again

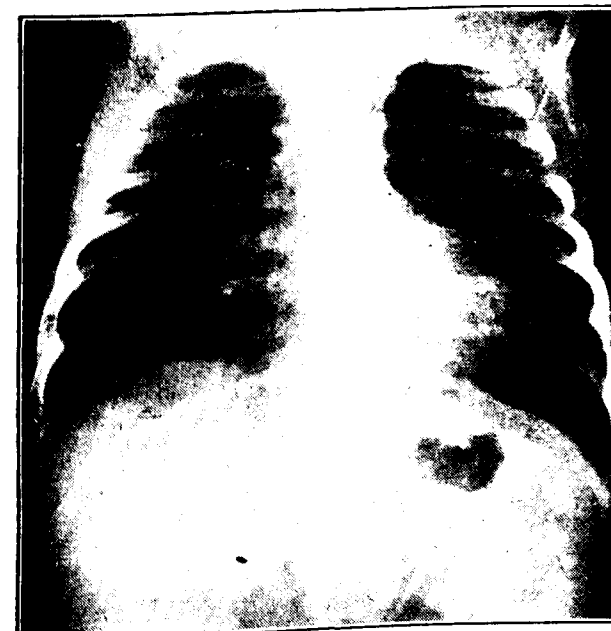


FIG. 3.—Case 1. Chest radiograph after treatment.



FIG. 4.—Case 1. Radiograph of lipiodol swallow after treatment.

tried, but there was immediate deterioration. X-ray examination at this stage (Fig. 5) showed a right basal pneumonia. Intravenous therapy was again started, though small oral feeds were continued. The condition improved very gradually. On April 8 lipiodol-swallow examination was repeated, and on this occasion the oil passed rapidly from mouth to stomach without spill-over or hold-up.

The patient was discharged well on May 5.

Case 3

A female patient aged 5 weeks was admitted to hospital on January 7, 1954. She had a normal history until 3 weeks of age, when she developed thrush of the mouth, which was treated daily with 1% gentian violet without improvement, and then unsuccessfully with chlortetracycline. She had been very difficult about taking feeds throughout this period. For one day she had had a cough.

On admission her temperature was 101° F. (38.3° C.), but she appeared to be fairly well. She was not cyanosed or dyspnoeic, but she dribbled continually from her mouth. Her chest was clinically quite clear. There was very marked thrush of the mouth. She was treated with penicillin, "bejectal," and local gentian violet. Two days later the mouth was worse and local chlortetracycline was tried. The mouth remained unhealthy, and on January 15 signs of severe pneumonia were present clinically and were con-

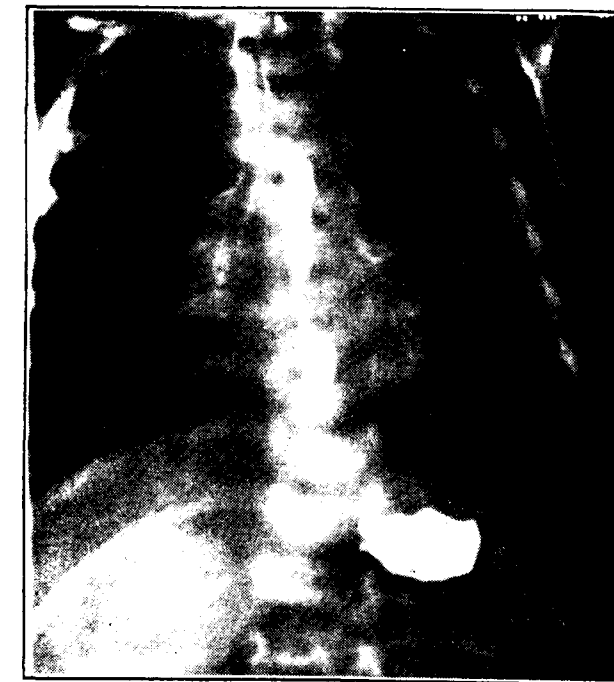


FIG. 5.—Case 2. Radiograph taken during treatment.

firmed by x-ray examination (Fig. 6). The plates were reported as being unlike moniliasis of the lungs. Following this, her condition deteriorated rapidly in spite of oxytetracycline and chloramphenicol. It was noted that feeding caused marked distress and cyanosis. She died on April 22. Unfortunately necropsy was refused.

Case 4

A male infant aged 9 months was admitted to hospital on April 21, 1952. His history was of a normal child until four days before admission, when he developed vomiting and an acute diarrhoea. These symptoms were not improving, so he was brought to hospital. On examination his temperature was 102° F. (38.9° C.); he was dehydrated and showed signs of malnutrition. His weight was 12½ lb. (5.7 kg.). Other positive signs found were severe thrush of the

mouth and pharynx and rhonchi throughout the lungs. Both the liver and the spleen were just palpable.

He was given intravenous fluids, intramuscular penicillin and streptomycin, and gentian violet was used locally. Oral feeding of skimmed milk and water was begun after 24 hours. Initially he improved on treatment, but the thrush never cleared. On April 30 he was noticed to be jaundiced, rather chesty, and cyanosed, and his chest was full of rales. His temperature rose to 103° F. (39.4° C.). After this his condition rapidly worsened, and he died two days later.

Necropsy showed a dehydrated child, with marked thrush of mouth and pharynx. The lungs showed basal congestion. The oesophagus was thickened and the surface covered with thick white granular membrane which stopped short at the entrance to the stomach. Histology of the oesophagus showed acute inflammatory changes with exudation and superficial necrosis, and on Gram's stain the presence of *C. albicans*.

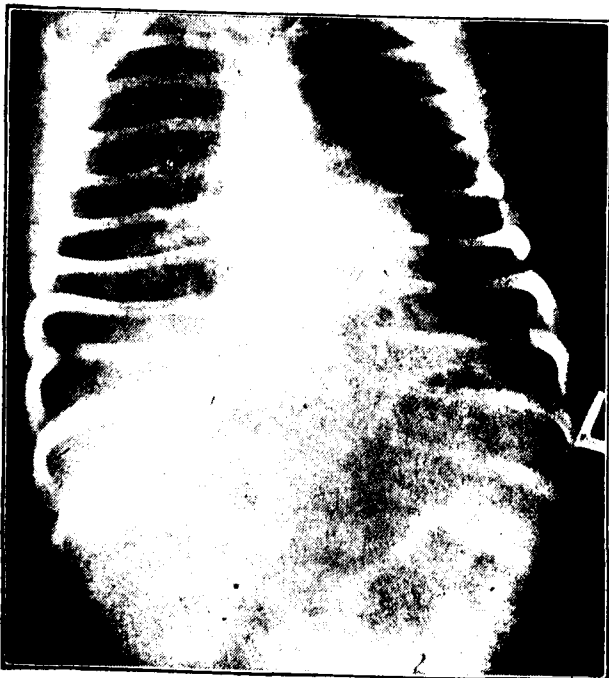


FIG. 6.—Case 3. Radiograph of chest.

Aetiology and Frequency of Moniliasis

C. albicans may be found in the normal mouth flora, especially in older children and adults. In the newborn and infants, where the oral pH is high, it is usually introduced from the exterior and causes disease. There is an increased incidence in children of mothers suffering from vaginal moniliasis. This has been observed many times, and one experiment was done to prove that vaginal thrush could be introduced into the mouth of the newborn, producing disease (Hesseltine *et al.*, 1934). Some nurseries have reported an incidence of infection as high as 18.2%. Apart from vaginal thrush as a cause, many cases must be produced by direct spread due to nurses' fingers, bottle teats, dummies, etc. Any trauma to the oral mucosa will increase the likelihood of infection. Airborne infection seems to play no part in the spread.

In any age group the use of broad-spectrum antibiotics has increased the incidence of moniliasis.

Complications of Moniliasis

Oral thrush, which in itself can be a severe disease interfering seriously with nutrition, can spread to cause three types of disease: (1) spread into the gastro-intestinal tract, especially the oesophagus; (2) spread into the lungs; and (3) systemic spread.

Gastro-intestinal Spread

As gastro-intestinal spread is the main topic of this paper it is dealt with in more detail than the other complications, especially as regards oesophagitis. The diagnosis of oesophagitis in Cases 1-3 cannot be proved. However, the syndrome which they represent is a definite one whether it be due to actual spread to the oesophagus, as some authorities have felt, or to an incoordination of swallowing due to thrush of the posterior pharynx, either leading to inhalation of food and aspiration bronchopneumonia. This syndrome may be described as one in which a baby with oral thrush becomes very toxic and sometimes dehydrated, has difficulty in swallowing, and during feeds is noted to choke and become cyanosed. Within a short period a severe bronchopneumonia develops, and without active treatment death may easily follow, as happened in Case 3. To substantiate the diagnosis x-ray films of the chest will show marked bronchopneumonia, and lipiodol swallow an incoordination of swallowing either at the upper (Case 1) or at the lower (Case 2) end of the oesophagus. Culture of the oral flora can show that *C. albicans* is present, but not at what level of the gastro-intestinal tract. Some authors working on adults with similar clinical pictures have performed oesophagoscopies on their cases, and shown that the oesophagus is involved in a disease similar to that in the mouth (Stenderup *et al.*, 1956). Such an investigation was not thought safe in these very ill babies.

In the literature this syndrome is well described. Ebbs (1938) performed necropsies on 28 infants under 10 months of age, the average being 4 months, all of whom had died of oesophagitis: 22 had thrush oesophagitis. The clinical picture in these children was very similar to that described above. Reye (1941) found that of 150 necropsies 10 showed oesophagitis, which was the cause of death in seven and in five was due to thrush. Henderson (1943) reviewed 163 cases of thrush during a three-year period, and 13 of these had oesophagitis and seven died from its effects. Adams (1944) described five fatal cases of thrush pneumonia in infants with a similar clinical picture. Lederer and Todd (1949) did routine necropsies on 28 infants under 4 weeks and on 176 under 1 year of age. In seven of the former and 19 of the latter moniliasis was thought to have caused death. Clinically a syndrome of vomiting and dehydration with aspiration of vomit and septicaemia is described. Six patients died suddenly from blocking of the respiratory passages.

Wolff *et al.* (1955) describe two cases identical with our Cases 1-3. Both responded well to similar treatment. Andrén and Theander (1956) and Geiger *et al.* (1946), writing on two adults, mention typical x-ray changes of oesophageal moniliasis. Both had been on long courses of antibiotics and were x-rayed because they had oral thrush with dysphagia. The entire thoracic oesophagus was irregular and ragged, and was made up of numerous small indentations and protrusions. Longitudinal folds were discernible and the lumen became distended on passage of a large bolus. Stenderup *et al.* (1956) had three adult patients with thrush, and in two oesophagoscopies showed thick coating of the oesophagus with monilia-like lesions.

Two authors mention intestinal moniliasis. MacGregor and Henderson (1943) examined two children found dead at home in whom marked intestinal thrush was present, and Zimmerman (1950) quotes a personal communication from Dr. Sydney Farber of five cases of disseminated moniliasis in childhood in which the primary site was the oesophagus or the intestines.

Thrush oesophagitis is a reasonably common disease, and, though for many years it was thought to be diagnosable only at necropsy, there is no doubt that it can be diagnosed and treated during life.

Broncho-pulmonary Moniliasis

Much controversy has arisen whether primary moniliasis of the lungs exists or not. From the first mention of the

condition by Castellani in 1905 until now, many authors have published reports of cases. Many, however, feel that there is no such disease and that where moniliasis is found in the lungs it is a secondary infection. Actual proof of moniliasis is made difficult by two factors—that it is hard to prove that a positive candida culture comes from the lungs when oral moniliasis is present, and that after death moniliasis is a common secondary infection of tissues. There is no doubt, however, that at any age oral thrush can be complicated by pneumonia, which is not always due to inhalation. Some cases—for example, that described by Beckmann *et al.* (1955) with prompt response to nystatin, and the fatal case described by Falkner and Wising (1955)—are very convincing cases of primary broncho-pulmonary thrush. Sahni (1957) describes a case without primary lung disease in which the patient responded adequately to treatment with potassium iodide and nystatin. It seems that pulmonary moniliasis must be regarded as a serious complication of the oral disease.

Systemic Moniliasis

A number of cases have been described of septicaemic spread of candida infection, with widespread lesions developing. References to the following cases were found:

Two patients with monilia meningitis, one of whom was found to be quite well after a four-year follow-up (Fine *et al.*, 1955; Carnu and Charanis, 1954).

A patient who died of thrush and was found at necropsy to have a perinephric abscess, thrombosis of the inferior vena cava, and bronchopneumonia, all growing pure *C. albicans* (Brown *et al.*, 1953).

A patient who at necropsy had multiple abscess of the brain, myocardium, and kidneys due to monilia (Brown *et al.*, 1953).

Two further cases quoted by Brown *et al.* were found at necropsy to have monilial abscesses of myocardium, kidneys, and lungs. Blood culture grew *C. albicans* in one case and *C. tropicalis* in the other. Both cases had had long courses of broad-spectrum antibiotics.

Zimmerman (1950) quotes the case of a patient who died of mycotic endocarditis, and mentions a personal communication from Dr. Sydney Farber quoting five cases of disseminated moniliasis in children being treated with various chemotherapeutics, and at necropsy there were widespread fungus lesions. The primary site in all was the oesophagus or intestines.

Geiger *et al.* (1946) quote another fatal case of *C. albicans* endocarditis.

Although these are not a vast number of cases, they do present a frightening aspect of the possible outcome of thrush.

Pathology

Case 4 illustrates the pathology of thrush oesophagitis. The organism grows as patches of greyish-white membrane on the mucous surfaces, this membrane consisting of a tangled growth of Gram-positive hyphae with spores produced at the junctions of the segments. Permeation and destruction of the epithelium occur and often there is secondary bacterial growth. The oesophagus is either primarily involved or involved through secondary extrusion from a contiguous lesion. There may be either superficial erosion or actual pseudomembrane formation with mycelial threads found in the tissue sections.

Treatment of Moniliasis

In the majority of simple cases of not very ill children with oral thrush local measures will suffice. These consist of gentle handling so as not to traumatize the mucosa, and swabbing with at most three daily applications of 1% gentian violet solution. If this is ineffective, and in more severe cases, drug therapy should be started. The possibilities in this direction are:

Nystatin, an antifungal agent derived from cultures of *Streptomyces noursei*, in doses varying from 50,000 units four times daily in the newborn to 500,000 units in adults, has proved a very powerful antimonilial weapon. It has eliminated or reduced

the number of candida organisms in the stools of 25 adult patients in 48 to 72 hours (Sternberg *et al.*, 1953-4). It is poorly absorbed from the gastro-intestinal tract and is mainly of use locally. There are few or no toxic effects.

Hydroxystilbamidine, which is one of the aromatic diamidine compounds and has been used in various mycotic infections, was found useful by Wolff *et al.* (1955) in two cases of thrush oesophagitis. The dosage suggested is 5 mg. per kg. given 12-hourly for four to six days. Toxic effects, such as trigeminal neuralgia and renal damage, which are common with stilbamidine therapy, have not been reported. There is a marked tendency to thrombophlebitis of the veins used for the intravenous injection, and there are reports of weakness and even circulatory collapse following the injection. In a series of three cases in adults pentamidine was found very effective (Sutcliffe *et al.*, 1954).

Brilliant green has been successfully used locally, intravenously, and by aerosol in cases of pneumonia. The suggested dosage for intravenous use is 0.16 to 0.5 mg. per kg. daily, and by aerosol 2 ml. of 0.1 to 0.2% solution in 50% propylene glycol by oxygen inhalation.

Potassium iodide has been effectively used in many cases, but largely in conjunction with other drugs.

"Paraben" (parahydroxybenzoic acid) has been used experimentally in moniliasis caused by chlortetracycline and found to be effective. So far it has not been found useful therapeutically, but it may be in the future. It is a substance used to prevent fungus growth in foods.

Recently other chemotherapy has been successful in some cases. (a) 1,2,3,4-Tetrahydrofluorenon (T.H.F.) was tried with excellent results in a child with lung thrush following a skin infection (Lindquist, 1957). He reports a series of 30 cases treated by A. Frisk with favourable results in 50%. (b) 2,2-Dihydroxy-5,5-dichlorodiphenylsulphide has been used systemically with success in one case. It was previously used only locally (Richter, 1950). (c) Sodium caprylate has been used in two cases (Keeney, 1946).

Additional and supportive therapy varies according to the complication present. Difficulties of feeding are obvious in cases of oral thrush, as is the need for oxygen in pneumonia. The vital stopping of all oral feeding in cases such as those described here must be borne in mind and instituted before fatal inhalation pneumonia occurs. Intravenous therapy must be continued until a lipiodol-swallow examination shows the baby is able to swallow properly.

Summary and Conclusion

Four cases of thrush oesophagitis are described; two patients survived and two died. An attempt is made to describe the clinical syndrome related to this complication of thrush and how it should be treated. There is a review of cases described with one or more of the complications of oral thrush and their outcome. The possible therapy and the pathology of the condition are outlined.

Whilst oral thrush is an extremely common condition in newborn and infants' wards, the severer complications are not so well known, and as therapy may be life-saving, especially in cases of oesophageal spread, an attempt is made to review some of these complications. Thrush oesophagitis, or a syndrome as cited to it, is fairly common, and often fatal if unrecognized or incorrectly treated. The entity of monilia bronchopneumonia definitely exists, whether as a primary or a secondary disease. Rarer complications, especially monilial septicaemia, are worth remembering, though they are mainly diagnosed at necropsy.

One feels that no case of oral thrush should be regarded light-heartedly until all traces of the disease have cleared up and one is certain no complications have developed.

We thank Dr. Seymour Heymann, head of the department of paediatrics, for his permission to publish these cases, and Dr. S. Javett, Dr. J. Parnell, and Dr. H. Falcke, who were the physicians

ber 28:—Morphine, 50 mg. q.i.d.; amiphenazole, 20, 100, 100, 10 mg. Brighter, no longer drowsy, and able to converse with visitors and read easily. November 30:—At this point amiphenazole was discontinued and he became drowsy again and unable to stay awake for visitors or to read. December 3:—Restored to amiphenazole, 40, 120, 120, 10 mg., and again became bright. This patient's level of alertness could be altered at will by altering the dose of amiphenazole which accompanied his morphine.

Case 8.—Married woman aged 56. This patient had risen slowly to a dose of morphine, 110 mg. q.i.d., with amiphenazole, 40, 40, 20, 20 mg. She was taken off amiphenazole; after 10 days on this dosage of morphine alone, she appeared normal except for slight nausea and tremor. However, further questioning and administration of the Wechsler memory scale showed gross confusion and disorientation of a type typical of a brain lesion or toxic psychosis. She was incapable of performing any task properly. She was given amiphenazole, 60, 60, 40, 40 mg., and over a week she recovered until she became indistinguishable from a normal person. Her Wechsler memory scale corrected score rose from 66 to 98 over that week. It was thought unethical to repeat withdrawal of amiphenazole. This patient has continued medication with morphine and amiphenazole until the time of writing (May, 1958), and at no time has there been a recurrence of an episode similar to that when taken off amiphenazole.

Case 9.—Married woman aged 55. For some weeks this patient was maintained successfully on morphine, 15 mg. q.i.d., with amiphenazole, 50 mg. q.i.d. The patient's liver became enlarged and jaundice appeared, soon after which there was a sudden onset of drowsiness. Amiphenazole was increased from 100 mg. to 150 mg. to 200 mg. q.i.d. with no effect. Respirations dropped to 6 a minute. Death occurred one week after the onset of the drowsiness. At necropsy the liver weighed 2,800 g. and showed almost complete replacement by growth.

Case 10.—Man aged 60. For some weeks maintained successfully on morphine, 15 mg. q.i.d., with amiphenazole, 80 mg. q.i.d. A sudden onset of drowsiness coincided with a very tender enlarging liver. Morphine was discontinued except occasionally at night, but amiphenazole continued. No improvement occurred and the liver continued to enlarge. Death occurred just under one week after the onset of drowsiness. At necropsy the liver weighed 2,150 g. and showed diffuse nodular secondaries.

Up to date, five cases which closely follow the pattern of Cases 9 and 10 have been observed. In the latter cases, after the enlargement of the liver the onset of drowsiness could be predicted in each case, and this was not controlled by an increase in the amiphenazole dosage.

Discussion

The 10 case histories given are illustrative of the results which have been obtained with 500 patients over a period of four years. The following points can be made with a considerable degree of certainty.

In the presence of amiphenazole: (a) Morphine may be given in large doses (200 mg. q.i.d.) without any risk to the patient, provided the usual small doses are given at first. The dosage can be increased rapidly over a few days. (b) Drowsiness does not develop unless there is gross liver damage. The degree of alertness of the patient can be controlled by varying the dose of amiphenazole. (c) Addiction to morphine does not develop. This can be stated for the following reasons: (1) euphoria is absent, (2) no patient has ever expressed a craving, and (3) in at least four cases in which morphine (over 65 mg. q.i.d.) has been given for months there were no withdrawal symptoms on abrupt cessation of morphine administration. (d) Complete analgesia for 24 hours in the day can be obtained. The psychological value of the patient's never experiencing pain cannot be stressed too much. (e) It is necessary to reduce the dose of amiphenazole at night, otherwise the patient will complain of insomnia. (f) In certain cases, where the patient

becomes aware of the hopelessness of his condition and when the downhill progress is rapid, it is necessary to omit the amiphenazole.

The mechanism of the combined role of morphine and amiphenazole is still unknown. A tentative hypothesis is that morphine and amiphenazole combine, probably in the liver, to form a non-narcotic analgesic substance. The evidence for this is that (1) the beneficial effect of the addition of amiphenazole to a drowsy patient already receiving morphine usually takes several hours to become apparent—for example, amiphenazole has only limited value in controlling the respiratory depression and vomiting induced by single doses of morphine (Christie *et al.*, 1958); (2) patients with liver damage do not derive benefit from amiphenazole; (3) patients suddenly deprived of morphine do not show withdrawal symptoms—that is, they are not really deprived of morphine but of the new compound (morphine and amiphenazole), and this deprivation does not lead to withdrawal symptoms; and (4) a similar suggestion would explain the lack of addiction.

This hypothesis, if correct, would indicate the method to be employed in the post-operative use of morphine and amiphenazole. About two days before the operation several small doses of morphine and amiphenazole should be given. Then immediately in the post-operative period the dose of morphine (with amiphenazole) could be increased to the desired degree to produce complete analgesia for intervals of six to eight hours as long as the pain continues (see Weber, 1958).

It should be particularly noted that the doses of amiphenazole used at present are much greater than those previously recommended. As much as 200 mg. may be given t.i.d. or q.i.d., either orally or intramuscularly.

More recently (Gershon *et al.*, unpublished) it has been shown that large doses of amiphenazole (up to 200 mg. a day) will relieve mild depressive states. This action would offer another explanation for the anti-narcotic effect of amiphenazole.

Summary

The beneficial effect of amiphenazole in preventing drowsiness or narcosis when large doses of morphine are administered in intractable pain of terminal carcinoma has been confirmed.

Addiction does not develop, so that the morphine may be withdrawn at any time without the production of withdrawal symptoms.

Case histories supporting the above conclusions are presented.

A tentative hypothesis for the mode of action of amiphenazole is advanced.

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PETROL-VAPOUR POISONING

BY

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In view of the widespread use of petrol it is surprising that deaths from inhaling the fumes are so rare. Petrol or gasoline vapour has been known for many years to be poisonous. In the reports of the Chief Inspector of Factories for 1937-47 four deaths due to gassing by petrol vapour have been recorded (Ministry of Supply, 1952).

I have been unable to find an account of death from petrol vapour in British medical journals, and so think the following accident worth recording, as many workers both inside and outside the medical profession are unaware of the lethal properties of the vapour.

Case Report

At a non-medical research laboratory in which petrol was used experimentally it was the custom for laboratory assistants to go to a hut 20 yards (18 metres) from the main building and fill a 2-gallon (9-litre) can with petrol. The petrol was kept in a poorly ventilated hut in a 40-gallon (180-litre) metal drum. The drum stood 33 in. (84 cm.) in height and was kept covered with a tightly fitting metal lid.

At 2.30 p.m. on a hot day a youth of 17, 5 ft. 6 in. (167 cm.) in height, was sent to fetch petrol. As he had not returned at 3.15 p.m. a messenger was sent, who found him dead, slumped with his head, shoulders, and arms over the edge of the drum. There was 9 in. (23 cm.) of petrol in the drum, and the youth had apparently placed the can inside the drum and had been ladling petrol with a beaker into the can.

At necropsy irregularly shaped areas were present on the right forearm and wrist where the superficial epithelium had disappeared, leaving dark-red areas. These excoriations involved areas on the upper arm and round the elbow, and resembled the raw areas seen on the body of a macerated stillborn foetus. Several similar smaller areas measuring up to 1 cm. in diameter were present on the forehead. There was slight bruising over the right anterior-superior iliac spine and on the right side of the abdomen, probably caused by pressure from the edge of the drum.

The body was pale and cyanosed; there were no external haemorrhages. The stomach contained semi-digested food, and the oesophagus and the trachea regurgitated stomach contents. Nothing else abnormal was found. There were no petechial haemorrhages in the lungs, heart, or thymus, nor were there any other signs of asphyxia. The internal organs were not congested. No smell of petrol was noted from the lungs. Microscopically the lungs, liver, heart, and kidneys were normal.

Inquiries showed that other workers, when getting petrol from the drum, left the can on the floor and ladled petrol out without stooping down and putting their heads into the drum. The dead lad could not do this, as he was not tall enough, but apparently had to bend his head and shoulders into the drum.

Discussion

Machle (1941) exhaustively reviews the subject of death from inhalation of petrol vapour and gives many references to American and Continental sources.

Petrol is a mixture of hydrocarbons of varying volatility and toxicity. Octane, which is present in high proportions in some petrols, is very toxic. N-octane is about seven times as toxic as pentane (Lawrence, 1945). Some commercial petrols contain benzene and other aromatic hydrocarbons which are of still greater toxicity. In Great Britain

petrol contains 0.8 ml. of tetra-ethyl lead (T.E.L.) per litre (Ministry of Supply, 1952).

Poisoning by petrol vapour occurs rapidly by inhalation but slowly by ingestion. There is probably some skin absorption, but this is generally masked by the accompanying absorption through the lungs, which is the main factor in poisoning. Vigdortschik (1933) states that a concentration as low as 110 to 450 parts per million may produce symptoms in susceptible persons. Fieldner *et al.* (1921) found that 7,000 p.p.m. when inhaled produced definite intoxication in five minutes. Rambousek (1913) states that higher concentrations of the vapour cause almost immediate unconsciousness and death from respiratory arrest.

Machle (1941) records that men exposed to 1,000 p.p.m. showed drowsiness, dullness, and numbness at the end of 15 minutes, followed by vertigo, ataxia, and slight nausea after an hour. Symptoms occurred much more quickly after exposures to 3,000 p.p.m., while exposures to 7,000 p.p.m. caused intoxication in five minutes. Little is known about the concentration of petrol vapour that causes death in man after a short exposure. Machle records that a concentration of 10,000 p.p.m. is rapidly fatal in experimental animals. If the concentration of the vapour is high, absorption through the lungs may be very rapid and symptoms may appear within a few minutes of exposure. The type of coma appears to depend on the chemical nature of the petrol; paraffin hydrocarbons produce quiet coma, as shown by animal experiments, while unsaturated hydrocarbons cause convulsions (Haggard, 1920). The inferential evidence seems to be that the vapour contains a poison affecting the central nervous system. After a few minutes' exposure to a high concentration of vapour the victim passes into coma and dies without any respiratory struggle or post-mortem signs of anoxia (Machle, 1941).

The day of the accident was warm, favouring the formation of petrol vapour. Since the vapour is heavier than air, it seems certain that a heavy concentration formed in the closed drum. This was confirmed by the following test. In the early afternoon of a warm day in circumstances similar to those of the day of the accident an operator about the same height as the dead youth was equipped with an antitoxins hose mask apparatus; the free end of the breathing hose was placed well outside the hut. The concentration of the petrol vapour was measured by a Poole combustimeter. So as to obtain samples of air from a wider area than that occupied by the end of the rubber suction tube the end of the tube was attached to a 2½-in. (6.3-cm.) funnel. The funnel was then attached to the operator so that the opening of the funnel was within a few inches of where his mouth and nose were when covered with a mask. The lid was removed from the drum, which contained 9 in. (23 cm.) of petrol. The operator then proceeded to fill the can with the beaker. To do this he had to keep his head and shoulders well in the drum. Fifteen seconds after the lid was removed the petrol-vapour concentration was found to be 25,000 p.p.m. During the next 80 seconds, while the can was being filled, the concentration of petrol vapour varied from 8,000 to 35,000 p.p.m., averaging about 20,000 p.p.m. The higher values were obtained when the operator was pouring petrol into the can and some spilt in the process. Four minutes after the lid had been removed and one minute after it had been replaced the concentration of petrol vapour 3 ft. (91 cm.) from the drum was found to be 2,500 p.p.m.

At first the cause of death seemed debatable. It was suggested that the lad might have been struck by lightning. About the time of his death there had been a thunderstorm; however, the evidence seemed to be that the storm did not reach the area until after his death. There were no burns such as might be found on a body that had been struck by lightning. The excoriation of the skin was due, it is believed, to clothing soaked in petrol, which may cause severe blistering unless the clothing is quickly removed and the skin well washed. Presumably the process went

on after death. There is some evidence that the skin lesions may have been caused by T.E.L. in the petrol (Ministry of Supply, 1950). When leaded petrol evaporates about half of it evaporates before any of the lead comes off. Absorption is rapid through the lungs and unbroken skin. It is stated that T.E.L. has a specific toxic effect on the central nervous system. Death may occur within 10 minutes of exposure to a heavy concentration. A degree of consciousness and sensation is said to persist almost to the time of death.

Fifteen deaths from this cause are recorded by Bini and Bollea (1947). It seems, however, difficult to determine whether these deaths were due to petrol vapour or T.E.L. Cassells and Dodds (1946) describe chronic poisoning from T.E.L. but mention no acute cases. Machle (1941) states that T.E.L. is not a factor in acute poisoning. The possibility of vasovagal inhibition had to be considered, but there was no evidence of any painful stimulus. Nor was there any evidence of pressure on the carotid body or evidence to support such a questionable diagnosis as status lymphaticus or of death occurring in an epileptic fit.

The pathological changes found at necropsy are not specific in death from petrol vapour. If death is not immediate the lesions may be due to the irritant and lipolytic action of the vapour. There may be damage to the lungs, hyperaemia, petechial haemorrhages, subpleural extravasations, and sometimes gross haemorrhage into the lungs. Bronchitis and pleural effusions may be present. Severe acute exposure will cause sudden collapse; death may follow without loss of consciousness. In view of the great concentrations of petrol vapour, well over lethal level, that were demonstrated when the accident was reconstructed, there seems to be no doubt about the cause of death.

Summary

A case of accidental death due to inhalation of petrol vapour is described; the surprising rarity of this kind of accident is mentioned and the post-mortem findings are recorded. The reconstruction of the tragedy is described, showing that the concentration of petrol vapour must have been at a highly dangerous level. The literature is reviewed.

I thank Mr. D. E. Woods and Mr. A. J. Taylor for the estimation of the vapour concentration obtained at the reconstruction of the accident.

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A grant of £50,000 has been made by the King Edward's Hospital Fund for London to assist the North-east Metropolitan Regional Hospital Board in their plans for developing St. Clement's Hospital, Bow, as a modern psychiatric hospital. The hospital already provides to some degree for the mentally sick, in that it has an observation ward and a small unit for psychoneurotic cases. The board consider that in future this hospital will no longer be needed to play any part in providing for the general hospital needs of the area. They have therefore decided to extend the psychiatric work undertaken there, with a view to establishing a modern neuropsychiatric centre for East London. The aim is to provide full facilities for the investigation and treatment of all types of acute mental illness, as well as providing teaching and research facilities.

Medical Memorandum

Spontaneous Rupture of Haematocolpos

Atresia of the hymen is a comparatively uncommon condition and receives but brief mention in most gynaecological textbooks. The possibility of spontaneous rupture of the occluding membrane is not considered in any of the standard works of reference; the following case is described in which this very rare occurrence was encountered.

CASE REPORT

The patient, a girl aged 13, was admitted to hospital on April 30, 1957, because of severe vaginal haemorrhage. Since January she had suffered from attacks of acute urinary retention at approximately monthly intervals, but these had apparently settled readily after the administration of a simple diuretic mixture. Accompanying these episodes there had been some complaint of backache and abdominal pain and a feeling of general malaise. On the evening of admission she had suddenly begun to bleed profusely from the vagina.

On examination her face was pale, but the mucosae were well coloured and there was no evidence of shock. She was afebrile, with a pulse rate of 100 and a normal blood pressure. Inspection of the perineum revealed a bluish swelling just posterior to the urethral orifice; this swelling occupied the normal site of the vaginal introitus and from it a small quantity of dark blood was trickling. Closer examination confirmed that the vagina was occluded by a membrane in which there was a tear, about 3 mm. in diameter, immediately proximal to its anterior border.

Under general anaesthesia the membrane was incised in a cruciform manner, releasing a moderate amount of retained blood. The vagina was greatly distended, the cervix being just palpable at the limit of digital examination. Following operation she was given a course of oxytetracycline extending over five days. Her progress was uneventful, and on May 7 she was re-examined under an anaesthetic before being discharged. By this time the vagina had contracted to a size approximating to normal and the uterus could be easily palpated bimanually; it did not appear to be enlarged. In the pouch of Douglas a moderate quantity of soft clot could be felt, but, as she was symptom-free, no attempt was made to evacuate this. She was allowed home the following day, and has remained well since that date.

COMMENT

The preoperative diagnosis in this case might have been suggested by the history of recurrent attacks of urinary retention, but the picture was complicated by the unusually early age of onset and by the ready relief of symptoms on administration of a diuretic mixture. It is generally accepted that the retention of menstrual blood in cases of haematocolpos is almost invariably due to a membrane situated above the true hymen (Bourne, 1955). Spontaneous rupture of this membrane must be excessively rare, and the only previous reference to this occurrence appears to be an article by Puech (1878) entitled "Imperforation de l'hymen: accidents dépendant de la rétention des menstrues se terminant au bout de dix-huit mois par la rupture spontanée de l'obstacle." In the present case there had been no history of trauma, and it seems likely that rupture was due simply to the effect of increasing intravaginal tension on an abnormally thin area of the obstructing membrane.

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Reviews

POLYMYOSITIS

Polymyositis. By John N. Walton, M.D., M.R.C.P., and Raymond D. Adams, M.D. (Pp. 270+x; illustrated. 32s. 6d.) Edinburgh and London: E. and S. Livingstone Ltd. 1958.

During the last ten years renewed attention has been given to disorders of the voluntary muscles, and the authors of this monograph—Dr. Walton at the Royal Victoria Infirmary, Newcastle upon Tyne, and Dr. Adams at the Massachusetts General Hospital, Boston—have both made important contributions in this field. Although the name "polymyositis" was introduced in 1863 by Wagner, comparatively little interest has been taken in the condition till recently, and, apart from florid cases of dermatomyositis, the diagnosis has only rarely been made. This monograph is based on 40 patients, 25 of whom have been examined by one or other author, the remainder coming from the case-records of the Massachusetts General Hospital; in all of them muscle biopsy specimens were available. The cases in the series vary considerably in their clinical characteristics and to some extent in their pathological features, but the authors consider that in most there is "a single basic disease process related to the other collagen diseases." There is an excellent review of the relevant literature as well as a good clinical analysis, but the outstanding chapter is on the pathology as shown by muscle biopsy. Interpretation of muscle pathology is difficult and often open to more than one conclusion, but this chapter makes the authors' findings quite clear, and the reproduction of photomicrographs, some in colour, is of the highest quality. It seems likely that in the next few years the clinical, pathological, and electrical characteristics of polymyositis will become clearly defined, and possibly even the aetiology discovered. If this should be so, it will be partly the result of this monograph, which is highly recommended to anyone interested in disorders of muscle.

J. W. ALDREN TURNER.

DUSTS, SMOKES, AND MISTS

Particulate Clouds: Dusts, Smoke and Mists: Their Physics and Physical Chemistry and Industrial and Environmental Aspects. By H. L. Green, M.A.(Cantab.), F.Inst.P., and W. R. Lane, B.Sc.(Birm.), F.Inst.P. (Pp. 425+xix; illustrated. 70s.) London: E. and F. N. Spon, Ltd. 1957.

This book comes from the Physics Section of the Chemical Defence Experimental Establishment at Porton, where so much classic work on particulate clouds has been done, and by virtue of its parentage alone the volume would command respect. Part I is concerned with the basic physics and physical chemistry of suspended particles, special attention being paid to the genesis and examination of dusts, smokes, and mists. In Part II theoretical principles are applied to environmental and industrial problems. No clinician can be wholly unconcerned about the nature of aerosols, since many substances of known or suspected physiological action are dispersed in this form. Bacteria, pollens, radioactive substances, tobacco tars, air pollutants, industrial dusts and fumes, agricultural chemicals, and many therapeutic agents may be suspended in the air, and the properties of such systems are fully discussed. The lucid style of the authors is never abandoned in the face of the complexity of their subject. The foreword contains a timely warning against repetitive work and pointless publication, and in the light of this expressed opinion the extensive bibliography—the chapter on health hazards is followed by 126 references—may be regarded as authoritative.

To attempt in these columns to assess the stature of this work as a textbook of applied physics would be an impertinence. The authors say that they have endeavoured to

systematize their subject and "bring to it some coherence where only distantly related topics appear to exist," and in the admirable fulfilment of this modest claim they have made, incidentally, a valuable contribution to the literature of clinical science.

P. J. LAWTHOR.

EFFECTS OF RADIATION

Medical Radiation Biology. By Friedrich Ellinger, M.D. (Pp. 945+xxxiv; illustrated. £7 10s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

The results of the Japanese atomic explosions and further developments in the warlike and peaceful uses of atomic energy have invested radiation effects with a new importance, and clinicians in most branches of medicine must now be expected to have some knowledge of radiobiology if they are to be able to exercise an informed judgment on problems in which the effects of radiation may play a part. Not only physicians, but also dermatologists, ophthalmologists, haematologists, and others are encountering these problems with increasing frequency, and the need has been felt for a comprehensive work on radiation effects, their mode of production and clinical diagnosis. The present volume has been designed to meet this need, and it may be said at once that it succeeds well in doing so. It covers the whole field of radiation effects on cells and on living tissues, in health and disease, as they appertain to man.

When a subject of this extent and complexity is compressed within the confines of a single volume, from the pen, moreover, of a single author, it is only to be expected that there will be some variation in the coverage of the different aspects of the subject. Thus the sections on fundamental radiation biology are sometimes more in the nature of a summary than of a complete discussion, while those on the effects on human tissues and organs are, generally speaking, full and detailed. The chapters on the effects of ionizing radiations on the skin and its appendages are outstanding. Of special importance at the present time are the chapters on the biological effects of ionizing radiation originating from sources within the body (such as ingested radium and radiostrontium) and that on ionizing radiation as a health hazard. There is an extensive bibliography comprising no fewer than 5,000 references covering the literature up to 1955.

Written as it is primarily for the clinician this is an important and valuable book, and in spite of its high cost in this country it should find a place on the bookshelf of every physician and of those others who may have to deal frequently with problems of radiation effects.

W. M. LEVITT.

AN UNUSUAL THERAPIST

Recovery from Schizophrenia: The Roland Method. By John Eisele Davis, Sc.D. (Pp. 162+xi. 36s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

This book, which consists mainly of extracts from papers, describes the Roland method of treating chronic schizophrenia. Mr. Roland's qualifications are in physical education. After the war he worked with Dr. Karl Menninger at Topeka, Kansas, and became interested in the application of physical activity to the treatment of "regressed" patients—that is, chronic catatonic schizophrenics. The book is noteworthy for the manner in which it conveys Mr. Roland's enthusiasm—one might say evangelical zeal. We are told that the therapist must feel deep down that his own well-being is in some significant way linked with that of the patient, and hints are given on the handling of the "strong interpersonal relationship" which develops between the patient and the therapist. The therapist, indeed, appears to be actively involved emotionally with the patient, a procedure which would seem to be fraught with risks, especially as the therapist apparently receives no psychiatric training.

The method involves "an intensive, continuous, and sustained programme occupying all the patient's waking hours day after day." It can perhaps be illustrated by describing the initial stages. The patient, who is naked apart from his socks and shorts, lies upon the relaxation table. The therapist, whose voice should be soft, kind, understanding, and demonstrate love and acceptance, says such things as, "I am here to help you," or, "I know you can't talk, but I will help you." He then massages the spine, the neck, the face, saying from time to time, "Relax . . . relax." The patient slowly begins to co-operate. The author gives an example to illustrate the dramatic results which can be achieved. One patient after five weeks' treatment assisted the therapist when he held the patient's arm and patted a piece of clay with it, the therapist meanwhile reciting the nursery rhyme, "Patty cake, patty cake, baker man."

The data on the results of this method are sketchy. The main investigation was the Downey evaluation, by a committee of psychiatrists and psychologists. They comment on "the marked discrepancy between the stated objectives of the programme and the results achieved," and would presumably regard "recovery from schizophrenia" as somewhat hyperbolic. It is well known that hospitalized chronic schizophrenics tend to get "bogged down" in stereotypes of thinking and behaviour, and that their behaviour degenerates so that they become dirty, mute, open masturbators, and so on. This is a tendency which has to be combated according to the methods developed by Bleuler and his school. If this deterioration in behaviour has not been combated, any physician who pays attention to these patients will achieve improvements in behaviour, often to a startling degree. It is probably by virtue of this rather than any specificity of his method that Mr. Roland achieves his results. The patient certainly does receive a great deal of attention; one therapist, with his "aides," is fully occupied treating three patients.

The book includes a revealing biography of Mr. Roland. We are told that his "Rohrschach [sic] tests have shown underneath the surface much anxiety and tension," and "his tendency to overstrive and overintellectualize is largely a compensatory mechanism." He "has good intellectual potentialities," but "intellectual judgment may suffer at times due to the disrupting and disorganizing components in the personality." Biographies such as this are perhaps a useful innovation.

A. W. BEARD.

MEDICINE AND TOWN PLANNING

Medizin und Städtebau: Ein Handbuch für Gesundheitlichen Städtebau. Edited by Paul Vogler and Erich Kühn. Two volumes. (Volume 1: pp. 700+ix; Volume 2: pp. 727+ix; illustrated. D.M.190.) Munich, Berlin, Vienna: Urban and Schwarzenberg, 1957.

This so-called "handbook" on medicine and town planning, edited by Professor Paul Vogler, a distinguished physician, and Professor Kühn, a distinguished architect, consists of two volumes of Teutonic thoroughness that are weighty in both mental and physical senses. The relationship between health and the environment in which we live is no new subject, and this work does not, it is felt, set out to be original—rather to collate all the evidence from all over the world proving the harm that has been done in the past and indicating the potentialities that may be realized in the future.

While the work is of special interest to architects and town-planners, the medical aspects are dealt with in some detail. For example, diseases of childhood, of the upper and lower respiratory tracts, and of old people can have an obvious connexion with environment. Town planning which uses the land artistically and scientifically is seen as a potent ally in the prevention of disease, and authoritative contributors from many countries have been enlisted in order to prove this.

The late Professor John Ryle, when he transferred his energies from clinical medicine to the newer field of social

medicine, deplored that medicine, while profiting over the last quarter of a century from modern scientific and technical advances, had in the process fallen out of tune with some fundamental human needs. The partnership between medicine and town planning is a reform such as he would have visualized. Social planning as here advocated echoes his plea that the basic causes of disease should be in the first line of defence, and their conquest would lead to economies which would make possible a National Health Service in fact as well as in name.

Impressive as are these two volumes, one doubts whether the best-intentioned public-health authority would find the time to study all 1,400 pages. Unfortunately, also, as a book of reference it loses some of its value in having no bibliography, which would facilitate a follow-up of many of the subjects discussed. The illustrations, culled from primitive lands to the newest housing schemes of Scandinavia, warrant unqualified praise, and the index is conscientious and helpful. As befits a work dealing with two specialties ordinarily widely separated, a glossary enables specialists in one field to understand the technical language of the other.

Many of the contributors are not known in this country, but to judge by the high reputation of the two English contributors—E. G. S. Eliot, of the Ministry of Housing and Local Government, and Otto Königsberger, of the London School of Tropical Medicine—they are one and all of the first water, and each deals with his particular subject lucidly and in detail.

The work of the editors must have been stupendous. In the face of such a mammoth achievement one hesitates to ask, Was it worth while?

PHILIP ELLMAN.

TRUTH ABOUT CANCER

Cancer and Common Sense. By George Crile, jun., M.D. (Pp. 143. 10s. 6d.) London: Robert Hale Limited, 1957.

For those who really want to know the truth this is an excellent little book. It is very simple and very sensible, but it is, naturally, written primarily for the American public, who are known to be much more knowledgeable about cancer than their British counterpart. It is of interest to learn, therefore, in view of the efforts which are being made in this country at the present time, especially by the B.B.C., to educate the public about disease in general and cancer in particular, that this same education has had some disturbing effects in the United States. Dr. Crile has, it would seem, thought it necessary to write this book in order to dispel "the fear which those responsible for telling the public about cancer have chosen to use as a weapon." It will come as a surprise to most of us in Britain to read that "the American College of Surgeons has been attacking this group [of surgeons] who exploit fear in order to do unnecessary operations and has been driving them out of many hospitals."

Before leaving this book on their waiting-room tables, doctors should ponder well whether the whole truth about cancer, as stated here, should be told. Dr. Crile himself says that "the harsh facts, at the moment they are revealed, may seem unbearable," and indeed a layman will get little comfort, if that is what he is seeking, from many of the pages of this book. He will learn, for instance, that:

"Our present diagnostic tests are totally inadequate to detect internal cancers at a stage when they can often be cured."

"Our efforts in the last twenty years have failed to reduce the death rate from cancer."

"The most important factor in the survival of a patient is the type of cancer that he happens to have."

Maybe this is the sort of thing that an educated man or woman in 1958 ought to be aware of. But one can foresee quite a bit of trouble for doctors if patients cross-examine them on these lines. For doctors this is a first-class book; for patients it is, in our present state of knowledge, probably better not to know the worst.

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FOETAL BLEEDING

Severe anaemia in the baby at birth is most often due to haemolytic disease, in which the diagnosis of rhesus incompatibility is easily made. Severe anaemia developing soon after birth may also be due to external haemorrhage, usually from the bowel or umbilical cord, which can hardly escape notice. It is less widely known, however, that a non-haemolytic anaemia may be present at the time of birth because of haemorrhage during foetal life. This may not have been visible, or, if visible, the blood may have been misinterpreted as a sign of maternal bleeding. Foetal bleeding constitutes a serious emergency which if not immediately recognized is likely to cost the infant his life. Bruce Chown¹ has recently reviewed the circumstances in which the foetus may develop the anaemia of haemorrhage.

Most common is haemorrhage following incision of the placenta during caesarean section. This hazard has been recognized for many years and is greatest when the lower-segment operation is performed for anterior placenta praevia. Various workers have suggested methods of avoiding damage to the placenta during delivery by this route.^{2,3} The foetus may also bleed severely *in utero* from rupture of a blood vessel on the foetal aspect of the placenta, so that the resultant anaemia may have been present for some hours before its birth.⁴ This catastrophe should be suspected if during labour bright red blood flows suddenly and in quantity from the vagina. Chown¹ considers that the obstetrician must reach and treat the baby within 3½ hours if its life is to be saved. On the other hand, loss of blood from the foetus via the vasa praevia, or into the placenta itself,⁵ may be much less severe. If bright red blood trickles

from the vagina before or early in the course of labour it should be tested for foetal (alkali-resistant) haemoglobin.^{6,7} A strongly positive result is proof that the blood comes from the foetus and is a warning that treatment may be urgently called for.

The need for prompt recognition of post-haemorrhagic anaemia in the newborn cannot be overstressed. Where blood loss has been severe the infant will be pale and shocked, but the onset of respiration is usually spontaneous and the heart rate is rapid.¹ This contrasts with the slow heart rate and the ineffectual gasps of the infant in a state of asphyxia pallida, who is usually covered with meconium. Hepatosplenomegaly and jaundice are absent. The blood volume returns to normal remarkably quickly after massive haemorrhage in the newborn, and serial estimations of the haemoglobin level in the baby's skin-prick blood afford a relatively reliable assessment of the magnitude of the haemorrhage. G. A. Neligan and J. K. Russell² regard a haemoglobin level below 90% (13.3 g. per 100 ml.) as an indication for immediate transfusion. In fact, the need may be so urgent that the normal process of blood-grouping must be forgone. Chown¹ wrote: "The blood that can be obtained *most quickly* is the *right* blood. . . ." In most British maternity hospitals group O rhesus-negative blood would be immediately available.

In the circumstances so far considered, the loss of blood from the foetus is observable before or during delivery and may be classified as overt. By contrast, it may be classified as occult when the foetus bleeds across the placenta into the mother's circulation, a situation first postulated in a case reported by A. S. Wiener.⁸ Chown¹ was the first to prove beyond doubt that a severe non-haemolytic anaemia in the newborn could arise in this way. Two instances of transplacental haemorrhage from the foetus have recently been reported from Dundee by H. B. Goodall and his colleagues.¹⁰ The clinical picture is one of gross pallor, tachycardia, hypotonicity, and weakness at birth. The liver and spleen are not enlarged and respiration is regular. Blood from the cord or the infant shows the microcytic hypochromic picture of haemorrhage of some weeks' duration. The presence of normoblasts in fair numbers excludes congenital hypoplastic anaemia. When a rhesus-negative mother has been immunized against the foetal red cells by previous rhesus-positive pregnancies, the entry into her circulation of foetal blood has been reported to cause a rigor during labour.^{5,10}

Proof of transplacental foetal haemorrhage is to be found in the mother's blood, which should be taken for testing as soon after the infant's birth as

¹ Chown, B., *Pediat. Clin. N. Amer.*, 1957, 371.

² Neligan, G. A., and Russell, J. K., *J. Obstet. Gynaec. Brit. Emp.*, 1954, 61, 206.

³ Butler, N. R., and Martin, J. D., *Brit. med. J.*, 1954, 2, 1455.

⁴ Wickster, G. Z., and Christian, J. R., *Pediat. Clin. N. Amer.*, 1954, 555.

⁵ Chown, B., *Amer. J. Obstet. Gynec.*, 1955, 70, 1298.

⁶ Singer, K., Chernoff, A. I., and Singer, L., *Blood*, 1951, 6, 413.

⁷ Beavon, G. H., Ellis, M., and White, J. C., *Nature (Lond.)*, 1956, 178, 857.

⁸ Wiener, A. S., *Amer. J. Obstet. Gynec.*, 1948, 66, 717.

⁹ Chown, B., *Lancet*, 1954, 1, 1213.

¹⁰ Goodall, H. B., Graham, F. S., Miller, M. C., and Cameron, C., *J. clin. Path.*, 1958, 11, 251.

¹¹ Bergstedt, J., *Acta paediat. (Uppsala)*, 1957, 46, 201.

possible. Direct serological proof may be obtained by differential agglutination.^{5, 9, 10} This entails extensive grouping of the bloods of both mother and infant in the hope of finding some antigenic differences which will allow small numbers of the baby's cells to be recognized in the mother's circulation. The maternal blood is incubated with serum containing the appropriate antibodies in saline and in albumin, and the indirect Coombs test is performed. With both techniques the maternal blood will show scattered clumps of agglutinated foetal cells in a background of many unagglutinated maternal cells. Strongly presumptive evidence was obtained in one case by detecting the adsorption of anti-D by a rhesus-negative mother's blood containing D-positive cells from the foetus. Moreover, this mother was shown, after delivery of the foetus, to develop antibodies against D with a positive indirect Coombs test.⁹ Goodall and colleagues¹⁰ obtained support for the concept of foeto-maternal transfusion in their two cases by examination of the buffy coat in the mother's blood. In one, who had previously given birth to two infants with haemolytic disease, evidence of the entry into her circulation of incompatible foetal blood was found in the presence of marked erythrophagocytosis. In the other, not previously sensitized to the rhesus factor and not herself anaemic, the buffy coat contained many small ring-stained erythrocytes and tiny normoblasts similar to those seen in her infant's blood and presumed to have come from this source. Direct chemical evidence of transplacental bleeding may also be obtained from the estimation of the alkali-resistant haemoglobin in the mother's blood by a quantitative technique. A gross increase in foetal haemoglobin in the maternal blood is proof of foeto-maternal bleeding, but a level just above that found in normal controls is only suggestive unless supported by morphological and serological evidence.

Finally, mention should be made of another form of occult foetal haemorrhage, in which one twin bleeds through the placenta into the other.¹¹ In consequence, one twin is born with anaemia which may be severe enough to require transfusion, whereas the other is polycythaemic and may in fact have to have blood removed.

AMERICAN DOUBTS ABOUT B.C.G.

Of the few trials of B.C.G. vaccine on groups of the general population, four have been outstanding. The first is that of J. D. and C. F. Aronson in North American Indians with low standards of living and high tuberculosis rates.¹ About 1,500 tuberculin-negative subjects, from infancy to 20 years old, were

given B.C.G. and a similar number left unvaccinated; the tuberculosis morbidity, judged by annual radiography, was studied for 11 years and the mortality for 20 years.² The protection against death from tuberculosis was good, about 80%, though, since very few deaths had occurred towards the end of the observation period, it was difficult to be sure that this was maintained beyond the first 10 years. The non-tuberculous death rate was similar in the two groups. The second notable trial is that proceeding under a committee of the Medical Research Council in which 56,000 volunteer schoolchildren, aged 14½–15, in three English urban areas were x-rayed and tuberculin tested; those with negative reactions to 100 tuberculin units (T.U.) were given B.C.G. vaccine (14,100), vole bacillus vaccine (6,400), or were left unvaccinated (13,200). The follow-up is by postal and personal contact, annual chest radiography, and ascertainment of clinical cases routinely diagnosed through the National Health Service. The first progress report³ covered 2½ years and gave an annual incidence of tuberculosis of 1.9 per 1,000 among the unvaccinated, and 0.4 both in the B.C.G. and in the vole-bacillus-vaccinated groups—that is, about 80% protection. There has been no waning of protection by either vaccine up to at least 4 years.^{4, 5} No death from tuberculosis was reported in any group within 2½ years. The third and fourth trials are taking place under the United States Public Health Service in Puerto Rico, where the tuberculosis rates are still very high,⁶ and in two adjacent counties in the states of Georgia and Alabama, where the rates are probably lower than in the catchment areas for the British trial.

A report from the U.S. Public Health Service covering a follow-up period of 6–7 years is now available,⁷ the authors being Carroll E. Palmer, L. W. Shaw, and G. W. Comstock. In Puerto Rico nearly 200,000 volunteers aged 1 to 18 were enrolled and tuberculin tested; those negative to 10 T.U. were given B.C.G. vaccine (50,600) or were left unvaccinated either because they refused vaccination (31,600) or through the process of random selection (27,300). Those vaccinated and the controls received an additional test of 100 T.U. In Georgia and Alabama about 64,000 volunteers aged 5 and upwards were x-rayed and tuberculin tested; those negative to 5 T.U. were vaccinated (16,900) or left unvaccinated (17,900). The follow-up in both trials is confined to the routine notification of cases to the local health authorities. No periodic re-examinations are undertaken. The most important reason for this omission is now given as the avoidance of bias in the diagnosis of cases, though from an earlier report⁸ it seemed that lack of

time, staff, and money were mainly responsible. The calculated incidences of tuberculosis take no account of migration; the true incidences would be underestimated because of this, and also because of using routine notification as the sole method of ascertainment. These factors may indeed provide some explanation for the finding in the Puerto Rico trial that the annual incidence of tuberculosis was only 0.43 per 1,000 among the unvaccinated controls in an environment where 21% of the children entering in the trial aged 6 were already reactors to 10 T.U. In the B.C.G. group in Puerto Rico the annual incidence was 0.30—giving a protection by vaccination of 31%, which is statistically significant. For Georgia and Alabama the corresponding rates were 0.22 (controls) and 0.14 (vaccinated) per 1,000—that is, a protection of 36%, which, however, is not statistically significant. The morbidity ratios between controls and vaccinated in each trial had changed little over the period of follow-up.

The effectiveness of B.C.G. vaccination in the non-reactors to the initial tuberculin tests in these two trials by the U.S. Public Health Service is poor compared with the results obtained in the American Indian study and in the Medical Research Council's trial—and indeed runs contrary to previous experience in trials of varying statistical quality in America and elsewhere.^{9, 10} Some explanation for this disturbing finding must be sought. Two vaccines from different mycobacterial species—B.C.G. and natural vole bacilli—were used in parallel in the Medical Research Council's trial: in Puerto Rico and in Georgia and Alabama vaccines different from those used in Britain and from each other were used. Did the differences in performance reflect differing post-vaccination tuberculin sensitivities? The American authors point out that, while both vaccines in the British trial produced strong post-vaccinal tuberculin sensitivity and gave good protection, the inferior protection observed in the two American trials was given

by one vaccine producing sensitivity of the same high order as in the M.R.C. study and by another with mediocre powers of sensitization—although this in its turn was about the same as in Aronson's successful vaccinations made many years previously. Hence, on the conventional view that the protective efficacy of a vaccine is related to its average sensitizing potency—a theory based on animal experiments^{11, 12}—the poor results in the American trials cannot easily be ascribed to low-potency vaccines. On the other hand, this explanation cannot be entirely excluded, since it is possible experimentally to sensitize without protection and vice versa.^{13, 14} To have known the proportions of subjects with local vaccination lesions would have provided a useful check, but these were not systematically ascertained. Viable counts of the vaccines would be even more valuable if they were available. If the cause of the American results should indeed be deficient antigenicity it would emphasize the urgency of improving the means of accurately differentiating a good from a less good vaccine. The tests on mice described by G. P. and A. S. Youmans¹⁵ might serve as a useful addition to the usual animal tests of protection. It is worth noting that freeze-dried B.C.G. vaccine has recently been accepted by the Ministry of Health¹⁶ for optional general use in Britain on the basis of its sensitizing potency in man.¹⁷

Discussing other possible causes for their results, Palmer and his colleagues mention what they consider to be statistical faults in the Medical Research Council's trial; but of the two trials the British would appear to be the more carefully conceived and executed—a true model, according to one authority.¹⁸ For example, no attempt was made in the Puerto Rico study to verify the accuracy of the notifications of disease or death. However, the general high quality of both American and British trials makes it difficult to see how the differences in the degree of protection afforded to the vaccinated groups can be attributed to statistical shortcomings, and there will no doubt be general agreement with Palmer and his colleagues that other reasons are probably responsible. Apart from differences in the vaccines, differences in the populations might have led to divergent results. In the British trial, reactors to 100 T.U. but not to 3 T.U. were excluded from the random selection of those to be vaccinated, and their separate follow-up showed a lower incidence of tuberculosis than among those who were negative to 100 T.U.—though not so low as the incidence among the vaccinated. This may have been due to natural protection. In the American trials vaccination was on the basis of a negative reaction to 5 or 10 T.U., and

¹ Aronson, J. D., and Aronson, C. F., *J. Amer. med. Ass.*, 1952, **149**, 334.
² ——— and Taylor, H. C., *Arch. intern. Med.*, 1958, **101**, 881.

³ *Brit. med. J.*, 1956, **1**, 413.

⁴ Hart, P. D'Arcy, Pollock, T. M., and Sutherland, I., *Fortschr. Tuberk. Forsch.*, 1957, **8**, 171.

⁵ ———, *Living Conditions and Health*, 1957, **1**, 159.

⁶ *Bull. nat. Tuberc. Ass.*, 1958, **44**, 47.

⁷ Palmer, C. E., Shaw, L. W., and Comstock, G. W., *Amer. Rev. Tuberc.*, 1958, **77**, 877.

⁸ ———, *ibid.*, 1953, **68**, 462.

⁹ Dahlström, G., *Acta paediat. (Uppsala)*, 1954, **43**, 25.

¹⁰ Rosenthal, S. R., *BCG Vaccine against Tuberculosis*, p. 258, 1957, Boston.

¹¹ U.S. Public Health Service, *Amer. J. Hyg.*, 1955, **62**, 185.

¹² Meyer, S. N., *Tubercle (Lond.)*, 1956, **37**, 11.

¹³ Raffel, S., *Experientia (Basel)*, 1950, **6**, 410.

¹⁴ Weiss, D. W., *Amer. Rev. Tuberc.*, 1958, **77**, 719.

¹⁵ Youmans, G. P., and Youmans, A. S., *J. Immunol.*, 1957, **78**, 318.

¹⁶ Ministry of Health, 1958, Circular 7/58.

¹⁷ Medical Research Council, *Brit. med. J.*, 1958, **1**, 79.

¹⁸ Wallgren, A. J., *Amer. Rev. Tuberc.*, 1957, **76**, 715.

¹⁹ Pollock, T. M., *Brit. med. J.*, 1957, **2**, 20.

²⁰ Dubos, R. J., et al., *Amer. Rev. Tuberc.*, 1957, **76**, 726.

²¹ *J. Amer. med. Ass.*, 1957, **164**, 951.

because there was a particularly high regional prevalence of persons reacting to 100 T.U. only, large numbers of these must have been included in both vaccinated and control groups. This inclusion of persons already partially protected might have reduced the contrast in the incidence of tuberculosis between these two groups. Palmer and his colleagues discuss this possible explanation but are unable to come to a firm conclusion on its authenticity. They have not considered another possibility: could it be that a booster to B.C.G. by natural tuberculous superinfection is required to maintain full effectiveness, and that this superinfection is less common under the conditions of the American than of the British trial, because of a lower prevalence of infectious cases in the communities concerned?

The authors of the American report are at one with the Medical Research Council's workers in recognizing the importance of the yield of cases of tuberculosis from the non-vaccinated group of tuberculin-positive reactors. Estimates of the benefits of vaccination in a community must take note of the proportion of positive reactors to tuberculin and of the estimated future incidence of tuberculosis among them as well as of the infection rate and estimated incidence among the negative reactors, vaccinated and non-vaccinated. Chiefly owing to the 30% effectiveness of vaccination in the negative reactors in the American trials, in contrast to the British 80%, Palmer and his colleagues estimate that only 10% of the total number of cases of tuberculosis in their study populations could have been prevented by vaccination, compared with the estimate of more than 40% over a shorter period of follow-up in the British trial. On this basis, and for other reasons, the American authors believe that in most circumstances in the U.S.A. to-day the disadvantages of B.C.G. vaccination as a means of controlling tuberculosis outweigh its advantages. This generalization may be correct, for infection rates in the U.S.A. are low. But to the further argument that B.C.G. cannot help those already infected it could be answered that earlier vaccination might forestall this,¹⁹ though Palmer would doubtless reply that in his hands effective vaccination has not been evident at any age. His views on the use of B.C.G. in the U.S.A. coincide more or less with those of a distinguished advisory committee of his own service under the chairmanship of Dr. E. R. Long,²⁰ but differ sharply from those expressed by another equally distinguished advisory committee with Dr. G. P. Youmans²¹ as chairman. Whatever the reason for the differences between the results of the American and British trials, the usefulness of the current British scheme for the B.C.G.

vaccination of 13-year-old children need not be doubted, at least while morbidity from tuberculosis retains its current importance.

PULMONARY ALVEOLAR PROTEINOSIS

From the U.S.A. comes news that another clinico-pathological entity has been split off from the ill-defined group of chronic diffuse pulmonary infiltrations. In the last five years three distinguished pathologists¹ have collected twenty-seven cases of a disease which "consists of the filling of the alveoli by a PAS-positive proteinaceous material, rich in lipid. This material appears to be produced by the lining cells, which slough into the lumen, ultimately becoming necrotic and yielding granules and variable laminated bodies to the alveolar content." The constancy of the histological structure and the high lipid content of the affected alveoli were remarkable, and only after laborious microbiological, chemical, and spectrographic studies were the authors forced to the conclusion that "pulmonary alveolar proteinosis" represented a distinct entity.

Of the twenty-seven patients, sixteen were studied at the Armed Forces Institute of Pathology. Their ages ranged from 2 to 57, only two being under the age of 19; of the civilians, fifteen were males and six females. Although almost one-half had a premonitory pneumonia-like illness, the exact time of onset could not be determined in the majority. The principal symptoms were slowly progressive dyspnoea, cough, and sputum; when the disease progressed, lassitude and loss of weight were usually apparent. The radiological features, upon which the diagnosis ordinarily rested in the first instance, were strikingly uniform and consisted of a "fine, diffuse, perihilar, radiating, feathery or vaguely nodular, soft density, resembling in its butterfly distribution the pattern seen in severe pulmonary oedema." Since the first patient was diagnosed less than five years ago, the clinical course of this chronic disease cannot yet be fully described, but on the evidence available serial radiographs have shown that eight had improved, thirteen had persistent infiltrations of varying intensity, and eight had died with signs of progressive dyspnoea and cyanosis. Studies of the morbid anatomy were based mainly on biopsy specimens, which showed nodules of yellowish-grey material up to 2 cm. in diameter, from which a milky, pus-like substance oozed on gentle pressure. Necropsy material from seven cases revealed large masses of confluent consolidation.

The problems posed by this newly described disease are manifold. Having been detected in a laboratory, the pathological aspects have received the greatest attention so far. At first, a fungal aetiology was suspected, but exhaustive researches have been unrewarding. The interstitial plasmocytic pneumonia attributed to infection by *Pneumocystis carinii* has been considered in great detail, but numerous staining techniques have failed to show any cysts; the cellular structure is different and the lipid content of the foci is even greater

¹ Roser, S. H., Castleman, B., and Liebow, A. A., *New Engl. J. Med.*, 1958, 258, 1123.

than in that disease. No bacterium or virus has been incriminated, nor have chemical analyses revealed any causative agent; no excess of beryllium, cadmium, nickel, zinc, or mercury was found on spectrographic examination. From the clinical viewpoint the occupational histories may be significant—four patients worked in or about timber works; two were in the vicinity of broken fluorescent tubes, but no beryllium was found in subsequent tissue analysis; and several were in contact with the newer industrial products such as volatile solvents, plastics, aerosols, and detergents. This range of experience might be expected in an industrial nation, but the cases derived from all parts of the United States, and, of the twenty-seven under review, one each was discovered in Canada, England, and Italy. Whatever the causative agent may be, whether living or inanimate, careful microbiological, chemical, and epidemiological studies must be undertaken, for the disease seems not to be rare. As the lesions appear to be limited to the lungs and possibly the draining lymph nodes, they may well derive from inhaled material, and the possibility that they are a non-specific response to a variety of agents is worth bearing in mind.

This most stimulating paper is bound to cause much interest. The suggested title is somewhat unwieldy in its present form. Perhaps the word "pulmonary" might be omitted, leaving "alveolar proteinosis," which is a big enough mouthful in all conscience, but is probably acceptable to most physicians until more is known of its cause or causes.

PUBLIC HEALTH ON THE ROADS

What is coming to be recognized as one of the great public-health problems of the day¹—road accidents—was prominent in several different discussions held at the B.M.A. Annual Meeting recently. They caused 5,500 deaths and over 60,000 serious injuries in Great Britain last year. But the attention that these deaths and injuries evoke among medical men is not, unfortunately, to be found among lay people. As Mr. E. J. Dodd, chief constable of Birmingham, said at the meeting,² "the sad thing is that road accidents are no longer 'news' and nobody cares about them." And Mr. G. F. Rowbotham saw here the duty of the medical profession to examine and explain this apathy.

Meanwhile a certain amount of technical research goes on into the mechanical causes of accidents, and some of it is outlined in the report issued last week of the Director of Road Research.³ Owing perhaps to the greater acceleration and smaller wheels of modern cars, skidding is reported to be increasing as a factor in accidents. Figures given for three years show that skidding played a part in 13% of personal-injury accidents in 1954, 14% in 1955, and 15.5% in 1956. Of special interest in the wet summer that we are experienc-

ing is the observation that skidding is more frequent on wet roads in hot weather, so that more skids due to wet roads are seen in summer than winter.⁴ But it would seem that at least part of this might be due to the greater impatience of some drivers on congested roads. At any rate, a careful watch is kept for dangerous sites, and the road surface is altered when found to be defective on test. The report refers also to special "on-the-spot" studies of accidents being carried out in Buckinghamshire, Berkshire, and Middlesex. They have given some results of interest. Among them is the finding that car seats are sometimes badly fixed and injuries have been aggravated in consequence. Secondly, a yielding rather than a rigid steering column will reduce the severity of the injury to the driver. Thirdly, toughened safety glass is safer than the laminated variety. And, fourthly, the doors of British cars do not tend to fly open in a smash as do those of American cars.

In relation to the damage done by road accidents the amount spent on research into them—something over £70,000 a year⁵—does seem small, though mechanical safety is probably only a small part of the problem. Many would agree with the speaker who said at the Birmingham Meeting that "inconsiderate, inexperienced, careless, and over-confident motorists are the sinners."

ON TAKING A CUBIT FROM THE STATURE

Society has of late been kinder to tall women. An association ensures that the stores contain the clothes and shoes they need; models, it is said, are taller than they were and some new styles are designed for tall women rather than for short. The Victorian cult of the little woman, whether brave or sweet, has departed. However, most mothers would still prefer that their daughters should not be more than about 5 ft. 10 in. (178 cm.) tall; and if it was possible by medical means to prevent this happening there would undoubtedly be some demand for treatment. On the other hand, there would be little enthusiasm among parents for a treatment destined to prevent boys growing taller than 6 ft. (183 cm.).

Before therapy is undertaken to prevent girls from growing excessively tall two conditions need to be satisfied: first, that ultimate height can be predicted with reasonable accuracy; and, secondly, that such treatment is not harmful. The prediction of ultimate height depends on a consideration of the relation of the present height both to age and to skeletal maturity.⁶ The assessment of skeletal maturity is made by x-ray examination of epiphyses, and the most accurate methods of doing this have been the subject of much investigation.^{6,7} If a girl's height at the age of 12 years is 6 in. (15 cm.) above the 50 percentile, although the skeletal maturity

¹ Bayley, N., and Pinneau, S. R., *J. Pediatr.*, 1952, 40, 423.

² Greulich, W. W., and Pyle, S. I., *Atlas of Skeletal Development of the Hand and Wrist*, 1950, Stamford University Press.

³ Acheson, R. M., *Clin. Orthop.*, 1957, 10, 19.

⁴ Goldzieher, M. A., *J. clin. Endocr.*, 1956, 16, 249.

⁵ Freed, S. C., *J. Amer. med. Ass.*, 1958, 166, 1322.

¹ *Brit. med. J.*, 1957, 1, 753.

² Section of Accident Surgery, *ibid.*, 1958, 2, 305.

³ *Road Research 1957*, H.M.S.O., 1958.

⁴ *Road Research 1956*, H.M.S.O., 1957.

is consistent with her age, then an ultimate height of 70 in. (178 cm.) may be predicted. The accuracy of these measurements is subject to many variables, and the forecast has a considerable margin of error. It would therefore be justifiable to give treatment only if the excess above average height promises to be considerable.

Oestrogen, in doses of 2.5 to 5 mg. of conjugated oestrogens daily, has been used^{8,9} to reduce ultimate height with apparent success. Its action may depend both on antagonism to the growth hormone (which stimulates linear growth by acting on the epiphysal cartilage) and also by supplying a direct stimulus to epiphysal development. In terms of bone physiology, chondroplasia would thereby be slowed and oestrogenesis would be advanced; linear growth is retarded and ultimate height reduced by more rapid epiphysal development. Oestrogen to produce these effects would have to be given for two or three years, or until the fusion of the epiphyses with the long bones is complete. Uterine haemorrhage may be expected to occur, but the testimony of M. A. Goldzieher⁸ and S. C. Freed⁹ is that regular menstruation was established in their patients, sometimes before, and always after, therapy was withdrawn. Certainly the evidence seems to be that little permanent harm comes from using the "target" hormones such as oestrogen, testosterone, cortisol, and thyroid. The corresponding anterior pituitary action is temporarily suppressed, but both the pituitary and the target glands appear to recover without damage from their atrophic state, provided it is not too long continued. Conservative endocrinologists and gynaecologists, however, would not recommend that oestrogens should be given to adolescent and pubertal girls to reduce ultimate height without careful consideration of the two conditions here discussed.

MENTALLY HANDICAPPED YOUNG PEOPLE

Three years ago the department of Public Health and Social Medicine at the University of Glasgow produced a useful survey of a group of mentally handicapped girls. A complementary survey on a group of boys has now been completed.¹ Together these surveys trace the history of some 400 boys and girls from the time of leaving special schools for the mentally handicapped in Glasgow until reaching their early twenties. How do they fare?

On the whole their employment record is surprisingly good when the level of intelligence quotient (as estimated at school) exceeds 50 for girls and 60 for boys. About 75% of the girls in this group had a record of at least five years in continuous employment, while only 8 of the boys were unemployed. The girls succeeded rather better than the boys in occupational grade, for about half of them were in semi-skilled jobs compared with only 20% of the boys. However, 13 out of 162 boys had successfully served an apprenticeship and reached the status of skilled craftsmen. Clearly mental handicap is not

necessarily incompatible with manual skill. But the picture is not wholly bright. Half of the girls and the majority of the boys were in unskilled, and in many cases unsuitable, jobs. "Often the lads found their way into jobs which were dirty, unpleasant or heavy, or which, from their nature, were not likely to be of universal appeal." One girl in five was found in "general labouring work, often dirty, sometimes in foundries." When I.Q. fell below 60 for boys, or 50 for girls, the record was more often of unemployment.

The marriage rate was about half that for the general population of Glasgow, though when the I.Q. was below 50 the prospects of marriage were more remote. It is much too early to look for information on size of family. A more disquieting feature is the frequency with which the boys run foul of the law. By the age of 22 some 30% had one or more convictions—a rate twice as high as that for a group not suffering mental handicap and for whom figures were available. The pattern showed an increasing rate of delinquency as I.Q. increased. When I.Q. exceeded 70 the proportion convicted exceeded 40%.

Nevertheless the general picture is better than might have been expected. Many of these mentally handicapped young people seem to be leading useful and contented lives. The most difficult problems centre round the virtual unemployability of those with a low I.Q., the ease with which the lesser handicapped are led into crime, and the unsuitability of many of the jobs which the young people accept. Those in the first category will probably always remain a dependent group, but more could be done to help the others. Some local authorities, but by no means all, have set up a special department of their youth employment service to cater for the needs of handicapped children. If this special service were extended, and if industry could be persuaded to co-operate, many of the problems of unsuitable employment might be well on the way to solution. The problem of delinquency is more intractable, and seems likely to remain a serious problem for many years to come. No solution is in sight. Personal supervision has helped in some cases, but the available skilled staff are far too few to make more than a small contribution. The problem must, however, eventually be tackled in a wider context, for a growing body of evidence points to social environment as a major factor. It has frequently been shown that the more depressed areas of our large cities contribute much more than a proportionate share of these unhappy cases. In the legal sphere we are moving towards a doctrine of "diminished responsibility" without waiting for any counterbalancing attack on the social and psychological problems of prevention.

Underlying the whole range of problems is the importance of the home. In the Glasgow surveys, where the home background was assessed as "good" there was a record of less unemployment, higher-grade jobs, and less delinquency. It may be that the best efforts of both central and local authorities, and the whole apparatus of the Welfare State, can provide no adequate substitute for a good home.

¹ Ferguson, T., and Kerr, A. W., *Scot. med. J.*, 1958, 3, 31

NUCLEAR WARFARE AND THE TREATMENT OF MASS CASUALTIES*

BY

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The apathy in this country, and perhaps especially among the medical profession, towards Civil Defence and education in protection from nuclear warfare is very evident. One is told either that "it can never happen" or "that nothing can be done about it." Both these statements should be carefully examined.

It is hoped that, in the cause of brevity, some dogmatism will be excused.

Apart from conventional weapons there are three hazards of total warfare—chemical, biological, and nuclear. In the first category, in addition to the well-known blister gases, there is now "G" gas, a colourless, odourless liquid which antagonizes cholinesterase, allowing accumulation of acetylcholine, a few drops causing immediate contraction of the pupil, followed by convulsions and, within four minutes, death. Apart from being under cover or wearing a gas-mask, some protection can be provided by the immediate injection of atropine, 2 mg., and experiments are being made with pyridine aldoxime methiodide (P.A.M.), which may prove more effective.

Biological warfare, which could be so well exploited by saboteurs, has fearful potentialities—incubation periods, mixed infections, and the infection of animals and crops all adding to its danger. Hygiene, knowledge of home nursing, and stockpiling of vaccines and antisera seem the only antidotes.

But it is nuclear warfare that perhaps merits most attention—destruction by blast, burns, and radiation liberated by either fission or fusion of the atom.

Mechanism of Nuclear Bombs

The atom bomb (Fig. 1A) consists of two "sub-critical" masses of uranium-235 that can be pressed

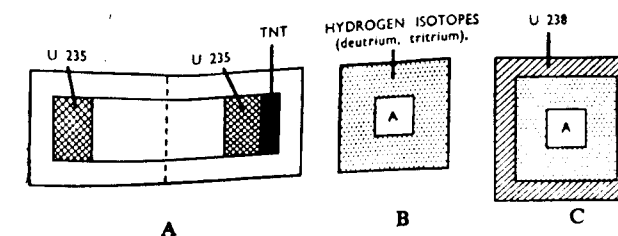


FIG. 1.—A: Atom bomb (fission bomb). B: Hydrogen bomb (fission-fusion bomb). C: Uranium bomb (fission-fusion-fission bomb).

together by a charge of T.N.T., the whole being surrounded by a reflecting tamper. In the "safe" position a shield rests between the two masses of uranium. This is a true fission bomb.

The so-called hydrogen bomb (Fig. 1B), a fission-fusion bomb, is an atom bomb surrounded by hydrogen isotopes which fuse under the influence of the intense heat to form inert helium with release of more energy—a comparatively "clean" bomb if exploded well off the ground.

*Presidential address to the Bath, Bristol, and West Somerset Branch of the British Medical Association, 1957.

This bomb can receive yet another coat of uranium-238, which, though less radioactive than the ²³⁵U needed for the atom (A) bomb, can be "split" by the large number of neutrons liberated by the hydrogen bomb. The fall-out from this fission-fusion-fission bomb (Fig. 1C) will be radioactive even if no dust is sucked up from the ground and irradiated.

Within minutes of an atom or hydrogen bomb being dropped on the free world, planes would take off with nuclear weapons from hundreds of bases. There would be a few days of holocaust, during which every activity would cease except for attempts to survive, and at the same time to destroy the enemy. After this there would be a long, long period attempting to make the world again a place in which it would be possible to exist.

There are two things that will reduce the risks of such a disaster—being strong, and being prepared for the worst. The latter in particular concerns us, and includes planning for dispersal and the teaching of self-help, first aid, and hygiene. Such preparation, costing nothing, but requiring medical backing, would more than halve the casualty rate—it might in the long run even decimate it. But more of this later.

We have said a word about the mechanism of nuclear bombs, but what of their effect? One "nominal" atomic bomb is equivalent to 20,000 tons of high explosive, more than a quarter of the total tonnage expended on the United Kingdom in five years. One H bomb of 10 megatons is equivalent to 500 times the A bomb or more than 100 times the weight of T.N.T. which fell on this country in the whole war.

Effects

The effect of either the A or the H bomb varies greatly according to the height of the burst, terrain, and weather, but the former would normally be an air burst to obtain maximal blast effect and would then be "clean," with negligible fall-out and with radiation effects only from the flash. The H bomb might well be a ground burst, and, in addition to perhaps some fall-out from an outer casing of ²³⁵U, it would draw up in the mushroom cloud behind its fire ball of expanding incandescent gas many tons of dust, in which it would induce radioactivity. The radioactive flash from the H bomb loses its significance, as anything in its area of influence would also be both blasted and burnt to death.

On the burst of a bomb, the sequence would be a fantastic light flash, causing temporary blindness, radiation effects, and intense heat of short duration, igniting material depending on its constitution, colour, and screening. This would be followed by the blast effect many seconds later, allowing time to take cover under a table to seek shelter from glass and rubble. The blast would also fan fires started by the original flash.

With the "nominal" A bomb, the size of that dropped on Hiroshima and Nagasaki, almost total destruction would occur within a radius of $\frac{1}{2}$ mile (0.8 km.), severe blast, burns, and radiation effects for 1 mile (1.6 km.), and houses largely uninhabitable for $2\frac{1}{2}$ miles (4 km.). With the 10-megaton H bomb—on all targets except the large conglomerations of population a 2-megaton bomb might be more realistic—total destruction might be expected over a $3\frac{1}{2}$ -mile (5.6 km.) radius, severe damage up to 10 miles (16 km.), and slight damage up to 20 miles (32 km.). With the 2-megaton bomb there would be only slight damage at 10 miles (16 km.). In spite of the "magnificence" of the H bomb, the A bomb is still likely to be used for military purposes, where ground must later be occupied by the attacker and for some small objectives such as air fields.

Medical Organization

The medical services that must cope with this situation will be civilian augmented by the Services. Broadly speaking, the medical organization will consist of headquarters,

forward medical aid units, hospitals (acute, auxiliary, and home cover), ambulance-car organization, and medical stores.

The hospital service and mobile units, until called out, will be administered, under the regional senior administrative medical officer, by an area hospital officer, who will be responsible for the direction of casualty admission within his area of some ten thousand beds. The principal medical officer at regional level will advise the Civil Defence Controller.

The first-aid teams, consisting of a medical officer, one S.R.N., and eight or nine auxiliaries, are "mobile"—ready to go to an incident and help to deal with serious emergencies and triage (the sorting of casualties)—or "static," to be situated at each acute hospital and helping to screen it from the less seriously injured cases and, in fact, provide a service for the walking wounded. The mobile first-aid unit is equipped with a car, 10-cwt. (500-kg.) truck, and motor-cycle. Both types of first-aid units are an integral part of the hospital service, but will be assisted as necessary

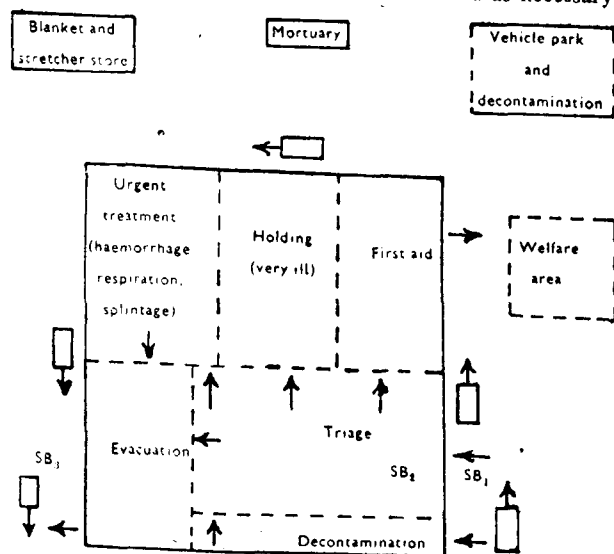


FIG. 2.—Suggested layout of a forward medical aid unit. SB₁ = Squad for off-loading. SB₂ = Squad for internal movement. SB₃ = Squad for on-loading. Triage by team of one senior medical officer, one clerk, and one nursing orderly.

by a casualty-collecting party from the Civil Defence Service. Until called out, both will work in the hospital to which they are attached, and will continue to be maintained by that hospital, but the mobile unit will be at the disposal of the Civil Defence Controller when required.

The tendency is now to group together some four mobile first-aid units to form forward medical aid units of much greater value and potentialities. With these larger units some serious attempt at sorting casualties may be made, and a suggested layout is here given (Fig. 2). On arrival patients would be "frisked," if necessary, with a geiger counter in the ambulance to see whether they need pass through decontamination, to be stripped of their clothes and washed, before entering triage. One or two medical officers of considerable experience should do the actual sorting, each accompanied by one or possibly two clerks and a nursing orderly. One medical officer might superintend both the first-aid section, from which light cases would be passed on to welfare or home, and the holding section for the very sick, though most of the care of the latter would be under the direction of a senior member of the nursing service. Two medical officers will be required in the urgent treatment section, where haemorrhage would be checked and correctable respiratory defects dealt with, and where compound fractures would receive attention. The evacuation section would require only a couple of nursing orderlies. An administrative officer could relieve medical staff of some duties and stretcher-bearers would be in three squads—one

for off-loading, one for on-loading, and one situated in a corner of the triage section for internal transportation. Two stretcher-bearers would stand by a stretcher case from its entrance, until it had been taken to first aid, holding, treatment, or evacuation, and they would then return to their rendezvous. Ambulances, after discharging cases, would proceed to an ambulance park, to be cleansed if necessary, pick up new stretchers and blankets, and then await orders.

Documentation must be of the simplest. A casualty label should be attached to the patient, if this has not already been done, with name, main diagnosis, symbols of M for morphine (with dose and time), T for tourniquet (with time), X for priority, H some haemorrhage, and R, C, XX, and P for contamination with radioactivity, blister, nerve gas, or phosphorus. Immediate disposal must be marked on the label in writing or by tabs, and if time is available the patient's address and where he was found should be added. Tabbing could be of five colours: (1) urgent, acute hospital; (2) urgent treatment and then acute hospital; (3) acute hospital not urgent; (4) hold; (5) first-aid and welfare. For the unit record, all that is required is a nominal roll of name, main diagnosis, and disposal.

An "acute hospital" will be any hospital with operating facilities expanded up to its maximum and possibly augmented by the addition of a tented extension provided by the Army. Nursing will be largely by auxiliaries supervised by S.R.N.s. These hospitals will be supported by auxiliary hospitals with approximately an equal number of beds, set up in stores, factory buildings, and the like, under the charge of a general practitioner and relying almost entirely on auxiliary nurses. They will deal with the less seriously ill cases both before and after admission to the acute hospital. In "target areas" only small "home cover" hospitals of not more than 15% normal capacity will be retained to deal with accidents and emergencies, and they will be staffed on a rota basis from one of the acute hospitals in the periphery.

All ambulances and commandeered vehicles for movement of casualties will come under the ambulance and collecting section of the Civil Defence organization. It seems likely that a key point, where a senior ambulance officer should be situated, may be the forward medical aid unit. Here, obtaining reports from ambulances arriving and keeping in the closest contact with the Area Civil Defence Controller, he will be in an excellent position to co-ordinate and control the forward "hauls" and those back to the hospital area.

Medical stores will be stock-piled at strategic points, and it is presumed that they will be under the control of the regional board.

The Army will keep in close liaison with the Civil Defence Authority, and field ambulances, when available, will make ideal forward medical aid units, while military hospitals can open hospital extensions of 200 beds within four hours, if suitably situated.

It is estimated that about 40% of casualties are likely to be due to blast—many caused by flying glass—and that about 60–70% will have suffered some burning. In the later stages radiation casualties will become a problem—perhaps 15 to 30%—but most of these will have to be treated at home.

Sorting

Triage is, of course, of the very first importance. Let us first consider the ideas of forward sorting of casualties and the experience of a large-scale exercise carried out in America in 1956, and then the ideas arising from the United Services Symposium held at the Royal Society of Medicine in June and at the Mayo Clinic in September, 1957 (*Proc. Mayo Clin.*, 1958).

A mobile team with one triage, three resuscitation, and one holding and four surgical sections dealt with 250 "casualties," 90 miles (145 km.) from their base. The "make-up" of the casualties was: major lacerations, 35%; uncomplicated burns, 29%; wounds to the ex-

trémities, 13%; head and nervous system injuries, 8%; chest and abdominal cases, each 5%; faciomaxillary, 3%; and ophthalmic, 2%. Of the total, 55% had some burning. The planning took 23 days, but as the result of this the units started work full blast within five hours of the alert.

Many lessons were learnt, but in particular the importance of the sorting section, which was staffed by four physicians of great experience. This section was hardly big enough, and it was felt that, with overpowering numbers, many of the hospital sections would have to drop their work and take over sorting and resuscitation. The whole advance station was organized into (1) triage, (2) resuscitation, (3) holding, and (4) evacuation of sections. The motto "The greatest good for the greatest number" had always to be kept in mind. Every effort had to be made not to overload the "acute hospital" section—even with relief teams the number of cases that can be operated on in the first 24 hours is very limited, and General Drummond suggests that a surgeon can operate on only 12 serious cases per day for any prolonged period. Only cases of really top priority must be thus labelled. Head cases did not as a rule merit urgent treatment. All cases were graded into (1) emergency surgery, mainly to check haemorrhage and remove devitalized tissue, (2) resuscitation, and (3) holding (non-urgent, slight injuries, and moribund).

About 50% of cases were sent to the acute hospital, 25% to distant hospitals for less urgent treatment, and 25% kept in the holding unit.

The main lessons learnt from the "exercise" were the importance and magnitude of triage and the need for a very large supply of tracheotomy tubes and blood and blood substitutes. It seemed likely that tracheotomy might very often be required in multiple injuries with C.N.S. involvement and especially when there was the complication of burns.

The Filter Unit

In the recent symposium on the treatment of mass casualties, Colonel Ahern (1957) dealt with triage and the possible use of a filter unit. He envisaged a 10-megaton bomb on a city with a million inhabitants. There might be 210,000 immediate casualties, excluding the dead. Of these, 60,000 would be light cases and 150,000 seriously hurt. Of the latter, 100,000 would be trapped and some be released, dead or alive, within a few days. There would thus be 50,000 untrapped serious casualties to be evacuated to hospitals as soon as possible. This was the debit side of the ledger. On the credit side there were over 50,000 hospital beds at distances of from 5 to 15 miles (8 to 24 km.) from the edge of the devastated area—just enough to care for the untrapped serious cases, but not enough for the trapped cases. A filter unit might consist of 10 doctors, 120 to follow. A filter unit might consist of 10 doctors, 120 nursing personnel, and 160 stretcher-bearers and "police." It that is, one field ambulance plus a company of infantry. It could filter 6,000 cases in 24 hours (allowing two minutes per patient for sorting and nine minutes for emergency surgery). It is estimated that 40% would be minor injuries, 20% urgent cases, 20% requiring delayed expert treatment, and 20% "write-offs"—labelled expectant treatment.

The unit would first turn away, after first aid, all walking wounded to a Civil Defence Welfare Centre. The remainder, wounded to a Civil Defence Welfare Centre. The remainder, after being monitored, and if necessary cleansed, would pass to the sorting department, and would then be divided into almost equal groups for immediate treatment, evacuation, and holding. This unit should therefore divert from the neighbouring acute hospitals approximately two-thirds of the cases that found their way to the sorting department.

On arrival at hospital, General Drummond (1957) suggests direct admission to the ward of cases filtered elsewhere—in this way 100 patients can be bedded down in 60 minutes. He stresses the hopelessness of overloading a hospital beyond the capabilities of its staff, and recommends the "locking of the gates" when it is full. One medical company can, however, open and admit an additional 100 patients within two hours of arriving at a hospital to which it may be

attached. If, however, casualties have not been already sorted, this must be carried out in as large a hall as possible at, or adjacent to, the hospital. In the first instance, with minimal documentation, casualties must be sorted by experts into (1) fit to go home at once or after first aid, (2) for transfer to an auxiliary hospital, (3) cases requiring admission and treatment "at leisure," (4) cases requiring urgent treatment and resuscitation, and (5) moribund.

The serious but treatable cases to be admitted to an acute hospital fall into two categories: the very urgent—easily accessible haemorrhage, correctable respiratory distress, crush injuries of limbs, and open fractures—and the less urgent—15 to 40% surface burns, major closed fractures, and damage to the central nervous system.

Types of Casualty

All who dealt with casualties in the last war will be familiar with the danger of flying glass. Much can be done in prevention by screening and sandbagging windows and taking cover. Only the most severely injured would be able to be admitted to acute hospitals. There would be no scope for professional individualism.

Burns would be on an unprecedented scale, and again only for those where expert treatment is necessary to save life and where life can probably be saved will transfusions and infusions be available—they would largely be reserved for 15 to 40% surface burns, perhaps one-third of the cases. For the remainder, sedation—sodium phenobarbitone, 3 gr. (0.2 g.)—analgesics, copious saline by the mouth, and possibly oral antibiotics and a clean covering for the wounds, will be all that is likely to be possible. Exposure to air with the burnt part raised is, however, perhaps best if practicable. The value of early amputation of a badly burnt limb must not be forgotten. Treatment for anaemia later must also be remembered.

An interesting "help yourself canteen" for the treatment of the less serious burns cases is envisaged by Hunt (1957). Instead of a bun, the customer would collect the appropriate burns dressing; for a drink there would be saline and bicarbonate of soda; and at the cash desk would be some simple printed instructions.

For abdominal casualties, treatment of shock and minimal disturbance before urgent surgery are indicated. Intravenous infusion, gastric suction, antibiotics, and sedation will probably, however, be required. Chest cases may need closure of sucking wounds, release of tension pneumothorax, aspiration from the pleural cavity, maintenance of airway, fixation of a floating chest, and, of course, infusions, oxygen administration, and antibiotics. Lower-limb fractures may indicate skeletal traction by insertion of a Steinmann pin under local analgesia through the tibial tuberosity or os calcis. For the upper limb temporary splintage is all that is required, with no attempt to reduce displacement until later. Waterson (1957) outlines the principle of treatment of fractures by the application of standard plasters, none of which surround the limb or can obstruct the circulation, and which can be put on immediately by pairs of trained orderlies as soon as the medical officer has made the diagnosis.

Radiation Treatment

In the treatment of radiation casualties a selection will have to be made of those most deserving of expert help. Prognosis is therefore the first essential. Some guide to the amount of radiation a person has absorbed can be obtained from calculation of the intensity of radiation, duration of exposure, distance from radioactive particles, and screening factors. Screening and distance factors are illustrated by the fact that 6 in. (15 cm.) of concrete quarters the dose, occupation of the centre ground-floor room of a two-storied house reduces the dosage factor by 40, and staying in a cellar by as much as 300. Intensity of radiation from fall-out at first decreases rapidly, so that an area showing a reading of 1,000 r per hour, one hour after an explosion, will have that reading reduced to 100 r per hour

in 8 hours, to 10 r per hour in 48 hours, and to 1 r per hour in three months. It must be noted that the drop in radiation is much slower in the later stages because this latter radiation is due to isotopes with much longer half-lives. 50 r in 48 hours is considered a permissible dose for rescue workers in an emergency. 100 r will produce some morbidity, 200 r 50% casualties but little if any mortality, and 400 r 50% mortality.

Prognosis on these physical factors is, however, both difficult and uncertain, as some people can absorb nearly twice as much radiation as others without serious harm. The very old and very young are the most susceptible. Pathological examinations would not only be largely impracticable but of little use. We come eventually to old-fashioned clinical medicine and observation, and particularly to timing of onset of symptoms after exposure, for our real guide. If there are no symptoms for 24 hours after exposure and then they consist only of slight vomiting and nausea, the prognosis is good. If persistent vomiting occurs within two hours (a victim may be sick because of shock or other causes), fever before seven days, or purpura or loss of hair before three weeks, the prognosis is probably hopeless. Treatment consists of rest and sedation and a bland nourishing diet with plenty of fluids. In the more severe cases intravenous fluids and antibiotics of the erythromycin wide-spectrum type, to be started after the fifth day, when the leucopenia becomes manifest, may be helpful if available.

The distribution of medical and all rescue planning will have to be governed by "fall-out." As stated before, when a nuclear explosion takes place on or near the ground a large quantity of dust is sucked up and irradiated. This will be carried by the prevailing air currents at the levels it traverses and will gradually settle again downwind. Meteorological observations will give some indication of likely areas of fall-out, but a zone some 50 miles (80 km.) across and perhaps 200 miles (320 km.) long may be expected. Weather conditions will also determine how long a warning there may be before the fall-out settles—in some areas there may be perhaps an hour. The intensity will be at once plotted and zones demarcated on this information. The policy in the whole area must be to "go to ground," and the critical time for moving again is 48 hours. The reason for this is, as mentioned before, that the degree of radioactivity falls off rapidly for about this time and then much more slowly, and that this time is about as long as it is considered feasible to keep the population under cover. After this two-day lapse, in the periphery the population may be allowed out about half the day, a little more central for two hours, and in the centre, where there is still more than 10 r per hour radioactivity, everyone must be evacuated—but again not till 48 hours after the burst.

Conclusions

What do we learn of practical importance from these sketchy remarks?

Firstly, plans must be made in advance for dispersal of population and voluntary partial evacuation by families in target areas. As the warning period is likely to be short, previous planning is essential. As part of this evacuation, about 80% of all patients would be sent home from all hospitals and the hospitals in the target areas would be completely cleared.

Secondly, enrolment, organization, and teaching of auxiliary nurses is of paramount importance, as on these we shall largely have to rely.

Thirdly, more information must be given to the public on the grounds of reducing panic. The unknown is the worst of all, and besides this there is some reassuring information that can be given. For instance, when a nuclear bomb has dropped it is unlikely that there will ever be another in that area; that flash blindness is often temporary though lasting hours; that mild face burns may cause loss of vision due to oedema for 24 to 48 hours only.

Fourthly, the "stay put" policy must be completely accepted; not only will evacuation after an incident increase risk to the individual from fall-out but it will hamper rescue, and also there may be nowhere for the evacuee to go. A badly bombed but just habitable house is better than none at all.

Fifthly, the population as a whole must learn some first-aid, home nursing, and self-help. Not only will there be no medical services available to deal with the minor casualties, but for those in a fall-out area no help can be obtained from outside for the first two days.

Finally, everyone should know something of hygiene. With concentrated populations in "safe" areas, burst water and sewage systems, and reduced resistance, resulting perhaps from both malnutrition and radiation effects, the results of epidemics might be worse even than the immediate bomb burst. As rigid a standard of hygiene as possible would be essential. Here again the Army Medical Services, with their vast experience, will be invaluable.

I should like to express my thanks to the D.G.A.M.S., Lieutenant-General Sir Alexander Drummond, and to General Lethbridge, Civil Defence Controller of the South-western Region, for reading this paper and for valuable comments, and to officers of the South-western Regional Hospital Board for encouragement and help.

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ADAPTATION TO STRESS CONFERENCE OF BEHAVIOURAL SCIENTISTS

[FROM A SPECIAL CORRESPONDENT]

The Mental Health Research Fund held a conference on "Research on Stress in Relation to Mental Health and Mental Illness" from July 15 to 18 at Lincoln College, Oxford. Its purpose was to arrive at a synthesis of the concepts used in different branches of the behavioural sciences when discussing stressful situations and stress effects, or at least to clarify the differences between the ways these terms are used. Physiology, endocrinology, biochemistry, ethology, psychology, and psychiatry each had one or more representatives, and the conference brought together some 40 scientists, American, Canadian, and British, under the chairmanship of Sir GEOFFREY VICKERS, V.C., the chairman of the Fund's research committee.

Finding a Common Language

The fare was rich and varied. It was hardly surprising, therefore, that, suffering from indigestion, some participants should have expressed doubts about the feasibility and even the desirability of achieving a useful degree of synthesis. They tended then to argue that each branch of science requires to work out its own conceptual models, and that models worked out in other branches lose their precision and usefulness if they are incautiously extended. However, there were few who were not in sympathy with the thesis, argued cogently by Professor R. W. GERARD, of the Neuropsychiatric Institute, Ann Arbor, in a final summing-up, that the behavioural sciences form a unity, and that the processes of adaptation, whether to the physical, biological, or interpersonal environment, have a great deal in common; the similarities are more impressive than the differences. Several speakers had asserted that psychosocial stressors are very different from biological stressors because their meaning and therefore their effects depend upon past experience, which differs from one individual to another. Professor Gerard countered their arguments by pointing out that biological individuality is no less evident than psychological individuality and depends as much upon residues of past experience, remote as well as recent, and that in any event if there were only individuality and idiosyncrasy there would be no science, for the purpose of science is to show what is common to a number of individual instances.

The variety of meanings given to the term "stress" was a source of difficulty in the earlier sessions, for it was used to describe not only factors in the physical, biological, or social environment but also the disorders they produce. The conference soon discovered that confusion could be avoided by speaking of stressors or stressor agents, following Professor HANS SELYE (Montreal University), or stressful situations, on the one hand, or stress effects, stress processes, or distress on the other. Alternatively, the difficulty could be avoided by speaking of a defence reaction, for instance, instead of a stress response.

Restraint and Bereavement

The stressful situations whose effects were discussed were various. Professor SELYE described the effects of immobilization on cats in terms of adrenocortical mechanisms and the general adaptation syndrome. Dr. H. HOAGLAND, of the Worcester Foundation for Experimental Biology, discussed the effects of situations allowing no outlets for aggression on the excretion of adrenaline, noradrenaline, aldosterone, and related compounds by sportsmen, patients, and others. Professor H. S. LIDDELL (Behaviour Farm Laboratory, Cornell University) discussed the part played by restraint in the Pavlov harness and frame in the production of experimental neurosis in pigs, sheep, and goats. Dr. E. J. ANTHONY (Institute of Psychiatry, London) reported on the part played by restrictive and coercive attitudes of mothers in the production of sleep disturbance and encopresis in children. These situations have in common that the organism is restrained or confined, and the restraint prevents or imposes delay on adaptation. Superficially, although perhaps not fundamentally, they differ from the other psychosocial stressors discussed.

Professor E. LINDEMANN, of Harvard University Medical School, described the effects on the health of adults of bereavement—that is, what he termed "the cessation of interaction with an emotionally relevant person." Professor interaction with an emotionally relevant person." Professor M. ROTH (Durham University) reported similar effects in the elderly, and Dr. JOHN BOWLBY (Tavistock Clinic, London) pointed out the similarities in the concept of bereavement and his own concept of the effects on the young child of separation from the mother. Brigadier R. PHILLIPSON, director of Army psychiatry, reported on the effects reflected in official sickness statistics of removing young men from their families for the two-year period of National Service. Mr. E. L. TRIST (Tavistock Institute of Human Relations, London) discussed the effects of the reorganization of working groups on the sickness-absence, accidentation, and productivity of coal-face workers. Professor H. G. WOLFF, of the New York Hospital, reported data which show that disturbances in social relationships perceived by individuals as threatening are correlated with increases in the incidence of a wide range of diseases, many of them not hitherto regarded as "psychosomatic" (such as bronchial carcinoma). Professor LIDDELL reported that kids which have been separated from their dams for an hour or two immediately after birth suffer a very high mortality subsequently, the majority dying within a year. All these psychosocial stressors demand from the individual a "role transition" and a reorganization of social relationships, which may be successfully accomplished; otherwise illness and even death result.

Conflict and Monotony

This does not exhaust the list of stressful situations discussed. Dr. R. A. HINDE (Cambridge University) described the several different classes of behaviour observed in birds when they are subjected to conflicting stimuli to behave in incompatible ways or when they suffer deprivation. Professor LIDDELL told how the presence of the mother reduces the effects on lambs of monotonous, unreinforced stimulation. Lambs so tested in the presence of their mothers move freely and actively about the pen; lambs separated from their mothers become virtually immobile.

The attempt was made by several speakers to identify the common features in all these situations. Stressful situations, it was remarked, are those in which drives remain unsatisfied, or expectations are not fulfilled; there is a mismatch between the actual and the target (the "is" and the "ought-to-be"), business is unfinished, problems are not resolved, or there is a crisis—that is, suspense in the taking of a decision. Perhaps all these definitions amount to much the same thing.

The stress-strain analogy from physics is unsatisfactory in at least one important respect, it was agreed, when the effects of stress on organisms are considered. The effects constituting strain in materials cease as soon as the stress ceases, whereas the agents or situations which cause strain in the adaptation mechanisms, even if they produce disorganization, tend also to produce reorganization, which is not reversed. Great importance was attached by several speakers to the processes of reorganization, whether they described these as "reprogramming," "the establishment of new defences," or "the redistribution of interactional patterns"—for example, following bereavement. Dr. DENIS HILL (Institute of Psychiatry, London), in an interim summing up, defined stress as a "process of change during which a new adaptation may be reached."

Fixity of Response Under Stress

There appears to be a general tendency for the reorganizations which result from stress to involve a narrowing, or stenosis, in the range of activities of the organism. A striking instance of such restriction in activities and interests is seen in the traumatic neuroses, and especially in the selective forgetting, or repression, which may follow upon stress. Reorganization in a given case may be evaluated by reference to the number and range of factors which the subject is able to take into account in making decisions. It is worth noting that each role-transition undergone by human beings as they grow up in a complex society tends to bring with it an increase in the specialization of their skills and interests.

Reorganization represents an at least partially successful adaptation to stress. Before it is accomplished, however, manifold changes in mental activity, behaviour, and physiological functions may be observed which reflect the homeostatic mechanisms and may be regarded as attempts at adaptation and restoration or reorganization. Psychological observations suggest that stressful situations tend to produce immediately a narrowing of attention, or preoccupation, with a corresponding neglect of things that are peripheral in place or significance. At the same time as perception is thus affected, behaviour tends to become less versatile and more restricted and stereotyped. Another aspect of this tendency is the fixation of responses, which is a characteristic result of stress; particular responses tend to be repeated even after they have proved ineffective in relieving the stress. Thus the effects of stress on behaviour are selective. It is tempting to suppose that the uneven distribution of the effects of stress upon physiological and especially endocrinological functions reflects a similar tendency.

Dr. J. I. LACEY (the Fels Research Institute for the Study of Human Development, Yellow Springs), in particular, emphasized that the strain is always distributed unevenly; there is overaction of some mechanisms and underaction of others. He reported evidence to show that specialization and stereotypy in the responses of the autonomic nervous system to stress occur at least as early as 6 years old—that is, organ-vulnerability is established by this age. He asserted that the differential distribution of the effects shows some consistency over years and is largely independent of the nature of the stress. He attached major importance, therefore, to the constitutional determinants.

Professor SELYE pointed out, however, that the pattern of the stress responses composing the general adaptation syndrome varies widely with the conditions that are established experimentally, and Dr. HOAGLAND's results also show that the adrenal medulla's pattern of responses depends largely upon the nature of the stressful situation. There is probably some truth in both views.

EAST AFRICAN PHYSICIANS

The following are some of the points brought out at the annual conference of the Association of Physicians of East Africa, which was held in Nairobi from June 26 to 23 under the chairmanship of Dr. A. D. CHARTERS.

Tuberculous pericarditis is common in East Africa, according to Dr. P. P. TURNER, and often fatal. In about a third of the cases he could culture tubercle bacilli from the pericardial fluid. He recommended treatment with anti-tuberculous drugs, prednisone, and intrapericardial hydrocortisone. Although this might save life, the end result was poor and surgery might be needed. Dr. A. A. KHAN described 28 cases of radiologically proved duodenal ulcer in Africans admitted to the King George VI Hospital, Nairobi, between September, 1957, and April, 1958. Statistically, duodenal ulcer was on the rise in Africans in Kenya, and it affected all income, social, and educational groups. Dr. Khan thought it would become yet more frequent as urbanization of the African progressed. Dr. A. G. SHAPER said that steatorrhoea, on the other hand, was excessively rare in Africans. He described two cases.

Dr. J. M. VAIZEY illustrated the change chloramphenicol has made in the outlook for the typhoid patient by comparing the results achieved at Mulago Hospital in 1957 with those in 1949, when chloramphenicol was not available. Mortality had fallen from 24.5 to 7.5%, and the duration of fever and of stay in hospital by about a half. The complications of haemorrhage and perforation still remained serious, however. Dr. Vaizey also reported the emergence of a resistant strain of *Salmonella typhi*. Dr. K. SOMERS described the severe iron-deficiency anaemia which often occurs with heavy hookworm infections in Uganda and sometimes leads to heart failure. He demonstrated the reversible E.C.G. changes found in 15 such patients.

Dr. P. MANSON-BAHR read a paper on histoplasmosis in East Africa. All forms of the disease had been reported there—the localized, the disseminated, and the benign pulmonary form. Dr. Manson-Bahr then described a case of benign pulmonary histoplasmosis (or "cave disease") in a European male who had visited the Amboni caves near Tanga (Tanganyika), where the floor is covered in bat guano. Symptoms developed 14 days later and a histoplasmin skin test was positive. Treatment did not help, but the patient made a gradual spontaneous recovery.

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Apresoline (Ciba Laboratories Ltd.).—This is 1-hydrazino-phthalazine hydrochloride, or hydralazine, in tablets of 25 mg. or ampoules containing 20 mg./ml. Hydralazine lowers arterial blood pressure by producing generalized vasodilatation. In addition to reduction of blood pressure, cardiac output and renal blood flow are increased. The glomerular filtration rate remains unchanged or falls as a result of glomerular arteriolar dilatation. After intravenous injection, the arterial pressure begins to fall within 20 minutes, reaches its lowest level between 20 and 90 minutes, and returns slowly to pre-injections level in 4–8 hours. The cardiogram may show transient ST depression and T wave inversion,

especially in subjects with hypertensive or ischaemic heart disease, probably as a result of increase in cardiac output without increase in coronary artery flow.

Hydralazine can also reduce arterial pressure when given by mouth, but side-effects may be prominent, consisting of headache, flushing, palpitations, oedema, nausea, and vomiting. In about 10% of subjects a syndrome resembling systemic lupus erythematosus appears after 4–8 weeks' treatment and necessitates withdrawal of the drug.

The side-effects of the drug limit its value, while the effect on cardiac output prohibits its use in patients with hypertensive or ischaemic heart disease. It is usually less satisfactory than the ganglion-blocking agents, but has been used in combination with hexamethonium or reserpine. It may occasionally have a place in the treatment of patients with hypertension and renal failure in whom the reduction in renal blood flow produced by ganglion-blocking agents is undesirable. It is advisable to start treatment with small doses and increase gradually. In late pregnancy, the free passage of ganglion-blocking agents across the placenta may cause dangerous ganglion blockade in the foetus, and in these circumstances a limited course of hydralazine by mouth, or in emergency by injection, may be warranted if reduction in blood pressure is required.

N.H.S. basic price: 100 25-mg. tabs., 11s.; 100 50-mg. tabs., 20s. 4d.; 6 ampoules, 10s.

Predsol Nasal Drops (Glaxo Laboratories Ltd.).—Prednisolone disodium phosphate 0.1% in isotonic buffered solution.

Predsol-N Nasal Spray (Glaxo Laboratories Ltd.).—Prednisolone disodium phosphate 0.025%, neomycin sulphate 0.5%, and naphazoline nitrate 0.025% in aqueous solution.

Delta-Feno Nasal Spray (Boots Pure Drug Co., Ltd.).—Prednisolone 0.01%, phenylephrine hydrochloride 0.25%, naphazoline nitrate 0.025% in an aqueous solution.

This is a series of preparations of prednisolone for local application to the nose for hay-fever and vasomotor rhinitis. Provided the presence of serious infective conditions such as sinusitis can be excluded, there seems no objection to their use. They provide an alternative to hydrocortisone snuffs, and seem to be equally satisfactory and rather easier to use. Predsol, which contains only prednisolone, would seem likely to be the most satisfactory preparation, but no doubt the combination with neomycin is unobjectionable for local application to an infected allergic mucosa.

N.H.S. basic price: Predsol nasal drops, 10 ml., 5s.; predsol-N nasal spray, 15 ml., 5s.; delta-feno nasal spray, 15 ml., 3s.

Hibitane Dihydrochloride (Imperial Chemical Industries Ltd.).—This compound, chlorhexidine dihydrochloride, is a slightly soluble white powder which is strongly bactericidal against a wide range of micro-organisms, including staphylococci, streptococci, and coliform bacilli. It can be sterilized by dry heat at 150° C. for one hour. Resistant strains are not found and do not emerge in attempts at habituation. Its activity is somewhat diminished by contact with serum and blood.

Because of its bactericidal properties and low solubility, chlorhexidine dihydrochloride has been found suitable and safe as an application to burns, with some prophylactic action especially against *Staph. aureus*. It is desirable to use it in combination with other agents, such as neomycin and polymyxin. The cream should be made with a non-ionic emulsifying wax (e.g., cetomacrogol B.P.C.) and contain 1 or 2 mg. "hibitane" dihydrochloride per gramme of cream. It is unlikely to be of therapeutic benefit in cases of established infection. Wound-dusting powders (5% with lactose) have also been used. For other uses of chlorhexidine, such as disinfection of skin and of instruments, the soluble chlorhexidine diacetate is more suitable.

N.H.S. basic price: 10 g., 7s.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Tabo-paresis

SIR,—Some senior and experienced psychiatrists have recently had cause to give considerable thought to the topic of tabo-paresis. One British psychiatrist recently found that there was concern in responsible circles in America on the same topic. When the time-lag between primary infection with syphilis and the onset of tabo-paresis is considered, it appears possible that the recent virtual disappearance of tabo-paresis is due to the efficiency of arsenical treatment in the years before the large-scale employment of antibiotics.

It may be that cases treated in the early years of the antibiotic era have yet to develop tabo-paresis. The time factor suggests that the next few years may be particularly important in this respect. Recently a senior psychiatrist with considerable experience of neurosyphilis had four cases referred to him within a very short period—more cases than he had seen for a very long time previously. Two of these cases could easily have been missed by a more junior man with little practical experience of tabo-paresis. Moreover, some of the old, characteristic physical signs seem to be changing somewhat.

It may be hoped that fears of a reappearance of tabo-paresis on a considerable scale may prove groundless, but there appears to be reason for clinicians to be very alert on this topic, so that if an increase in the number of cases should occur the sufferers from it may be diagnosed early and therefore successfully treated.—I am, etc.,

NOEL G. HARRIS,
Chairman, Public Relations Committee,
Royal Medico-Psychological Association.

London, W.1

Neurological Complications of Pertussis Immunization

SIR,—Drs. D. C. Thursby-Pelham and C. Giles's letter (*Journal*, July 26, p. 246) is of great interest. It is remarkable that Dr. Thursby-Pelham has seen six patients in the space of 10 years with neurological reactions following pertussis immunization, in view of the fact that only seven such cases have been recorded in Great Britain (see my paper, *Journal*, July 5, p. 24). One of these seven is Case 2 in their series. It may be, as Drs. Thursby-Pelham and Giles state, that the dangers of whooping-cough immunization are greater than is commonly thought, but this can only be established if the possibility of reactions to immunization are borne in mind and reported when they occur. One would like to make a plea, therefore, that this should be done.

It is possible that the relatively large number of cases of neurological complications of pertussis immunization reported from the United States, as opposed to other countries, including Britain, is due to a greater awareness of, and interest in, the problem in America. If further cases are reported, as Drs. Thursby-Pelham and Giles have now done, it may be that the commonly held view, that the dangers from whooping-cough itself are much greater than those from immunizing against it, will require modification.—I am, etc.,

J. M. BERG.

London, S.W.17.

SIR,—Further to the article by Dr. J. M. Berg (*Journal*, July 5, p. 24) and the letter from Dr. D. C. Thursby-Pelham and Dr. C. Giles (*Journal*, July 26, p. 246), I have given many thousands of injections of both combined diphtheria-pertussis and triple antigen vaccines, and in two instances only have I known convulsions to follow, in sisters.

Case No. 1.—A female infant, first child of a Rhesus-negative mother. Became jaundiced three days after birth. Was admitted to hospital but replacement transfusion unnecessary. At 6 months of age she had a severe convulsion which occurred four hours after her first injection of triple antigen. She was un-

conscious for 10 minutes and made a full recovery within 24 hours. One month later she had a similar convulsion following her second injection. The third dose was not given and one year later she was seen and is quite normal.

Case No. 2.—Sister of Case No. 1. Female infant. Second child of a Rhesus-negative mother. Labour was induced at 38 weeks. At birth, the infant was severely affected by haemolytic disease and replacement transfusion was carried out. At 4 months of age the first injection of triple antigen was given. Three hours later a minor convulsion occurred. Recovery was complete within a short while. In view of her sister's reaction after her second injection, and after reading the article by Dr. Berg, no further injections were attempted.

The fact that these two cases were sisters both suffering at birth from haemolytic disease and both born of a Rhesus-negative mother makes me wonder if the aetiology of this dangerous reaction to pertussis vaccine may not in some way be connected with the Rhesus factor.—I am, etc.,

Tetbury, Glos.

JOHN N. H. ANDREWS.

Dummy Tablets

SIR,—Dr. E. C. Atkinson (*Journal*, June 21, p. 1478) makes out a case for having "some control tablets of inert substances" or "a genuine placebo" included in the *British National Formulary* to help doctors with their investigation of "the relative values of the mass of proprietary drugs" which appear on the market. Dr. W. N. Leak (*Journal*, June 28, p. 1546) points to the difficulty which may arise for a doctor prescribing dummy tablets, when he has to choose between honesty with his patient and impersonal science; and concludes "regrettably, that it would be wrong for the B.N.F. to include a dummy tablet. . . ." May I set out in detail some of the considerations which should guide a family doctor in his choice of controls for any therapeutic research which he intends to pursue?

It is not primarily the task of a family doctor to test the pharmacological effects of unknown or untested substances on those who seek his advice about their treatment. Logically a doctor could only advise a patient to take such an unknown substance if there was no accredited or orthodox treatment for the condition from which he was suffering. The medicaments prescribed by a general practitioner should be those which he uses in good faith and on the basis of knowledge which he has obtained of their composition and action from different sources. Where the progress of a disease invariably follows a predictable and well-established course, then the past experience of accumulated medical knowledge supplies the control for any therapeutic trial of a possibly beneficial drug, and no other may be needed. The most obvious examples are those diseases in which death is the invariable or predictable result. If, on the grounds of a reasonable hypothesis, the first therapeutic trial of a new substance for the treatment of such a disease were being planned—for example, streptomycin in tuberculous meningitis—it could be argued that it would be unethical to withhold this test substance from any patient in the trial. A proper structure of this first trial might well be to test the action of the new substance in a continuous series of cases until the question was beyond doubt, either that it had no action or that the predictable course of the disease was undoubtedly altered by the use of the test substance. In general practice, however, such trials are rare.

Therapeutic research in general practice falls broadly into six categories. The first, and perhaps a neglected field, is a fresh assessment of the action of time-honoured remedies in common diseases—for example, the use of potassium iodide or tincture of stramonium in asthma. Second comes the controlled trial of new drugs for old and familiar diseases, such as the prophylactic use of sulphonamides for the complications of measles. Third come trials designed to reveal new uses of familiar drugs, such as aspirin in diabetes. Fourth, and we hope rarely in general practice, comes the administration of new and unfamiliar drugs to patients with diseases for which a standard treatment already exists. The fifth comprises those trials where the family doctor is in ignorance of the precise nature of the

substance which he personally prescribes or dispenses for any particular patient—for example, "blind" trials—and, lastly, there is the experimental use of drugs in volunteers who may be either sick or healthy.

In planning a therapeutic trial of any of the first three types, if a control is necessary, what kind should be selected in general practice? There are four possibilities: (i) the action of the drug in question may be compared with that of one or more other accredited remedies already in common use for that particular disability (e.g., potassium iodide or tincture of stramonium in asthma; sulpha drugs or penicillin in measles); (ii) the action of the test substance may be compared with that of one or more *innocuous* substances or mixtures, whose accepted use in general practice lies as much in their psychological as in their chemical value, in so far as they have been found to allay any apprehension by the patient that nothing could be done for his condition (placebo); (iii) the action of the test substance may be compared with that of one or more "inert" substances; strictly speaking these should have been proved already to have absolutely no positive or negative action on the course of the disability for which they are given, but more commonly the phrase is used to include substances which are *expected to be inert* but whose action in this disability has never been put to a critical therapeutic trial. Where an "inert" substance is made to resemble in presentation the form of the test substance, the use of the phrase "dummy" tablet (mixture, capsule, etc.) is not only justified but more explicit, since it draws attention to the purpose of the counterfeit, which is to deceive the patient and often also the doctor taking part. (iv) The action of giving the test substance may be compared with that of withholding it. In fact this is what is done in both (ii) and (iii) above, and the reasons for choosing either (ii) or (iii) rather than (iv), or for choosing (iii) rather than (ii) needs to be examined closely.

In trials of the fourth, fifth, and sixth types mentioned above—namely, with unfamiliar drugs—if the general practitioner is working "blind" or where the consent of the patient is sought, legal and ethical as well as statistical difficulties may arise for the investigator. For example, it is the duty of a doctor to act only in what he considers to be the best interest of each individual patient. He ought not, in relation to any particular patient, to regulate his treatment according to any other consideration unless with the express knowledge and approval of his patient. An "infant" cannot and his parents may not give consent for any treatment not directed towards his own benefit; he may not be experimented on for the sake of others. Furthermore, it is dangerous to rely merely on the knowledge and approval of the patient, because he does not have the necessary medical knowledge to enable him to appreciate in full the considerations involved; the doctor would have to be quite sure that the patient really had a full appreciation of the position. This is particularly important when the toxicity of the trial substance is uncertain or known not to be negligible. Failure to act in accordance with the principles set out above might expose the doctor to risk of legal proceedings, based on a breach of contract or duty, or on assault.

Any general practitioner taking part in the National Health Service has a further duty to carry out his terms of service conscientiously and to the best of his ability. In selecting an inert substance as the only treatment of a patient seeking medical advice, the legal requirements of the terms of service under the N.H.S. would seldom, if ever, be met.

In dealing with new drugs a clear distinction should be drawn between a general practitioner's use of an unfamiliar drug on the advice of a consultant, as the appropriate and necessary remedy for a particular patient, and his use (either alone or with others) of a drug with which he is unfamiliar or uncertain, as part of a clinical trial on patients, whether volunteers or not. It is one thing to use a familiar drug as a new line of treatment in some particular condition; it is quite another to experiment with new drugs on our patients as though they were guinea-pigs.

Finally a word about "blind trials," in which the person observing the response to treatment is intentionally kept in ignorance of whether a particular patient is receiving the trial drug or a control. Such an observer is really acting

as an assistant to those who planned the trial. A family doctor who is in general practice as a principal could ethically be in some difficulties about taking part in such a trial, unless he had a share in its design, since he is personally responsible to his patients for the treatment which he prescribes for them. An assistant, however, can act as observer for his principal, and a single-handed practitioner can plan his own "blind" trials, if he in turn seeks help from a nurse or relative as observers, or in appropriate cases from the patient himself. This applies particularly to trials in which treatment is given for the relief of symptoms, such as pain, sleeplessness, worry, or anxiety, rather than for the alteration of physical signs which the doctor himself can observe. For all these reasons I agree with Dr. Leak, without regret, "that it would be wrong for the B.N.F. to include a dummy tablet. . . ."—I am, etc.,

Peaslake.

G. I. WATSON.

Congenital Dislocation of the Hip

SIR,—In your annotation on congenital dislocation of the hip (*Journal*, July 5, p. 38), you say that most cases of the disease in this country are diagnosed at the age of 1 or 2 years. A recent answer in "Any Questions?" referred to asymmetry of the skin creases as a useful sign.¹ Much earlier diagnosis could and should be made. Professor Marino Ortolani,² director of the Instituto Provinciale per l'Infanzia, Ferrar, has described a sign which can be elicited in newborn babies which is obviously not sufficiently well known in this country. First the thigh is flexed on the abdomen; then pressure is exerted along the long axis of the femur. The femur is then abducted. As the head of the femur rolls over the rim of the acetabulum there is a click, which may be felt or even heard.

From now on all newborn babies should be subjected to this manoeuvre at their first examination. In this way cases will be detected early, and much suffering prevented.—I am, etc.,

Bath.

H. R. E. WALLIS.

REFERENCES

- ¹ *Brit. med. J.*, 1958, 1, 1432.
- ² *Pediatrics (Napoli)*, 1937, 45, 129.

Aetiology of Cancer

SIR,—The highly interesting lecture on the aetiology of cancer by Dr. Ludwik Gross (*Journal*, July 5, p. 1) prompts me to draw some conclusions from the viewpoint of a clinician. The principle of "vertical transmission of potentially pathogenic agents" remaining harmless to their hosts often for generations and activated into cancer-producing pathogens only occasionally by "obscure reasons," "intrinsic or extrinsic stimuli," necessitates the following unavoidable logical conclusion as to human cancer aetiology. The latent harmless pathogenic agent must be ubiquitous in humans, since there is hardly any human family without a case of malignancy in the last four or more generations. In other words, every human being would be potentially susceptible to malignancy and the real enigma of cancer aetiology would remain unsolved because "the obscure reasons" for activation of the cancerogenic virus would be completely unknown in the great majority of human cancers.

We must taken exception to Dr. Gross's statement that genetic factors as contrasted with "vertical transmission" are "transmitted in an orderly and foreseeable manner." This is not the case where polygenic (multifactorial) heredity is involved.¹ As to inheritability of predisposition to malignancy, it can be foreseen as little as physical resemblance of a child *in statu nascendi* to any of his ancestors. Thus the genetic concept of cancer aetiology does not seem to me to be overthrown by the concept of "vertical transmission" of a virus. The question of similarity of a gene with a virus, however, is another matter.—I am, etc.,

Los Angeles, Calif.

JULIUS BAUER.

REFERENCE

- ¹ Bauer, J., *The Person Behind the Disease*, 1956, Grune and Stratton, New York.

Childhood Malignancies

SIR,—I have read with great interest the paper of Dr. Alice Stewart and her colleagues entitled "A Survey of Childhood Malignancies" (*Journal*, June 28, p. 1495). If diagnostic x-rays can cause leukaemia, it is reasonable to assume that they can also cause non-malignant changes of importance in the leucopoietic tissues. It is known that toxic substances like benzol which can cause leucopenia can also cause leukaemia. It would be interesting to know whether diagnostic x-rays can, in childhood, cause leucopenia, however slight, especially after radiographs which have been taken in pregnancy.

The dose concerned in radiodiagnosis is very small, and the radiation which penetrates the bone and reaches the bone marrow is only about 10% of the surface dose. The reticulo-endothelial apparatus on the other hand receives the full surface dose over the entire body. This radiation could easily be significant in a foetus of which a radiograph is taken during pregnancy. According to Dominici,¹ even myeloid cells can originate in the reticulo-endothelial apparatus, as I was able to confirm.² Non-malignant changes in the leucopoietic system, caused by x rays, are usually eliminated by recovery, but can lead, if permanent leucopenia ensues, to leukaemia or impairment of cellular and humoral reaction.³ In order to avoid the exposure of the entire radio-sensitive foetal reticulo-endothelial apparatus to radiation, radiographs should be avoided during pregnancy, if not strictly indicated.—I am, etc.,

St. Albans.

REFERENCES

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- ² Freund, F., *Virchows Arch. path. Anat.*, 1928, 269, 501.
- ³ Warren, S., *J. Amer. med. Ass.*, 1956, 162, 464.
- ⁴ Freund, F., *Strahlentherapie*, 1937, 58, 694.

F. FRIEND.

Comfort in the Surgical Ward

SIR,—Your leading article entitled "Comfort in the Surgical Ward" (*Journal*, July 12, p. 95) prompts me to make a few comments and a practical suggestion regarding post-operative thrombo-embolic phenomena. These "complications" still occur in spite of (and as you mention) early plications, since the process has commenced *before* the ambulation, since the process has commenced *before* the patient has recovered consciousness and is fit to carry out the various exercises, etc., advised. There are other factors—the indolent patient, changes in the constituents of the blood, etc.

Why is it that the thyrotoxic patient so very rarely suffers from thrombosis and embolism? In the few hundred thyrotoxic cases I have operated on I cannot recall a single case of thrombosis or embolism. The absence in the thyrotoxic of these phenomena—so distressing and dangerous—may be due to the faster circulation time, high B.M.R., increased hyperkinetic movements in bed, a lowered blood cholesterol level, etc., all of which should be considered and assessed. This freedom from thrombosis, etc., occurs whether the operation on the thyrotoxic patient is in the neck or in another region. As a practical suggestion I submit that, as a prophylactic, we should make patients somewhat thyrotoxic *before* operation. Here again the risks would have to be considered.—I am, etc.,

Dundee.

F. R. BROWN.

Card for Patients on Steroid Therapy

SIR,—It is recognized that sudden withdrawal of steroids in patients undergoing long-term treatment may be dangerous, particularly when such patients have been subjected to sudden stress, such as an acute illness, accident, or emergency operation. In these circumstances it may be of vital importance for the physician or surgeon responsible for the patient's immediate care to be made aware that the patient has been on steroid therapy, the form in which it is being administered, and the daily dose.

The education subcommittee of the Empire Rheumatism Council gave this matter consideration at a recent meeting

and reached the conclusion that a useful purpose would be served by the issue of a card (see Fig.) to patients receiving steroids, stating the preparation in use and its daily dose. The hospital or clinic supervising the patient's treatment and the name and telephone number of the family doctor should

STEROID TREATMENT

Hospital:	
Name:	
Address:	
Family Doctor	Phone No.
Drug	
Date	
Daily Dose	

1. DO NOT STOP taking these tablets except on medical advice. Always have a supply in reserve.
2. In case of acute illness, accident or emergency operation the treatment MUST be continued. A LARGER dose may be necessary at such times.
3. If the tablets cause indigestion, consult your doctor AT ONCE.
4. ALWAYS CARRY THIS CARD.

Issued by the:

EMPIRE RHEUMATISM COUNCIL
Faraday House,
8-10, Charing Cross Road, W.C.2.

also be recorded along with simple instructions to the patient. I have been instructed by my committee to bring this matter to your notice, as the Empire Rheumatism Council would be prepared to make a supply of these cards available to any physician who might wish to use them.—I am, etc.,

Faraday House,
8-10, Charing Cross Road,
London, W.C.2.

J. J. R. DUTHIE,
Chairman, Education Subcommittee,
Empire Rheumatism Council.

Post-operative Pulmonary Function

SIR,—In their paper on the effect of abdominal operations on total lung capacity and its subdivisions (*Journal*, July 12, p. 84), Mr. Anthony R. Anscombe and Dr. Roger St. J. Buxton mention that they gave a bronchodilator (aminophylline) to two of their patients before and after partial gastrectomy and found no significant changes in the total lung capacity and its subdivisions. In 1950 I measured the maximum breathing capacity (M.B.C.) pre-operatively and post-operatively before and after the inhalation of 1 ml. of a bronchodilator (isoprenaline) in 12 patients undergoing elective repair of inguinal hernia. It was found that, whilst there was a reduction in M.B.C. after operation, there was no significant increase in the M.B.C. before or after operation after the bronchodilator in patients who had normal chests. In two patients with mild bronchitis, however (one of whom developed atelectasis), although there were trivial increases in the M.B.C. after the isoprenaline pre-operatively, post-operatively after the bronchodilator there were increases of 20% and 30%.

Subsequent experience with a large number of cases confirmed this suggestion that patients with slight and often unrecognized bronchitis are most likely to develop post-operative atelectasis when undergoing abdominal operations. The reason for this is that they readily develop bronchospasm and secrete viscous bronchial mucus, which in combination with the reduction in ventilatory capacity which occurs in all patients to some extent after abdominal operations, leads to sputum retention, atelectasis, and bronchopneumonia. These considerations led to the development of a regimen which was found to be very effective in the prevention and treatment of post-operative atelectasis.—I am, etc.,

Aberdeen.

REFERENCE

- ¹ Palmer, K. N. V., and Sellick, B. A., *Lancet*, 1953, 1, 164.

K. N. V. PALMER.

Dysgerminoma in Pregnancy

SIR,—Dr. Jill M. Evans's report of a case of dysgerminoma in pregnancy (*Journal*, July 12, p. 105) was very interesting, but, without being captious, one may ask why a patient, 14 weeks pregnant, who had a "mobile firm swelling . . . the size of a foetal head," was discharged

from hospital and not subjected to laparotomy until four weeks later. It is surprising that so many textbooks still subscribe to the view that ovarian tumours should not be removed until after the 16th week of pregnancy because of the increased risk of abortion in the earlier months. Under modern conditions, however, the planned removal of pelvic tumours would appear to be far less dangerous to the foetus than the 10 to 20% abortion rates given by McKerron¹ and Spencer,² the usual authorities quoted, and any increased tendency to abortion would be more than outweighed by the technical advantages of operating in early pregnancy—ease of access, less handling of the uterus, etc.

In a paper read to the Newcastle Obstetric Society in May, 1954, I reported a series of 46 cases in which ovarian tumours and fibroids had been resected in early pregnancy with only one abortion resulting. (Most of the operations were performed by my former chief, Dr. Frank Burke, of Sunderland.) No fewer than 17 patients were dealt with during the first trimester, and in three of these an active corpus luteum was found in the cyst wall on section. During the past three years I have performed a further two myomectomies and excised five ovarian cysts before the 16th week without any foetal loss. Solid ovarian tumours are apt to be malignant (as in Dr. Evans's case), and by virtue of their weight and mobility there is a greater tendency to torsion. Hence I feel that the preferable policy for such cases is to operate as soon as possible without any reference to the duration of pregnancy.—I am, etc.,

J. P. O'DWYER.

Ballinasloe, Co. Galway.

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² Spencer, H., *Tumours Complicating Pregnancy, Labour, and the Puerperium*, 1920. Harrison, London.

Chromosomal Sex and Abnormal Sexual Development

SIR,—Since reporting upon an investigation into the oral smear method for the determination of chromosomal sex in a group of 260 normal individuals¹ we have had opportunity to apply the technique to more than 60 cases of abnormal physical or psychological sexual development. As was the case with normal individuals, we experienced little difficulty in determining the chromosomal sex from oral smears, and, provided the criteria which were stipulated in the previous study were observed, a count of 25 cells proved sufficient. With the younger cases, the youngest child being 1 month old, the examination was a little more tedious, for, as we also observed previously, it is difficult to find the appropriate number of suitable cells in a single smear. We would advocate therefore in these cases that as routine practice more than one smear should be available for examination.

The results from this further application of the oral smear technique emphasize our earlier contention that in the majority of cases skin biopsy for chromosomal sex determination appears to be unnecessary.

The present series includes cases of true and pseudo-hermaphrodites; Turner's and Klinefelter's syndromes; eunuchoids, transvestites, and homosexuals. The method has been particularly useful in separating out those cases with definite physical abnormalities—for example, Klinefelter's or Turner's syndrome—from those of an essentially psychological nature, without resort to laparotomy. In the psychologically maladjusted group it has been our invariable experience that the physical sex diagnosis is borne out by the chromosomal sex findings.

It has been most interesting to note that the incidence of sex chromatin in some of the chromosomal females with physical abnormalities has been surprisingly low, falling well below the normal incidence range¹; in a limited number of cases this feature has also been observed in the mother of the patient. However, at this stage we are unable to comment on the significance or otherwise of this finding. Finally we would agree with other workers^{2,3} that, whilst this method appears to give a true diagnosis of genetic sex, it

should not be allowed to exercise undue influence in the determination of the "social sex" of the individual.

We are much indebted to Professor R. Platt, P.R.C.P., of Manchester Royal Infirmary; Mr. L. R. Broster and Mr. J. Adler, of Charing Cross Hospital; and Drs. P. M. F. Bishop, F. Osmond-Clarke and M. Murray, of Chelsea Hospital for Women, for sending us material for investigation.

—We are, etc.,
Manchester, 13.

A. D. DIXON.
J. B. D. TORR.

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² Barr, M. L., *Lancet*, 1956, 1, 47.
³ Segal, S. J., and Nelson, W. O., *J. clin. Endocr.*, 1957, 17, 676.

Suffocation in Infancy

SIR,—Dr. W. H. Davison (*Journal*, July 26, p. 248) is quite right to reply to Dr. J. Shackleton Bailey's letter (*Journal*, July 12, p. 104). Our own findings would go even further than those of Dr. Davison's survey in Birmingham. Even when the circumstances would appear to be greatly in favour of overlying, it is frequently possible to find an adequate natural cause of death. We are prepared to go so far as to suggest that the normal child is never simply "found dead in bed or cot from external mechanical suffocation."

I feel that it is important for the benefit of other children in the same family when a child is found unexpectedly dead that the parents should not be subjected to a police investigation. It is surely not necessary for a doctor to submit a child immediately to the coroner as a suspected case of suffocation if he can in the meanwhile obtain the parents' consent for necropsy, and have the body examined by a pathologist experienced with such cases. It is equally important that the parents should not be blamed for leaving a child on a pillow or taking it into bed with them.—I am, etc.,

Sheffield, 10.

JOHN L. EMERY.

Iron Preparations

SIR,—In Dr. C. F. Herridge's interesting paper on the comparison between ferric chelate and established iron preparations (*Journal*, July 19, p. 140), the question of cost is raised in assessing the choice for a given patient with iron-deficiency anaemia. The preliminary report of the Hinchliffe Committee has made many of us price-conscious, and therefore I have calculated the price of the three iron preparations, adding for comparison the B.N.F. mist. ferr. sulph. pro inf.

Dr. Herridge gave his three mixtures for six weeks, and I have calculated the total of each required to give his suggested dose. Some difficulty arose with the new ferric chelate mixture ("sytron"). The daily elemental iron (assuming a utilization factor of 14%) available from the dose he used is somewhat higher than the figure given. However, the commercially available sytron differs from the preparations available for Dr. Herridge's investigation in being only nearly half the strength (380 mg. per 8 ml. (approx. 2 drachms) instead of 600 mg.). I have therefore provided the price of 21 oz. (596 ml.) as suggested by Dr. Herridge, and of 27 oz. (767 ml.) as calculated to produce the daily figure of 142 mg. elemental iron. In the case of mist. ferr. sulph. pro inf. the quantity required to give the same daily amount of elemental iron (using the utilization factor of 14%) is 1.4 oz. (39.4 ml.) per day—a total amount of almost 60 oz. (1,704 ml.) for the six weeks. However,

Drug	Am't	Basic	P.T.	On-cost	C-A	D-F	Total
"Sytron"	27	200	60.5	65.125	1.55	48	375 (31s. 3d.)
"Ferlucon"	21	155.5	47	50.63	1.55	24	278.7 (23s. 3d.)
"Ferromyn"	10.5	75.5	Nil	18.88	1.55	14	109.93 (9s. 2d.)
Mist. ferr. sulph. pro inf.	8	94	28	30.5	1.55	14	168 (14s.)
	60	80	Nil	20	1.55	48	149.55 (12s. 5½d.)
	21	28	..	7	1.55	42	60.55 (5s. 1d.)

Am't: Quantity in fluid ounces (1 oz. = 28 ml.) calculated for six weeks.
Basic: Cost of ingredients or wholesale price. P.T.: Purchase tax. On-cost: An additional 25% of the basic price + purchase tax. C-A: Container allowance. D-F: Dispensing fee. Total: in pence.

clinical experience suggests that two drachms twice daily (9.5 oz. (14 ml.) per day, or a total of 21 oz. (596 ml.)), gives a satisfactory haematological response. I have therefore priced both 60 oz. (1,704 ml.) and 21 oz. (596 ml.) of the B.N.F. mixture.

The various factors which go into the price paid under the N.H.S. for a drug have been listed separately (in pence, as is the customary method). I find this breakdown of the total cost is as instructive as the cost itself. If any comment is to be made from all these figures it is that, while some preparations may have a valuable place in treating difficult cases (either difficult diseases or difficult patients), as "tonics" or placebos we should be very wary of their price.—I am, etc.,

London, W.12.

STUART CARNE.

Heat Illness

SIR,—Among the discoveries of Ur was a little clay image of the "God of the South Wind." Homer¹ mentions the death of one hero, during a battle before Troy, due to a "stroke from the Sun God" (translation by Andrew Lang). Alexander the Great (*O si sic omnia!*) chose the winter for his Mesopotamian campaign, culminating in the battle of Arbela on September 20, 331 B.C., attended by a lunar eclipse.

Your enlightened annotation and the article "A Classification of Heat Illness" (*Journal*, June 28, pp. 1351 and 1353) draw attention to a little-considered but very important problem. Clinically the "effects of heat" are numerous, and most extensively displayed by W. H. Willcox.² For practical purposes, hyperthermia (heat stroke) and heat exhaustion (heat collapse) may include all the major disorders: prickly heat and heat cramps being merely symptoms, although very unpleasant ones. The best and most universal form of treatment is the provision of an artificially cooled environment for the sufferers. Modes of prevention include suitable acclimatization, avoidance of drugs like atropine; anaesthetics are also taboo (unless in a cooled theatre); ichthyosis is an absolute bar to employment in the Persian littoral (gathered from bitter experience). For armies that have to consider shipping space a form of "iron lung" with mechanical refrigeration could be used to revive cases in the zone of operations. The Croonian Lectures by Dr. H. L. Marriott³ reveal a first-hand knowledge of the problems involved. He had to deal with conditions where no mechanical aid was possible: that phase should belong to the past. I have also made suggestions for improvement in hospital and living conditions and for better treatment.⁴ The writings of the late Professor M. S. Pembrey⁵ deal with the investigation of the problems of marching men. Endocrine factors are still much neglected—as remarked in your annotation, but the artificial production of "coolth" is still the keystone of the arch of treatment.—I am, etc.,

FRANK MARSH.

Epping, Essex.

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² *Brit. med. J.*, 1920, 1, 392.
³ *Ibid.*, 1947, 1, 245, 285, 328.
⁴ *Marsh, F., British Encyclopaedia of Medical Practice*, 1937, Vol. 6, p. 396.
⁵ *Butterworth, London.*
⁶ *Trans. roy. Soc. trop. Med. Hyg.*, 1930, 24, 257; 1933, 27, 255; 1935, 29, 309.
⁷ *J. roy. Army med. Cps.*, 1913, 21, 156; 1914, 22, 692.

Prevention of Lung Cancer

SIR,—Whilst agreeing strongly with the ideas embodied in Dr. Lennox Johnston's letter (*Journal*, June 21, p. 1483) on the need for a national campaign to put the facts about smoking and lung cancer squarely before the public, he does, I think, miss one rather strong point. He omits the importance of directing such a campaign against children and young adults. The middle-aged man who has been smoking all his life is almost beyond redemption, but the children of to-day are the lung-cancer victims of thirty years hence, unless they can be taught the wisdom of not smoking. Young men in the Forces are also accessible to education in

this matter; my own Service days were punctuated by lectures and films on the dangers of venereal disease, malaria, and typhoid, so I should think that some education on the dangers of smoking would not be out of place.

Taken in its broadest aspect, the question of smoking and lung cancer has now entered the domain of preventive medicine, and as doctors we are neglecting our precepts and responsibilities if we do not say, "At last here is a positive approach in dealing with one major malignant disease, that of prevention." Which medical man in his right mind would fail to be shocked to learn that one of his patients was daily drinking tuberculous milk—particularly if this was a young person? And yet, year in and year out, every doctor has a large number of his patients paving their way to early and unpleasant deaths by a daily habit which is just as preventable as the marketing of tuberculous milk.—I am, etc.,

Boston, Lincs.

E. R. NYE.

Cancer Education

SIR,—I am sorry to have to take issue with so eminent a correspondent as Professor Ian Aird, but I feel most strongly that in his letter on cancer education (*Journal*, June 14, p. 1417) he has fallen a victim himself to the "education and propaganda" which he seeks to uphold. The term "cured of cancer" is probably more frequently used on this side of the Atlantic than Professor Aird's, and I am becoming more than ever convinced that its use is as much to satisfy the ego and present methods of the therapist—be he surgeon or radiologist—rather than to indicate the true status of the patient. After all, it rather depends on one's standards of "cure." If this only amounts to, say, one year's survival—to take an arbitrary figure—then a so-called cure is relatively easy to obtain, but if, on the other hand, 5, 10, 15, or 20 years of survival is demanded, then a cure becomes correspondingly more difficult to obtain. A cure can only be certain when a patient has received treatment for a carcinoma, and necropsy at some later time demonstrates that death is due to some other cause and that there is no evidence of the original carcinoma either macroscopically or microscopically.

I question the wisdom and truthfulness, in the present state of our knowledge, of instilling in the mind of the general public the idea that sometimes cancer, especially early cancer, is a curable disease. There is absolutely no proof to back up this statement. Absolute survival figures of treatment of carcinoma have altered little over the decades, and what improvement there has been is entirely due to the fact that blood transfusion, chemotherapy, antibiotics, and vastly improved anaesthesia have caused fewer patients to die from the immediate effects of treatment of the primary growth. Relative survival statistics are not worth the paper they are written on, as they are always "loaded" because the operator is choosing the most suitable cases for his particular type of therapy. By "early cancer" is meant a small circumscribed lesion, with no evidence of metastasis and a short or absent history. This could just as easily be an old carcinoma in terms of morphological time but one which is slow growing and slow to metastasize, which is the reason why it has not been picked up earlier. Obviously, treatment of such a lesion would lead to a reasonable survival time, but this is due rather to the nature of the carcinoma than the time at which treatment was given, as the lesion is a slowly growing and slowly metastasizing one.

Cancer detection clinics may have failed to improve the mortality from the disease, but they have contributed a great deal of useful data to our knowledge of the natural history of carcinoma. It now appears likely that a frankly carcinomatous epithelium may be restrained from spreading through the basement membrane and remain *in situ* for a variable time—sometimes for years. The epithelium may regress and return to normal, or it may progress to a frank carcinoma by the carcinomatous cells bursting through the basement membrane. The patient's fate is then decided by the metastasizing ability of the cells, and this occurs at a period of time long before a diagnosis is made. Again it is a question of standards when one discusses early carcinoma, and I do not think I need to labour the point further, except to point out that many doubtful carcinomas are being treated as carcinomas, with consequent vilification of statistics and subjection of patients to unnecessary surgery.

I have no objection to the public receiving cancer education as advocated by Professor Aird, provided it is based on truth, but can this be done at this time? May I draw the attention of your readers who are interested in this subject to two particularly informative and thoughtful articles which have probably been neglected because they do not subscribe to popular orthodox opinion, but which do indicate that perhaps a glimmer of truth is beginning to emerge from the morass in which we find ourselves. I refer to a paper by J. R. S. Douglas¹ entitled "Survival Curves as a Means of Investigating Cancer," and George Crile, junior's, paper "Factors Influencing the Spread of Cancer."²—I am, etc.,

Petersburg, Virginia, U.S.A.

J. KENWORTHY OGDEN.

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² Crile, G., jun., *Surg. Gynec. Obstet.*, 1956, 103, 342.

Chloramphenicol Suspension for Intrathoracic Infections

SIR,—We would like to draw the attention of your readers to our experience with a suspension of 15% chloramphenicol for use as a local application in the treatment of certain intrathoracic infective conditions. We have used the suspension in six cases so far and have been favourably impressed with the results.

The series of six cases comprised five patients with pulmonary tuberculosis and one with a bronchial carcinoma. All six cases had surgical treatment carried out and developed their intrathoracic complications following operation. One of the tuberculous patients had a right upper lobe excision and developed a *Staph. aureus* empyema, and this responded to a course of systemic chloramphenicol combined with daily aspiration of the empyema space and the instillation of the suspension. In the other cases the infecting organism was a *Staph. aureus* too, but because of the nature of their condition and the operation performed it was difficult to eradicate completely the factors favouring continuation of their infection. Two of these were pneumonectomy cases who developed a *Staph. aureus* empyema of the pneumonectomy space, and although the suspension helped temporarily in overcoming the infection there was still a residual space left which would favour the perpetuation of chronic infection.

We feel it justifiable to publish these results, as in one case there was complete cure and in the other five cases definite clinical improvement was obtained. We feel, therefore, that the preparation described has a useful place to play in the local treatment of certain types of intrathoracic infections.

The 15% suspension was kindly supplied to us for clinical trial by Parke, Davis and Co., Ltd., through the kind auspices of Dr. H. W. Pearson

—We are, etc.,

Newton Mearns,
near Glasgow.

NORMA MCFARLANE.

JOHN M. REID.

JOHN G. STEVENSON.

Pioneers in India

SIR,—On reading the report of the opening of the Eighth Congress of the Medical Women's International Association (*Journal*, July 26, p. 244), I was surprised that the name of Dame Edith Brown was not mentioned among the pioneers in India. Dame Edith probably was the first woman doctor in India to receive this award. She founded the Women's Christian Medical College in Ludhiana, Punjab, about 1895. I am sure there are many, like me, who appreciated the loyal and trustworthy work done by the graduates of the Women's Christian Medical College, Ludhiana.—I am, etc.,

Cobham, Surrey.

HILDA L. KEANE.

Medical War Crimes

SIR,—My letter (*Journal*, July 5, p. 551) seems to have been so badly worded that I appeared to champion Dr. Herta Oberheuser. My intention was otherwise, and I would like to make this quite clear. I wished, in fact, to champion justice, which, I felt, might miscarry if we were ignorant of

the facts about her as she is now. This information was not presented.

I did not state that she was a "dedicated practitioner," only that she might be, which is a very different thing. There is not the slightest doubt in my mind about the enormity of her past behaviour, and for this very reason I thought it important to know something about her now. I felt that justice demanded such knowledge and that our verdict should have been tempered by it. However, it is obvious that, when the medical profession sits in judgment on its members, this particular principle is not observed.—I am, etc.,

Chesterfield, Derbyshire.

A. P. TAIT.

Orthopaedic Medicine

SIR,—I feel that the review by Professor J. H. Kellgren of the *Textbook of Orthopaedic Medicine* by Dr. James Cyriax (*Journal*, July 12, p. 93) should not be allowed to pass without comment. Some of the observations made are incredible. It is stated that "much of the treatment proposed seems to be of unproven value, since most of the complaints he is dealing with are naturally of short duration." Is it being suggested that a backache lasting several years is a complaint of short duration, and that, when it is dramatically relieved by manipulation, this contributes nothing to the immediate improvement? The sceptics may say that patients helped by manipulation are hysterics or neurotics, but in my opinion that is an admission of failure to explain the result, and every general practitioner knows that it is not a satisfactory explanation.

I do not know what is meant by the statement "the author shows a disregard for the dangers of spinal-cord lesions which have been so clearly demonstrated in recent neurological work and anatomical studies of the cervical spine," but I do know that I have given lasting relief to patients with backache and "fibrositis," by manipulation. I also know, after attending Dr. Cyriax's clinic, that the treatments carried out there are urgently needed in general practice and would result in a saving of thousands of pounds by removing these patients from the physiotherapy department, where they receive general physiotherapy of little or no value.

The material in the *Textbook of Orthopaedic Medicine* is based on years of experience in this work and thousands of cases successfully treated. The opinions given in the review are coloured too much by morbid anatomical studies, and I feel that the importance of careful clinical observation is not fully appreciated.—I am, etc.,

Hemyock, Devon.

THOS. LOGAN.

Electrified

SIR,—The other day, starting the septic hand clinic, I reached out to examine the first patient's hand, when, to my surprise and his, as our hands were about one inch (2.5 cm.) apart there was an audible snap. I experienced a sharp needle-like stab of pain in my thumb and the patient a similar stab in his index finger which made us both withdraw our hands involuntarily.

In many thousands of examinations I have never previously received a static electric shock, and so far as I could judge there was nothing peculiar about our clothing or the atmospheric conditions on this occasion. I wonder whether any of your readers have had similar experiences or can throw any light on the occurrence?—I am, etc.,

Birmingham, 4.

LIONEL H. PIMM.

POINTS FROM LETTERS

Fidgety Legs

Dr. PERCY G. HARRIS (Belfast) writes: "Orthoxine" (methoxyphenamine) is claimed by the makers as being effective for the relief of nocturnal leg cramp in old age and pregnancy. It occurred to me that patients complaining of "leg fidgets"—that most disturbing syndrome to the unhappy sufferer—might also benefit. In a small series this treatment has proved most effective, being almost 100% successful.

Obituary

W. E. BARNES, C.B.E., M.R.C.S., L.R.C.P., D.T.M.&H.

Air Vice-Marshal W. E. Barnes, formerly Deputy Director-General of Medical Services of the Royal Air Force, died at Brighton on July 28, four days after his 61st birthday.

William Edward Barnes was born at Finchley on July 24, 1897, and was educated at University College School, Hampstead. He interrupted his medical training at University College Hospital, London, to enter the Royal Field Artillery for service in the first world war, being awarded the French Croix de Guerre in 1918. Returning to University College Hospital in 1919, he qualified M.R.C.S., L.R.C.P. two years later. Entering the R.A.M.C. as a lieutenant immediately after qualifying, he transferred to the Royal Air Force Medical Service in 1922, with the rank of flying officer. For the next seventeen years he served mostly abroad, in Iraq and India, and when the second world war broke out in 1939 he was in charge of a mobile field hospital attached to the Advanced Air Striking Force, with the rank of wing commander. On returning to England he was placed in command of No. 1 Medical Receiving Establishment, and then, in March, 1941, he was appointed commanding officer of Princess Mary's Hospital, Halton. In 1944 he was principal medical officer to the 3rd Tactical Air Force in Burma, becoming deputy principal medical officer at the headquarters of Transport Command, South-east Asia, a year later. On his return to England in 1946 he became principal medical officer at the headquarters of Transport Command, until his appointment as commandant of the R.A.F. Central Medical Establishment. In 1947 he was appointed Deputy Director-General of R.A.F. Medical Services. Three years later he took the D.T.M.&H. of the English Royal Colleges. From September, 1950, he served as principal medical officer, with the rank of air vice-marshal, at the headquarters of Home Command, which at that time took over administrative control of R.A.F. hospitals and medical units in the United Kingdom from Technical Training Command. He retired from the R.A.F. at his own request in 1953. Barnes was a member of the Central Medical War Committee in 1949–50, and in 1954 he was elected to the Council of the British Medical Association, becoming an *ex officio* member of the Armed Forces Committee, of which he became chairman last year. He was appointed C.B.E. and an Honorary Surgeon to the King in 1951, becoming an Honorary Surgeon to the Queen the following year. He married Miss Kathleen M. King in 1923 and had one son.

J. M. K. writes: The name of William Edward Barnes will always have a foremost place among those who built up the medical branch of the Royal Air Force. The record of his service shows this, and points to his devotion and high achievement. But it cannot bring out the qualities which bound him to his friends. He made friends wherever he went and lost none.

He was indeed the best friend anyone could have, considerate to all, courteous almost in the fashion of an earlier day, generous in thought and action, frank when frankness was necessary, completely unselfish; above all—and this was characteristic—he did not change. This stability was perhaps a part of his enviable attitude to life. He saw his duty clearly and did it. He was not in doubt between right and wrong, and never compromised, his principle sustained by his firmness of purpose and his self-reliance. He could be stirred to anger, and three things roused him—slipshod work, evasion of responsibility, and injustice. Faced with these he spoke his mind vividly and to the point. Folding of the hands held no appeal for him, and to his latest days he was active, vital, and interested.

In the earlier years of his service, as a most able clinician, Barnes was meticulous in the care of his patients, seeing to

every detail which might be helpful whatever the cost in effort, and not only detail of medical treatment but matters of welfare or of personal or family concern. Any who would come between him and what he thought best for his patients had to reckon with a strong opponent. Later in his service he brought the same clear outlook to the wide administrative problems which fell to his care. His interest in his chosen Service never failed, and after his retirement he was eager as always for its advancement, and jealous for its reputation.

He was a cheerful and stimulating companion, and in his circle liveliness was assured. Those who knew him in the surroundings of his home are grateful for the memory of the real accord and the deep happiness of a united and devoted family. This true man will not be forgotten.

E. W. BAIN, M.B., F.R.C.S.

Mr. E. W. Bain, honorary consulting surgeon to the ear, nose, and throat department of the General Infirmary at Leeds, died at his home at Arkendale, near Knaresborough, Yorkshire, on July 15. He was 81 years of age.

Edward Walter Bain was born on March 11, 1877. He received his medical training at the London Hospital, graduating M.B., B.S. from London University in 1902. Five years later he was admitted F.R.C.S. After graduation he held a number of house appointments at his teaching hospital, and then undertook postgraduate study in Vienna. On his return to London he became senior clinical assistant in the ear and throat department at the London Hospital, assistant surgeon to the Metropolitan Ear, Nose, and Throat Hospital, and surgeon to the ear and throat department of the Royal Waterloo Hospital for Children and Women. A career as a London specialist seemed in prospect for him, but he moved to Leeds in 1912, when he began what was to be a long connexion with the General Infirmary there. For well over thirty years he was surgeon (ultimately senior surgeon) to the ear, nose, and throat department; and the Ikley Coronation Hospital, the St. James' Hospital, Leeds, and the Castleford, Normanton and District Hospital also had the benefit of his services over a long period. In addition, he was for some time clinical lecturer in diseases of the ear, nose, and throat in Leeds University. During the first world war he served as a captain in the R.A.M.C. at the 2nd Northern General Hospital. When he retired in 1937 he was appointed consulting surgeon in his specialty to the hospitals he had served so well. His retirement, however, was short-lived, for, soon after the outbreak of the second world war in 1939, he was recalled to active work, finally retiring in 1947.

O. C. L. writes: Edward Walter Bain came to Leeds from the London Hospital in 1912 on his appointment as surgeon to the ear, nose, and throat department of the General Infirmary at Leeds. It was to be a happy association lasting in an active way for almost thirty-five years, for he retired in 1937 but returned at the outbreak of war and remained in practice until 1947. He had a large, successful practice which extended throughout Yorkshire and the north, and his services were in big demand when the surgery of the acute mastoid was an important part of otology. He was a careful and deliberate surgeon with a leaning towards conservatism. He had a most equable and calm temperament and nothing ever seemed to disturb or excite him. He was extremely kind and courteous to all patients.

The generous hospitality of "Bill" Bain and his wife will be remembered by many older colleagues and friends who had the opportunity and pleasure of being entertained in the delightful houses they occupied; houses which were graced by beautiful old furniture, of which Bill Bain was no mean connoisseur. For many years he played golf at Alwoodley, and many of us, as students, first met Bill Bain when he organized the annual staff v. students match—and what a delightful encounter it was. In later years he became an enthusiastic fisherman, but throughout his life

his garden gave him greatest joy, and he was tending his flowers only a few hours before he died. During the last few years a neuralgia caused him a good deal of distress, but he was always happy to welcome old colleagues and friends to his home in Arkendale, and with great delight would show them round the garden and entertain them to tea. The death of his wife in 1943 was a severe blow to him, but he was fortunate to be cared for to the end by those who had served him loyally for almost forty years.

P. P. DEBONO, O.B.E., M.D., F.R.C.S., D.P.H.

Professor P. P. Debono died on June 3 in Malta, where for many years he was senior surgeon at the Central Hospital and professor of surgery in the university. He was 67 years of age.

Peter Paul Debono was born on June 29, 1890, and graduated M.D. from the University of Malta in 1910. As first student in his course he won a scholarship which took him to London for postgraduate study, and in 1911 he obtained the Cambridge D.P.H. Returning to Malta, he was assistant to the professor of anatomy and of pathology in the university until 1917. During the first world war he was acting pathologist at the Central Hospital, Malta, and civil surgeon attached to the Royal Navy and, later to the R.A.M.C.; assistant to the pathologist, Malta Command; and officer in charge of a district laboratory. After a period as medical officer of health in Malta in 1918-19, he returned to England for postgraduate surgical studies at St. Bartholomew's Hospital, and was admitted F.R.C.S. in 1920. In the following year he held the appointment of resident surgical officer at Manchester Royal Infirmary. From 1921 to 1926 he was junior surgeon at the Central Hospital, Malta, and he then became senior surgeon and professor of surgery in the university, retiring in 1951. From 1936 to 1939 he served on the Executive Council of Malta, and shortly after the beginning of the second world war he became chief surgeon of the emergency medical services. He was appointed O.B.E. in 1944. Elected to the Maltese Legislative Assembly in 1947, he became Minister of Health and, subsequently, Speaker of the Assembly. He was a member of the British Medical Association for forty-five years, being assistant secretary of the Malta Branch from 1919 to 1923, honorary secretary and treasurer from 1923 to 1930, and president from 1935 to 1937, and again in 1942-3. He leaves a widow and two daughters.

V. G. GRIFFITHS writes: Professor P. P. Debono established modern surgery in Malta. He combined in the highest degree intellectual abilities and skilled craftsmanship, and, coming to surgery by way of physiology and pathology, he proved an ideal teacher whose precept and example founded a sound surgical school in the island. His versatility was remarkable, and he had more than made his mark in bacteriology and pathology before his superabundant energies were providentially turned towards surgery. Even in his most hectic surgical period, however, his interest in natural history never flagged, and his students habitually regarded him as their mentor in practically every subject of the medical curriculum.

During the first world war, when Malta was "the Nurse of the Mediterranean," he was inspired by contact with Sir Charles Ballance and men of similar calibre who were treating the wounded from Gallipoli. His training in England made of him a teacher of the British school, and he was very well known to the leaders of British surgery of his time. The second world war, in which Malta occupied a most honourable front-line position, brought him the burden and the glory of treating almost single-handed the thousands of serious civilian casualties of enemy bombing: it is safe to say that no surgeon in the Commonwealth had a task of equal magnitude in operating for months and months of continuous bombardment in makeshift hospitals with the slenderest resources. Yet throughout that period he also coped successfully with routine surgery and with his teaching.

P. P. Debono was a true general surgeon of such high quality that the results of his incursion into any part of the human body could bear comparison with those of most specialist surgeons. His approach to surgery was lion-hearted, and his courage was matched by superb judgment and marvellous dexterity. He reached the peak of his achievement when he was yet denied those ancillary advances of anaesthesia and chemotherapy that we now almost take for granted. Surgery was not made easy for him, but he did seem to make it easy for others. He was magnificent in times of stress, when his own broad shoulders seemed made for the burdens of all around him: very seldom was he known to lose patience with his assistants, and never to stoop to blaming them when things went awry. He has created in Malta an example and a tradition which his pupils and successors are honoured in attempting to preserve.

CORRIE HUDSON, C.B., C.I.E., D.S.O., F.R.C.S.Ed.

Major-General Corrie Hudson, who had a distinguished career in the Indian Medical Service, died on July 11. He was 84 years of age.

Corrie Hudson was born at Clifton, Bristol, on April 5, 1874. Educated at Manilla Hall, Clifton, where his father, C. T. Hudson, F.R.S., was headmaster for some twenty years, he received his medical training at Charing Cross Hospital, qualifying M.R.C.S., L.R.C.P. in 1897. He then held the appointments of house-surgeon and house-physician at Charing Cross before entering the Indian Medical Service in 1899. From that year until 1907 he was medical officer with the 2nd Queen's Own Rajput Light Infantry, and with that regiment served with the China Expeditionary Force in 1900-2, becoming captain in the latter year. He was with the Somaliland Field Force in 1903-4 and was present at the action at Jidballi. His services there were recognized by a mention in dispatches and the award of the D.S.O. in 1904, as well as the medal and clasp. From 1908 to 1912 he was staff surgeon at Bangalore, promotion to major coming in 1910, and in 1912-13 he served in the war in the Balkans. He was elected F.R.C.S.Ed. in 1912. In November, 1914, soon after the outbreak of the first world war, he was appointed deputy assistant director of medical services with the 1st Indian Cavalry Division in France, and held the post until June, 1916, being mentioned in dispatches for his services. From 1918, when he was promoted lieutenant-colonel, to 1919 he was an instructor at staff schools in India, and from 1919 to 1923 an assistant director of medical services—first, with the Lines of Communication of the Waziristan Field Force in 1919-20, being mentioned in dispatches, awarded the medal, with clasp, and appointed C.I.E. in 1920; then with the Wana Column in 1921-1, again being mentioned in dispatches and receiving the clasp; and with the Razmak Field Force in 1922-3, with a further mention and clasp. In 1924-5 he was director of medical organization for war at Army Headquarters. He became colonel in 1925, and in 1927 was appointed C.B. From 1928 to 1932, when he retired, he was deputy director of medical services in the Eastern Command, with the rank of major-general, and an Honorary Surgeon to the King. His elder brother, Lieutenant-Colonel Charles Tilson Hudson, who died in 1948, also had a distinguished career in the Indian Medical Service. In 1904 Corrie Hudson married Miss Frances E. Barratt, by whom he had one daughter. Mrs. Hudson died in 1945.

KEITH CHITTY, M.B., F.R.C.S.

Mr. Keith Chitty, consultant surgeon to the mid-Worcestershire group of hospitals, died at his home at Chaddesley Corbett, near Kidderminster, on July 9. He was 38 years of age.

Keith Chitty was born on May 12, 1920, the son of Mr. Hubert Chitty, F.R.C.S., of Bristol. From Clifton he won an exhibition to Peterhouse, Cambridge, in 1938, and from

there he went on to University College Hospital to receive his clinical training, distinguishing himself by winning the Erichson prize in practical surgery. He qualified by taking the London Conjoint Diploma in 1943, and in the following year he graduated M.B., B.Chir. After holding the appointment of house-surgeon at University College Hospital, he served in the R.A.M.C. from 1944 to 1947. On return to civilian life he was appointed surgical registrar at his own teaching hospital, and in 1949 he obtained the F.R.C.S. From 1952 to 1957 he was a senior registrar at Bristol Royal Infirmary, for the first three years in the urological department, and then in general surgery. Last December he was appointed consultant surgeon to the mid-Worcestershire group of hospitals. He leaves a widow.

A. M. writes: The sudden death of Keith Chitty at the age of 38 when he seemed to be at the beginning of a satisfying surgical life has saddened his many friends. He had been appointed consultant surgeon to the mid-Worcestershire group of hospitals as lately as December 1, 1957, and had barely had time to begin his work there. Although he went almost straight away into the Army after qualification, and was among other things medical officer to the Royal Engineers who built "Mulberry Port," his interests were always in surgery and led him to be a surgical trainee when serving later in India until he left the R.A.M.C. in 1947. An interest in genito-urinary surgery and the prospect of returning to the West Country brought him as senior registrar to the urological department in Bristol in 1952. Here the greater responsibility and the wider practical experience produced an immediate response, and Keith Chitty developed into a clinician whose soundness and judgment were respected by all; he was an excellent example of the happy result of combining a sound basic knowledge of surgery with a kindly, reassuring manner and a real ability to inspire confidence in his patients. After three successful years in urology he changed over to general surgery and spent his last two years, before obtaining a consultant post, as senior registrar at the Bristol Royal Infirmary. His as senior registrar at the Bristol hospitals were legion: he was greatly liked by his colleagues, and his relationship with his chiefs was on the terms of a personal friendship. He was beloved by the nursing staffs and especially by the students, whom he taught thoroughly and with humour the basic bedside clinical surgery of which he was a master. It is true to say that he left Bristol with universal good wishes, and the news of his death was received with dismay and with the feeling that the world of surgery has been suddenly and unaccountably deprived of a member whose value and potential influence for good were very great indeed. His mother and father and his wife have our sincere sympathy in their tragic bereavement.

Dr. A. G. FREEMAN writes: The news of the death of Keith Chitty at the early age of 38 has been received with great sorrow by his many friends in Bristol. His loss has been keenly felt, especially by the junior hospital staff. As chairman for some time of the south-western regional junior hospital staff group and member of the executive committee of the group council he had done much to encourage and promote the welfare of his junior colleagues. Although he died on the threshold of his career as a consultant surgeon, the many appreciations received from his surgical colleagues of his work and skill speak for themselves. However, it is not in a professional capacity that I wish to add my personal tribute but rather as one who has had the immense privilege of friendship since we were undergraduates together at Cambridge some twenty years ago. Even in those days Keith knew that, like his father, he would become a surgeon. Soon after qualification his training was interrupted by war service, and as an Army doctor he landed in Normandy on "D" day. On demobilization he resumed his surgical training, and a few months before his death had achieved his ambition. To the casual acquaintance Keith may have appeared somewhat quiet and retiring in manner. Yet to those who knew him well it soon became evident that here was a man with a fine sense of

humour and with high ideals and a firmness of character which were to be admired. His quiet and friendly nature bred trust and respect. Before he left Bristol at the end of last year the housemen and registrars in the area gave a dinner in honour of Keith and two of his colleagues who had recently obtained consultant appointments. We felt at that time that we were wishing godspeed to our friends. Now we in Bristol mourn the loss of one who will be sadly missed, and our sincere sympathy goes out to his wife and to his family in their bereavement.

W. H. C. SPOONER, M.B., B.S.

Dr. W. H. C. Spooner's untimely death on August 1 through the ramming of his yacht by a tug at Brest has caused consternation and sorrow in the town and district of Blandford Forum, Dorset. He was 49 years of age.

William Henry Casswell Spooner was born on July 2, 1909, at Blandford, where his father, grandfather, and great-grandfather were all in general practice before him. Educated at Epsom College and at St. Mary's Hospital, he took the London Conjoint diploma in 1932 and the London degrees of M.B., B.S. two years later. After a period of residence in hospital and acting as assistant in Llandudno, he returned to his birthplace in 1936, where he went into partnership with Dr. K. J. T. Wilson and Dr. D. Oliver, following the retirement of Dr. L. Bodley Scott, and since 1954 also with Dr. D. I. T. Wilson. His knowledge of the locality, his sympathy, kindness, tact, and skill, enabled him to build up a large practice in a short time, and he held the esteem and affection of all who knew him. During the second world war he left his practice to serve as a medical officer in the Royal Air Force, attaining the rank of squadron leader. Apart from his work, his chief interests lay in yachting and in art. He was instrumental in founding the Blandford Forum Club and in organizing local art exhibitions. A physician, counsellor, and friend to his patients, a grand colleague, who always gave of his best, he continuously radiated to his friends, colleagues, and patients the finest qualities of his profession. He was a faithful and devoted servant to the people of Blandford and district, and both they and his partners have suffered an irreparable loss. The greatest burden of grief and sense of loss falls on his widow and three children, and to them the town and countryside and his fellow practitioners extend the most sincere sympathy.—K. J. T. W.

**A. K. COSGRAVE, M.C., M.B., B.Ch., L.M.
D.P.H., D.T.M.&H.**

Dr. A. K. Cosgrave, who was for many years a member of the Colonial Medical Service, died suddenly at Beaconsfield on June 20.

Alexander Kirkpatrick Cosgrave was born in 1885, and was a medical student at Trinity College, Dublin, graduating M.B., B.Ch. in 1909. Soon after graduation he went out to the Straits Settlements as a surgeon in the medical department there. When the first world war broke out in 1914 he was on leave in England and immediately joined the R.A.M.C., serving until the end of the war and attaining the rank of major. In 1918 he was awarded the Military Cross for his services. In the same year he obtained the Dublin D.P.H., and in 1920 the L.M. at the Rotunda Hospital and the D.T.M.&H. of the English Royal Colleges. In 1921 he transferred to the health branch of the medical department in the Federated Malay States to become health officer to the state of Negri Sembilan, where he did very good work, especially in connexion with the sanitation of the very malarious town of Gemas. Later, he was transferred to Kuala Lumpur as health officer, subsequently becoming senior health officer. In 1929 came a change in the medical organization. The federal post of chief health officer was abolished and the posts of senior health officer and senior medical officer, which existed in each of the four states of

the federation, were amalgamated to form for each state one combined medical and health administration. Dr. Cosgrave received one of these appointments, which he held until he retired in 1934. A few years before this he was chairman of the Federated Malay States Division of the B.M.A. After his return to Britain he settled at Beaconsfield, but throughout the second world war he again served in the R.A.M.C. A Fellow of the Royal Society of Tropical Medicine and Hygiene, he seldom missed a meeting after his retirement. Throughout his life he got on well with all classes of people, and his many friends will wish to extend their sympathy to his wife and family.

D. R. MURLEY, M.R.C.S., L.R.C.P.
D.Obst.R.C.O.G.

Dr. D. R. Murley, who was in general practice at Mullion, Cornwall, for most of his all-too-short professional life, died on July 6. He was 35 years of age.

David Ronald Murley was born on September 27, 1922, and brought up in Cornwall, where his father, the Rev. D. R. Murley, was vicar of Ludgvan. He was educated at Wellington School, Somerset, and at St. Mary's Hospital, where, after qualifying M.R.C.S., L.R.C.P. in 1945, he was obstetric officer. Joining the R.A.M.C., he served abroad in Saudi Arabia, attaining the rank of major. On returning to this country he was orthopaedic house-surgeon at the St. Mary's orthopaedic unit, at Park Prewett Hospital, and then returned to his beloved Cornwall, where he was in practice at Mullion. In 1949 he obtained the Diploma in Obstetrics of the Royal College of Obstetricians and Gynaecologists.

P. R. G. G. writes: It was with great regret that I learned of the death of Dr. D. R. Murley. As a medical student I shared a flat with him in London until he qualified, and knew him extremely well. Despite his rather serious looks he had a keen sense of humour, and he brought an unswerving loyalty and vigour to every task he undertook. Dr. Murley was also a keen horseman and tennis player, and he had that great gift of getting on equally well with young and old, rich and poor, wherever he happened to be. His death will be a great loss to those who knew him, and sincere sympathy is extended to his widow and two daughters.

C. H. writes: The sudden loss of David Murley is a personal tragedy to all who knew him well. An excellent doctor and a delightful companion, he combined integrity and deep sincerity with a cheerful outlook and ebullient sense of humour. Men of his character and temperament are rare: we shall not replace him in our life.

T. BEN THOMAS, M.R.C.S., L.R.C.P.

Dr. T. Ben Thomas, medical superintendent of Mount Pleasant Hospital, Swansea, and anaesthetist to the Glangawe Hospital Management Committee, died on July 12 after an operation. He was 60 years of age.

Thomas Ben Thomas was born at Swansea on October 23, 1897, and was educated at the Swansea Grammar School, Taunton School, and St. Bartholomew's Hospital. He interrupted his training to serve in the Army in the first world war. After qualifying in 1923 and doing some post-graduate hospital work, he settled in practice in Swansea, where he soon became a well-known and well-liked medical figure in the district. He built up a successful practice, but, much to his patients' regret, gave this up after some years to become medical superintendent of the Tawe Lodge Infirmary. During his lifetime he saw one of his greatest ambitions realized—the gradual transition of a good and well-run Poor Law institution, Tawe Lodge, to a modern and well-equipped and well-staffed hospital, the Mount Pleasant Hospital. He was the ideal person to be in charge during this transition period; it was in no small measure due to his drive, enthusiasm, tact, and perseverance that this change took place so smoothly and so steadily. His home and his hospital were always sources of great joy

and great pride to him. Although a busy man, he found time to be one of the honorary secretaries of the Swansea Division of the B.M.A. from 1937 to 1943, and eventually he became a very successful and popular chairman in 1951–2. Later, he acted, also very successfully, as joint charity steward of the Swansea Division, a post he held until his death. He was an active member of his Church and was also a freemason. He became president of the Rahere Society and captain of the Pennard Golf Club.

T. O. L. writes: Ben, as Dr. Thomas was known to us (Dr. Ben to his patients), was a lovable character. His cheerfulness, youthful exuberance, and sense of fun infected both his patients and his colleagues. He lived his life to the full, in work and play. Outstanding among his qualities were his kindness and his desire to help the sick and distressed without thought of himself. We in this community know how difficult it will be to fill the gap left by his death. He will be greatly missed and mourned for many a day by all who knew him, and we, in turn, extend our deepest sympathy to his widow and two daughters. It is a great privilege to have known him.

MARY T. PENRICE, M.B., Ch.B.

Dr. Mary Penrice, who was in general practice at Bebington, Cheshire, for nearly 30 years, died at Clatterbridge General Hospital on July 13 after a short and painful illness. She was 55 years of age.

The only daughter of a Birkenhead sea-captain, Mary Thompson Penrice was educated at Birkenhead and studied medicine at Liverpool University, where she graduated M.B., Ch.B. in 1926. After resident appointments and a short period in practice at Birkenhead, she settled at Bebington in 1930 and worked there whole-heartedly until her last illness. She was well known in the district, not only as a very careful doctor but also as a woman whose advice and help were always freely given to those who sought them. She upheld the highest professional standards, and her death is a blow to her patients and colleagues alike.—G. B.

Medico-Legal

FEMININE BEHAVIOUR

[FROM OUR LEGAL CORRESPONDENT]

Earlier this year (*Journal*, May 17, p. 1187) we reported a case in which the judge held that the behaviour of a husband in dressing up as a woman with the knowledge that it must cause his wife distress, a course of conduct which would ultimately have a serious effect on her health, amounted to cruelty. The wife was granted a decree of divorce. On May 22 Mr. Justice Davies (*The Times*, May 23) had to deal with the petition of another wife. She was married in April, 1950. In May, 1951, a child was born of the marriage, but apparently the husband had started shortly after the marriage to develop female characteristics, at any rate mentally. After consulting psychiatrists in 1952 and 1954 he was sent to hospital for treatment, and was given hormones with the express intention on the part of the doctors to accelerate and facilitate the development in him of female characteristics. The endocrinologist who with psychiatrists had advised this treatment said it was plain that the husband was suffering from a mental illness which made him to some extent feel like a woman and want to be a woman.

In 1957 the husband left his wife because of his desire to become a woman and because he could not stand living with her, and now dressed as a woman and was employed as a woman clerk. This naturally caused his wife revulsion.

Mr. Justice Davies held that the husband's consent to undergo hormone treatment for this mental illness was not cruelty on his part, since he could not help his illness any more than any other illness. He added that if the wife waited until May, 1960, she might get a divorce on the ground of desertion.

Medical Notes in Parliament

COMMONS REVIEW PROGRESS AND PROSPECTS OF HEALTH SERVICE

It was not to be expected that the Commons would allow the tenth anniversary of the National Health Service to pass without making it the occasion for a debate (the House of Lords having already had theirs); nor that on such an occasion Mr. ANEURIN BEVAN, its progenitor as Minister of Health in the 1945–50 Labour Government, would resist the opportunity to emerge from his preoccupations as "Shadow Foreign Secretary" in the Labour hierarchy for a foray into domestic affairs.

The speech with which he opened the debate on July 30 was a racy mixture of pride and politics. He went a long way back, to the period of preparation before the National Health Service Bill was brought, to pay a handsome tribute to the officials at the Ministry of Health, mentioning in particular Sir William Douglas, then the Permanent Secretary, and Sir Wilson Jameson, Chief Medical Officer, but embracing all in an expression of gratitude and appreciation for loyal, efficient, and inexhaustible service. The claim that the facilities the Health Service had provided to the population as a whole could be regarded as a marked success, and that there was general satisfaction with its therapeutic side, Mr. Bevan coupled with some party thrusts. So successful had it been that there was now competition in claiming paternity. He had even found Conservative members who had forgotten that they had voted against it on every occasion and for every conceivable reason. It had been said that all parties were in favour of it, but when he went to the Ministry of Health he found no evidence of that. Opposition was being whipped up—but he had been singularly fortunate in his opponents.

Free for All

Two conceptions underlay the Health Service. The first was to provide a comprehensive free health service for all at time of need. The second, which had been somewhat overlooked, was the redistribution of national income by a special method of financing the Service. On the first principle, there had always been more medical care in existence than the masses had been able to reach. It was that that the National Health Service was intended to put right. To-day, 98% of the population were registered with general practitioners. Not all the credit for the improvement in the nation's health went to the Service; there had been better standards of nutrition, and of housing, and new drugs. But the main point remained: all these drugs and medical facilities would not have been available under the old system. The new knowledge would be there, but it would not reach the people needing it. That was why the medical profession got it all wrong when it started to oppose the Service in 1946. Medical men seemed to believe, or some of them at least pretended to believe, that all nationalized medicine would do would be to interfere in the practice of medicine. He had had no such intention. What the Health Service was intended to do was to organize the practice of medicine in such a fashion as to reach the people who needed it most. That had been done.

Tax on the Better Off

On the financial side, he was getting a little worried. The insurance principle had been rejected at the inception of the Service as wholly inapplicable, and it was decided that the best and fairest way to finance the scheme was through the Exchequer, by general taxation, and those who had most would pay most. Conservative Members had been engaged in trying to reverse the redistributive aspect of the Service, and one of their chief supporters was the man who tried to stop it coming into existence at all, Dr. Charles Hill, Chancellor of the Duchy of Lancaster. The Treasury

through Mr. Dalton, took as an appropriation-in-aid that part of the contribution of the old National Health Insurance which had been used for medical benefits, amounting to about £41 millions. It had nothing to do with the Health Service, and was not paid to the Health Service. There was no organic, financial, or administrative link between the two. Although expenditure on the Health Service went up by £200 millions, the appropriation-in-aid remained the same.

The link between insurance and national health had been created in the minds of the Government to justify a tax on the poor. The contribution had been raised to £57 millions in 1957–8 and to £95 millions this year. By assuming the link the Government had called for more money from the National Insurance Fund instead of increasing taxation to provide the additional money. It was a transfer of the burden from the rich to the poor. He resented it because it was inimical to the second principle of the scheme, and because if persisted in it would appear to justify a gradual transfer of the whole cost of the Health Service to the shoulders of the poorest members of the community.

Pay-beds

After a reference to the great mischief done to the Health Service by continual changes in the Ministers at its head, Mr. Bevan turned to the pay-bed provision—a concession which was, in some cases, seriously abused. He received letters about it every week. The consultants, if they could get a paying patient into hospital, jumped the waiting-list and got him in. There was no justification for saying that in every instance it was for medical reasons. It was for financial reasons. He did not for a moment say this was universal, that it was so grave as to impair the Service, but it had caused great grief. He hoped this kind of thing would stop. If it was, the whole climate of the Service would be much happier, and the hospitals much more wholesome. If it was not stopped, then, in spite of the fact that some consultants might take him to court, he would send their names to the Minister—and not even try to claim qualified privilege.

Minister's Reply

Mr. D. WALKER-SMITH, Minister of Health, began his reply with some ripostes to Mr. Bevan's "highly selective remembrances" of things past, acknowledging in the process that no one would wish to grudge him any of the credit due for the inception of the Health Service, but was more concerned with the pattern of the future. One of the things that had turned out better than some had expected in the 10 years had been that the strength of the voluntary work in the Health Service and hospital work had continued unabated. There was still a sound basis of voluntary work, freely given and highly regarded.

The country was getting a good bargain for the very large amount the Health Service was costing. There was an increase in the number of effective beds in hospitals, greater speed and efficiency of treatment, and a great increase in the range of drugs to heal and vaccines to prevent disease. But there was not a universal pattern of success to match the conquest of diphtheria and the approaching conquest of tuberculosis. On the other side was the upward curve in cancer of the lung, leukaemia, and arteriosclerotic diseases. In this, as so often in this imperfect world, the successes left their problems. By increasing the expectation of life they put greater emphasis on the malignant and degenerative diseases of the later years.

Value of Prevention

Two signposts to future action were provided by the success with tuberculosis and diphtheria. One was the importance and potential of preventive medicine and action; and second, the contribution that could be made towards a solution of the accommodation problem in hospitals by the virtual elimination of some diseases. He was anxious to apply the principle of preventive medicine wherever possible. A heavy programme of vaccination

against poliomyelitis had been carried through this summer. One had to tread very delicately on this unpredictable ground, but it was perhaps significant that up to and including the 29th week of this year there were fewer cases, and fewer paralytic cases, than in the same period in any previous year, and the figures were far below the average. Another promising preventive measure was the fluoridation of water supplies against the incidence of dental decay. He hoped that in the areas concerned the people would appreciate its benefits and understand that there was no harmful effect from it. Mr. J. BAIRD (Wolverhampton, North-East, Lab.) here interrupted that the results of the experimental schemes could not be studied until 1962. Why not take action now, on the ample evidence from towns in England and from the U.S.? Mr. WALKER-SMITH told him they would rather see a continuance of the policy of demonstration on which they were embarked.

Planning for an Ageing Population

The impact of age structure on the changing pattern of disease was one of two great special problems which must condition thinking and planning for the future of the Health Service. By 1975 one person in seven would be over 65 years old, compared with one in 21 at the beginning of the century. Extended expectation of life must be accepted as a challenge to be met. There was a double duty: socially, to see that the increased span of life was a time of happiness; and economically, to see that looking after the old did not place an undue burden on the working community. The policy, therefore, was to seek to keep the elderly in their homes as long as possible, and when they had to go to hospital to rehabilitate them wherever possible. Two encouraging developments were that there had been a steady rise in attendances at chronic sick and geriatric clinics (from 7,000 in 1950 to 39,000 last year); and on the in-patient side, although there had been only a small increase in the number of beds a better use of them had enabled more patients to be treated. There were now over 70 geriatric departments, and more would be set up as resources permitted.

The other great special problem was mental health. More than two out of five hospital beds were devoted to those suffering from mental disorder. The Royal Commission had recommended, among other things, the abandonment of the assumption of the need for compulsion in favour of the offer of care without deprivation of liberty. The review of existing patients he had asked for in January to give effect to this as far as possible without legislation was in progress. Approximately 18,000 recommendations for discharge from compulsory powers had been received by the Board of Control, and about 12,000 accepted. Only about 100 had been refused. Examination of the remainder was continuing. Over the whole field of practice and procedure in mental health, Parliament would have the opportunity when the time came for mental health legislation to add to the volume of social progress a notable new chapter on this very human theme.

Efficiency in Hospitals

Whatever success was achieved in the policy of out-patient treatment, there would always be an important residue calling for in-patient treatment. The hospital service would always loom large; running costs took 54% of expenditure on the Health Service. Obviously it was necessary to seek the highest common factor of efficiency and economy. Organization and method studies were a constructive challenge to tradition, and should be accepted as such. The results could be dramatic, particularly in manual work. These potential savings were a hidden reserve of the greatest value. The development of this work should be encouraged, and its good results demonstrated to hospital authorities as fully as possible. The present experimental unit in the Ministry was to be enlarged and made permanent. A group of management consultants had offered to undertake a series of surveys at their own expense to

demonstrate the economies and improvements in efficiency which could be achieved in the hospital service. He had accepted the offer, and had suggested four subjects for investigation. The Royal College of Nursing had suggested that an advisory council on work study should be set up, and he would consult the other interests involved before settling the role and membership of the council.

Points from the Debate

Dr. A. D. D. BROUGHTON (Batley and Morley, Lab.), speaking about mental illness and overcrowded hospitals, said he hoped the Minister would resist pressure to build new hospitals to relieve the congestion. Mental cases should be sent into residential hospitals only if that was absolutely unavoidable. He advocated the extension of day hospitals, out-patient departments, psychiatric clinics, and domiciliary services.

Mr. JOHN CRONIN (Loughborough, Lab.), on the theme that neither doctor nor consultant had any incentive to consider economic questions, said that general practitioners were competing to obtain patients, and had a more or less blank cheque on the finances of the Service. Similarly consultants, in prescribing and ordering ordinary treatment, were completely autonomous. There was no doubt it would be possible for hospital consultants to treat patients more economically. The medical profession had co-operated with the Health Service in a remarkable way, but few had any idea of the economics of the Service. There was a case for some sort of administrative control of the medical profession itself.

Dr. EDITH SUMMERSKILL (Warrington, Lab.) deplored the general practitioner's lack of adequate training in psychiatry. Prescriptions were often written solely to terminate a protracted but necessary interview in a busy surgery with a patient suffering from some form of neurosis. Did the system that had been evolved encourage a doctor to be frank, and to refrain, whenever possible, from sending people to hospital? The surgical waiting-lists were so long, and falling so slowly, that more facilities were needed. She invited the Minister to consider territorial redistribution for long waiting-lists.

Parliamentary Secretary Winds Up

Mr. RICHARD THOMPSON, the Parliamentary Secretary, in his reply to the debate, expressed general agreement with the points made by Dr. Broughton, and assured him that the kind of objectives he had in mind were desirable ones that the Ministry intended to pursue.

The general practitioner was the key man in the non-hospital medical services. Through the executive councils and in other ways they wanted to build up his position in the Health Service and to ensure that it was one of proper status and importance. It was not true, as had been suggested, that because of insufficient co-operation among the various arms of the Service the general practitioners were working in isolation. The increase in partnerships, which helped to produce effective co-operation, had been notable. There were now about 68% of practitioners in partnership, compared with 50% in 1948. Group practices had also been encouraged with the aid of loans.

Of the drug bill, estimated to cost £74 millions, he pointed out that 40% would go to chemists for overheads and the services they provided, and 60% for the wholesale cost of drugs and dressings. An inquiry in 1955 revealed no evidence of excessive prices, but the Ministry were quite prepared to renew the inquiry if they judged it necessary. The scheme for voluntary regulation of prices covered 90% of proprietary preparations. When first applied in 1957 it resulted in 285 price reductions and an estimated saving of £400,000 a year. A much more substantial final report from the Hinchliffe Committee was on the way, and the closest attention would be paid to the recommendations. Some immediate administrative steps were being taken on the interim recommendations, and the appropriate organizations consulted on further action.

MEDICAL ACT, 1956

The Medical Act, 1956 (Amendment), Bill was read the third time and passed in the House of Lords on July 24, and on August 1 received the Royal Assent.

PNEUMOCONIOSIS AND BYSSINOSIS APPEALS

The Draft Pneumoconiosis and Byssinosis Benefit Amendment Scheme, 1958, was approved by the Commons on July 24. Mr. W. VANE, Parliamentary Secretary, Ministry of Pensions and National Insurance, explained that the Pneumoconiosis and Byssinosis Benefit Act was designed to bridge the gap between the old Workmen's Compensation Acts and the new Industrial Injuries Act. The adjudication provisions followed the pattern of the compensation Acts, and the decision on the cause of death was made by the Silicosis Medical Board, from which there was no appeal. The draft scheme was in no sense a criticism of the board, but experience had shown that this could be improved and some appeal allowed. The decisions were not wholly medical; there were also legal implications. The draft scheme substituted the adjudication procedure familiar under the Industrial Injuries Acts. The cause of death would be determined by the insurance officer, with medical advice, and from his decision a right of appeal would lie to the local appeal tribunal, and there could be a further appeal to the Commissioner. No large number of appeals was expected, but experience suggested that a few people would have been better satisfied if they had been able to exercise a right of appeal.

QUESTIONS IN THE COMMONS

Charing Cross Hospital

Mr. G. RIPPON (Norwich, South, C.) asked the Minister of Health on July 29 whether he had reached a decision regarding the future of Charing Cross Hospital.

Mr. WALKER-SMITH stated that on February 9, 1955, the House was informed by the then Minister that the Government's plans for hospital building expected to start in the next few years included a project for the rebuilding of Charing Cross Hospital at Northwick Park, Harrow. This proposal had had to be abandoned because further consideration by the University of London and the University Grants Committee caused these bodies to decide that it was not in the best interests of medical education to remove the Charing Cross Hospital Medical School to Northwick Park.

The existing Charing Cross Hospital building is outmoded and inadequate for hospital purposes and it cannot be properly redeveloped on the same site. To meet university requirements the new site must be within reasonable access of all the facilities of the university, including the basic sciences and general student activities, and in August last the responsible hospital authorities were asked to consider the possibility of rebuilding on the site of the existing Fulham Hospital, which was in close proximity to these university facilities and which also required rebuilding.

I am glad to say (he continued) that a large measure of agreement has been reached by the responsible hospital authorities about the practicability of amalgamating Charing Cross Hospital, the West London Hospital, the Fulham Cross Hospital, and the Fulham Maternity Hospital as a first step towards the ultimate replacement of all of them by a new general teaching hospital at Fulham.

I have given close and careful consideration to all the representations made to me, including those made by the committee headed by the Mayor of Fulham, and I am satisfied that the Board of Governors of Charing Cross Hospital in close co-operation with the South-West Metropolitan Regional Hospital Board will provide a service to the locality which will compare favourably with that which might have been provided by the rebuilding of Fulham Hospital as a non-teaching hospital. I propose, therefore, to make arrangements for the proposed regrouping at the earliest practicable date so that the replanning of the new teaching hospital may proceed without delay. The necessary

facilities for clinical teaching will be provided at the new hospital, but the question of preclinical facilities is under consideration in consultation with the university and the University Grants Committee.

Scope of Inquiry into Artificial Insemination

Mr. R. A. BUTLER, Home Secretary, announced on August 1 that the terms of reference of the proposed committee on human artificial insemination were to be

To inquire into the existing practice of human artificial insemination and its legal consequences and to consider whether, taking account of the interests of individuals involved and of society as a whole, any change in the law is necessary or desirable.

The Earl of Feversham had agreed to serve as chairman. He hoped shortly to announce the names of the other members of the committee.

Russian Multiple Sclerosis Vaccine

Mrs. JOYCE BUTLER (Wood Green, Lab.) asked what further details the Minister had been able to obtain of the New Zealand experience of the Russian multiple sclerosis vaccine. Mr. WALKER-SMITH replied that he had received no further details from New Zealand. The replies received to inquiries which were addressed to the Soviet Union were being studied.

A letter published in the *British Medical Journal* for July 26, from Dr. A. K. Shubladze, of Moscow, and Professor G. W. A. Dick, of the Queen's University, Belfast, said that they thought it clearly necessary to reinvestigate and characterize the original isolates of the virus from which the vaccine was prepared, as recent experiments had shown that the strain in current use was similar to rabies virus. So far as treatment with the vaccine was concerned, they said that it was not possible to make any further recommendation until reinvestigations had been made. This latest information made it clear that both the efficacy and the safety of this vaccine were at present in doubt.

B.M.A. Conference and Merit Awards

Mrs. JEGGER (Holborn and St. Pancras, South, Lab.) asked the Minister what communication he had received from the British Medical Association's annual conference on the subject of merit awards; and what reply he was making thereto. Mr. WALKER-SMITH: None.

Institute of Criminology

Mr. BUTLER announced on July 31 that he had been informed by the Vice-Chancellor of Cambridge University that, provided the necessary funds could be made available, the university would be glad to consider the establishment of an institute of criminology, whose functions would include both teaching and research, as well as facilities for exchange of views and information with those concerned with the practical administration of the law. The nucleus of the institute would be the existing Department of Criminal Science, but it would be developed on a broader basis, and steps would be taken to associate all interested faculties with its management.

Universities and Colleges

UNIVERSITY OF DURHAM

At Congregations held on July 4 and 5 the following degrees and diplomas were conferred:

M.D.—G. S. Anderson, *G. Pringle, *G. A. Stirling.
M.B., B.S.—J. Anderson, W. V. Anderson, Margaret S. Atkins, Judith C. H. Bullen, Margaret S. Burrill, Mary Bynon, I. G. Campbell, J. Cape, Jean Carr, Ben-Zion Chalk, J. R. Cox, W. G. Donald, C. M. Dunn, L. E. Dunn, Elizabeth Elliott, M. A. Ferri, G. Gill, C. P. Gillie, H. L. Goldwater, R. Heslop, D. H. Irvine, Fiona M. Lehmann, Margaret A. Lewis, T. Lind, J. B. McCafferty, A. J. McComas, C. H. McCulloch, A. Malcolm, P. F. Moran, J. M. Morrison, H. N. Murray, H. Narvik, Sarah H. J. Nelson, S. A. Oduntan, I. L. T. Oluwole, A. Powney, D. G. Proudler, D. N. Raine, D. Rankin, M. F. Reece, E. Ross, Dorothy A. Stevenson, J. R. C. Stubbs,

Margaret A. Stubbs, E. Taylor, I. H. Taylor, S. Tetlow, Jean B. Thompson, P. R. Uddall, M. Ward, Joan M. Whitmore, P. G. Wood, P. H. Yorke, *P. M. Calamel.

DIPLOMA IN PUBLIC HEALTH.—Jean M. Bainbridge, Florence Cadogan, Marion Harrison, T. W. L. Knaggs, June K. Lloyd, R. T. Pagan, Doris Story.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—E. S. Lower.
*In absentia.

UNIVERSITY OF MANCHESTER

The following candidates have satisfied the examiners at the examinations indicated:

D.P.H.—Margaret Armistead, H. Bailey, Irene S. Bailey, A. D. Bostock, J. R. Brown, A. S. Dunn, B. R. Ellis, A. Gatherer, R. E. Jones, W. Lees, Joyce E. Leeson, J. E. Morris, D. W. Preston, Rachel D. R. Sasieni, H. R. Simpson, D. H. Vaughan.

UNIVERSITY OF BIRMINGHAM

Professor W. Melville Arnott will represent the University at the second World Conference on Medical Education to be held in Chicago from August 29 to September 4, 1959.

Mr. A. L. d'Abreu has been appointed to the board of governors of the United Birmingham Hospitals.

Professor J. W. Orr has been reappointed to the Birmingham Regional Cancer (Co-ordinating) Committee for the year ending March 31, 1959.

The title of University Research Fellow has been given to the following during the tenure of their present posts: *Department of Medicine*, Dr. L. A. G. Davidson, senior medical registrar, Queen Elizabeth Hospital; Dr. Mary Bateman, Endowment Fund Research Fellow, Queen Elizabeth Hospital; Dr. N. Segel, Nuffield Fellow, *Department of Experimental Pathology*, Dr. G. M. Aber, medical registrar, Queen Elizabeth Hospital.

Dr. F. N. Garratt has been appointed Research Fellow in Social Medicine from July 1, 1958.

The following have resigned their appointments from the dates indicated in parentheses: Dr. K. Aterman, Senior Lecturer in Biophysics in the Department of Anatomy (July 31, 1958); Mr. P. G. Bevan, Lecturer in Surgery (July 15, 1958); and Dr. K. R. Thornton, Lecturer in Pathology (September 30, 1958).

The University has accepted the offer of Dr. Arthur Beauchamp, a former student of the Medical School, to endow an annual prize to be awarded for the best essay on some aspect of general practice.

In Congregation on July 5 the following degrees were conferred:

Ch.M.—K. D. Roberts, R. W. Tudor.
Ph.D.—In the Faculty of Medicine: *L. Kornel, J. C. Lawrence, D. G. Moulton.

M.B., Ch.B.—1. A. J. G. Campbell, 2. A. J. Fawcett, 3. B. Goodhead, T. R. Abbott, Ada M. Adams, D. Atkinson, Ann I. Ballantine, A. D. Barnes, Ruth Barton, Vivien E. Basco, L. S. Bernstein, *C. Berry, J. E. Bewley, K. S. Bhogal, H. E. Black, A. W. Burdon, Brenda M. Chant, A. C. Cottrill, D. C. Crawford, J. T. Davies, P. W. Davis, D. G. Emery, Sylvia D. Gardner, Catherine M. Gay, *J. R. Geddes, *Jean M. Gibbon, S. Glick, M. G. S. Golby, I. G. Goldman, R. W. Griffin, R. G. Harrison, Frances E. Heron, M. J. Hoare, G. B. Hunt, S. E. O. Jones, M. Joorey, *Menigha Kemmer, *A. B. Lavelle, M. Lewis, Edna J. Lloyd, Wendy I. McNeilly, G. L. Morgan, Philippa N. Mourant, M. G. Mullin-Feroze, *K. Newbold, D. M. Nicoll, B. A. Oni-Okpaku, C. E. Oxenard, Doris H. Pereira, C. R. Phillips, P. R. Preston, Susan E. M. Richards, *C. J. Roberts, R. N. Smith, D. B. Southall, *Sheila M. Statham, Margaret S. Taylor, *C. W. Thompson, *F. R. Wallford, A. West, Nora E. Wild, T. H. Willits, P. J. Witherow, D. A. K. Woodward.

The following scholarships and prizes were awarded: *Queen's Scholarships*.—Final year, F. J. Fawcett; Fifth year, A. Rhodes. *Ingleby Scholarships*, J. R. Geddes (obstetrics and gynaecology), A. J. G. Campbell (paediatrics and child health). *Special Undergraduate Scholarships*, A. R. Beebejaun, G. B. Gelling, Margaret G. Hudspeth, E. A. Jones, H. G. Percival, Diana M. Price, K. Prowse, D. Sampson, M. Thomas, W. J. A. Westwood. *Arthur Foxwell Memorial Prize in Clinical Medicine and Beckwith Whitehouse Prize in Obstetrics and Gynaecology*, F. J. Fawcett. *Sampson Gamgee Memorial Prize in Surgery and Joseph Sankey Prize in Clinical Surgery*, C. W. Thompson. *"Queen's Hospital" Joseph Sampson Gamgee Prize in Surgery*, A. D. Barnes. *Cyril Raison Prize in Surgical Diseases in Children and Russell Memorial Prize in Nervous Diseases*, B. Goodhead. *Priestley Smith Prize in Ophthalmology*, B. Goodhead and C. J. Roberts. *Douglas Marsh, Ear, Nose, and Throat Prize*, G. R. Horton. *Leith Newman Medical Prize in Pathology*, R. M. Finch. *Bostock Hill Memorial Prize in Social Medicine*, A. Rhodes. *Bertram Windle Prize in Anatomy*, A. Wakeling. *John Barritt Melson Memorial Prize in Physiology*, H. G. Percival. *Peter Thompson Prize in Anatomy*, Dorothy J. Bicknell.

*With second-class honours. *Distinction in paediatrics and child health. *Distinction in obstetrics and gynaecology. *Distinction in surgery. *Distinction in medicine. *Distinction in pharmacology and therapeutics. *Distinction in social medicine. *Distinction in forensic medicine and toxicology. *In absentia.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

M.D.—B. J. Fairhurst, A. W. Howel-Evans, E. A. Nieman, J. R. Roberts, D. Taylor-Robinson, D. J. West.

Ph.D.—In the Faculty of Medicine: K. Devakul.

Ch.M.—E. C. Edwards, J. H. Y. Fung.

M.B., Ch.B.—1. R. Harris, 2. May B. Jones, H. M. Alty, A. L. Ansdell, W. K. H. Barnard, J. M. Beresford, G. N. Bhadesra, J. N. Boardman, Mary J. Boardman, M. J. Brindle, A. Broughton, T. N. Calvey, R. P. Christian, P. Cochrane, R. L. Coupe, Marie T. Cox, D. G. Ellis, E. R. Evans, R. E. Fallowfield, R. S. Ford, W. Green, Malvina Harris, J. Higham, L. J. Hipkin, Anne T. Irvine, J. A. Jackson, Anne Jacques, A. W. Jones, D. Jones, E. W. Jones, K. E. Jones, R. H. T. Jones, J. F. Kane, W. E. Kearns, N. B. Kirkland, K. Lilley, W. F. W. E. Logan, H. Martin, Maureen D. Martin, K. Martindale, P. J. Moorhead, Evelyn J. Moss, D. L. Parry, H. J. Phillips, G. H. Prince, P. G. Rae, G. B. Riley, Catherine O. L. Rimington, Aline M. Robertson, R. F. Robertson, C. Roby-Jones, J. M. Romer, Yvonne A. Roope, C. E. Sissons, J. F. Taylor, J. M. Taylor, R. W. Taylor, V. R. Taylor, N. E. Thomas, D. E. Wallace, R. Whitehead, J. G. M. Williams, J. A. Wilson, J. S. Wright, *W. D. R. Writer, C. Wynne. Passed in separate subjects: D. Cooper, R. F. Evans, and J. F. Farrall (surgery and obstetrics and gynaecology); D. D. Hughes (medicine and obstetrics and gynaecology); D. A. Hutchinson, G. W. Jones, and I. E. Roberts (medicine and surgery).

DIPLOMA IN PUBLIC HEALTH.—Sheila I. Angles, Cynthia J. Bladon, P. J. Burke, D. C. Curtin, A. Depares, Cecilia T. Diskin, F. R. Howell, J. V. Loughlin, Anne D. Micah, S. Naylor, J. M. V. Packer, J. A. Seddon, D. Wild.

DIPLOMA IN RADIOLOGY.—Radiodiagnosis: Varunee Amatyakul, E. H. Burrows, L. R. Levin, T. Nopparat, R. G. Putman, H. G. Row. Radiotherapy: A. K. Bose, G. A. L. G. Blazebrook, R. Spencer.

*With second-class honours. *Distinction in surgery. *Distinction in obstetrics and gynaecology. *With distinction.

UNIVERSITY OF BRISTOL

Dr. T. J. Betteridge and Dr. L. A. Faigan have been appointed Demonstrators in Pathology.

Vital Statistics

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in June was 116, compared with 87 in the previous month and 91 in June, 1957.

The numbers of cases of industrial diseases in the United Kingdom reported during June, 1958, were as follows: lead poisoning 2, aniline poisoning 1, compressed-air illness 1, anthrax 1, epitheliomatous ulceration 19, chrome ulceration 24; total 48. There were no deaths. *Ministry of Labour Gazette*, July, 1958.

Week Ending July 26

The main feature of the return for England and Wales in the week ending July 26 was an increase in the notifications of food-poisoning by 154, from 332 to 486. Small fluctuations were recorded for other diseases. These included increases of 21 for scarlet fever, from 651 to 672, and of 6 for acute poliomyelitis, from 57 to 63. Falls in notifications were recorded for whooping-cough 78, from 827 to 749, measles 80, from 6,674 to 6,594, dysentery 75, from 712 to 637, and pneumonia 38, from 220 to 182.

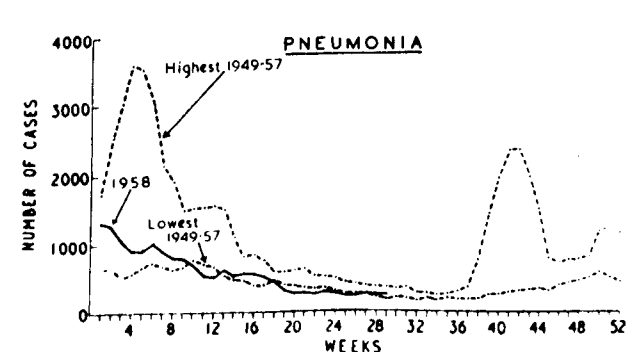
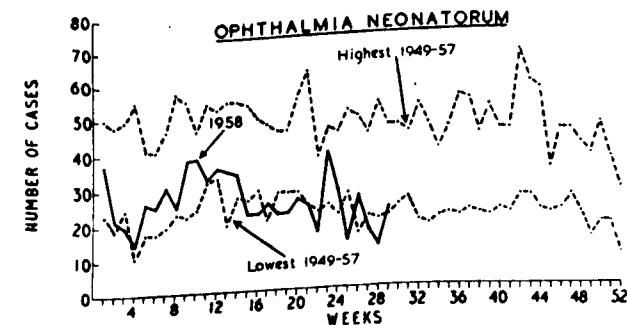
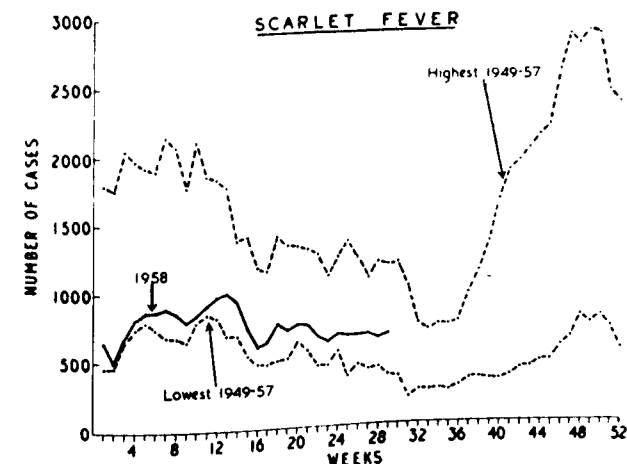
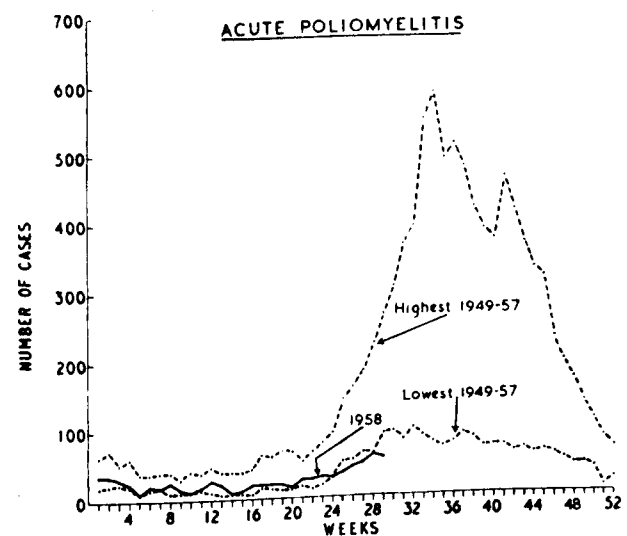
The 63 notifications of poliomyelitis comprised 38 paralytic and 25 non-paralytic, which were respectively 1 more and 5 more than in the previous week. The largest return was from Yorkshire West Riding 16 (Leeds C.B. 5, Halifax C.B. 2, Normanton U.D. 2).

Two large outbreaks of food-poisoning were notified: Denbighshire, Abergele U.D. 139, and Lancashire, Formby U.D. 80.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus ———, the figures for 1958 thus ———. Except for the curves showing noti-

fications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending July 19 (No. 29) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	3	1	1	0		2	0	1	0	1
Dysentery ..	712	105	122	4	1	480	28	139	5	1
Encephalitis, acute	1	0		0		4	1		0	
Enteric fever: Typhoid ..	4	1	1	1		5	1	0	0	
Paratyphoid ..	4	0	2(B)	0	5(B)	5	0	0	1	
Food-poisoning ..	332	32	18	13		372	35	27	1	
Infective enteritis or diarrhoea under 2 years ..				13	18				7	32
Measles* ..	6,674	568	42	29	26	12,778	255	73	142	78
Meningococcal infection ..	15	0	12	0	1	16	1	6	2	
Ophthalmia neonatorum ..	23	2	6	0		21	2	2	0	
Pneumonia† ..	220	16	97	3	1	156	6	117	2	
Poliomyelitis, acute: Paralytic ..	37	3	21	3	7	105	7	3	14	5
Non-paralytic ..	20	1				84	10			
Puerperal fever§ ..	223	46	10	0		220	42	1	1	
Scarlet fever ..	651	37	31	8	14	544	37	59	16	23
Tuberculosis: Respiratory ..	578	62	71	22		596	63	97	20	
Non-respiratory ..	81	9	14	6		95	8	14	2	
Whooping-cough ..	827	34	37	12	37	1,577	50	52	2	47

DEATHS	1958					1957				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	1	0	0	0	0	0	0	0	0	0
Dysentery ..	1	0		0		0	1	0		
Encephalitis, acute		0		0		0			0	
Enteric fever ..	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years ..	6	0	2	0	1	0	7	0	2	
Influenza ..	3	0	1	0	0	0	1	0	0	
Measles ..		0	0	0	0	0	0	0	0	
Meningococcal infection ..		0	0			0	0			
Pneumonia ..	281	28	8	6	1	18	9	12	5	
Poliomyelitis, acute	4	0		0	0	0		0	0	
Scarlet fever ..		0	0	0	0	0	0	0	0	
Tuberculosis: Respiratory ..	49	5	5	1	2	5	4	0	3	
Non-respiratory ..	3	2	0	0		0	0	0	0	
Whooping-cough ..	1	0	0	0	0	0	0	0	0	
Deaths 0-1 year ..	253	31	21	3	8	26	26	4	15	
Deaths (excluding stillbirths) ..	7,842	632	464	102	126	652	512	104	125	
LIVE BIRTHS ..	13,732	1092	516	202	373	1151	983	281	384	
STILLBIRTHS ..	306	24	28			23	20			

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

Medical News

Royal College of Physicians.—At the Quarterly Comitia held on July 31 with Dr. ROBERT PLATT, President, in the chair, the following officers were elected:

Censors: Drs. J. R. H. Towers, E. R. Cullinan, E. R. Boland, and J. C. Hawksley. *Treasurer:* Dr. R. R. Bomford. *Registrar:* Sir Harold Boldero. *Harveian Librarian:* Sir Charles Dodds. *Assistant Registrar:* Dr. J. R. Ellis. *Library Committee:* Drs. C. E. Newman, W. S. C. Copeman, W. Brockbank, and W. H. McMenemey. *Finance Committee:* Drs. L. C. Martin, J. F. Stokes, and J. W. D. Bull.

M.R.C.P.—The following, having satisfied the censors' board, have been admitted members of the Royal College of Physicians of London:

C. H. Ashton, G. V. Balmforth, J. L. T. Birley, D. F. Cappell, J. R. Curtis, C. T. Dollery, E. B. D. Dowdle, D. W. Evans, K. F. Fairley, O. W. Hill, W. B. Jackson, J. V. Jones, N. F. Jones, H. R. Klein, R. E. Lovelace, M. W. McNicol, V. Parsons, D. J. Patel, J. S. Penington, R. W. B. Penman, E. V. Pieris, A. Pollard, D. H. H. Pullon, A. M. Rankin, M. D. Readett, J. L. Reed, S. M. Richards, C. E. Rotem, H. H. Shawdon, C. K. Simpson, J. G. Sloman, M. A. Smith, A. E. Stevens, Squadron-Leader D. J. Stoker, M. W. Swallow, A. K. Thould, G. E. G. Williams, I. V. Wilson, J. Wilson, S. M. Woodcock, K. J. Zilkha.

Royal Medical Benevolent Fund.—At the annual general meeting held on July 30 the following honorary officials were re-elected: president, Sir HENRY TIDY; honorary treasurer, Mr. F. A. JULER; and honorary secretary, Dr. T. ANWYL-DAVIES. During 1957 the Royal Medical Benevolent Fund disbursed a total of £43,942 in grants and annuities. 97 of the 398 cases helped by grants were new. The annual report points out that the total number of people who benefit is much larger than the "cases," since many of these include married couples, children requiring financial help and education, and widows with families. Emphasizing the need for new subscribers, the report goes on: "Surprisingly enough, many of the profession do not know of its [the Fund's] existence or of its work. Many gladly subscribe when their attention is drawn to its purpose of acting as a Good Samaritan to the whole of the medical profession."

Royal College of Surgeons.—At a meeting of the council of the College on July 31 Lieutenant-Colonel R. H. ROBINSON, R.A.M.C., was awarded the Mitchiner Medal, and Wing Commander W. B. THORBURN was awarded the Lady Cade Medal. The award of the Gilbert Blane medal to Surgeon Commander W. E. CROCKER, R.N., was reported. The Hancock prize was awarded to Mrs. E. M. COOKE, of the Royal Free School of Medicine.

Medical Insurance Agency.—The thirtieth annual meeting of the Medical Insurance Agency was held in B.M.A. House on July 24. New records of business were achieved in all branches of the Agency's work last year, and new high levels of profits were allocated to the medical charities. Two new members were elected to the Committee of Management, Sir RUSSELL BRAIN and Sir CECIL WAKELEY. Retiring members re-elected were Dr. J. FENTON, Sir ARCHIBALD GRAY, Mr. A. M. A. MOORE, Mr. R. W. RAVEN, Dr. O. L. S. SCOTT, Mr. BEN THOMAS, and Sir HENRY TIDY. Dr. FENTON was re-elected chairman and Dr. HENRY ROBINSON as honorary secretary; a vote of thanks was passed to both of them for their services during the past year. The report of the committee contained an emphatic tribute to the work of the general manager, Mr. A. N. DIXON, and his staff.

Protein Extraction.—Among recent Rockefeller Foundation grants is one to help Dr. N. W. PIRIE, F.R.S., and his colleagues to help develop their machine for extracting edible protein from waste vegetable matter. The work is being carried out at the Rothamsted Experimental Station, Harpenden, Herts.

Biosynthesis of Protein.—The Royal Society has awarded a Mr. and Mrs. John Jaffé donation studentship from

October 1 to Dr. Jennifer Wildy to work on the biosynthesis of the protein and haem components of haemoglobin in the department of chemical pathology, University College Hospital Medical School.

Dr. W. J. H. Butterfield has been appointed to the university chair of experimental medicine tenable at Guy's Hospital Medical School.

Surgeon Captain C. B. Nicholson has been appointed an honorary surgeon to the Queen in succession to Surgeon Rear-Admiral E. T. S. RUDD.

COMING EVENTS

British Association for the Advancement of Science.—Annual meeting, August 27 to September 3, in Glasgow. Details from the association, 18, Adam Street, Adelphi, London, W.C.2.

Institute of Biology.—Symposium on "The Effects of Pollution on Living Material," September 25 and 26, at the Royal Geographical Society, London, S.W.7. Further details from the general secretary of the Institute of Biology, 41, Queen's Gate, London, S.W.7.

Sixth International Congresses on Tropical Medicine and Malaria.—To be held in Lisbon from September 5 to 13. Further information from Professor Dr. MANUEL R. PINTO, Instituto de Medicina Tropical, Lisbon, Portugal.

International Association of Gerontology.—First meeting of the European Clinical Section, October 1-4 in Sunderland. Details from Dr. E. WOODFORD-WILLIAMS, Department of Geriatrics and Medicine, the General Hospital Chester Road, Sunderland, Co. Durham.

South African Paediatric Association.—Fourth congress, October 9-11, at the Pretoria Hospital. Further details from the secretary, Dr. E. FASSER, 201, Medical Centre, Pretoria, South Africa.

Conference on General Practice.—The *Medical World* is holding a conference on October 26 at the Victoria Halls, Bloomsbury Square, on general practice topics such as emergencies, rehabilitation, and the doctor-patient relationship. Admission by ticket (10s. 6d.). Further details from the *Medical World*, 55-56, Russell Square, London, W.C.1.

NEW ISSUES

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Friday, August 15

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. N. C. Oswald: clinical demonstration.

APPOINTMENTS

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—K. M. Mackenzie, M.D., M.R.C.P., Part-time Consultant Physician, West Suffolk General Hospital; J. H. Roberts, M.B., Ch.B., Radiological Registrar, Ipswich and East Suffolk Hospital; J. H. A. Black, M.B., B.Ch., and D. F. Craggs, M.B., B.S., Registrars in Psychiatry, Fulbourn and Addenbrooke's Hospitals; H. L. Clarke, M.B., B.S., Anaesthetic Registrar, Newmarket General Hospital.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Ostlere.—On July 29, 1958, at King's College Hospital, London, S.E.1, to Mary (formerly Patten), M.B., Ch.B., M.R.C.P.Ed., F.F.A.R.C.S., and Gordon Ostlere, M.B., B.Chir., F.F.A.R.C.S., of 22, St. George's Road, Bickley, Kent, a daughter—Katharine Mary.

Shemilt.—On July 25, 1958, at Salisbury Infirmary, Wilts, to Janet (formerly Brownscombe), wife of Mr. Philip Shemilt, a daughter.

DEATHS

Smith.—On July 24, 1958, at his home, Ascot, Berks, Malcolm Arthur Smith, M.R.C.S., L.R.C.P., aged 82.

Upton.—On July 22, 1958, in hospital, Bryan Harold Burgin Upton, M.B., Ch.B., of "Brentwood," Long Street, Dordon, Tamworth, Staffs.

Worthington.—On July 23, 1958, at the home of his son, Stanley Worthington, M.D., D.P.H., B.Hy., of the Grange, Leeds.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Prednisolone and Pregnancy

Q.—Is pregnancy in a young woman being treated with prednisolone, 5 mg. daily, for severe eczema an indication for stopping treatment?

A.—This dose of prednisolone is very unlikely to have any effect on pregnancy or on the foetus. However, in experimental animals developmental anomalies appear to have been produced when steroids are given during pregnancy. Although this is not known to occur in man it perhaps sounds a note of caution. It seems very unlikely that any other complications will ensue on the dosage mentioned. At the same time it is questionable whether 5 mg. of prednisolone daily would have very much effect on the eczema. Eczema is subject to spontaneous remissions and relapses, and it may well be that the patient mentioned is now in a partial remission and that the prednisolone is not really having much effect. In the circumstances, therefore, the prednisolone might be stopped and resumed at the same dosage only if it is quite clear that the patient's condition has materially deteriorated as a consequence. The effect of pregnancy on eczema is variable and usually unpredictable. Some patients improve, some get worse, and the majority are not affected.

Sequestrene

Q.—Is sequestrene as good in laboratory work as Wintrobe's double oxalate? May sequestrenized blood be used for all those investigations for which blood anticoagulated by Wintrobe's method may be used?

A.—Sequestrene (E.D.T.A.) is at least as good in laboratory work as Wintrobe's double oxalate and for certain purposes rather better. Blood in sequestrene can be used for all those investigations for which Wintrobe's oxalate mixture is normally used.

The main advantage of sequestrene is its ability to preserve the cellular elements of the blood for a longer period than is possible with the double oxalate mixture.¹ If the than is possible with the double oxalate mixture.¹ If the correct amount of sequestrene is used, there are no obvious morphological changes in the white cells up to 4-5 hours after collection of the blood. Total red and white cell counts may be carried out up to 24 hours after collection of the blood. Sequestrene is a particularly good anticoagulant for platelets not causing any appreciable clumping or disintegration, allowing platelet counts to be made up to 6-8 hours after collection of the blood. As it is non-toxic, sequestrene is also a suitable anticoagulant for fresh blood transfusions of platelets.

Two salts of ethylene-diamine tetra-acetic acid have been used as anticoagulants—the disodium salt has been more widely used, but the dipotassium salt is probably better owing to its greater solubility (seven times as great in water.)² Both salts of E.D.T.A. may be used in a similar way. For routine haematological procedures the salts are best used in the dry form. A 10% solution in distilled water is prepared, 0.1 ml. is placed in tubes or bottles marked at 5 ml. The solution is allowed to dry at room temperature, giving 5 mg. of E.D.T.A. in each bottle, which is sufficient for 5 ml. of blood. The bottles should not be placed in a hot-air oven to dry, as this tends to make E.D.T.A. relatively insoluble. The other way to use sequestrene is as a 3% solution in 0.7% sodium chloride solution, when 0.5 ml. is sufficient to stop 9.5 ml. of blood from clotting.

REFERENCES

- Hadley, G. G., and Larson, N. L., *Amer. J. clin. Path.*, 1953, 23, 613.
- and Weiss, S. P., *ibid.*, 1955, 25, 1090.

Hypertrophy of Prostate

Q.—What is the present view on the aetiology of the hypertrophy of the prostate, and what are the earliest and average ages of its manifestation?

A.—The consensus of opinion is that hypertrophy of the prostate is due to hormone imbalance, but much experimental work and many therapeutic trials have given inconclusive results as to the exact mechanism.¹ Other theories that it is due to neoplasia, arteriosclerosis, or inflammation contain too much conflicting evidence to be tenable. Both histological and clinical evidence shows that the changes in the gland begin at about the age of 40 and are maximum at about 60. Within the past year two patients aged 42 have been seen with retention due to prostatic hypertrophy, but this is most uncommon and the clinical manifestations of the condition are most frequent from the age of 60. The changes may continue or the condition may remain stationary. Schinz and Reich² have shown from mortality statistics that there is a true age predisposition to the disease. Franks³ found from necropsy material that 80% of men over 80 years old had prostatic enlargement. The need for surgical as opposed to conservative treatment depends on the obstructive changes produced in the kidneys and on the amount of inconvenience or loss of sleep caused by nocturnal micturition.

REFERENCES

- Thomson, R. V., and Ash, J. E., in *Urology*, 1954, edited by M. Campbell, vol. 2, chap. 4. Saunders, Philadelphia and London.
- Schinz, H. R., and Reich, Th., *Dtsch. med. Wschr.*, 1956, 81, 439.
- *ibid.*, 1956, 81, 572.
- Franks, L. M., *Ann. roy. Coll. Surg. Engl.*, 1954, 14, 92.

Cruikshank's Hypothesis

Q.—Apart from statistical evidence, has any bacteriological, virological, or animal experimental evidence been found or sought in favour or refutation of Cruikshank's hypothesis?

A.—Cruikshank's statistical studies suggested to him that, as the mortality from pulmonary tuberculosis falls and the number of individuals with arrested tuberculosis rises, the mortality rate from lung cancer will also rise. To account for this he enunciated the purely speculative hypothesis that the body of the tubercle bacillus contains a series of carcinogenic phages and that destruction of bacilli in the lung will liberate these carcinogens, which eventually induce lung cancer. The tubercle bacillus has been exhaustively investigated and no claim has been made that it contains a bacteriophage, but there are no reports that an exhaustive but unsuccessful search for a specific bacteriophage has been made.

REFERENCE

- Cruikshank, D. B., *Papworth Research Bulletin*, 1939, No. 2, p. 1. Pen-dragon Press, Papworth.

Operation Stockings

Q.—Are those long woollen stockings, known as operation stockings, now considered necessary?

A.—Although long woollen stockings are still widely used there is no doubt that they are quite unnecessary at the time of operation. Fashion and tradition die hard in medicine, and this is particularly true of some routine nursing procedures. The ritual use of purges and enemas took many years to expunge, and even to-day these practices are kept alive in some hospitals. The abolition of operation stockings may take as long.

The long stocking was mainly introduced as an anti-shock measure in the era when we thought it right to keep patients as warm as possible. Our views on shock have changed a good deal in the last decade or two, and it should now be recognized that these stockings are not only unnecessary but frequently positively objectionable. They are unnecessary because a patient confined to bed in a warm hospital ward, or transferred to a properly prepared

theatre trolley, should certainly not suffer from cold feet. They are objectionable because they commonly carry pathogenic organisms from the ward into the operating theatre. Ordinary laundering of woollen stockings tends to spread pathogenic organisms between the various articles and does not sterilize them. If stockings are autoclaved or boiled they will, of course, shrink badly. If surgeons insist on using such stockings, then they should equally insist on having them sterilized, and this can be done in formalin vapour without damage to the wool. Alternatively, stockings can be made of other materials which are resistant to autoclaving.

Salt and Hypertension in the Tropics

Q.—Should an elderly man with some hypertension (170/110) of ten years' duration, proceeding to the tropics, take added salt in his diet to prevent heat exhaustion? He has been on a salt-reduced diet for years.

A.—In this patient the hypertension is not severe, perhaps as a result of the low-salt diet he has been taking. It would be helpful to know whether there are any hypertensive complications such as heart failure, renal insufficiency, or cerebral vascular disease. The use of salt additional to a normal diet cannot be advised, as it might precipitate heart failure and would certainly increase the blood pressure. The patient should continue with moderate salt restriction and do his best to avoid situations where excessive sweating is likely to occur over long periods, which should not be too difficult with modern facilities for cooling houses and places of work in the tropics. If appreciable chronic renal insufficiency is present, residence in the tropics is inadvisable.

Cross-Channel Swimming

Q.—What emergencies should a doctor be ready for when accompanying a cross-channel swimmer?

A.—Medical emergencies during the organized cross-channel swims have been notably absent. The obvious risk is that of drowning. This may be precipitated by exhaustion and chilling, inhalation of vomitus during seasickness (from which the swimmers do suffer), helplessness due to cramps, drowsiness due to premedication with sedative drugs, injury due to being struck by some object (including the accompanying boat), and possible separation from the boat. Artificial respiration should be given at the earliest opportunity and time should not be wasted in clinical examination of any description. The Holger Nielsen method is not only one of the most efficient, but it is the method most practicable in the cramped conditions usually present in an accompanying boat, which may possibly be pitching and rolling. Success depends on the absence of delay in starting aeration. Pure oxygen is desirable, but its administration should be left to someone other than the doctor until normal respiration has been restored. Delay in starting artificial respiration may be caused by difficulty in getting the unconscious grease-covered swimmer into the boat, but a roller towel placed under the axillae will facilitate this operation.

It should be mentioned that, although spontaneous respiration may be restored within a few minutes, the victim may remain unconscious for some hours. A careful watch should be kept on the breathing during this unconscious phase, as respiration may fail again as a result of the hypoxia due to the gross pulmonary oedema which accompanies near-drowning.

Chilling may be sufficiently severe to cause retirement. The swimmer should be dressed as quickly as possible in woollen clothing and an outer windproof garment. Exercise and an ample supply of a hot drink—tea or coffee—are the therapeutic procedures. Degreasing should be left until later. Cramp may be severe and painful. Warmth and physiological rest are necessary; morphine is rarely likely to be required. Retention of urine and distension of the bladder may occur in those who float on their backs for long periods in cold water. This has been observed experi-

mentally in association with the greatly increased urine output in these circumstances, but it has not been reported in Channel swimmers.

The equipment bag should contain the obvious dressings for minor surgical treatments. Salt-water conjunctivitis can scarcely be described as an emergency, but it does occur, and room might be found for a dropper and a bland lotion or liquid paraffin. If it is intended to provide any anti-seasickness remedy it would be advisable to make sure beforehand that the competitor has no idiosyncrasy to whatever preparation is used. Except for a roller towel, no special items which common sense does not suggest need be carried in the emergency bag. But the value of the towel cannot be overstressed.

NOTES AND COMMENTS

Steroid Therapy and Resistance to Infection.—Professor D. A. LONG (Pittsburg, Pennsylvania, U.S.A.) writes: In reply to the question, "Is resistance to colds and other infections reduced during corticosteroid therapy?" ("Any Questions?" May 17, p. 1191), your expert states, quite correctly, that in experimental animals steroids may convert a trivial infection into a malignant one, but that in practice the risk of doing so in man is slight. Indeed, the dose of steroid should be increased during infection. He implies that the reason for this rather paradoxical state of affairs is that there is no relationship in terms of dose per kg. between the therapeutic dose in man and that required to cause septicaemia and death in animals. This is not true. The explanation for this difference is important, and indeed vital, to an understanding of research in this field and to future research on this subject. Rats, mice, and rabbits infected with bacteria and treated with corticosteroids develop overwhelming infections and die. Rhesus monkeys and guinea-pigs do not. These species may be termed "cortisone-sensitive" and "cortisone-resistant." Man belongs to the latter group and shares with them several important interrelated analogous features. The evidence for these statements has been reviewed in a recent paper.¹

REFERENCE

¹ Long, D. A., *Int. Arch. Allergy*, 1957, 10, 5.

Halitosis.—Dr. L. MCGOLRICK (Dublin) writes: Your expert's reply ("Any Questions?" July 12, p. 117), in common with many other annotations I have seen on this subject in the past, has failed to point out what I consider to be the most common cause of this embarrassing complaint in subjects whose dentition is perfect and who have neither naso-oral sepsis nor pulmonary nor gastro-intestinal disease. That is the presence of minute fragments of putrefying protein material persisting between the molars, usually the upper. These resist removal in many cases even by the most meticulous brushing, and the only remedy is the routine use of dental floss, "stimulents," or the non-U toothpick. An occasional exploration with the latter and the presentation of the result to the olfactory organ will offer a surprise and explanation to those who find their best friends averting their faces on occasions.

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BRITISH MEDICAL JOURNAL

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INVESTIGATIONS IN A CASE OF MURDER BY INSULIN POISONING

BY

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Since it was introduced in 1921 the potential dangers of insulin in the treatment of diabetic (Joslin, Root, White, and Marble, 1952) and psychiatric patients (Rees, 1949) and in diagnostic tests upon insulin-sensitive subjects such as those with hypopituitarism or Addison's disease have become well recognized. Deaths are known to have occurred in such patients as a result of accidental overdosage with insulin. Blotner (1954), in a comprehensive search of the literature, found eight recorded cases of attempted suicide by means of insulin and cases of attempted suicide by means of insulin. The present hand knowledge of the effects of insulin. The present account describes the medical and scientific investigations in a case (Regina v. Barlow) in which a man was convicted of murdering his wife by injecting her with insulin. So far as we are aware, this is the first occasion on which such a charge has been substantiated and also the first in which insulin has been demonstrated in human tissue, other than the pancreas, after death.

Outline of the Case

On Friday, May 3, 1957, Mrs. E. B., a woman of 30 years, returned home from her work in a laundry for her midday meal. At about 11.20 p.m. on the same day she was found dead in the bath, which was empty when the police arrived.

The body, which was left undisturbed until seen by the pathologist at 3.30 a.m. on May 4, lay on its right side in the empty bath with the right leg drawn up so that the right knee rested against the side of the bath and the right foot lay beneath the left knee, which was slightly flexed. The arms were bent so that the hands lay in front of and slightly below the face; the fingers of the right hand were loosely curled round the left wrist and the left hand was closed. The position of the body as a whole was one associated with natural sleep. Blood-stained froth ran from the nose down the right side of the face on to the right hand. On retraction of the eyelids it was noted that the pupils were widely dilated, and the colour of the iris, which was only discernible as a faint line round the pupil, could not be determined. In the hair, which had settled on the side of the bath, were fragments of vomited food which were also found on the sides and bottom of the bath. Caught in the crook of the right elbow were 110 ml. of clean warm water. The skin was damp where it came in contact

with the surface of the bath, the bottom of which was also damp. The body was beginning to cool and rigor mortis was developing. The face was cyanosed and there was hypostasis on the right side of the body corresponding to the position in which it was lying. There were no obvious signs of violence, and the only other things in the bath were a wet face-cloth, a tablet of carbolic soap, and a soap-dish which lay together beneath the right loin and thigh.

The police, who searched the small semi-detached house in which the body was found, noted that the walls of the bathroom were dry and that there were no signs of splashing on the floor. In the hand-basin were two pillow-cases soaking in water and stained with vomit. In the main bedroom were some lady's sweat-soaked pyjamas, and a man's dressing-gown and pyjamas which were quite dry; one side of the double bed was disturbed as though someone had lain on it. In the kitchen downstairs were found a pair of vomit-stained sheets in a washtub, two hypodermic syringes, one of which was wet, four hypodermic needles, and many drugs, including quinine. No insulin or insulin phials were discovered.

The history, as obtained by the police from the husband, was that after her midday meal of fish and chips the deceased woman had done some housework and washing. At about 5 p.m. she had her tea, which consisted of toast, grapefruit, bread, butter, and tea with sugar, and then retired to bed at 6-6.30 p.m. At 7.30 p.m. she had asked to be called so that she could watch a television programme, but, in the event, she felt "too comfortable to move" and remained in bed; she had by this time changed into her pyjamas. At 8 p.m. her husband took her a drink of water; she was then "too tired" to say good night to her stepson. At 9.20 p.m. she called to her husband, who came upstairs and found that she had vomited on the bed. Having changed the bedclothes, he also retired to bed, whilst his wife, who complained that she was "feeling too warm," lay on the bed. Later she removed her pyjamas in the bedroom and went to have a bath whilst her husband remained in the bedroom reading. He dozed off to sleep, and when he woke at about 11.20 p.m. his wife had not returned. He found her submerged in the bath and apparently drowned, so he removed the plug to let the water out and then tried artificial respiration by "pressing on her abdomen." As he was unable to lift her from the bath and as his efforts at artificial respiration did not appear to have been successful, he then summoned assistance. The husband also said that his wife was pregnant.

The preliminary examination of the body described above suggested that the immediate cause of death had been

drowning. This was confirmed at the detailed post-mortem examination which was carried out at 5.45 a.m. on May 4 and is described in detail below. Specimens were taken from the body for chemical analysis, but no common poisons or abortifacients were found. A specimen of mixed heart blood, to which no preservative had been added, was shown seven hours later to contain glucose in a concentration of 210 mg./100 ml.

At this stage, three days after her death, it seemed difficult to explain why a healthy young woman should have drowned in her bath without any apparent signs of reaction to inhaled water; she lay as though asleep with no evidence of splashing or violence. It was concluded that immediately prior to her death she must have been unconscious and that the agent responsible for this had made her sweat and vomit and had produced the gross dilatation of the pupils. These observations suggested that the deceased woman may have been hypoglycaemic. The glucose concentration in the heart blood appears to contradict this hypothesis, but, as discussed later, such an observation has little value as an indication of the glucose level in the blood during life. The detailed post-mortem examination revealed no evidence of any disease which would suggest that the woman had become hypoglycaemic spontaneously, and the possibility that she had been injected with insulin was therefore considered.

On May 8 the body, which had lain on a mortuary slab at room temperature in mild weather conditions, was again examined. On this occasion and under better lighting conditions four hypodermic injection marks were found, two in each buttock just behind the greater trochanters. The tissues underlying these marks were therefore excised and it was shown, as described below, that they contained insulin in large amounts (84 units in 170 g. of tissue). The distribution of insulin was uneven, there being more in the left buttock, which was the site of the most recent injection mark, than in the right, and more in the superficial than in the deep tissues of the left buttock. The large amount found and the uneven distribution indicated that its presence was not the result of endogenous secretion. These findings, together with control experiments described briefly below, indicated that at the time of death the buttock tissues had contained at least 240 units of insulin. Such a dose must have been sufficient to produce either the soporific or comatose stages of the hypoglycaemic state (see Rees, 1949). No insulin was found in washings from the wet hypodermic syringe or needles.

On July 26 the husband of the deceased woman, a trained male nurse, was arrested and charged with the murder of his wife. He denied having injected insulin, but explained the presence of the injection marks by stating that on several occasions he had injected his wife with ergometrine maleate in therapeutic doses during the two weeks preceding her death in an attempt to procure abortion; he said he gave the last injection after the midday meal on the day of her death. The actions of this drug do not explain the signs and symptoms found in this case, and analysis of the urine and part of the buttock tissues did not reveal its presence.

The trial took place before Mr. Justice Diplock at Leeds Assizes in December, 1957, and the accused man was found guilty and sentenced to life imprisonment.

Post-mortem Examination

Two examinations were made; the first about six and a half hours after the body was found, and the second about four days later. On the first occasion artificial strip lighting with a bluish tinge was in use, and this was known to make identification of minute haemorrhages difficult. No such difficulty was encountered on the second occasion in bright daylight.

First Examination (5.45 a.m., May 4)

The body was that of a very well nourished young woman 5 ft. 3 in. (160 cm.) tall and proportionately built. The face

was cyanosed and the hypostasis was not fixed. The skin on the palms of the hands and soles of the feet was sodden, whilst elsewhere there were moles, freckles, and acne spots. Blood-stained froth issued from the nose, and petechial haemorrhages were found beneath the conjunctivae, the blood vessels of which were suffused with dark blood. No external evidence of violence was detected at this stage.

Internally the nose, mouth, and air passages contained blood-stained froth. The lungs were very bulky, congested, and wet; froth could be expressed from the smaller air passages, and subpleural petechial haemorrhages were found. The heart was apparently healthy, but was dilated on the right side, which was full of dark fluid blood. The uterus contained a normal foetus of about eight weeks' gestation with unruptured membranes; the cervix was healthy and a mucus plug was present. Petechial haemorrhages were found in the sheaths of the temporal muscles, and the meningeal vessels contained dark fluid blood. Routine examination of all other organs disclosed no abnormality other than that associated with acute venous congestion. No macroscopic evidence of disease was found in the pancreas, pituitary, thyroid, or suprarenal glands.

Histological examination of the lungs revealed oedema, small haemorrhages, and acute emphysema. The brain and spinal cord showed vascular engorgement and small haemorrhages. The heart muscle was normal. Vascular engorgement and some cloudy swelling were noted in the liver, spleen, and kidneys.

Bacteriological examination revealed no pathological organisms in the intestinal contents or the spleen.

It was concluded that death probably occurred between 5 p.m. on May 3 and 1 a.m. on May 4, the narrower limits being between 10 and 11 p.m. on May 3; that death was caused by asphyxia due to drowning; and that at the time of her death the deceased was probably under the influence of a drug.

Second Examination (9.15 a.m., May 8)

With the aid of a hand-lens four possible hypodermic injection marks were found, two lying close together on each buttock about 2 in. (5 cm.) behind the greater trochanters. One mark on the left side appeared to have a red track in the skin almost at right angles to the surface of the body and a small area of fat necrosis was found about 1-1½ in. (2.5-4 cm.) from the surface; these findings were confirmed microscopically. One of the marks on the right side also showed a doubtful vertical red track in the skin and, microscopically, a slight inflammatory reaction was found in the underlying fat. It was concluded that one mark in the left buttock was comparatively recent and had been produced a few hours before death, whilst one on the right buttock was slightly older.

A piece of skin, fat, and muscle (178 g.) including the hypodermic marks was excised from the right buttock; this is subsequently referred to as Sample R. A similar piece of tissue (131 g.) was cut from the left buttock (Sample L), but as this did not appear to include as much muscle as the sample from the right buttock a further piece (62 g.) of deep muscle (Sample DL) was excised. These pieces of tissue were stored without addition of any preservative in a refrigerator at about 4° C. for 15 days, after which they were examined, as described below, for their insulin contents.

Chemical Analysis

At 11 a.m. on May 4 a standard routine toxicological analysis was begun on specimens removed from the body at the first post-mortem examination. This analysis consisted of a search for several hundred poisons and drugs (including, *inter alia*, procaine, ergometrine, and quinine), and also certain biochemical investigations such as the measurement of the glucose content of the mixed heart blood and analysis of the urine for sugar and acetone. Specimens of vomit and of stomach and intestinal contents were examined separately, and 500-g. aliquots of liver and brain were analysed for the presence of poisons which might

have been injected; details of this routine analytical procedure will be published elsewhere (Curry, 1958a, 1958b). Nothing abnormal was found.

Traces of procaine penicillin were found in one of the hypodermic needles. In view of this, and because of the statement by the accused that ergometrine maleate had been injected into the deceased woman some hours before death, tests capable of detecting 1 µg. of ergometrine or procaine in buttock tissue were applied to samples (approximately 60 g.) of the buttock tissue. No evidence of either alkaloid was found. Had she received a therapeutic dose of ergometrine seven hours before death, the alkaloid would have been detectable in as little as 5 ml. of the urine; in fact, none was found in 35 ml.

Tests capable of detecting the phenolic preservatives present in 0.2 ml. of commercial insulin solutions were also applied to the samples of buttock tissue. The results of these tests were not conclusive, but, since these substances rapidly disappear from the injection site, they suggest that the injections had been made some time before death occurred.

Because injections of insulin preparations containing added zinc do not appreciably increase the zinc content of tissues, analysis for zinc would not have been of any value in identifying the type of insulin used.

Blood-sugar Concentrations after Death

The glucose concentration in a sample of mixed heart blood taken from the body of the deceased woman about six hours after death and examined seven hours later, after storage without addition of preservative, was found to be 210 mg./100 ml. Urine taken at the same time contained neither glucose nor ketone bodies. The latter finding excluded the possibility that the woman was diabetic and in a hyperglycaemic coma at the time of her death, but the high blood-sugar level did not support the hypothesis that she had been hypoglycaemic.

It is known that the glucose concentration in the blood on the right side of the heart may rise for a period after death (Hamilton-Paterson and Johnson, 1940; Hill, 1941). This rise, often most marked in well-nourished subjects after asphyxial death, is due to glycogenolysis in the liver and subsequent diffusion of glucose into the inferior vena cava and the right heart. On the left side of the heart the glucose concentration usually falls progressively owing to glycolysis by the blood cells.

In 38 non-diabetic subjects, most of whom had died sudden or violent deaths, these observations were confirmed. The glucose concentration in blood drawn from the right side of the heart ranged from 20 to 671 mg./100 ml. and side of the heart ranged from 20 to 671 mg./100 ml. That was frequently much greater than 210 mg./100 ml. This rise was due to release of glucose from the liver after death was shown by the fact that it could be prevented if the inferior vena cava was ligated. The glucose level in the inferior vena cava was lower than that blood from the left side of the heart was lower than that on the right side and ranged from 18 to 180 mg./100 ml.; if any rise occurred it was minimal (not more than 10 mg./100 ml.), and on one occasion only was a high level (440 mg./100 ml.) found.

In one case, that of a woman who committed suicide by drowning herself in a bath, a sample of mixed heart blood taken 29 hours after death contained glucose in a concentration of 355 mg./100 ml. The glucose levels in blood taken from the right heart (44 mg./100 ml.), inferior vena cava (56 mg./100 ml.), and left heart (50 mg./100 ml.) of another subject five hours after a slow death were low and approximately equal; 12 hours later the levels in the right heart (120 mg./100 ml.) and inferior vena cava (343 mg./100 ml.) had risen, while that in the left heart remained low (60 mg./100 ml.).

It is apparent that many factors, such as the glycogen content of the liver and coagulability of the blood, affect the degree and speed of the changes that occur in the glucose content of the blood after death. It is also apparent

that the high glucose content of mixed heart blood taken from the dead woman in the case described here does not exclude the possibility that she was hypoglycaemic before death.

Detection, Assay, and Identification of Insulin in Tissues

Although the structure of insulin, a protein of small molecular weight, is now known (Ryle, Sanger, Smith and Kitai, 1955), no chemical or physico-chemical method has yet been devised for its identification when mixed in small amounts with other tissue proteins. The only method available for identification and assay of insulin in the present case involved its extraction from the tissues in a crude form and examination of the biological activity of the extract. Chromatographic methods of separation were investigated and yielded some confirmatory evidence. A detailed account of the technical methods employed will be published elsewhere.

Extraction of Tissues

Crude extracts were prepared from the tissue samples by an improved method based on that originally described by Fisher and Scott (1934). By this method insulin is extracted irrespective of whether it is present as soluble insulin or in the form of one of the delayed-action preparations such as protamine zinc insulin or insulin zinc suspension. To assist in the identification of the insulin, portions of some of these extracts were further purified by a method similar to that described by Dodds and Dickens (1924); in this way a fourfold increase in insulin concentration was obtained.

After removal from the body four days after death the specimens of tissue were stored at 4° C. for 15 days, and subsequently at -20° C. until extracted. Extracts R, R₂, L, L₂, and DL were prepared from aliquots of the corresponding tissue samples.

In addition, many experiments were done on human tissue obtained at necropsy. Over 20 pieces of buttock tissue were removed from cadavers of both sexes, including a female drowned in a bath, and extracts prepared either immediately or after preliminary storage under conditions similar to those used for the tissues of the deceased woman; none of these extracts showed hypoglycaemic activity. Other pieces were injected with soluble insulin or protamine zinc insulin and then extracted immediately or after storage. It was shown that insulin could be recovered by the extraction method and that a considerable proportion of any insulin present in buttock tissue survives under the conditions of storage to which the specimens from the dead woman had been subjected. Although it is impossible to be precise, the control experiments suggested that about two-thirds of the insulin present in the injected tissue was recovered by extraction and that roughly half of the insulin originally injected survived the period of storage; these conclusions apply both to soluble insulin and to protamine zinc insulin. It was also shown that extracts of cadaver tissue injected with ergometrine exert no hypoglycaemic effect; nor does its presence modify the effect of insulin injected simultaneously.

The only control extracts mentioned in this account are extract E, prepared from buttock tissue removed from a fresh cadaver, and extract F, prepared from tissue (from the same cadaver) into which a known amount of soluble insulin had been injected.

Biological Activity of Extracts

Hypoglycaemic Action in Mice.—The mouse convulsion method of insulin assay described in the *British Pharmacopoeia* (1953) was employed; the results are shown in Table I. The activity in the extracts from 170 g. of tissue from both buttocks was equivalent to a total of 84 units of insulin. The uneven distribution in the two buttocks is clearly seen from Table I; widely differing concentrations were also found in two extracts (R and R₂) from

and the police officers assigned to the case; the directors of Boots Pure Drug Co. Ltd., Nottingham; Dr. D. K. Bruce, medical superintendent, Storthes Hall Hospital, near Huddersfield; Professor C. S. Russell, department of obstetrics and gynaecology, Sheffield University; Professor R. H. S. Thompson, department of chemical pathology, Guy's Hospital Medical School; and Mr. T. Dean, consultant obstetrician and gynaecologist, Barnsley Group of Hospitals.

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CASE FOR INDUCTION OF LABOUR IN TREATMENT OF HAEMOLYTIC DISEASE OF THE NEWBORN

BY

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In a series of papers in the *British Medical Journal*, Walker and his colleagues have reported their experience in the management of cases of haemolytic disease of the newborn (Walker and Murray, 1954, 1956; Walker, Murray, and Russell, 1957; Walker and Neligan, 1955). Their analysis has been based largely on a series of cases referred for treatment in the Newcastle United Hospitals and in other centres in N.E. England during the past ten years. The management of the cases reported in those studies has been modified in the light of experience, so that the earlier reports refer to methods of treatment rather different from those used currently.

In the initial studies Walker and his colleagues subscribed to the view that the induction of labour had no place in the treatment of the infant suffering from haemolytic disease of the newborn. This view was based largely on the results of a clinical trial which suggested that prematurity greatly increased the risk of death in affected infants (Mollison and Walker, 1952; Armitage and Mollison, 1953). More recently, however, the Newcastle group has suggested that induction of labour should be used in cases where an Rh-immunized mother has already had a stillbirth due to

Rh incompatibility in a previous pregnancy. This suggestion has been incorporated in the second edition of *Blood Transfusion in Clinical Medicine* (Mollison, 1956). Subsequently, as a result of a study of the influence of the father's genotype on the severity of haemolytic disease in the affected infant, Murray (1957) has suggested that induction of labour might be justified also in cases where the father is shown to be R_2R_2 (cDE/cDE), since the risk of stillbirth in such cases, according to her analysis, is much greater than if the father is of any other Rh genotype.

In contrast to the views of the English workers, we have during the past seven years consistently advocated the use of induction of labour as an integral part of the treatment of Rh cases where the antenatal indications suggest that the infant will be severely affected. We believe that the time is now ripe to attempt a detailed comparison of the work of both the English group and our own.

Criteria of Severity

Indications for Exchange-transfusion

Walker and Murray (1954), as a result of several years' experience, have adopted the following criteria for determining the need for exchange-transfusion: "A Coombs-positive baby with a cord Hb level of 14.8 g.% or less, and a cord Hb level of 14.9 to 17.7 g.% associated with a bilirubin level greater than 2.7 mg. per 100 ml. . . . In those cases in which the cord-blood samples were not ideal we have been guided by whichever result was available. In practice this has usually been the cord bilirubin level, and we have treated any infant with a value greater than 2.7 mg. per 100 ml. . . . If cord-blood values were not available we have relied on clinical criteria."

Our practice during the past six years has been to rely upon the antibody level in the maternal serum as determined by a carefully standardized indirect antiglobulin method (Kelsall and Vos, 1952; Watson and Vos, 1952; Kelsall, Vos, Kirk, and Shield, 1957). No baby receives treatment if the maternal indirect antiglobulin titre at term is 1/64 or less. On the other hand, we exchange-transfuse all infants where the maternal indirect antiglobulin titre at term is higher than 1/128. Our original procedure was to transfuse all infants where the maternal titre at term was 1/128. We have found more recently, however, that some infants in this category with a high cord-blood haemoglobin value and no excess antibody free in the cord serum can safely be left alone.

Indications for Induction of Labour

In order to justify the premature termination of a pregnancy some reliable criterion must be available for predicting the severity of the disease in the infant. Since at the present time no complete certainty is associated with any of the criteria used for assessing severity in Rh cases we have to rely on a statistical evaluation of whatever criterion is being considered.

Walker and Murray (1956) have shown that when a mother has had one or more stillborn infants due to Rh incompatibility the chance of stillbirth in the next Rh-positive pregnancy is approximately 80%. A previous stillbirth is suggested, therefore, as a sufficiently reliable indication to justify induction of labour in the next pregnancy.

This criterion of severity, though perfectly valid, has the disadvantage that the mother must experience at least one stillbirth in order to provide the yardstick for prognosis in the next pregnancy. In addition there are many cases where the mother has had a seriously affected but surviving child in which the chances of a stillbirth in the next pregnancy are quite high. Walker and Murray have shown for their own series that if the previous baby was very severely affected the chance of a stillbirth is almost as high as when the previous pregnancy ended in a stillbirth, and that even when

the previous baby was severely affected the chance of a stillbirth is still 25%. In a more recent but still preliminary study Walker (1957) has explored the use of spectrophotometric analysis of samples of amniotic fluid obtained by abdominal paracentesis. He reports that specimens obtained at the 32nd week of pregnancy can be used to forecast correctly an affected child in approximately 90% of cases, and suggests that this method may be of value in discriminating between an Rh-negative and an Rh-positive foetus in cases where a woman married to a heterozygous husband has had a previous stillbirth.

We believe that it is desirable to use a criterion of severity which is applicable in the absence of a previous stillbirth and also during the first pregnancy in which Rh antibodies are present in the mother. For this reason, since 1950 we have assessed the need for induction of labour, as we have the need for exchange-transfusion, using the indirect antiglobulin titre of the maternal serum. Our practice in general is to recommend induction at the 35th or 36th week of pregnancy when the maternal antiglobulin titre is at 1/512 or higher, and at the 37th or 38th week when the titre is at 1/128 or 1/256. A maternal titre of 1/64 or less does not merit the artificial termination of pregnancy.

Reliability of Antiglobulin Titre as a Prognostic Index

From October, 1951, to April, 1957, we have observed 429 infants which have resulted from 421 consecutive pregnancies where Rh antibodies were detected in the mother's serum. A further series of 69 cases between January, 1950, and October, 1951, have been analysed in part previously (Kelsall and Vos, 1952). These early cases were accumulated during the exploratory period in this investigation; treatment was not consistent throughout, and they have therefore been excluded from the present discussion. Kelsall *et al.* (1957) have analysed in detail the first part of the series of cases reported here.

From October, 1951, we have attempted to follow our standard rules for the management of the cases as closely as possible, although we have not always been able to do this. All antibody titrations have been carried out in the same laboratory, using the same procedure, and 96% of the exchange-transfusions have been performed by the same operator (G. A. K.). All cases have been included where an antiglobulin titration of the mother's serum was carried out either on the day of birth or within two or three days prior to birth and where the pregnancy continued for at least 20 weeks. In 265 cases weekly or fortnightly antiglobulin titrations were carried out over at least the last ten weeks of pregnancy; 43 of these pregnancies resulted in Rh-negative infants. In the remaining cases, for various reasons, titrations could be carried out only sporadically throughout pregnancy, or near term.

Of the total of 429 infants, 56 (13.0%) were Rh negative. Of the remaining 373 incompatible infants, 65 (17.4%) were stillborn and 308 (82.6%) were liveborn. Thirty-four of the stillborn infants (9.1% of the incompatible infants) subsequently died, 20 of them despite prompt and adequate exchange-transfusion. The other 14 were untreated, death

TABLE I.—Distribution of 373 Cases of Incompatible Infants Born to Rh-immunized Mothers from October, 1951, to April, 1957, by Maternal Indirect Antiglobulin Titre at Term

Maternal Titre at Term	No. of Cases	Liveborn Rh+ Infants		Stillbirths	% Foetal Wastage
		Survived	Died		
1/64 or less	60	59	0	1*	1.7
1/128	30	28	1	1†	6.7
1/256	60	53	5	2	11.7
1/512	70	62	4	4	11.4
1/1,024	82	46	9	27	43.9
1/2,048 or over	71	26	15	30	63.4
All titres	373	274 (73.5%)	34 (9.1%)	65 (17.4%)	

* Mongol. † Anencephalic monster.

having supervened before exchange-transfusion could be started. Four of these untreated infants were of 30 weeks or less gestation.

Table I shows the distribution of these cases by the indirect antiglobulin titre of the mother's serum at term. The foetal wastage from all causes rises from 1.7% where the maternal titre is 1/64 or less to 63.4% where the titre is 1/2,048 or higher. Infants born to mothers with titres of 1/64 or less, with the exception of four cases, received no treatment. All viable infants, with the exception of 13 cases, born to mothers with titres of 1/128 or higher were exchange-transfused. The four cases which were exchange-transfused where the maternal indirect antiglobulin titre at term was 1/64 or less were transfused because of over-anxiety by the patient's doctor. There is nothing to suggest that they would not have survived normally if they had been left untreated.

Almost all of the foetal wastage in this series occurred in cases where the maternal antiglobulin titre at term was 1/512 or higher. The remaining cases, although indicating that stillbirth or neonatal death may occur where the maternal titre is lower than 1/512, have to be considered in the light of the actual causes of death. Of the four stillbirths in the lower-titre categories, two at least were not due primarily to Rh incompatibility, one being a mongol and the other an anencephalic monster. There were six neonatal deaths in the same titre categories. One of these was of only 29 weeks' gestation, was untreated, and died primarily of prematurity; another died at the age of 4 days with an obstruction of the duodenum, whilst one died at home aged 3 weeks, the diagnosis of the cause of death being septicaemia. Thus of the 10 cases where a stillbirth or a neonatal death resulted if the mother had an antiglobulin titre at term of less than 1/512, only five were due primarily to Rh incompatibility. This means that in this series, with our methods of treatment, 95% of the foetal wastage due to Rh incompatibility occurred in mothers with an indirect antiglobulin titre at term of 1/512 or higher.

Any criterion of severity based on neonatal wastage will be dependent on the effectiveness of the exchange-transfusion therapy. If no therapy had been given the number of deaths would have been much higher. It is possible, however, to test the value of indirect antiglobulin titre at term as a measure of severity in another way. We have shown previously (Kelsall *et al.*, 1957) that there is a highly significant

TABLE II.—Relationship Between Maternal Indirect Antiglobulin Titre at Term and Cord-blood haemoglobin values for Rh-positive Infants Born to Rh-immunized Mothers

Cord-blood Hb (g./100 ml.)	No. of Cases at Maternal Titre of:						All Titres
	1/64 or Less	1/128	1/256	1/512	1/1,024	1/2,048 or Higher	
18.0 and over	7	1	3	4	1	1	11
16.0-17.9	11	7	6	16	9	3	30
14.0-15.9	24	9	23	18	8	3	84
12.0-13.9	6	6	14	11	9	5	55
10.0-11.9	2	1	6	4	10	11	34
8.0-9.9			1	1	6	5	25
6.0-7.9				1	6	7	13
5.9 and less					6	7	14
Total	50	24	53	55	49	35	266
Not available	9	5	5	11	6	6	42

correlation between the maternal indirect antiglobulin titre at term and cord-blood haemoglobin values ($r = -0.612$). The relationship between maternal titre and cord-blood haemoglobin for the 266 cases of the present series of live-born Rh-positive infants where the relevant information is available is shown in Table II.

Two points of interest emerge from a consideration of the distribution of these cord-blood haemoglobin values. The first is that the cases in our series are more severe than those reported by Walker and Murray (1954). For the two years 1952 and 1953, 30% of their cases had cord haemo-

globin values of less than 13.3 g. per 100 ml. In our series 53% had haemoglobin values of 13.9 g. per 100 ml. or less (44% were actually less than 13.3 g. per 100 ml.). Allowance for this difference in severity must be made when comparing either the percentage of cases requiring exchange-transfusion or the success of the treatment in the two series.

Secondly, it is clear that there is a considerable area of overlap in the infants which Walker would consider to require exchange-transfusion and those which would receive it by applying our rules. Fifty-nine of our Rh-positive infants required no treatment (although, as noted above, four of these received it) since the maternal antiglobulin titre at term was 1/64 or less. In addition treatment was withheld from a further 10 infants with a maternal titre of 1/128 largely on the basis of absence of excess antibody in the cord serum at term. In total, therefore, at least 69 out of 308 liveborn Rh-positive infants (22.0%) survived without treatment. It is interesting to note from a study of the individual Hb values that at least 29 of these had a cord-blood haemoglobin of 14.8 g. per 100 ml. or less and would have been exchange-transfused by the English workers.

On the other hand, two of our cases which were exchange-transfused had a cord haemoglobin value above 17.7 g. per 100 ml. and would not have been exchange-transfused on the English standard. In addition, 40 of our exchange-transfused cases fell into the intermediate category where a bilirubin estimation would be necessary on the English standard. We have extracted the bilirubin values from our records for the cases with cord Hb values of 14.8–17.5 g. per 100 ml. in the titre categories of 1/128 or higher. Thirty-three of these had bilirubin determinations, and 15 of them were lower than 2.7 mg. per 100 ml. in the cord serum. Thus at least 17 of our cases which were exchange-transfused would not have merited exchange-transfusion on the English standard at birth, though some of these may have required either exchange or simple transfusion later on if severe jaundice developed after birth.

It is interesting to note, therefore, that the two sets of criteria employed as an indication for exchange-transfusion—maternal indirect antiglobulin titre on one hand, and a combination of cord-blood haemoglobin and bilirubin values on the other—have about the same efficiency in predicting the need for exchange-transfusion.

Titre Level and Duration of Response During Pregnancy

Although there is a close relationship between the maternal indirect antiglobulin titre at term and the chance of having a successful outcome of pregnancy, this by itself does not mean necessarily that the early induction of labour should be carried out. If the maternal titre at 36 weeks is 1/512, it could be argued that it might remain at this level during the next four weeks. The relationship between maternal indirect antiglobulin titre at delivery and outcome shown in Table I would indicate the chance of successful outcome in such a case to be greater than 90%. But the picture obtained by considering the relationship between a single maternal indirect antiglobulin titration at term and chance of survival may be misleading. It does not indicate whether the titre determined at the time of delivery has just arrived at that level, perhaps quite suddenly from a low or zero value, or whether the foetus has been exposed to the same quantity of antibody for a considerable length of time.

In 222 of our incompatible cases antibody titrations have been carried out weekly or fortnightly during the last 10 weeks of pregnancy. This has made possible the calculation of a "titre index" to give some measure of the effect of the titre level and the duration of the response on the severity of the disease in the affected child. The titre index is calculated by multiplying the titre code number by the number of weeks and summing for the total 10-weeks period. The code numbers used range from 1 for a titre of 1/16 or less, 2 for 1/32, 3 for 1/64, etc., to 9 for a titre of 1/4,096 or higher. Thus a mother who has maintained a titre of 1/1,024 over

the whole 10-weeks period will have a titre index of $7 \times 10 = 70$. On the other hand, a mother who has a titre of 1/1,024 at term but started the 10-weeks period with a titre of 1/64 and rose progressively each two weeks up to this titre will have an index of $2 \times 3 + 2 \times 4 + 2 \times 5 + 2 \times 6 + 2 \times 7 = 50$.

The distribution of our 222 cases in four categories of titre index where this information is available is given in Table III. Where the titre index is 40 or less, as it was in

TABLE III.—Relationship Between Maternal Indirect Antiglobulin Index and Outcome of Pregnancies of Rh-sensitized Mothers. See Text for Method of Calculating the Index

Indirect Antiglobulin Index	No. of Cases	Liveborn Rh + Infants		Stillbirths	% Foetal Wastage
		Survived	Died		
40 or less	87	84	2	1*	3.4
41–60	71	54	8	9	23.9
61–70	39	16	3	20	59.0
71 and over	25	5	4	16	80.0
All indexes	222	159	17	46	28.4

* Mongol.

87 of the cases (39%), the chance of a fatal outcome is only 3.4%. The one stillbirth was the mongol referred to previously. If the titre index is between 41 and 60 the chance of a fatal outcome is 23.9%, and from 61–70 it is 59.0%. If the titre index is above 70, as it was in 25 of our cases, the chance of a fatal outcome is 80%.

On the basis of these results it is possible to estimate the increase in severity which will occur if a pregnancy is allowed to continue for any particular length of time. For example, if a mother has reached 36 weeks and has a titre of 1/1,024, and during the previous six weeks her titre score has reached 40, then even if her titre remains unchanged she will accumulate $4 \times 7 = 28$ points to give a final titre index of 68 if the pregnancy continues to full term. This means that there is almost a 50% chance that the infant will be stillborn, or, if liveborn, will be very seriously affected, with a 30% chance of death. In some of the liveborn cases death will occur before exchange-transfusion can be started. It is clear, therefore, that accurate knowledge of the maternal antibody level and its behaviour from the 26th week of pregnancy onward enables one to predict before birth the degree of severity in the affected child with a high degree of accuracy.

Two factors at present complicate the use of the indirect antiglobulin titre and index as prognostic tools, though neither reduces its value when used with care. The first complicating factor is that even though a high titre index may be obtained, owing to the persistence of antibodies from a previous pregnancy, an Rh-negative infant may result. Out of 43 cases in the present series where the outcome was an Rh-negative infant and for which a titre index was available, 5 had an index of over 60, and 17 had an index between 41 and 60. Most of these cases were induced, since, although it was known that the father was heterozygous, we could not be certain that the infant was negative. However, despite this we have no evidence that prematurity adversely affected in any way the small number of negative infants which resulted from this procedure. All but one of the induced Rh-negative infants survived and are now alive and well. The one neonatal death occurred from cerebral haemorrhage in a baby induced at 40 weeks' gestation.

The other complicating factor is the presence of severe oedema in the mother. In our hands a falling antibody titre may be associated with developing maternal oedema, and care must be taken in such a case not to conclude that the infant is Rh-negative. In Table I the neonatal death shown against the maternal titre of 1/128 illustrates this point. The mother was grossly oedematous and the infant at birth was hydropic and did not breathe. The titre of antibodies present in the cord-blood of this infant suggests that the maternal titre should have been 1/1,024. This case, however, is exceptional in our experience in the degree of reduction of the

maternal antiglobulin titre. In most cases of maternal oedema the indirect antiglobulin titre, if reduced at all, is affected by only one tube dilution, and more rarely by two. Appropriate care must be exercised, therefore, in determining the prognosis where pregnancy is complicated in this manner.

Evaluation of the Policy of Induction of Labour

If Rh-negative infants are excluded, there have been 194 infants resulting from spontaneous labours and 179 infants from induced labours in the present series (Table IV). The spontaneous group includes some that were left to proceed to term because of low maternal titres, some that went into spontaneous premature labour before induction could be started, and some that proceeded to term because they were not referred to us early enough for induction to be instituted. Among the induced group 61 (or 30% of the induced infants) resulted from pregnancies which were terminated before the 37th week.

The pregnancies which terminated spontaneously are notable for the large number of stillbirths, all but 4 of the total of 65 occurring in this group. Of the 61 spontaneous stillbirths, 48 resulted from pregnancies of less than 37 weeks, and 34 of these were from pregnancies of less than 35 weeks. Thus, of the remaining stillbirths, only 27 could possibly have been affected by inducing labour at the 35th or 36th week. Some of these, moreover, had been dead *in utero* for varying lengths of time before birth, so that only a proportion would have been born alive had they been successfully induced. It is possible that half of these may have been retrieved in this way.

There were 15 neonatal deaths in the spontaneous group. Seven of these infants were born to mothers with a titre of 1/1,024 or higher after 37 weeks' gestation. Most of these, perhaps five, could have been retrieved had they been induced at the 35th or 36th week.

Of the total of 76 stillbirths and neonatal deaths in the spontaneous group it is possible, therefore, that 25% could have been saved if induction had been carried out early, followed by prompt and adequate exchange-transfusion.

Among the 179 induced infants there were 19 neonatal deaths and 4 stillbirths. The 11 deaths and 2 stillbirths under 37 weeks group probably represent the irreducible mortality by our methods of treatment. However, perhaps four of the eight deaths in the 37 weeks and over group might have been prevented if induction had taken place one or two weeks earlier.

It is possible to make the converse calculation and estimate how the severity of the cases in the induced group would have been affected if they had all been left to go to term. There were 36 cases induced at 35 and 36 weeks for which an indirect antiglobulin index is available. If it is assumed that the titre at delivery would have persisted at the same level for another four weeks—that is, until full term—the level for another four weeks—can be recalculated by using the last six weeks of the actual pregnancy and adding the remaining four weeks. When this is done, 8 of the 36 cases would have had the antiglobulin index increased by 10 or more points. Eleven of the cases would not have changed their antiglobulin index, but since 10 of these already had an index

above 60 at the time they were induced it is most unlikely that many of them would have continued to term and produced a living infant.

The above estimate is based on the assumption that no increase in the maternal antiglobulin titre would occur between the 35th and 36th weeks and full term. In actual fact, of course, many of the titres would have risen considerably, producing a more serious prognosis in an even greater proportion of cases. Further, the same arguments would apply to those induced at the 37th–38th week of pregnancy if they had been allowed to go to full term.

If these figures are used as a guide it is possible that at least another 20 neonatal deaths and stillbirths might have resulted in our series if no induction of labour had been performed. This would have meant a total foetal wastage of 119 (31.9%) in 373 cases of incompatible infants born to Rh-immunized mothers if all pregnancies had been allowed to terminate spontaneously. In contrast to this, if we had been able to apply our rules for induction and treatment in every case in our series it is likely that the number of neonatal deaths and stillbirths would have been reduced to 76 (20.4%). On this basis we can conclude that the uniform adoption of early induction of labour in cases where the antiglobulin titre of the maternal serum indicates the need, followed by prompt and adequate exchange-transfusion, would effect an overall reduction of mortality of 11%, or, put in another way, one in every three of the foetal deaths would be saved.

Discussion

The arguments for and against the early induction of labour in the treatment of haemolytic disease of the newborn have been stated many times during the past ten years. Diamond (1947) reported the use of induction of labour, but, following the demonstration by his group that kernicterus was more commonly associated with the immature infant, its use was gradually abandoned (Allen *et al.*, 1950). More recently, however, the same group has concluded that a certain number of stillbirths can undoubtedly be prevented by premature induction of labour. They recommend induction at 37 weeks, when the conditions are obstetrically favourable and the foetus is of good size and viable (Allen *et al.*, 1954; Allen, 1957).

The main argument in England against induction of labour in the treatment of haemolytic disease rests on the analysis of a series of controlled clinical trials (Mollison and Walker, 1952; Armitage and Mollison, 1953). In the analysis of these trials a critical comparison was made between the number of deaths (including stillbirths) in a group of 77 infants resulting from artificially terminated pregnancies and 108 infants from spontaneously terminated pregnancies. Although the stillbirths were reduced in the former group the neonatal deaths were increased, so that the overall mortality was 36.4% for the induced group compared with 24.1% for the spontaneous group.

The difference in mortality, as the authors were careful to point out, was not significant at the 5% level. But they go on to conclude, on the basis of the results obtained, that induction is unlikely to improve the survival rate by more than 1%.

TABLE IV.—Outcome of Pregnancies Terminated Spontaneously or Artificially. Rh-negative Infants have been Excluded

Length of Gestation	Maternal Indirect Antiglobulin Titre at Time of Delivery															Total
	1/128 or Lower			1/256			1/512			1/1,024 or Higher			All Titres			
	Still-births	Died	Survived	Still-births	Died	Survived	Still-births	Died	Survived	Still-births	Died	Survived	Still-births	Died	Survived	
Spontaneous: Under 37 weeks 37 weeks and over All durations	1 1 2	1 0 1	1 61 62	0 2 2	1 1 2	2 16 18	2 1 3	2 0 2	0 19 19	45 9 54	3 7 10	1 18 19	48 13 61	7 8 15	4 114 118	59 135 194
Induced: Under 37 weeks 37 weeks and over All durations	0 0 0	0 0 0	3 22 25	0 0 0	2 1 3	7 28 35	0 0 0	0 2 2	15 28 43	2 2 4	9 5 14	23 30 53	2 2 4	11 8 19	48 108 156	61 118 179

among the patients who were considered sufficiently ill to warrant therapy, but who were not treated because they could not co-operate or lived too far away, were excluded.

It can be seen, therefore, that long-term anticoagulant therapy has reduced the mortality rate after 18 months from an expected rate of 24.3% in an unselected group of 325 patients to 11.6% in a selected group of 77 patients with severe disease. In this selected group of severe cases the percentage of patients with recurrent infarction was 66%, compared with only 19% in the unselected control series. The incidence of heart failure in the treated group was 44%, compared with 36% in the untreated control group. Had no anticoagulant therapy been given, one would certainly have expected the mortality rate in the treated group of selected severe cases to be much higher than that in the control series, to counterbalance the much lower mortality rate in the group of untreated patients who were not considered sufficiently ill to warrant therapy (Table V). The results of treatment with anticoagulant therapy are therefore better than appears from a straight comparison of the mortality rates for the treated patients (Table IV) and the control series (Table III).

Analysis of Deaths in Treated Series

A brief summary of the condition and progress of the patients who died whilst receiving long-term anticoagulant therapy may be informative.

1. Woman aged 74. Twice admitted to hospital for congestive cardiac failure and coronary thrombosis. After third admission to hospital for second attack of coronary thrombosis complicated by arterial embolism of the leg, long-term anticoagulants started, but patient died at home six weeks after discharge from hospital. Was not under adequate anticoagulant cover at time of death. No necropsy.

2. Man aged 75. Long-term anticoagulants started after second episode of coronary thrombosis. Patient in persistent severe congestive cardiac failure with grossly enlarged heart. Developed retention of urine from an enlarged prostate, for which suprapubic cystotomy needed whilst patient was on anticoagulants; was not fit to undergo prostatectomy, being practically bedridden throughout. Died after ten months' treatment; anticoagulants stopped one week before death. Necropsy showed whole of left ventricle replaced by shell-like aneurysm of muscle wall. Death due to heart failure with no evidence of recent infarction.

3. Woman aged 76. Attack of coronary thrombosis four years previously. Long-term anticoagulants continued after recurrence of infarction accompanied by severe congestive cardiac failure, which persisted throughout her illness. Grossly enlarged heart and auricular fibrillation present. Died after three months' treatment. Necropsy showed an old but no recent infarction, death being due to cardiac failure.

4. Man aged 81. Anticoagulants continued after severe attack of thrombosis accompanied by shock, hypotension, cardiac failure, and heart block. Heart greatly enlarged. Remained remarkably well and active, with few signs of cardiac failure for 12 months. He then developed severe cardiac failure and auricular fibrillation. Anticoagulant therapy, which had been under excellent control, became unstabilized, presumably because patient was not able to co-operate; he lived alone. Found dead at home; was presumed to have been dead for four days before being discovered. Coroner's post-mortem examination gave the cause of death as cardiac failure and coronary thrombosis.

5. Man aged 66. Long-term anticoagulants continued after his second coronary thrombosis. He had also been treated in hospital on four occasions for chronic bronchitis. Twice admitted to hospital for bronchitis and cardiac failure whilst on anticoagulant therapy. Developed recurrence of cardiac failure and died in hospital 13 months after starting anticoagulant therapy. Necropsy showed almost totally occluded coronary arteries from advanced atherosclerosis with greatly enlarged heart. No recent thrombus discovered in vessels, but section of myocardium reported as organizing infarct present in muscle with multiple old infarcts.

6. Man aged 64. Treated for hypertension for several years with blood pressure 230/140 and heart grossly enlarged with cardiac failure present. Long-term anticoagulants continued after first attack of coronary thrombosis and also treated with hypotensive drugs. Required admission to hospital on three occasions whilst on anticoagulant therapy for treatment of cardiac failure. Died quietly in his sleep at home 14 months after starting treat-

ment. Necropsy was not held. Anticoagulant therapy was not easy to control, and patient was thought to have had inadequate anticoagulant cover.

7. Man aged 63. In hospital on three occasions for two attacks of coronary thrombosis and basilar artery insufficiency. The blood pressure was 220/120, with a grossly enlarged heart. Patient developed cardiac failure with second attack of thrombosis. Collapsed at a football match and died shortly afterwards, 14 months after starting long-term anticoagulant therapy. Coroner's post-mortem examination reported cause of death as coronary thrombosis.

8. Man aged 61. Three-year history of intermittent claudication before development of first episode of coronary thrombosis, after which long-term anticoagulants continued till patient's death 15 months later. Died in his sleep at home. Coroner's post-mortem examination reported cause of death as severe coronary atherosclerosis and ruptured aortic aneurysm.

9. Man aged 51. Anticoagulant therapy continued after second episode of coronary thrombosis. Patient remained active and relatively fit for 15 months and then developed left ventricular failure. Admitted to another hospital for treatment; anticoagulant therapy continued. Died after running to his car several weeks after discharge from hospital. Coroner's post-mortem examination reported extensive fibrosis and dilatation of heart with coronary arteries narrowed to almost pinpoint diameter from advanced atherosclerosis. Thrombus present in one coronary artery. He had not been seen at our anticoagulant clinic for 10 weeks for control of his anticoagulant therapy and did not attend the New End Clinic after his discharge from hospital.

It can be seen from the above that in four of the nine patients adequate anticoagulant cover was not considered to have been given. In a fifth patient anticoagulants were stopped one week before death, but it was obvious from his critical state that death was inevitable.

Final evaluation of the results of long-term anticoagulant therapy and the decision whether or not it should be used in the treatment of all patients will depend on the results achieved when all patients have been treated for a much longer period. Nevertheless these preliminary results are promising enough to warrant wider adoption of the treatments. It should be noted, however, that several patients who have been on anticoagulant therapy for many years have died from progressive cardiac failure, so that while long-term anticoagulant therapy significantly prolongs life it is not a sufficient cure in itself.

Control of Long-term Anticoagulant Therapy

The control of long-term anticoagulant therapy demands considerable skill and individual attention for each patient. This is necessary not only to prevent haemorrhage but also—and just as important—to ensure adequate treatment. It is essential when dealing with large numbers of patients to provide special clinics. For laboratory control both Quick's and Owren's methods give reliable results, the essential factor with both methods being the provision of a reliable thromboplastin (Toohey, 1958a).

Choice of Anticoagulant Drug

Two anticoagulant drugs were used—the very long-acting "marcoumar" and the shorter-acting phenindione ("dindevan"). Once experience was gained in allowing for the very slow delayed effect and pronounced cumulative action the results with marcoumar were excellent. When the correct maintenance dose has been exactly ascertained there is much less fluctuation in the prothrombin times with long-acting drugs owing to their cumulative effect, and therefore much less danger of the patient's escaping from anticoagulant cover. This is particularly important if inadvertently the patient misses a dose.

From a brief experience with the anticoagulant warfarin sodium, which gives excellent results for short-term therapy (Toohey, 1958b), it seems that this anticoagulant will also prove valuable for long-term treatment and will give better results than phenindione.

Undoubtedly the greatest single factor in maintaining adequate long-term anticoagulant cover and also in avoiding

severe haemorrhage is experience in the regulation of the dose of the anticoagulant drug. The greater the care taken to determine the exact maintenance dose, the smaller the fluctuations in the prothrombin times and also the less frequent the need for blood tests. A very exact assessment of the maintenance dose was possible for most patients, with the result that out of a total of 117 patients under treatment 105 attend only at intervals of 6 to 12 weeks for blood tests and are nevertheless having adequate anticoagulant cover. A small number of patients are for some reason less stable, but even in this group the minimum period between blood tests is four weeks.

It is amazing how stable are the requirements of the majority of patients with regard to the dose of the anticoagulant drug, provided that there is not intercurrent illness or marked change in diet and that the patient is not taking certain drugs which may interfere with the treatment. In the absence of such circumstances, any marked fluctuation in the prothrombin times will usually be caused by too large a change in the dosage of the anticoagulant drug. It has been definitely found in this series that as much as a 5% variation in the dose will cause appreciable fluctuations in the prothrombin times over a period of a few weeks. In the vast majority of patients it is essential to assess the maintenance dose to within 2% to 3% if the prothrombin times are to remain steady over long periods and so allow the patient to attend at intervals of 8 to 12 weeks. Such widely spaced attendances are of course highly desirable.

Instructions for Patients

The patients must be given the fullest information about all aspects of their treatment, such as the dose, strength of tablet, possible side-effects, the danger of intercurrent illness, and the danger of taking certain drugs. As long-term anticoagulant therapy has to be continued indefinitely it is only by taking all possible precautions that successful therapy can be maintained. All instructions should be written. There must be the fullest co-operation with the patient's private doctor, who must in particular be made fully aware of the danger of prescribing drugs which may interfere with the treatment, such as aspirin, phenylbutazone, and oral antibiotics—especially broad-spectrum antibiotics. The possible need to reduce, but not stop, the maintenance dose of the anticoagulant drug and the necessity to take more frequent blood tests during intercurrent illness are particularly stressed.

Surgical Procedures

Many dental extractions have been performed without undue bleeding and without the need for any material alteration in the dose of the anticoagulant. Several major operations, including intestinal anastomosis and prostatectomy, have been carried out whilst the patient has continued to have adequate anticoagulant cover. It is considered most inadvisable to stop anticoagulant therapy completely in order to carry out surgical procedures; it is only necessary to ensure that the prothrombin times are at the lower therapeutic limit of approximately twice the normal control time when Quick's method is used, or 20% to 25% by Owren's technique.

Summary and Conclusions

From 1955 onwards all patients discharged from New End Hospital who had sustained a severe attack of coronary thrombosis, particularly when complicated by heart failure, or who had had more than one episode of infarction were treated with long-term anticoagulant therapy. In all, 117 patients were treated for six months or longer. In this selected group of treated patients the incidence of recurrent infarction was 66% compared with 19% for a control series of patients. The mortality rate for the treated severe cases was 1.7%, 3.0%, and 11.6% at 6, 12, and 18 months, compared with

11.3%, 18.3%, and 24.3% for the control series of 325 unselected patients discharged from New End and other hospitals in the same group between 1948 and 1955. It can be seen, therefore, that long-term anticoagulant therapy has reduced the expected mortality rate at 18 months by at least a half.

In all, 226 patients were discharged from New End Hospital following attacks of coronary thrombosis from 1955 onwards, from which date long-term anticoagulant therapy was given to all patients with severe or recurrent infarction who could co-operate or attend for treatment. The total mortality rate for all these patients—treated severe cases and untreated milder cases—was 2.6%, 6.4%, and 13.2% and 6, 12, and 18 months. There was therefore a significant lowering of the total mortality rate compared with that of the control series. In the untreated group of patients discharged from 1955 onwards several patients died whose condition would have justified treatment, but who did not receive anticoagulant therapy because they could not co-operate or attend for control of their treatment. If these patients were excluded the mortality rate would be still lower.

Several of the most severely ill patients who have been on continuous anticoagulant therapy for many years have died from progressive cardiac failure, so that while long-term anticoagulant therapy does significantly prolong life, something more is needed to halt the underlying atherosclerosis.

Long-term anticoagulant therapy is a feasible practical procedure, and the vast majority of patients can be adequately controlled with blood tests taken not more frequently than every 8 to 12 weeks. The minimum period required for attendance for routine blood tests in the small minority of patients who prove difficult to control is four to five weeks. To ensure that patients are co-operating fully over their treatment it is essential that they should attend for their blood tests whenever possible and a "postal service" is not advised as a routine.

Full written instructions about all aspects of the treatment must be given to the patient and his private doctor, particularly with regard to the risk of bleeding, the need for more frequent blood tests during intercurrent illness, and the possible necessity for a reduction in the maintenance dose of the anticoagulant drug during such illness. The anticoagulant drug must not, however, be stopped, as there is a definite danger of a recurrence of thrombosis, particularly in severe cases. The danger of taking certain drugs such as aspirin, phenylbutazone, and oral broad-spectrum antibiotics is especially stressed.

Major surgical procedures, such as intestinal operations and prostatectomy, have been performed whilst the patients continued to have adequate anticoagulant therapy, and it is inadvisable and unnecessary to stop treatment completely at such times.

When large numbers of patients are being treated with long-term anticoagulant therapy it is essential to have special clinics with personnel who are experienced in the use of anticoagulant drugs and who fully understand the necessary laboratory procedures.

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FIG. 2.—Volume of blood cleared of carbon monoxide per minute is plotted against ventilation (volume breathed out per minute) in l./min. ● = Breathing air during steady exercise. ○ = Breathing 100% oxygen during recovery. × = Breathing 5% CO₂/95% O₂ during recovery. ▫ = Breathing 100% oxygen but voluntarily hyperventilating. + = Breathing 5% CO₂/95% O₂ but voluntarily hypoventilating.

remained oedema-free, without proteinuria, for 15 months; proteinuria (2 g. a day) then returned, followed later by oedema. He was given a further course of prednisolone (0.7 g. over 20 days), followed by 5 mg. of prednisolone on alternate days. Although oedema-free, proteinuria persists (0.5-1 g. a day). K. G., who caught measles, had a return

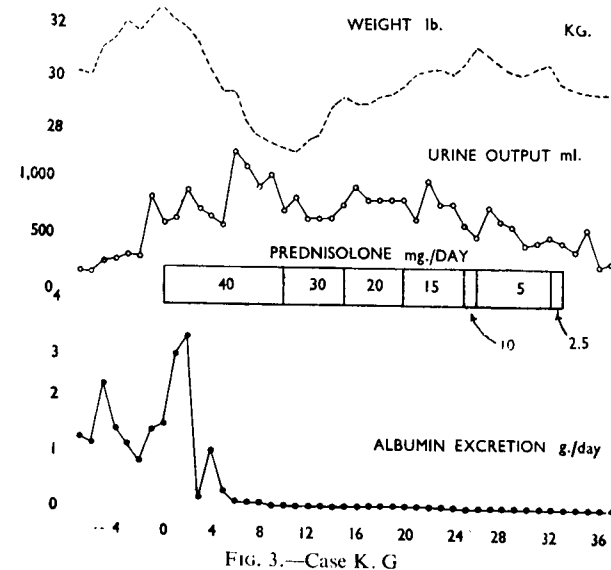


FIG. 3.—Case K. G.

of proteinuria and oedema three months after discharge and has responded again to a course of prednisolone (total of 1 g. in 40 days). D. C., in whom proteinuria had never disappeared, remained oedema-free for 13 months, although she continued to pass up to 2 g. of protein a day. She was readmitted, oedema-free, and given a further 40-day course of prednisolone followed by a maintenance dose of 5 mg. on alternate days, which reduced the proteinuria to a trace.

In no case was there any evidence of deterioration in renal function or of the development of hypertension.

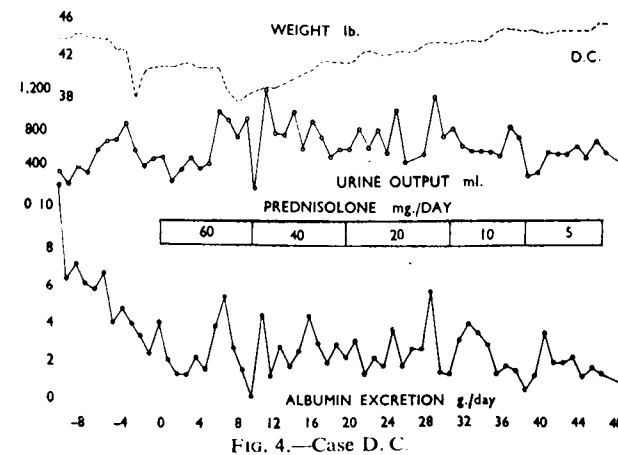


FIG. 4.—Case D. C.

TABLE II.—Response to Prednisolone

Patient:	D. C.	P. M.	S. T.	T. J.	K. G.	L. L.
Interval between onset of oedema and start of prednisolone therapy	1 year	1 week	6 months	9 months	9 days	1 year
No. of admissions to hospital before prednisolone	3	0	2	3	0	1
Date prednisolone started	20/7/56	25/3/57	4/5/56	24/4/56	15/3/57	23/6/56
Dose of prednisolone	60 mg. for 10 days 40 " " 10 " 20 " " 10 " 10 " " 10 "	60 mg. for 10 days 40 " " 10 " 20 " " 10 " 10 " " 10 "	60 mg. for 10 days 40 " " 10 " 20 " " 10 " 10 " " 10 "	60 mg. for 10 days 40 " " 10 " 20 " " 10 " 10 " " 10 "	40 mg. for 10 days 30 " " 6 " 20 " " 4 " 15 " " 5 " 10 " " 1 day 2.5 " " 7 days	60 mg. for 10 days 40 " " 10 " 20 " " 10 " 10 " " 10 "
Results at end of prednisolone therapy:						
Proteinuria	2 g./day	Absent	Absent	Absent	Absent	Absent
Oedema	Absent	Absent	Absent	Absent	Absent	Absent
Serum proteins	Normal	Normal	Normal	Normal	Normal	Normal
State in October, 1957	No oedema for 13 months. Proteinuria up to 2 g./day. Partial response to further course	No recurrence for 6 months. Passing an occasional trace of protein	No recurrence for 18 months	No proteinuria for 15 months, then relapsed. Partial response to further course	Developed measles at end of course. 3 months after discharge proteinuria recurred and persisted at 0.25-1 g. day. Responded to further course	No recurrence for 15 months. Is on small maintenance dose of prednisolone

TABLE III.—Laboratory Investigations at Intervals

Investigation	Time Before and After Start of Prednisolone Treatment	D. C.	P. M.	S. T.	T. J.	K. G.	L. L.
Serum albumin (g./100 ml.)	Before:						
	12-6 months	1	—	—	3.4	—	—
	6-3 "	1.3	—	—	1.6	—	—
	3 months-0 days	—	2.4	<1	2.7	—	1.6
	After:						
	1-10 days	—	2.8	—	—	3.0	—
	11-20 "	—	4.9	3.8	3.8	4.8	—
	21-30 "	3.8	4.8	4.9	4.8	4.4	—
	31-60 "	—	—	5.0	5.0	4.4	5.0
	61-90 "	—	—	4.6	4.4	3.5	—
Blood urea (mg./100 ml.)	Before:						
	12-6 months	36	—	—	54	—	—
	6-3 "	—	—	99	—	—	—
	3 months-0 days	20	48	45	18	30	—
	After:						
	1-10 days	—	28	—	20	30	—
	11-20 "	—	31	25	18	42	—
	21-30 "	16	31	18	18	—	—
	31-60 "	—	—	17	20	22	—
	61-90 "	—	—	—	—	22	—

Discussion

The nephrotic syndrome in children is a fluctuating condition. It is characterized by episodes of exacerbation of proteinuria and oedema. Some children remit spontaneously, losing oedema and proteinuria permanently. Others continue to pass protein, without impairment of renal function, for long periods. A small proportion die of renal and cardiac failure or other causes. Absence of proteinuria for many months does not preclude a relapse. This makes it impossible to evaluate the results of treatment over short periods.

In two of our cases moderate doses of cortisone and prednisone did not affect the proteinuria, while a course of prednisolone produced a marked reduction. As Arneil (1956) and Lennard-Jones (1957) have also shown, prednisolone is the only form of treatment that consistently reduces or abolishes proteinuria in children. Proteinuria may recur many months after successful prednisolone treatment—as occurred in two of our children; however, these children responded to a further course. It is suggested that prolonged treatment with small doses of prednisolone—for example, 5 mg. on alternate days—may prevent relapse.

Summary

Six cases of the nephrotic syndrome in children have been treated with large doses of prednisolone and followed for periods of up to 18 months. Five cases lost their proteinuria, and three of these are protein-free at 6, 15, and 18 months after treatment. Two developed proteinuria and oedema after 3 and 15 months. Both were treated again with a course of prednisolone, with disappearance of oedema and reduction in proteinuria. One further case has continued to pass a decreased amount of protein, which was further decreased after another course of prednisolone.

ADDENDUM, August, 1958.—Since October, 1957, three of ten children—D. C., S. T., and T. J.—have had no relapses. P. M. and L. L., when last seen, some months ago, were also well. K. G. has had two more relapses; each has responded to further short courses of prednisolone (0.5 g. in two weeks). Two other cases have been treated and followed up for nine and six months respectively. Each responded to the initial course, and was kept on a maintenance dose. One of these had to be readmitted six months after his initial course, but responded to a short course of prednisolone (0.5 g. in two weeks). The latter remains well, but continues to have proteinuria, despite maintenance therapy.

Our thanks are due to Dr. J. Forest Smith, Dr. H. K. Goadby, and Dr. B. D. R. Wilson for allowing us access to their cases and for their encouragement, and to Dr. W. J. Griffiths for and for their encouragement, and to Dr. W. J. Griffiths for chemical studies. We are grateful to the sisters and nursing staff of the children's wards of St. Thomas's Hospital, St. Peter's Hospital, Chertsey, and St. Andrew's Hospital, Bow, for their help.

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The Public Health (Preservatives, etc., in Food) Regulations, 1925-1953, permit the importation of citrus fruit in not wrappers impregnated with diphenyl to the extent of not more than 40 mg. per 100 sq. in. Exporting countries now employ other methods of preservation—for example, the impregnation of the container with diphenyl or the inclusion of impregnated pads or spacers in the container—and the regulations have been amended to permit the importation and sale of citrus fruit which contains diphenyl or ortho-phenylphenol or admixtures of the two substances within prescribed limits.

EXOPHTHALMOS IN CUSHING'S SYNDROME

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Cushing (1932), in his original description of the syndrome that now bears his name, recorded several instances of mild-to-moderate exophthalmos. Subsequent reports have confirmed this finding. Although there does not appear to be any example of severe exophthalmos, some degree of proptosis was found in 8% of 189 patients with Cushing's syndrome reviewed by Plotz *et al.* (1952).

The following case appears worthy of record because of the unusual course of the disease in which the appearance of malignant exophthalmos preceded the evolution of severe Cushing's syndrome.

Case History

A woman of 39 was admitted to the London Hospital on July 11, 1956. She had been agitated and depressed for the six weeks before admission, and for the previous three days had been very excitable, unable to converse intelligently, and was quoting odd phrases from the Bible.

Her ankles had been swollen four weeks before admission, the oedema being dispersed by acetazolamide. Her eyes had been slightly prominent for as long as her relatives could remember, but for the previous 18 months they had been sore and watering, although no increase in prominence had been noted.

On examination she was found to be obviously psychotic. Bilateral proptosis was present in marked degree, with severe conjunctivitis and slight ptosis on the right. Thyrotoxicosis was looked for particularly, but no sign other than her exophthalmos was found. A provisional diagnosis of an intracranial tumour was made.

During the first night in hospital she made an attempt at suicide by cutting her wrists with pieces of a broken spectacle lens. Consequently on July 13 she was transferred to Warley Hospital, where she was found to be mentally inaccessible, with delusions and hallucinations. Physical examination revealed obesity and male distribution of body hair, together with a severe proptosis. Her blood pressure was 120/90.

By July 16 her exophthalmos had increased to such an extent that orbital decompression was considered. Two days later electric convulsion therapy was started and a course of seven electroplexies completed on July 27. A considerable improvement in her mental condition had occurred and her exophthalmos had diminished.

On August 16 her mental condition relapsed, her eyes became more prominent, but a further course of seven electroplexies improved her condition. Up to this time menstruation had been normal, but she then developed amenorrhoea, which persisted until December. On September 3 her blood pressure was 180/130. Another relapse necessitated a further course of electric convulsion therapy, but by October 21 she had so improved that she could be discharged. She was then referred to one of us (A. S. M.), and on this occasion volunteered the fact that she thought her face was changing and that some fat was

collecting over her shoulder girdle. On examination her face was fat and heavy, with a faint hairy down over her chin. Her scalp hair was thin. Bilateral severe exophthalmos was present. There was no ophthalmoplegia. Her skin was rather dry, and her blood pressure was 170/125.

At that time she did not exhibit the habitus of Cushing's syndrome, and her general appearance and skin texture were suggestive of myxoedema. Thyroid extract, in a dose

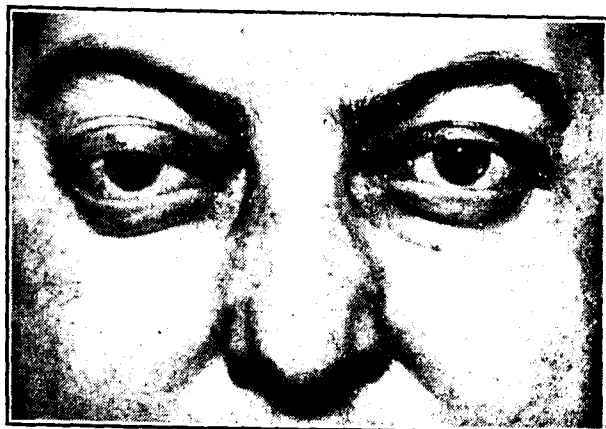


FIG. 1

of 3 gr. (0.2 g.) daily, was therefore started on September 20. On the 26th her exophthalmos was thought to be rather worse, but did not progress subsequently.

However, by November 1 a rounded face, fat around the neck, and a decrease in the bulk of the limb muscles became apparent. Stilboestrol in a dose of 2 mg. daily was started. At that time the 17-ketosteroid excretion was 14.1 mg./24 hours, and the skull did not show any radiological abnormality.

On January 30, 1957, she was admitted to New End Hospital for further investigation. Gross bilateral exophthalmos was still present with chemosis and conjunctivitis, though the retro-orbital tension was not unduly raised (Figs. 1 and 2).



FIG. 2

Her blood pressure was 175/120 at rest in bed. Two months previously the diagnosis had been problematic, but the subsequent rapid change in her appearance left no doubt that the diagnosis was Cushing's syndrome.

Investigations.—Hb, 103%; total W.B.C. 14,000/c.mm.; E.S.R., 12 mm. in one hour (Westergren); total serum proteins, 5.8 g./100 ml. (albumin 3.9 g., globulin 1.9 g.); serum sodium 156 mEq/l.; potassium, 5 mEq/l.; bicarbonate, 29 mEq/l.; chlorides, 95 mEq/l.; cholesterol, 225 mg./100 ml.; 17-ketosteroids (Medical Research Council, 1951), 7.7 mg./24 hours; 17-hydroxycorticoids (Appleby *et al.*, 1955), 38.2 mg./24 hours, and by the method of Reddy (1954) 21.4 mg./24 hours. Glucose-tolerance test (50 g. of glucose given orally): fasting blood sugar, 95 mg./

100 ml.; 30 minutes, 123 mg.; 60 minutes, 180 mg.; 90 minutes, 200 mg.; 120 minutes, 205 mg.; 150 minutes, 198 mg. X-ray examination of lumbar spine showed moderate osteoporosis and multiple disk lesions.

On February 6 she began menstruating. Nine days later, crops of petechiae appeared over her right breast, right arm, and right side of her back. Her blood pressure in bed and at rest was constantly in the region of 180/130.

Further Investigations.—Hess test positive. Platelets, 204,000/c.mm.; clotting-time (Lee-White), 3½ minutes; bleeding-time, 4½ minutes; 17-ketosteroids (M.R.C., 1951), 12.9 mg./24 hours; 17-hydroxycorticoids (Appleby *et al.*, 1955), 66.1 mg./24 hours, and by the method of Reddy (1954) 34.9 mg./24 hours.

While these investigations were being completed her mental state did not give rise to anxiety, and she appeared to be a calm and composed patient. On February 16, during the early hours of the morning, she jumped from a bathroom window to the street, two stories below. She died a few minutes later.

The cause of death was found at necropsy (Dr. F. Camps) to be due to a ruptured aorta. The endocrine glands all appeared to be of normal size. Dr. A. B. Bratton gave the following histological report. "Hyaline changes in numerous basophil cells in the anterior lobe of the pituitary correspond to those described by Crooke (1935). Slight hyperplasia of the adrenal cortex is present. There are numerous corpora fibrosa and a few cystic follicles in a slightly fibrotic ovary. One small microfollicular adenoma of the thyroid, otherwise normal thyroid tissue. The myocardium of the left ventricle is hypertrophied."

Discussion

The salient point in the natural history of this patient was the rapid progression of the signs of Cushing's syndrome after a period of 30 weeks in which the picture was that of a malignant exophthalmos and an episodic mental state consisting of an agitated depression. There was no evidence of thyroid dysfunction. The exophthalmos varied *pari passu* with the psychotic episodes, but did not become pronounced again as the adrenal disorder became obvious and progressive. The tragic end to this case again emphasizes the great care needed although mental disturbance is not obvious.

The occurrence of mental changes as a part of Cushing's syndrome is well known (Schleisinger and Horwitz, 1940; Spillane, 1951; Plotz *et al.*, 1952; Trethowan and Cobb, 1952). Starr (1952), in a series of 53 cases, observed that depression was the most frequent finding. The suicide rate of the series was 1,000 times that of the general population.

The pathological physiology of exophthalmos has been discussed extensively (Greene, 1955), but as yet there is no full explanation. All the evidence points to a pituitary-thyroid relationship. Apparent exophthalmos has been produced in the experimental animal by the administration of cortisone (Aterman, 1952; Aterman and Greenberg, 1953, 1954), and it might be possible to extrapolate such work to explain the findings in our case. However, another



FIG. 3

explanation has been offered by Boas and Scow (1954) for these results. They considered that the apparent exophthalmos was due to retarded body growth induced by cortisone. Essex (1955) also held the view that body growth is retarded by cortisone, while the eye, as an ectodermal structure, was little affected. Wyn Williams (1955) found that this cortisone-induced exophthalmos could be produced only in the growing animal. Moreover, it has been suggested that systemic cortisone might improve exophthalmos, and, although this was not borne out in a trial carried out under the auspices of the Medical Research Council (1955), no case was made worse by such treatment.

Although no definite mechanism can be implicated, the natural history of this case, with exophthalmos preceding the other signs of Cushing's syndrome, would suggest that the primary disturbance was hypothalamic or pituitary rather than adrenal.

Summary

A case of Cushing's syndrome with mental disturbance and malignant exophthalmos is described. A possible mechanism of the exophthalmos is discussed. It is suggested that the primary lesion of Cushing's syndrome was in the hypothalamus or pituitary rather than the adrenal glands.

We thank Dr. A. E. Clark-Kennedy and Dr. J. R. P. Edkins for access to the case records compiled while this patient was under their care.

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RENAL FAILURE DUE TO PARA-AMINOSALICYLIC ACID

BY

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Drug allergy has been said to have ousted syphilis in recent years as "the great imitator." Florid cases of allergic reactions to para-aminosalicylic acid (P.A.S.) have often been reported, but associated renal involvement has been uncommon and usually confined to patients who also had hepatitis. Accounts of allergic reactions to P.A.S. with renal failure and jaundice are given by Cuthbert (1950), Livingstone and Street (1950), Jeffrey *et al.* (1952), and Mann (1953). Two papers have also described renal failure in patients having allergic reactions to P.A.S. without jaundice, but in the earlier case (Le Melletier and Gerphagnon, 1950), the patient was already almost moribund with tuberculosis. In the other paper, Silverman *et al.* (1956) report a case of "toxic nephritis" without clinical but with biochemical evidence of hepatic damage. The following account is therefore the first authentic report of a case of renal failure due to P.A.S. without hepatitis.

Case Report

An Irishman of 31 was first found to be suffering from pulmonary tuberculosis, with a positive sputum, in April, 1956. In August, he was admitted to hospital, where he was given 1 g. of streptomycin daily with calcium B-P.A.S., 3.5 g. t.i.d., and isoniazid, 100 mg. t.i.d., for 83 days.

He was transferred to Colindale Hospital on October 30. On admission he was a healthy-looking man with a symptomless goitre. There was no clinical evidence of thyrotoxicosis. His temperature was 98.4° F. (36.9° C.), pulse 84, blood pressure 130/80. No abnormal physical signs were found in the chest or any other system. X-ray examination revealed bilateral apical pulmonary tuberculosis without cavitation. Sputum was negative for acid-fast bacilli on smear and culture. The E.S.R. (Westergren) was 3 mm. in one hour. The urine was found to contain sugar. Fasting blood sugar was 110 mg./100 ml. The glucose-tolerance curve was within normal limits. The blood count was normal; Hb, 106%.

There was no family history of asthma or other allergic conditions. His mother had a goitre. The patient did not remember ever having had a drug reaction. He had never had asthma or other manifestations of allergy.

On November 3 the patient started streptomycin, 1 g. three times a week, with daily sodium P.A.S. 12 g., and isoniazid 300 mg. by mouth. He made satisfactory progress until December 8 and 9, when the evening temperature was 99° F. (37.2° C.), and on December 10 it rose to 101.6° F. (38.7° C.). An injection of penicillin was given. Next morning a pink macular rash was noticed. The posterior cervical glands were enlarged, firm, and discrete, but not painful or tender. The patient was thought to be suffering from rubella. The evening temperature on December 11 was 103° F. (39.4° C.). Although no complaint of sore throat had been made the fauces were reddened. P.A.S. and isoniazid were continued, and streptomycin, P.A.S., and isoniazid were given the next day, December 12, as usual. That evening the temperature rose to 103.2° F. (39.5° C.) with enlargement of glands in the anterior triangles of the neck. Another injection of penicillin was given.

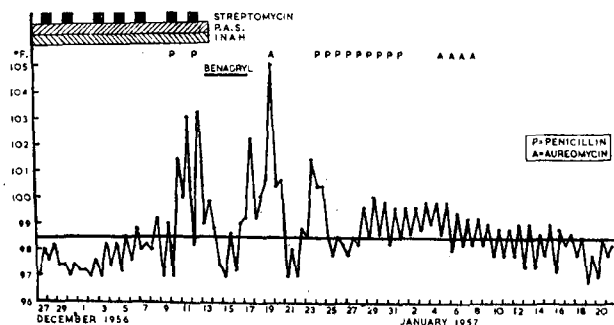
On December 13 the possibility of drug hypersensitivity was considered, and penicillin, streptomycin, P.A.S., and isoniazid were discontinued. A course of diphenhydramine hydrochloride was started. The same evening the temperature fell to 100° F. (37.8° C.), and by the evening of the 14th it was normal and remained so for over 36 hours, but the rash had become red and blotchy with considerable pruritus, and glands could be felt in the axillae and groins. The conjunctivae were suffused. The blood count remained normal. The Wassermann reaction was negative. No glandular fever cells were seen in the blood then or at any time. The Paul-Bunnell test and all other agglutination reactions were negative.

On December 16 and 17, while he was still on diphenhydramine hydrochloride, the temperature rose again to 99° and 102.2° F. (37.2 and 39° C.) respectively, and the drug was therefore discontinued.

On December 19 there was an evening pyrexia of 105° F. (40.6° C.) with a fresh crop of glands in the post-auricular regions, and the spleen was found to be palpable. One dose of chlortetracycline was given that night, but the drug was discontinued owing to vomiting. Although the rash gradually faded without desquamation, the urine became scanty and highly coloured. It contained sugar and a trace of albumin.

Another spike of pyrexia—101.4° F. (38.6° C.)—occurred on December 23 with a transient erythematous rash on the trunk. The general condition remained good, but the patient was still vomiting, and only 2 oz. (57 ml.) of urine had been passed in the previous 24 hours. This was solid with albumin and contained leucocytes, erythrocytes, and hyaline and granular casts. Culture was sterile. The blood urea was

found to be 150 mg./100 ml. Fluids were immediately restricted by mouth and penicillin was started. No pitting oedema was observed at any time. Daily blood-pressure readings never rose above 150/90. At no time was there clinical evidence of hepatic involvement. The blood count remained normal throughout. The blood urea rose to 245 mg./100 ml. on December 27 and thereafter fell, until by January 7, 1957, it was normal. (Urea concentration test was also normal on January 7.)



By December 30 fluid balance had been re-established and the spleen was no longer palpable. (The glands subsided more gradually, the last disappearing on February 13.) Urine was clear of red cells by December 31, casts by January 11, and albumin and leucocytes by January 21. Glycosuria persisted. A 24-hour specimen of urine contained no acid-fast bacilli on Löwenstein culture. Serum protein electrophoresis still showed a slight decrease in albumin and increase in α_2 and γ globulins on January 7.

Despite courses of penicillin and chlortetracycline the temperature subsided very gradually and did not settle finally until the middle of January.

Test doses of chlortetracycline and penicillin during March gave no reaction, nor did isoniazid or streptomycin.

On March 8, 4 g. of sodium P.A.S. given orally at 10 a.m. was followed by a prickling sensation in the skin during the afternoon. The temperature at 5 p.m. was 100° F. (37.8° C.). 50 mg. of diphenhydramine was given. At 10 p.m. the temperature was 101.8° F. (38.8° C.) and the patient vomited. Diphenhydramine, 100 mg., was then given and the temperature fell to normal. There was a deficit of 40 oz. (1,140 ml.) in urinary output during the next 48 hours. Blood urea was 30 mg./100 ml. The urine contained no albumin.

The patient was discharged home well on April 4.

Discussion

By far the commonest serious complication of P.A.S. therapy is hepatitis, an excellent review of which is given by Hensler *et al.* (1957). Hepatitis usually accompanies a severe allergic reaction characterized by fever, rash with pruritus, sore throat, conjunctivitis, eosinophilia, and enlargement of glands and spleen, or most of these signs.

It was noted by Lichtenstein and Cannemeyer (1953) and Cannemeyer *et al.* (1955) that 0.3% of their patients treated with P.A.S. had reactions of some sort, but in over 3,000 cases none had renal complications. This infrequency is confirmed in the literature reviewed here. P.A.S. remains a comparatively safe drug whose usefulness outweighs the possibility of occasional severe complications.

It is noteworthy that the patient described here took calcium B-P.A.S. for 83 days without mishap. After 35 days of sodium P.A.S. his severe allergic illness developed. Unfortunately, after recovery, a test dose of calcium B-P.A.S. was not tried. All the allergic reactions already alluded to were due to sodium P.A.S. (Cuthbert, 1950; Livingstone and Street, 1950; Jeffery *et al.*, 1952), or P.A.S. itself (Le Melletier, 1950; Mann, 1953; Silverman *et al.*, 1956). Phillips *et al.* (1957) has described three cases in which the patients exhibited allergic reactions to sodium P.A.S. and

were subsequently able to take calcium B-P.A.S. uneventfully. As calcium B-P.A.S. is of comparatively recent introduction, it remains to be seen whether it does in fact reduce the incidence of allergic reactions. Pharmacologically there would appear to be no reason to expect this.

Summary

A review of the literature of renal complications of P.A.S. therapy is given. The frequency of association of renal with hepatic complications is discussed.

A case is described of severe renal failure due to sodium P.A.S. as part of an allergic reaction to the drug. The diagnosis was confirmed by subsequent test doses. The patient made a spontaneous recovery some time after the drug was stopped.

The rarity of renal complications of P.A.S. therapy is mentioned. There would appear to be no indications for using P.A.S. less frequently than is at present the custom.

The possible relationship of P.A.S., sodium P.A.S., and calcium B-P.A.S. to allergic reactions is briefly considered. It is possible that calcium B-P.A.S. is the safest of the group available for routine use at the present time.

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LEIOMYOMA OF OESOPHAGUS

REPORT ON TWO CASES SURGICALLY TREATED

BY

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Leiomyoma is the most common benign tumour of the oesophagus. Until recent years most cases were discovered at necropsy. Lewis and Maxfield (1954) reported 47 surgically treated and 108 post-mortem cases in their collection of 150 cases from the world literature. Whether priority of surgical treatment belongs to Sauerbruch or Ohsawa, it is clear that there has since been a new chapter in the field of practical treatment and consequently an increase in the number of surgical cases. Storey and Adams (1956) collected 110 cases of these tumours surgically treated: 16 before 1948 and 94 from 1948 to 1956.

We do not propose to review the whole literature, as this has already been done recently by several authors. However, the infrequency and the successful operative treatment of leiomyoma of the oesophagus gives us reason to present our two personal cases.

Case 1

A male nurse aged 43 was referred to the E.N.T. out-patient department on June 15, 1956, complaining of dysphagia and retrosternal discomfort when swallowing. He stated that six weeks previously he had an attack of influenza, following which the dysphagia developed. On E.N.T. examination no abnormality was revealed. The chest x-ray examination showed no abnormality, but a barium swallow on June 26 revealed a large well-defined indentation of the middle third of the oesophagus; this was interpreted as probably due to extrinsic pressure; no hold-up of the barium occurred. On August 30 oesophagoscopy revealed only a slight swelling on the posterior wall of the oesophagus at the level of the upper and middle thirds.



FIG. 1.—Case 1. Barium swallow. Note the typical filling defect and the ring or crescent shape of the barium column.

Bronchoscopic examination was negative. A repeat barium-swallow examination again showed the filling defect at the junction of the upper and middle thirds (Fig. 1). The patient was admitted to our thoracic surgical unit on October 22, and in addition to the dysphagia some vomiting occurred and he had also lost a little weight. He had been suspected, about a year previous to the dysphagia, of having a duodenal ulcer. Otherwise he had always been in good health.

On examination he was of normal build; there were no signs of anaemia and no adenopathy. The cardiovascular and respiratory systems showed no abnormality, neither did his digestive system, apart from the dysphagia and vomiting. The abdomen was normal. Blood examination showed no anaemia, and the white-cell count was normal. The ensemble of the history and examination led us to the diagnosis of non-malignant tumour of the oesophagus, probably a leiomyoma.

Operation

On November 7 the oesophagus was explored through a right thoracotomy with the patient in the lateral position. There was no abnormality of the lung or mediastinum, but bulging and swelling of the oesophagus were found just below the arch of the azygos vein. The tumour was 3 to 4 cm. long and quite localized. A vertical incision over the wall of the oesophagus at the level of the tumour was made. The tumour, which was lying between the mucosa and the muscular layers of the wall of the oesophagus, was shelled out readily. The muscle layers of the oesophagus were repaired with fine silk. After drainage of the pleural cavity the thoracotomy wound was repaired.

Histological examination revealed a fibroleiomyoma. There was no sign of malignancy.

The immediate post-operative recovery was uneventful, and after 48 hours the patient started to drink water and then soft drinks, and later took a soft diet. After a further two weeks he was discharged, taking a normal diet, and had no dysphagia or digestive disturbance. Before discharge a barium-swallow examination showed normal passage of the barium and no filling defect. Six weeks after discharge he was very well and in a satisfactory condition. When seen on May 7, 1957, he had no dysphagia, was putting on weight, and his condition was very satisfactory.

Case 2

A schoolmaster aged 34 was first seen in November, 1956. He gave a history of two years' discomfort in the epigastric region, and dysphagia. When this dysphagia first started in 1954 he had a barium-meal examination, which was reported as normal. On questioning, he did not think he had lost any weight.

On examination there was no adenopathy. The cardiovascular and respiratory systems were normal. The abdomen was soft without any tenderness. There was no hepatosplenomegaly or anything relevant in the past history. The barium-swallow examination showed a



FIG. 2.—Case 2. The barium swallow; showing also the soft-tissue mass at the level of the filling defect of the oesophagus.

rounded filling defect in the upper oesophagus at the level of the sterno-clavicular junction. The defect in the oesophagus was smooth and suggestive of extrinsic tumour. Plain chest x-ray films from the lateral view showed a soft-tissue mass in the superior mediastinum (Fig. 2).

Oesophagoscopy at the end of December showed no abnormality. There was the impression of a hard mass pressing into the posterior wall of the oesophagus.

The patient was referred to our thoracic surgical unit with a diagnosis of chondroma or dermoid tumour pressing on the oesophagus.

On admission he gave the same history of dysphagia, and on clinical examination again no abnormality was discovered. The blood count was normal. A barium-swallow examination showed the same filling defect (Fig. 3). From the long-standing dysphagia, the clinical examination, and the typical barium-swallow examination, leiomyoma of the oesophagus was diagnosed.



FIG. 3.—Barium swallow of Case 2. Again the crescent-shaped barium column with a typical filling defect is present.

Operation

The tumour appeared to be at the level of the junction of the upper and middle thirds of the oesophagus. The oesophagus was explored through a right thoracotomy, with the patient in the lateral position. No abnormality of the lung or mediastinum was found, but a fairly large tumour the size of a small orange lay in the wall of the oesophagus at the junction of the upper and middle thirds; the arch of the azygos vein was running over the middle of the tumour. The oesophagus was mobilized after ligation and division of the azygos vein; then a vertical incision was made over the tumour (about 4 cm. long). The incision was through the muscle layers only, and the tumour was shelled out fairly easily. The tumour was lobulated (Fig. 4), the

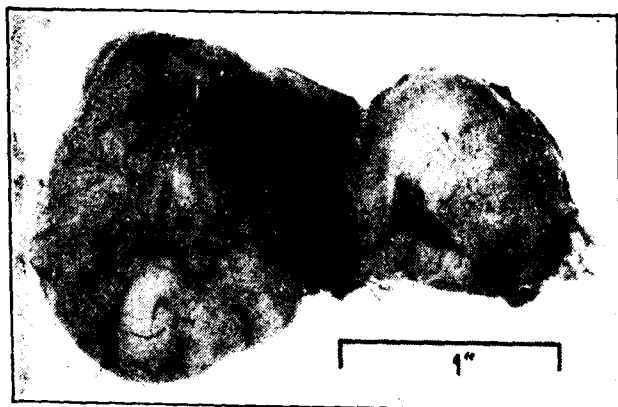


FIG. 4.—Case 2. Lobulated growth.

mucosa remaining intact. The muscle layers of the oesophagus were then stitched with fine silk, and after insertion of a drainage tube into the right pleural cavity the thoracotomy wound was repaired.

The immediate post-operative recovery was uneventful, and after 48 hours the patient was given water and then soft drinks. A week later he was eating very well on a soft diet. After two weeks he was discharged from hospital. His general condition was then very satisfactory and he had no digestive discomfort or dysphagia.

When seen six weeks after operation he was very well. A barium-swallow examination at that time showed that the barium passed quite normally through the oesophagus, the contours of which appeared to be normal. He later lived abroad, and has written to tell us that he has had no dysphagia and was enjoying his food.

Discussion

Authors who have collected cases of leiomyoma of the oesophagus from the world literature record that most leiomyomas usually occur in the lower and middle thirds of this organ. In our cases they were found at the junction of the upper and middle thirds. The age range of patients is between the third and sixth decades of life. In all series there are more males than females, the ratio being as high as 2 to 1.

Symptoms

1. *Dysphagia*.—Both of our patients complained of dysphagia. Many cases may be asymptomatic—about 50% in the series of Johnston *et al.* (1953). Obviously the presence of symptoms depends upon the size and location of the tumour, as it is of mechanical origin. Dysphagia is the most common symptom, alone or associated with other symptoms. The myoma being a slowly growing tumour, dysphagia may be present for a long time with various degrees of severity. In Case 2 the patient had dysphagia for three years before his operation. Dysphagia may be intermittent, as in our patients, and in the case of Chalmot *et al.* (1951). Most if not all of the oesophageal conditions at one stage or another present the symptom of dysphagia, and even long-standing dysphagia is not very helpful in making the differential diagnosis; this is based on other symptoms and investigations.

2. *Loss of weight* is a relatively unimportant symptom. In spite of long-standing dysphagia in this condition, loss of weight is either absent or very slight. Only one of our patients (Case 1) lost a little weight. The other, in spite of his long-term dysphagia, had not lost weight.

3. *Other Symptoms*.—One of our patients had attacks of vomiting. Epigastric pain and discomfort are often recorded in different series, and even the respiratory disturbances can occur (for example, the patient of Chalmot *et al.* with "respiration bouché").

Physical Examination and Clinical Investigations

Physical examination is usually negative. The blood count and laboratory findings are also usually normal.

Oesophagoscopy usually reveals no lesion of the mucosa. In both of our cases this examination showed no lesion of the mucosa, but the impression of extrinsic pressure. Occasionally ulceration or congestion of the mucosal membrane can be seen (Lortat-Jacob, 1949), and then the biopsy may establish the diagnosis. The value of the oesophagoscopy is to rule out the possibility of carcinoma.

The straight x-ray film of the chest may sometimes show the presence of the mediastinal mass with or without displacement of the trachea. This was the case in one of our patients. The barium-swallow examination, on the other hand, gives the most valuable diagnostic information. Radiological features of benign tumours of the oesophagus and their differential diagnosis from malignant ones have been described by many authors, and Buckstein (1953) discusses the matter fully in his book. Benign intramural tumours of the oesophagus have many common features whatever their histological structures may be. Also, the intramural, submucosal, and extrinsic ones may be differentiated one from another, although at times with difficulty (Schatzki and Hawes, 1942).

The filling defect caused by the tumour mass has a smooth surface, and there is a ring or an arc shadow of the barium column. This filling defect has been referred to by many as the "half-moon" or "lacunar" and "crescent shape." The tumour of the lower end may produce considerable dilatation.

Treatment

Removal of the tumour by surgery is the only method of cure. The enucleation must be considered in every case from the first instant, as most of the leiomyomas can be removed in this way. The operative mortality rate has been recorded to be about 9% on the whole. The rate is lower for enucleation and higher for excision by resection

(Lewis and Maxfield, 1954). Pleural and pulmonary complications have been noted to follow enucleation; also hiatus hernia and oesophagitis when resection has been performed.

Summary and Conclusion

Leiomyomas of the oesophagus were once incidental post-mortem findings, but recently they have usually been diagnosed and removed surgically. In cases of long-standing dysphagia, without loss of weight in young and middle-aged patients, this tumour has to be considered. Investigations, particularly barium-swallow examination, lead to the diagnosis. The diagnosis of the tumour is important because most, if not all, leiomyomas of the oesophagus can be cured by enucleation.

We have presented two cases, pre-operatively diagnosed and surgically treated by enucleation.

We thank Dr. A. Rickards, of the Royal Lancaster Infirmary, for the photographs.

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METASTATIC CARCINOMA OF THE PROSTATE AND BLEEDING

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The phenomenon of fibrinolysis and the presence of hypofibrinogenemia in metastatic carcinoma of the prostate, if searched for, is not infrequent; for example, Tagnon, Whitmore, Schulman, and Kravitz (1953) found six cases showing fibrinolysis in their series of 48. The knowledge of the mechanism of fibrinolysis is still limited, but has been diagrammatically represented by Stefanini (1953). Tagnon *et al.* (1946) state that fibrinolysis is present when the clot of whole blood or diluted plasma disappears completely in less than 24 hours at 37° C. Furthermore, Tagnon *et al.* (1952) believe that the mechanism of fibrinolysis in the prostatic cancer may be different—that is, that the prostatic cancer itself may be the source of the enzyme responsible for the dissolution of the blood clot. Huggins and Vail (1943) demonstrated such a fibrinolytic enzyme in prostatic tissue. Ratnoff (1952) demonstrated fibrinolysis and hypofibrinogenemia in cancer process was due to release of pancreatic trypsin. McKay *et al.* (1953) described a case of mucinous carcinoma of the body of the pancreas with hypofibrinogenemia and multiple fibrin thromboses, but did not carry out tests for fibrinolysis.

The relationship between metastatic carcinoma of the prostate and bleeding is of interest in that the bleeding, which may be dangerous (Swan *et al.*, 1957), may be due to fibrinolysis and fibrinogenolysis, or to the more frequent finding of thrombocytopenia secondary to bone-marrow involvement. Clinically, the bleeding sites, which are particularly from the nose and urinary and gastro-intestinal tracts, as well as in the skin or after minor trauma, may be identical. Tagnon, Whitmore, Schulman, and Kravitz (1953) report that the platelet count may be depressed in metastatic carcinoma of the prostate with fibrinolysis, but haemorrhagic manifestations in association with fibrinolysis occur despite the presence of a normal level of platelets.

The following report concerns a case of metastatic carcinoma of the prostate with fibrinolysis, hypofibrinogenemia, hypoprothrombinemia, and thrombocytopenia, and the response to stilboestrol therapy; and it is contrasted with another case with thrombocytopenia and bleeding secondary to bone-marrow involvement.

Case 1

A man aged 68 was admitted to hospital on May 10, 1957, complaining of anorexia, loss of weight, and low back pain; immediately before admission he had a brisk rectal haemorrhage, passing about 1½ pints (850 ml.) of bright red blood.

On examination he was pale and ill, with many ecchymoses and purpuric spots over the limbs and trunk. It was noted later that there was moderately severe oozing from venepuncture sites. Rectal examination revealed a hard, irregular prostate and the presence of bright red blood. He had several moderately severe rectal haemorrhages during the first few days after admission and he had to be transfused with four pints (2.3 litres) of whole blood. The blood sent for cross-matching remained in a fluid state, any clot that had originally been present having disappeared on reaching the laboratory.

Investigations.—Radiography showed osteoplastic deposits involving the right innominate bone and lumbar vertebrae. Haemoglobin, 5.1 g./100 ml. (35% Haldane). White blood count, 6,000/c.mm. (polymorphs 65%, lymphocytes 24%, monocytes 1%, eosinophils 1%, myelocytes 2%, metamyelocytes 7%). The blood film showed some macrocytes, occasional megaloblasts, and 24 nucleated red blood cells per 100 leucocytes. Serum alkaline phosphatase, 40 K.-A. units. Total serum acid phosphatase, 6.3 K.-A. units. Alcohol stable fraction, 3.5 units. Serum bilirubin, 0.6 unit. Thymol turbidity, 0.8 unit. Platelet count (Lempert), 40,000/c.mm. Prothrombin activity (Quick's one-stage), 40% of normal control. Plasma fibrinogen level, 100 mg./100 ml. Whole-blood clotting-time (Lee and White), 6 minutes. Plasma recalcification time, 2 minutes. Capillary whole-blood clotting-time, 4 minutes. Factor 5, no deficiency. Factor 7, no deficiency. Clot retraction test (Biggs and Macfarlane, 1953): the clot was formed in normal time but was gradually lysed, thus rendering the test impossible to carry out.

Test for Fibrinolysis.—A standard fibrin clot was formed from equal quantities of normal plasma, brain thromboplastin, and M/40 calcium chloride at 37° C. The standard clot was washed free from thrombin with physiological saline and was suspended in the patient's plasma and placed in a water bath at 37° C. At the same time controls were set up, using a similar fibrin clot and normal plasma. The fibrin clot suspended in the patient's plasma was completely lysed and disappeared after four hours. Those in the control tubes were intact up to at least 48 hours.

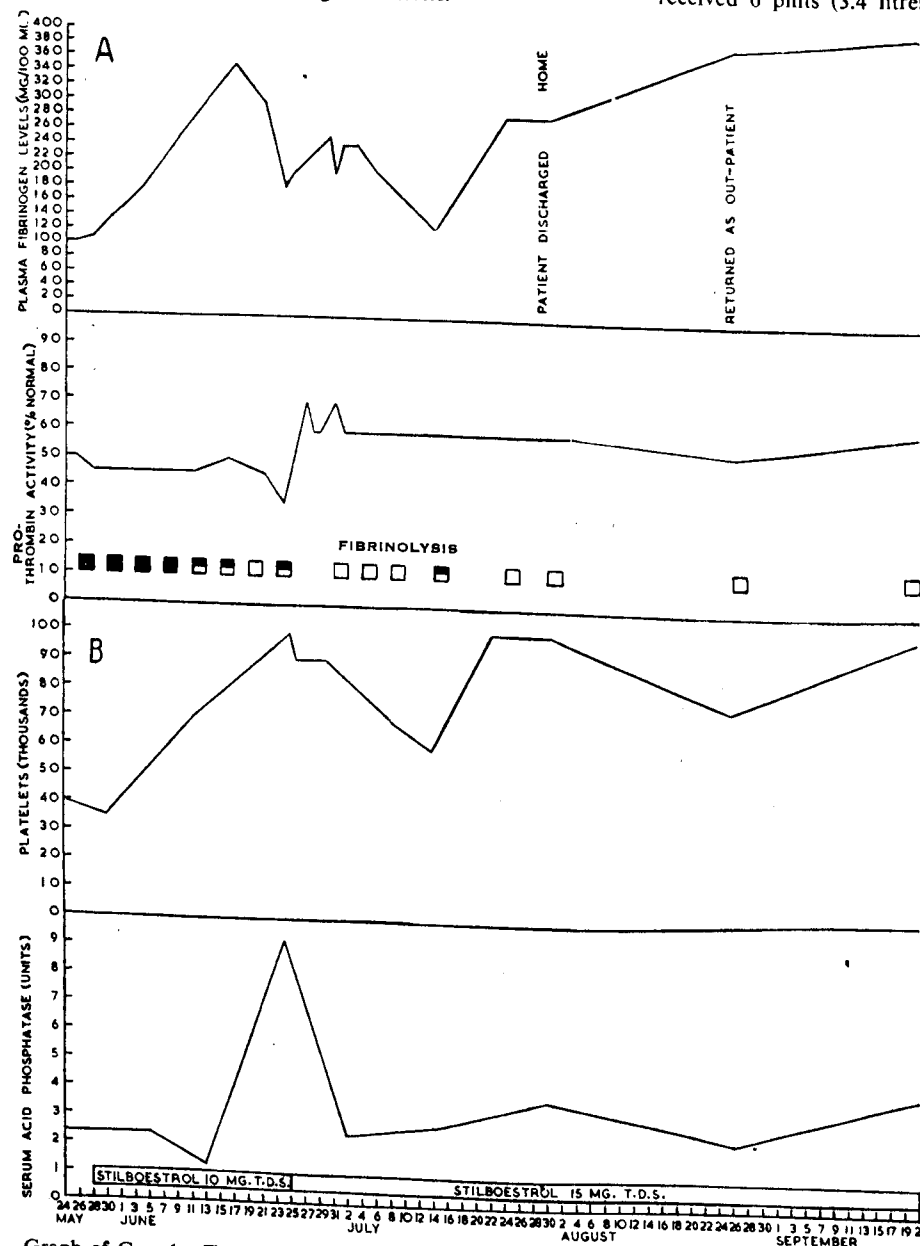
Two-stage prothrombin time (Biggs and Douglas, 1953): true prothrombin was 70% of normal control. Sternal marrow examination: mainly normoblastic but late megakaryoblasts were seen; no neoplastic cells seen. Fractional test meal with histamine showed the presence of free acid. A

biopsy of the prostate gland showed the histological appearance of an adenocarcinoma. Repeat sternal marrow examination showed no megaloblasts but several groups of neoplastic cells.

Course and Treatment.—The initial response to vitamin B₁₂ was satisfactory, the reticulocytes rising from 3% to 13%, and the haemoglobin from 5.1 g. (35%) to 9.1 g. (61%). Megaloblasts were not seen in the peripheral blood again.

Stilboestrol, 10 mg. t.d.s., was started on May 28, and the dose was increased to 15 mg. t.d.s. on June 25. The marked improvement of fibrinogen levels and the disappearance of fibrinolysis on therapy can be seen from the Graph. There are also some improvement in prothrombin time and a rise in platelets.

The patient was discharged from hospital on August 1 on stilboestrol, 15 mg. t.d.s. His haemoglobin had risen to 12.9 g. (87%) and the clot retraction was found to be within normal limits, a firm clot being formed which did not lyse. He attends the out-patient department and has remained well, free from symptoms; there has been no recurrence of the haemorrhagic diathesis.



Graph of Case 1. ■ = Complete lysis of the suspended standard fibrin clot in four hours. □ = Complete lysis of the suspended standard fibrin clot in 12 hours. □ = No fibrinolysis up to 24-48 hours.

Case 2

A man aged 66 presented with low back pain, anorexia, loss of weight, pallor, and multiple spontaneous ecchymoses and purpura. During his stay in hospital he had a melaena.

Investigations.—Haemoglobin, 10.5 g./100 ml. (71% Haldane). White blood count, 10,500/c.mm., with 10% immature granulocytes in the differential count. In addition the blood film showed 15 nucleated red cells per 100 leucocytes. Platelet count (Lempert)—the highest figure recorded was 22,000/c.mm. Plasma recalcification time, 2½ minutes. Prothrombin time (Quick's one-stage), 18 seconds (control 12.5 seconds). Total serum acid phosphatase, 6 K.-A. units. Fibrinolysis was absent. Unfortunately, fibrinogen estimations were not carried out. Radiographs of the thoracolumbar spine showed areas in the bodies of the eleventh thoracic and second lumbar vertebrae compatible with secondary deposits.

Course.—The patient rapidly deteriorated and his haemoglobin fell to 5.7 g./100 ml. (38% Haldane). Altogether he received 6 pints (3.4 litres) of whole blood, but terminally he developed signs of a cerebral haemorrhage and died in coma nine days after admission.

Post-mortem Findings.—Carcinoma of the prostate was found with metastases in the iliac and para-aortic lymph nodes, lumbar vertebrae, and sternum. The brain showed multiple recent haemorrhages, the largest being in the right occipital lobe. Histological examination of the bone marrow showed many groups of undifferentiated neoplastic cells. Megakaryocytes were very scanty.

Discussion

Fibrinolysis was present in Case 1 but absent in Case 2. In both cases the platelets were considerably reduced, more so in Case 2. In Case 1 the platelet count has somewhat improved on therapy (see Graph).

Tagnon, Whitmore, Schulman, and Kravitz (1953) have shown in cases of metastatic carcinoma of the prostate with fibrinolysis that the platelets may be normal or reduced. If the platelets are within normal limits the cause of the bleeding is due to the fibrinolysis, with or without hypofibrinogenaemia, and this alters the blood coagulation factors in such a way that the prothrombin time becomes prolonged. There is some difficulty when the platelets are reduced. The bleeding tendency due to a "leuco-erythroblastic" or myelophthisic type of anaemia with severe thrombocytopenia is illustrated by Case 2. In Case 1 the haemorrhagic manifestations were almost certainly due to the fibrinolytic mechanism. In this particular case the thrombocytopenia was probably due to the associated

"leuco-erythroblastic" anaemia. However, Tagnon, Whitmore, Schulman, and Kravitz (1953) and Swan *et al.* (1957) have reported cases of metastatic carcinoma of the prostate with fibrinolysis and thrombocytopenia, where the explanation of the latter is not clear. The clinical presentation of these two cases was very similar, and if operative procedures are contemplated this differentiation is important.

In Case 1 oestrogen therapy alone quickly abolished the patient's symptoms and the haemorrhagic diathesis, during which time a transurethral biopsy prostatectomy was performed with minimal bleeding. The resulting disappearance of fibrinolysis, improvement of the fibrinogen levels, and to a less extent the prothrombin activity can be seen from the Graph. There was no need to give corticotrophin or human fibrinogen in this case. Corticotrophin has been claimed to diminish the lysis, and the response was more rapid than with oestrogens (Stefanini *et al.*, 1953), but, if used, it should be given in conjunction with oestrogens. Tagnon, Schulman, Whitmore, and Leone (1953), however, showed that the addition of testosterone to a maintenance dose of oestrogens caused an increase in the patient's symptoms and serum acid phosphatase level, as well as the reappearance of fibrinolysis. Orchidectomy does not seem to be justifiable in Case 1 at the present time. However, if fibrinolysis and hypofibrinogenaemia should return, then bilateral orchidectomy, with probably the addition of human fibrinogen, may be required. Swan *et al.* (1957) have recommended fractionated fibrinogen or triple-strength reconstituted dried plasma as the only type of emergency therapy. This has not been necessary in Case 1.

Tagnon, Whitmore, *et al.* (1952), and Tagnon, Whitmore, Schulman, and Kravitz (1953) found no constant correlation between the occurrence of fibrinolysis and the level of acid phosphatase in the serum. There appears to be no satisfactory explanation for this. They also state that the test for the level of acid phosphatase in the serum cannot be replaced by that of fibrinolysis, since the latter occurs in only approximately 12% of patients with metastatic carcinoma of the prostate. In Case 1 the correlation between the serum acid phosphatase levels and the occurrence of fibrinolysis is variable (see Graph). This lack of correlation has still to be fully explained.

Summary

A case of metastatic carcinoma of the prostate with a haemorrhagic diathesis secondary to a circulating fibrinolysin (Case 1) is reported, and is contrasted with Case 2, with thrombocytopenia and bleeding secondary to bone-marrow involvement.

Therapy with stilboestrol alone caused the fibrinolysis to disappear in Case 1, with subsequent improvement of the fibrinogen level and prothrombin time. A transurethral biopsy prostatectomy was carried out during oestrogen control.

No correlation was found in Case 1 between the occurrence of fibrinolysis and the level of acid phosphatase in the serum.

We thank Mr. H. T. Cox for permission to publish Case 1, and Mr. William Lawson, F.I.M.L.T., for his help and technical assistance.

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ACUTE RADIATION NEPHRITIS IN CHILDHOOD

BY

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The following case of acute radiation nephritis associated with a uraemic haemolytic anaemia is reported because of the interest aroused by the annotation in the *British Medical Journal* of May 3, 1958 (p. 1053), on the effect of x-irradiation on the kidney.

Case Report

The patient, a pale normally developed girl of 2½ years, was first seen in January, 1957, when a large firm mass was found filling the whole of the left side of the abdomen. This was removed surgically and found to be a Wilms's tumour. She made an uneventful post-operative recovery, and a four-weeks course of radiotherapy (3,250 r) was given



FIG. 1.—Blood film showing "burr" cells, anisocytosis, and polychromasia. (×500.)

to the left renal area. She remained well until October, when a metastasis was discovered in the right perirenal fat. This could be treated only by a second course of radiotherapy (3,000 r) to the right renal area over a period of three weeks, after which the abdominal mass could no longer be palpated. On January 17, 1958, it was noted that the child, although still pale, was gaining weight, but when seen on February 7 she showed marked pallor, ankle and face oedema, full and bounding pulse, and enlargement of the heart in the transverse diameter. The B.P. was 130/85 mm. Hg. The urine showed albumin ++, R.B.C. ++, pus cells +, and a moderate number of granular and hyaline casts. The blood urea was 140 mg./100 ml. and the haemoglobin 6.2 g./100 ml. Blood films showed marked anisocytosis, polychromasia, and poikilocytosis with numerous "burr" cells of the type usually associated with the haemolytic anaemia of uraemia in childhood (Fig. 1). The white-cell count was 19,000, with a normal differential.

The child's condition deteriorated rapidly, and the blood pressure fluctuated between 135/80 and 170/110 mm. Hg. The blood urea rose progressively to 320 mg./100 ml., and she died on February 13, six days after the onset of the symptoms of acute nephritis.

Post-mortem Findings

The body was that of a pale, ill-nourished female child showing severe anasarca and extensive purpura. The heart (160 g.) showed marked left ventricular hypertrophy and

electrophoresis of serum in the younger brother was carried out, and the result showed him to be lacking completely in gamma-globulin. It would seem reasonable, therefore, to presume that Case 1 likewise lacked gamma-globulin, and was probably an example of congenital agammaglobulinaemia. The other cases here reported were probably examples of "physiological transient hypogammaglobulinaemia of infancy" (Janeway and Gitlin, 1957). These workers quote Orlandini's figures for normal gamma-globulin levels in the first two years of life and suggest that the initial fall and subsequent rise to normal represents a physiological state rather than a disease.

Janeway and Gitlin also comment on the possible relationship between agammaglobulinaemia and progressive vaccinia. They think it possible that there are gradations of agammaglobulinaemia and that infants with complete agammaglobulinaemia, or even transient hypogammaglobulinaemia, who are vaccinated in early infancy may be overwhelmed because other mechanisms of resistance are less well developed. In their paper they quote L. Pillemer as stating that normal levels of serum complement and properdin are found in congenital agammaglobulinaemia.

The mothers of three of the infants (including the one who died) had been vaccinated in infancy or early childhood, and so presumably had very little antibody to pass on to their infants. Janeway and Gitlin (1957) stated that it is not so much the quantity of gamma-globulin that the infant receives from its mother as the quality—that is, its content of specific antibodies.

All our patients were male, and it is interesting to note that all cases of agammaglobulinaemia have been male except for Keidan's case.

The method of vaccination in three of the infants was by a 1-in. (6-mm.) linear scratch, and the other by two 1-in. (6-mm.) scratches at right angles to each other. Two had been vaccinated at a clinic and two by their family doctor. The lymph for three was from the same supplier but of different batch numbers, while the fourth was done by lymph from a different supplier. Several other infants had been vaccinated by these methods, the same batches of lymph being used without ill effects.

Summary and Conclusions

Four cases of generalized vaccinia are reported, with one death. The role of agammaglobulinaemia and antibody formation is discussed. The treatment with hyperimmune vaccinia gamma-globulin is described.

It is felt that generalized vaccinia occurs in some infants because of a failure of their resistance mechanism. Whether or not the failure to form gamma-globulin and/or antibodies is the essential defect, it would appear necessary that infants developing any of the serious cutaneous complications of smallpox vaccination should be treated as soon as possible with hyperimmune vaccinia gamma-globulin and a wide-spectrum antibiotic.

We thank Professor John Craig for his advice in compiling this paper, Dr. T. E. Anderson and Dr. Alan Lyell for permission to publish Cases 3 and 4, and Dr. H. Thom for carrying out the electrophoretic studies.

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Medical Memoranda

Case of Progressive Vaccinia

A case of progressive vaccinia which responded well to hyperimmune vaccinia gamma-globulin is described below.

CASE REPORT

A West African infant aged 10 months was admitted to the South Western Hospital on March 25 with a generalized vaccinia eruption. He was first seen by his doctor on the previous day, when the lesions were reported to be pustular. The infant had been in hospital on two occasions with dietetic troubles, and on the second occasion was treated for ichthyosis. Primary vaccination was performed at a clinic on March 15. His mother stated that the rash appeared all over the body on March 22 and she noticed a swelling "under the left arm."

On admission his temperature was 102.8° F. (39.3° C.), pulse 150, and respirations 50. Apart from the skin, physical examination revealed nothing abnormal. The lungs were clear.

There was a raw granulating area 1 by 1 in. (2.5 by 1.25 cm.) over the left deltoid, presumably the site of vaccination. Extending both upwards and downwards from this point on the outer surface was a profuse crop of umbilicated vesicles, circular in shape and quite superficial. Small crops of lesions were scattered over the rest of the body, including the face and scalp, in situations which the child could reach, and very possibly due to auto-inoculation. There were only two or three vesicles on the back. The colour of the lesions was difficult to gauge owing to the deep pigmentation. The axillary glands were enlarged, especially on the left side. Fresh lesions appeared daily up to March 28, especially on the face; the conjunctivae and oropharynx remained clear; and the granulating area round the site of vaccination extended to the shoulder and elbow on the external surface. The temperature remained raised, varying between 101 and 103° F. (38.3 and 39.4° C.), the appetite was poor and the infant obviously toxic.

On March 29 blood was withdrawn for antibody estimation and 1 g. of hyperimmune vaccinia gamma-globulin was given intramuscularly. This dose was repeated 24 hours later. The effect was dramatic: no fresh lesions appeared; scabs formed and separated quickly, leaving shallow foveate scars. 27 hours after the first injection the temperature fell to 98.8° F. (37.1° C.), and thereafter fluctuated between 98 and 99° F. (36.7 and 37.2° C.) until April 1, when it remained normal until discharge. The child's general condition improved rapidly and the appetite returned. By April 10 all scabs were separated and the granulating area was soundly healed. There was still some irritation, and gloves were necessary.

From admission until March 20 he was given 250,000 units of penicillin, six-hourly, without effect. This was supplemented on March 27 with sulphonamides with similar lack of response.

Dr. F. O. MacCallum, of the Virus Reference Laboratory, reported that the serum contained 640 mg. of gamma-globulin per 100 ml., which he stated was a normal level. A heavy growth of vaccinia virus was obtained from the scabs. The child was discharged on April 10.

COMMENT

The normal level of gamma-globulin, in spite of the fact that lesions were continuing to appear and the general condition of the child to deteriorate, followed by rapid response to hyperimmune gamma-globulin, suggests that this is an instance of dysgammaglobulinaemia as described

AUG. 23, 1958

by Kempe *et al.* (1956) and Lewis and Johnson (1957), the deficiency being one of quality rather than quantity.

I thank Dr. J. Pickford Marsden for his advice in the case, and Dr. F. O. MacCallum for carrying out the virus investigations.

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Susceptibility to Methylpentynol and Methylpentynol Carbamate

Methylpentynol carbamate ("oblivon carbamate") has been used as an alternative to methylpentynol. Non-specific adverse effects have been recorded after a few daily specific adverse effects have been recorded after a few daily oral doses of 1-2 g. of methylpentynol (May and Ebaugh, 1953; Marley and Chambers, 1956) and after larger (1-3 g.) and more protracted dosage (one to seven weeks) with methylpentynol carbamate (Bartholomew *et al.*, 1958). These last workers stressed that toxic abnormalities were unlikely if the daily oral dose of the carbamate did not exceed 1 g. It seemed important to ascertain whether this stricture held good for a population known to be especially sensitive to methylpentynol.

METHODS

Methylpentynol carbamate was administered to 10 subjects who had previously developed toxic phenomena while receiving a five-day therapeutic trial of 0.5 g. q.d.s. of methylpentynol, a baseline of individual reaction having been obtained by the immediate prior administration of inert capsules for five days. Similarly with the carbamate, inert tablets were prescribed for five days and were immediately succeeded by 0.2 g. q.d.s. of the active substance for the same period. A lapse of at least a month occurred between the two drug trials, and the patient received no other medication during either the placebo or the drug phase.

Their consent having been obtained, the subjects were informed that they would receive a drug from which they might or might not derive benefit. Each was interviewed daily, and if marked toxic features appeared the drug was withdrawn.

Toxic developments were graded into three categories. A maximal toxic reaction presented with pupillary abnormalities, nystagmus, diplopia, ptosis, dysarthria, and tremor of the outstretched tongue. A cerebellar type of ataxia of the outstretched tongue. A cerebellar type of ataxia of the limbs or admixtures of this with a posterior-column type of ataxia and a positive Romberg sign. A minimal toxic reaction was epitomized by little more than nystagmus on conjugate lateral gaze and perhaps slight unsteadiness of gait or drowsiness. No reaction to the drug implied the absence of physical signs, although there might be a concomitant change of mood such as mild elation. The data obtained were analysed by means of an arc-sine transformation, a useful test of significance for small populations (Davies, 1954).

The series included five males and five females with an age range from 19 to 45 years, and minimal and maximal weights of 8 st. 6 lb. and 11 st. 13 lb. (53.52 and 75.75 kg.).

RESULTS

The distribution of patients allotted to the three clinical gradings for both drugs is depicted in the Table. This shows that there is a much smaller occurrence of toxic effects with methylpentynol carbamate than with methylpentynol. On analysis with the arc-sine transformation, the proportion of patients developing adverse features with methylpentynol (10/10) is found to be significantly greater

Distribution for Clinical Response to Methylpentynol and Methylpentynol Carbamate

Drug	Clinical Grading*		
	1	2	3
Methylpentynol	0	3	7
Methylpentynol carbamate	6	3	1

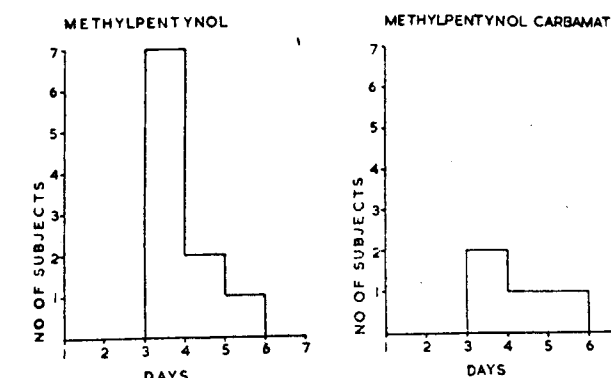
* Clinical grading: 3 = maximal toxic response; 2 = minimal toxic response; 1 = no toxic response.

than the proportion manifesting susceptibility to methylpentynol carbamate (4/10), the critical ratio being 3.96 ($P < 0.001$).

The time at which toxic phenomena with the two substances was first exhibited, and the number of subjects, are shown in the Chart; from this it can be seen that the maximum incidence was at the third day, although no instance occurred prior to this.

The details relating to the only subject showing a maximal toxic response to methylpentynol carbamate are as follows:

The patient was an unmarried woman weighing 9 st. 4 lb. (46.72 kg.) and aged 45. After five days of methylpentynol carbamate (0.2 g. q.d.s.), she had suffusion of the conjunctivae, sustained rhythmic nystagmus on conjugate lateral



Time and incidence of first appearance of toxic signs with methylpentynol and methylpentynol carbamate.

gaze, bilateral ptosis, sluggish reaction of the pupils to light, loss of tone in the facial musculature, dysarthria, and tremor of the outstretched tongue. There were cerebellar defects, including dysidiadokokinesis and ataxia on the finger-nose test in the upper limbs, with ataxia on the heel-shin test in the lower limbs. Her gait was ataxic, associated with a positive Romberg sign and overall reduction of the tendon reflexes. Her mental state was one of mild depression with impairment of attention and concentration, although orientation was correct. Within three days of stopping the drug the clinical abnormalities disappeared.

COMMENT

It is shown that, for the five-day period under scrutiny, methylpentynol carbamate is much superior to methylpentynol in its freedom from incidental toxicity. However, in a population known to be especially sensitive to methylpentynol, the use of the carbamate as an alternative in doses of 1 g. a day, or greater, is likely to be followed by the early manifestation of toxic signs.

I thank Dr. Dennis Leigh for permission to publish these findings, and British Schering Ltd. for a generous supply of methylpentynol and its carbamate.

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Reviews

RECENT ADVANCES IN UROLOGY

Recent Advances in Urology. By Howard G. Hanley, M.D., F.R.C.S., with the assistance of specialist contributors. (Pp. 270+viii; illustrated. 30s.) London: J. and A. Churchill Ltd. 1957.

The value of the Recent Advances Series lies in the fact that each volume records the most important works which have been published in the past few years in one particular specialty and indicates which of the theories and techniques are most widely accepted. The opening chapter of this one deals with how the modern conception of renal function, body-fluid disturbances, and blood electrolytes may be correlated with the causation and treatment of renal failure. The value of the numerous new methods of x-ray diagnosis of urological diseases is discussed and the techniques are described. The large number of modifications in operations on the renal pelvis which have been devised to relieve hydronephrosis indicates the modern tendency to conserve renal tissue whenever possible, which has culminated in the popularity of partial nephrectomy. The ever-controversial topic of the treatment of prostatic obstruction in acute and chronic retention is reviewed in the light of new methods of bladder drainage and prostatectomy. This is followed by a chapter which deals very fully with the position of perurethral resection of the prostate. The advances made in the diagnosis and treatment of carcinoma of the prostate are discussed and the surgical control of androgen production in support of oestrogen therapy is fully described. The classification of bladder tumours and the results which may be expected from the recently introduced internal and external methods of irradiation are considered. One of the most interesting chapters is that on diversion of kidney urine, in which the various techniques of implanting the ureters into the bowel and the changes in the electrolytes of the body which will result are described, and an excellent account is given of the use of the intestine in the formation of an artificial bladder. The recent theories on stone formation in the urinary tract and the treatments which have been tried to prevent or limit their formation are fully reported. The chapters on the treatment of genito-urinary tuberculosis, the surgery of the adrenal gland, and subfertility are most comprehensive. The author and his contributors are to be congratulated on producing a book which will be of the greatest assistance to all those who have to treat urological cases.

J. E. SEMPLÉ.

TREATMENT OF LOW BACK PAIN

Joint Ligament Relaxation Treated by Fibro-osseous Proliferation. By George Stuart Hackett, M.D., F.A.C.S. Second edition. (Pp. 115+xv; illustrated. 36s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

It has become so fashionable to equate low back pain with disorders of the intervertebral disks that it is refreshing to be reminded of the fact that there are other structures in the back that may cause pain and disability. Dr. Hackett reminds us that the posterior ligaments of the spine and the sacro-iliac joints were considered an important source of low back troubles some 20 years ago, and he quotes a number of cases in which he claims that he has demonstrated this to be the case. The novel feature he introduces is the idea that strained ligaments can be strengthened and the spinal joints consequently stabilized by the injection of a sclerosing fluid. Although he gives some sketchy case reports, he has not attempted a controlled study of his results and he does not disclose the precise composition of the material he injects. One might say that this book is the testimonial of an enthusiast, but the author's ideas can hardly be ignored by anyone concerned with the problem of low back pain.

J. H. KELLGREN.

RAUWOLFIA

Rauwolfia: Botany, Pharmacognosy, Chemistry, and Pharmacology. By Robert E. Woodson, jun., Ph.D., Heber W. Youngken, Ph.D., Sc.D., Phm.D., Emil Schlittler, Ph.D., and Jurg A. Schneider, M.D. Foreword by Arnold J. Lehman, M.D. (Pp. 149+xii; illustrated. 40s.) Boston, Toronto: Little, Brown and Co. London: J. and A. Churchill, Ltd. 1957.

Many have the feeling that the plants used in Chinese and Indian medicine must provide a wide field of research for valuable drugs. This idea received strong support when the alkaloid reserpine was isolated from *Rauwolfia serpentina* by Mueller, Schlittler, and Bein in 1952. This discovery has opened a new chapter in medicine and in pharmacology, and the pages of this chapter increase in number and importance year by year. A lesson may be learnt from the history of this discovery, which is that for progress to begin in the study of a plant the most certain aid is the isolation of the active principle. Withering used digitalis leaves, it is true, long before an active principle was isolated, but, unless some striking and indubitable use can be demonstrated to follow the administration of the leaves, tinctures, or extracts of a plant, a serious study of it does not begin until the active principle is found. Moreover, the isolation of the active principle by the chemists of a pharmaceutical firm means that the substance can be patented and then the whole weight of the firm can be put behind clinical trials and advertisement, so that the substance can be made widely known to the medical profession. This book, written by four authors, devotes the first 50 pages to botany and pharmacognosy, while the next 50 pages are concerned with chemistry. The pharmacology, which is the part of chief interest to doctors, is given only 28 pages, and this section, as is inevitable, is not up to date.

J. H. BURN.

BIOLOGICAL ASPECTS OF CANCER

Biological Aspects of Cancer. By Julian Huxley, F.R.S. (Pp. 156. 16s.) London: George Allen and Unwin, Ltd. 1958.

Huxley has performed the strenuous feat of compressing into a compact book of 156 pages the substance of over 500 publications on the biological aspects of cancer and on biological themes which have a bearing on cancer. It is to be regretted that the results of this Herculean task are not a complete success, one of the reasons being that too much compression soon leads to the exhaustion of the reader. Sir Julian is at his best in assembling material for the construction of a kind of intellectual cross-roads where phenomena such as plasmagenesis, virus creation, and differentiation will some day meet with the problems of carcinogenesis and the nature of neoplasia. But the author does not, of course, stop at the mere collection of facts; he has to use his scientific imagination. Nevertheless, it is debatable whether very much is gained when tumours are reclassified, from a biological aspect, into those with "genetic heterogeneity, taxonomic heterogeneity, intra-specific heterogeneity, epigenetic heterogeneity, and environmental heterogeneity"; and are we really better off when the mystery of differentiation is elaborated in terms of "pluripotent dedifferentiation, hypoplastic dedifferentiation, and anabiotic dedifferentiation"? So long as the author relies upon biological papers he is speaking with authority from his own territory; when he is dealing directly with those on cancer research he is on moderately safe ground; but when he attempts to draw conclusions or to derive generalizations or to form interpretations of neoplasia the products are not always felicitous. Cancer research has not yet had the time to arrive at the stage where theories can be formulated; it is still in its pre-Darwinian or pre-phlogiston era, and in consequence tautologies are sometimes mistaken for theories. Perhaps such a situation is unavoidable in a field where so much is still awaiting discovery.

I. HIEGER.

SOMETHING LIKE

Nothing Like Science. By Magnus Pyke. Illustrated by Michael Ffolkes. (Pp. 172. 16s.) London: John Murray. 1957.

Any reader who has heard Dr. Magnus Pyke broadcast will no doubt expect to find in this book a good deal of pert iconoclasm. So he will, and none the worse for finding what he expects. Taken in the broad, the book is informative as well as entertaining, whether the author is verging on psychology and metaphysics, as in the chapters called "The Comic Element" and "Life Automatic," or discussing more strictly practical issues, as in those on "Industrial Nutrition" and "Chemicals for Adam's Garden." Dr. Pyke is a bit of a glutton for facts, and he generally manages to regurgitate them—if I may be forgiven a somewhat physiological metaphor—in a form digestible by the young, and it is for the young in mind or in information that his book would seem to have been primarily written. Still, there's plenty in it to give to the maturer medical and other scientists something to think about, and this is as true of the book's manner as of its matter.

It is over the former, though, that I would suggest to the author some reconsideration of his attitude. In my view he does not take his debunking seriously enough. Indeed, he fails entirely to discriminate—verbally, at any rate—between solemnity, which is what he is really attacking in the open chapters and elsewhere, and seriousness, of which he himself has a more than ordinarily commendable share. This is no mere semantic distinction; it has truly been said that the British are probably the only people in the world who know, and act on their knowledge, that it is not necessary to be solemn when one is serious. And it is about the seriousness of presenting his readers always and all the time with a true picture of facts and opinions that Dr. Pyke is sometimes surprisingly cavalier. Thus to write of a virus's "organs of locomotion" (even in a jocular way); to say without at least two essential qualifications that penicillin "is employed in massive quantities as an addition to pig food or poultry food"; to call the sugar moiety of DNA "ribose"; to deprive Professor Wigglesworth of the chair he has for years so distinguishedly held at Cambridge: these are good examples of a bad habit of mind. Perhaps worse is the calm transference to human subjects of McCay's findings on laboratory albino rats; it's just not good enough to let the uninformed reader be deceived by such a statement as "the accelerating effect of the present 'high plane of nutrition' which we adopt so enthusiastically for children to-day and by which we shorten their life span" (my italics). Surely this is an occasion when a quarter, about, of the loaf of truth is unquestionably worse than no bread.

Dr. Pyke writes often with perspicacity on the part science plays, or could play, in the affairs of to-day, both material and mental or, if you like, spiritual, his attitude being on the whole humanist and rationalist, though he seems to me occasionally to cast sheep's eyes at a rather more transcendentalist standpoint. He can also write wittily. But he must beware lest his perspicacity is drowned by his wish to play the role of scientific *enfant terrible* and his wit by a markedly "upper fifth form A" sense of humour. If he does tend to try riding more than one hobby-horse at a time, moreover, the effect when they gallop off in different directions may add to the philosophically minded reader's amusement already aroused by Dr. Pyke's deliberate intent. amusements already aroused by Dr. Pyke's deliberate intent.

Because, therefore, this book can furnish us a few hours' light but instructive reading we must be prepared to overlook, look, and even to forgive, occasional lapses in grammar, style, and euphony. How anyone, though, can leave unaltered phrases such as "the instrument and nature of the scientific worker sees the structure and nature of the material with which he is dealing" and "the one illuminating fact that will spark off that flash of intuition that is the essential feature of the act of discovery" (italics again mine) just beats me. Again, Dr. Pyke must surely know that "to sleep sounder" (instead of "more soundly")

"fissionable" (instead of "fissile"), "due to" (instead of "owing to," on p. 96, l. 2), "anticipated" (instead of "foreseen" or "expected," on p. 63, para 3, l. 2) are all solecisms unbefitting a professional writer. They suggest to the percipient reader either that the author is unable to "polish up his English" or—even more regrettable—that he thinks that grammar and syntax and some stylistic graces just don't matter. Let me assure Dr. Pyke that there is no inconsistency whatever in both holding his belief about there being "Nothing like Science" and in avoiding words and constructions that are nothing like English.

A. L. BACHARACH.

GYNAECOLOGY FOR THE AMERICAN G.P.

Practical Gynecology. By Walter J. Reich, M.D., F.A.C.S., F.I.C.S., and Mitchell J. Nechtow, M.D., F.A.C.S., F.I.C.S. Second edition. (Pp. 648+xviii; illustrated. £5.) Philadelphia and Montreal: J. B. Lippincott Company. London: Pitman Medical Publishing Co., Ltd. 1957.

"This is a book designed principally for use by the general practitioner in the office practice of gynaecology." After reading the well-illustrated pages the family doctor in Britain will presume that his transatlantic colleague undertakes, and has facilities for undertaking, a much greater proportion of his own gynaecological investigations and treatments than is usual here. Nevertheless he will appreciate the excellent perspective in which the authors view the specialty in relation to the whole woman. In particular, he will glean much of value from the shrewd chapter on the "psychosomatics of gynecology" and from the sections on paediatric and geriatric aspects. There is a useful chapter on premarital counselling as in most such textbooks from the U.S.A., where, incidentally, the breasts are regarded as gynaecological appendages as well as surgical spheres. A powerful plea is made for the use of cytology smears by the general practitioner as a cancer screening test. Above all, this book provides a rich source of quotable epigrams, such as "Menstruation is a badge of femininity which may be worn in misery, pain or pride, depending on the personality of the woman"; "The brain is the centre for reception of sexual teaching, not the pelvic organs"; "The anesthetist is more important than the anesthetic agent." However, the pattern of medical practice in Great Britain is such that this book, for all its merits, is likely to be regarded here as somewhat too specialized for the general practitioner and too summary for the specialist.

S. BENDER.

GASTROENTEROLOGY FOR THE PRACTITIONER

Office Gastroenterology. By Albert F. R. Andresen, M.D. (Pp. 707+xxxiv; illustrated. 98s.) Philadelphia and London: W. B. Saunders Company. 1958.

Dr. Andresen is a senior, well-known and well-liked gastroenterologist in the United States. He has had a lifelong special interest in food allergy and in the elimination of septic foci, and his less conventional ideas have been maintained without losing the friendship and affection of his wide circle of medical colleagues in America, which is a tribute to his tolerance, modesty, and good humour. His book covers the entire field of gastroenterology, and its title of *Office Gastroenterology* has no special significance. Naturally, food allergy has a greater prominence than many would accord it, but the subject is dealt with intelligently and not aggressively. The book is written more from experience than from the literature—a not undesirable method; but it does mean that some sections are written without the perspective of recent work, and makes it less useful to the postgraduate student. It is in fact a book essentially for the practitioner, but it will be more value to American than to British doctors.

F. AVERY JONES.

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EMOTION, EXERCISE, AND THE
ADRENAL CORTEX

Few concepts have had more impact on medical philosophy than Selye's theory of stress as a factor in the causation of disease.¹ Though most of the theory remains unsubstantiated and may even have to be abandoned in so far as it postulates an imbalance of adrenocortical secretions as a cause of "stress" diseases in man, it has at least served to draw wider attention to the mysterious role of the adrenal cortex in facilitating resistance to acute stress. Among the many so-called stressor agents are extreme cold, physical trauma, anaesthesia, anoxia, hypoglycaemia, and infections. Most of these stimuli cause a marked increase in secretion of cortisol (hydrocortisone), and patients with adrenal insufficiency may readily succumb to them by going into circulatory failure or coma unless protected by one of the glucocorticoid steroids. Until recently less has been known of the effects on adrenal function of physiological stimuli such as emotional stresses and severe physical exertion. Such knowledge may be important in relation not only to individual performance but also, if Selye is correct, to the whole concept of stress and disease.

In attempting to define the adrenocortical response to physiological assaults, difficulties have arisen such as variations in the quality of stimulus and in individual susceptibility, the problem of separating the emotional from the physical content of muscular exercise, and, especially if the response is small, the

technical difficulty of assessing changes in the rate of adrenal secretion. The eosinophil count, used in earlier studies,² is no longer reckoned to be a specific index of adrenocortical function.^{3,4} Changes in cortisol levels in the blood must be interpreted in relation to diurnal variations as well as possible changes in hepatic, metabolic, and renal function, which, by altering the rates of reduction, conjugation, and excretion of adrenal steroids, may influence the levels in the blood independently of secretion rate. Under physiological conditions the urinary output of 17-hydroxycorticoids,⁵ or preferably 17-ketogenic steroids,⁶ as measured over a 24-hour period, is now accepted as a fairly reliable index of cortisol secretion and has been applied with some success to the study of these problems.

It has been found that the emotional stresses associated with armed combat,⁷ boat racing,⁸ disturbing interviews,⁹ the anticipation of surgical operations,¹⁰ and final examinations¹¹ are accompanied by a variable rise in 17-hydroxycorticoid output, though there may be a simultaneous fall in excretion of 17-ketosteroids.¹¹ These results agree with R. I. S. Bayliss's findings of a rise in the blood level of corticoid in subjects about to present a paper before an exacting audience.¹² Except in some of the battle cases the adrenal responses obtained from emotional upset would seem to be small compared with those evoked by pathological stresses such as surgery and ether anaesthesia.¹³

Since D. J. Ingle and his colleagues¹⁴ showed that massive doses of cortisone substantially increased the work performance of rat muscle it has been of interest to know whether intense physical exertion in man would elicit an adrenocortical response. The studies of G. W. Thorn and his group⁸ on the adrenal functions of a university boat-race crew, discussed previously in these columns,¹⁵ led to recognition of the importance of the emotional factor in competitive exercise. On race days the cox and the coach both had the same increase in adrenal activity as the oarsmen, and the latter showed no response during days of non-timed practice runs.

In a recent British study from the Army Operational Research Group,¹¹ A. M. Connell, J. Cooper, and J. W. Redfearn have measured the adrenocortical response to severe muscular exercise, divorced so far as possible from emotional content. The exertions of a heavy physical training course and of a 15-mile route march caused no increase in excretion of 17-ketogenic steroids. There was, however, a small and statistically insignificant increase after two hours on a treadmill, which, as the authors sympathetically suggest, may have reflected an emotional response to

"the boredom and frustration so well known to all who have been submitted to such prolonged exercise on a treadmill."

How is one to interpret these results? The first possibility is that peripheral utilization of cortisol may be enhanced during severe muscular exercise, so that urinary excretion of the steroid and its metabolites might not reflect an increased rate of secretion. In support of this view it has been claimed that administered cortisone disappears more rapidly from the plasma, and the urinary excretion of administered cortisol diminishes, in patients with Addison's disease who take exercise.^{8,16} On the other hand, F. Ulrich and C. N. H. Long¹⁷ could find no difference as a result of exercise in the disappearance rate of radioactivity from the plasma of rats given cortisol and corticosterone labelled with carbon-14. These authors concluded that there was "little, if any, positive evidence to substantiate the concept of increased peripheral utilization of adrenocortical hormones during stress."

To summarize the present position, it seems clear that severe emotional tension can be a potent activator of cortisol secretion. If this response is devalued as a preparation for physical activity, as it could well be in a primitive environment, it would be compatible with Ingle's findings¹⁴ that cortisone enhances muscular performance. This would not imply that so natural an activity as physical exertion needs to elicit or requires an adrenocortical response, and the balance of evidence might suggest that it does not. It should now be possible with newer radioisotope techniques¹⁸ to estimate more precisely the rate of secretion of cortisol during exercise. Until more is known about the metabolic fate of adrenal hormones in peripheral tissues, the issue of whether or not their utilization is increased during stress is likely to remain undecided.

POLIOMYELITIS VACCINATION IN ONTARIO

The Minister of Health recently announced¹ plans for extending the offer of poliomyelitis vaccine to those between the ages of 15 and 25 years, and for giving a third dose to those who had already received two. The extension of eligibility for vaccination to larger groups of the population has been carried out in stages, as supplies of the vaccine increased. A similar policy has been carried out in other countries, and an informative report² from Ontario has now been published describing three years' experience with the vaccine. The first phase in Ontario began in April, 1955, with the publication of the report³ of the

successful American trial of the previous year, when it was decided to offer vaccination to schoolchildren in Ontario between the ages of 5 and 7 years. The vaccine was prepared in the Connaught Laboratories in Toronto, where notable contributions to poliomyelitis immunization have been made, including the supply of virus culture fluid for the vaccine used in the original American trial and the production of large amounts of vaccine for use in Britain. The time available before the annual epidemic season in 1955 allowed only two doses to be given, and they were administered subcutaneously with an interval of one month. Before the next poliomyelitis epidemic in 1956 it was possible to extend the offer to all elementary schoolchildren and to give a third dose to those vaccinated in the previous year. During the next year, and before the 1957 season, children under the age of 5 years were included, and also children at secondary schools. By June, 1957, it was estimated that only one-seventh of the children under the age of 18 years remained unvaccinated.

In view of the high proportion of children accepting the offer of vaccination (over 90% of elementary schoolchildren), assessment of the protective effect of the vaccine had at first to be made by comparison of the incidence of poliomyelitis in vaccinated children with that in unvaccinated children who were largely in age groups not then eligible for vaccination. The finding in 1955 of 3 cases of paralytic poliomyelitis in 309,585 inoculated children—aged 5, 6, and 7 years—and 4 cases in 362,664 uninoculated children attending elementary schools but mostly in older age groups, was inconclusive. In passing, it may be mentioned that British workers at a similar stage were more fortunate in having sufficient time to prepare a controlled trial in which the vaccine was given to a random sample of children of a wider age spread, and they were thus able to demonstrate the protective action of the vaccine.⁴ During the 1956 epidemic in Ontario more convincing figures were available than in the previous year, 5 cases of paralytic poliomyelitis occurring in 840,000 vaccinated elementary schoolchildren, compared with 71 cases in 960,000 unvaccinated children largely of pre-school and secondary school ages. By the 1957 epidemic vaccination had been offered to all children under 18 years, 1,800,000 being vaccinated and only 300,000 remaining unvaccinated. In that year there were 17 cases of paralytic poliomyelitis in the vaccinated group and 21 in the unvaccinated, the rate in those who had received the

¹ Selye, H., *J. clin. Endocr.*, 1946, 8, 117.

² Renold, A. E., Quigley, T. B., Kennard, H. E., and Thorn, G. W., *New Engl. J. Med.*, 1951, 244, 754.

³ Thorn, G. W., Jenkins, D., and Laidlaw, J. C., *Recent Progr. Hormone Res.*, 1953, 8, 171.

⁴ Hunter, J. D., Bayliss, R. I. S., and Steinbeck, A. W., *Lancet*, 1955, 1, 884.

⁵ Reddy, W. J., *Metabolism*, 1954, 3, 489.

⁶ Norymberski, J. K., Stubbs, R. D., and West, H. F., *Lancet*, 1953, 1, 1276.

⁷ Howard, J. M., et al., *Ann. Surg.*, 1955, 141, 314.

⁸ Hill, S. R., et al., *A.M.A. Arch. Intern. Med.*, 1956, 97, 269.

⁹ Hetzel, B. S., Schottstaedt, W. W., Grace, W. J., and Wolff, H. G., *J. clin. Endocr.*, 1955, 15, 1057.

¹⁰ Franksson, C., and Gemzell, C. A., *ibid.*, 1955, 15, 1069.

¹¹ Connell, A. M., Cooper, J., and Redfearn, J. W., *Acta Endocr. (Kbh.)*, 1958, 27, 179.

¹² Bayliss, R. I. S., *Brit. med. J.*, 1955, 1, 495.

¹³ Moore, F. D., *Recent Progr. Hormone Res.*, 1957, 13, 511.

¹⁴ Ingle, D. J., Morley, E. H., and Nezamis, J. E., *Endocrinology*, 1952, 51, 487.

¹⁵ *Brit. med. J.*, 1956, 2, 592.

¹⁶ Kägi, H. R., *Helv. med. Acta*, 1955, 22, 258.

¹⁷ Ulrich, F., and Long, C. N. H., *Endocrinology*, 1956, 59, 170.

¹⁸ Peterson, R. E., and Wyngaarden, J. B., *J. clin. Invest.*, 1955, 34, 957.

¹ *Brit. med. J.*, 1958, 2, 257.

² Brown, W. G., et al., *Canad. med. Ass. J.*, 1958, 79, 155.

³ *Evaluation of 1954 Field Trial of Poliomyelitis Vaccine*, Vaccine Evaluation Centre, Ann Arbor, Michigan, 1955.

⁴ Report to the Medical Research Council by the Poliomyelitis Vaccines Committee, *Brit. med. J.*, 1957, 1, 1271.

vaccine thus being several times lower than in those who had not been vaccinated.

The diagnostic criteria used in the Ontario studies are worthy of note. All cases of paralytic or non-paralytic poliomyelitis and all cases considered to be suspects in either category were classified into one of five diagnostic groups. This classification was based on clinical signs and symptoms, including examination of the cerebrospinal fluid and virological examination of a specimen of faeces taken during the acute stage of the illness. The first diagnostic group was paralytic poliomyelitis, which was a clinical classification not dependent upon virological confirmation. To the second category, non-paralytic poliomyelitis, were assigned cases with invasion of the central nervous system and signs of meningeal irritation but no paralysis, and with demonstrable poliomyelitis virus in the faeces. The third group, non-poliomyelitic illness, included such conditions as mumps encephalitis, tuberculous meningitis, brain-stem tumour, and neuromuscular dystrophy. Numerically the largest group was that of aseptic meningitis, which was divided into two sub-groups—those with positive virus findings (most commonly of the ECHO type) and those in which no virus was found. The limitation of the non-paralytic poliomyelitis category to those with poliomyelitis virus in the faeces produced a ratio between the numbers of paralytic and non-paralytic cases very different from that usually described. In the three years of the investigation there were 121 paralytic and only 14 non-paralytic cases in the study population. During the same time 317 cases were classified as aseptic meningitis, and from 121 of these no virus was isolated.

The age grouping of the cases falling into the different diagnostic categories was also notable. Paralytic and non-paralytic poliomyelitis had a similar age incidence, but this was quite different from that of aseptic meningitis. Thus in the 1956 study, carried out when elementary schoolchildren, but not pre-schoolchildren, had been vaccinated, it was found that the number of paralytic cases in the 5 to 14 years age group was half that in the group of children under 5, and the number of non-paralytic cases at school age a quarter of those at pre-school age. These findings provided confirmation that the vaccine protected against both types of poliomyelitis. At the same time the number of cases of aseptic meningitis in the 5 to 14 years age group was more than twice that found in the pre-school group. It therefore seems possible that the inclusion of some cases of aseptic meningitis in the category of "non-paralytic poliomyelitis" in other vaccine studies has been partly responsible for the finding that the vaccine appeared not to prevent non-paralytic poliomyelitis.

RADIOACTIVITY FROM THE ENVIRONMENT

Some interesting new data have been reported by Professor W. V. Mayneord and colleagues¹ on the presence of elements of the radium and thorium series in the human body, in some animals, and in food and other substances. The method of detecting the alpha particles emitted by the radioactive elements (in ashed specimen) is a modern adaptation of Rutherford's method of counting the flashes of light, or scintillations, when an alpha particle strikes a fluorescent screen. Whereas in Rutherford's experiments the scintillations had to be counted visually, they are now detected by a sensitive photo-electric cell (a "photomultiplier") coupled to electrical counting circuits. The alpha-particle emitters of the thorium series can be distinguished from those of the radium series because they include a number of "fast pairs" of particles: one alpha particle follows another in a small interval of time as the decay of the short-lived thorium A (half life 0.14 second) follows quickly on that of its precursor thoron. When the bone specimens in the cases studied by Mayneord and colleagues had relatively high contents of radium or of radium-thorium mixtures, the method gave results in good agreement with assays made by other workers using different methods. Investigations of bone specimens from individuals exposed only to the radioactivity of the environment provided important new facts on the radioactivity of human and animal tissues.

The total alpha-particle activities of bone samples from adult London and Cornish subjects were on average respectively 0.17 and 0.50 micro-microcurie per gramme ($\mu\mu\text{C/g.}$) of bone ash, and about 60% of this activity is attributed to the radium series. These figures imply a radium content of about 0.02 and 0.06 $\mu\mu\text{C/g.}$ of bone ash for the London and Cornish subjects, and may be compared with average values ranging from 0.02 to 0.09 $\mu\mu\text{C/g.}$ in four groups of subjects in the U.S.A.² and an average value of 0.13 $\mu\mu\text{C/g.}$ for a group in Germany.³ A thorium content of about 40% of the total alpha-particle activity is high, however, compared with the findings of J. B. Hursh,² who concluded from his experiments that elements of the thorium series are not incorporated in the body in amounts comparable to the stored radium. In common with Hursh² and with H. Muth and colleagues,³ no correlation was found between radium content of bone and age. In stillborn children the bone radioactivity per gramme of ash was about the same as in adults.

A few animal bones were also included in these studies. Bones from the cow and sheep showed about ten times the radioactivity of human bone. Bones of the pig showed very little radioactivity indeed, while the single specimen from a horse had an alpha-particle activity of the same order as human bone. Whether these differences are real species differences or are determined mainly by feeding habits has not yet been determined. It is suggested that the high values of alpha-particle activity

¹ Turner, R. C., Radley, J. M., and Mayneord, W. V., *Nature (Lond.)*, 1958, 181, 518.

² Hursh, J. B., *Brit. J. Radiol.*, 1957, Suppl. No. 7, 45.

³ Muth, H., Schraub, A., Aurand, K., and Hantke, H. J., *ibid.*, 1957, Suppl. No. 7, 54.

⁴ Spiers, F. W., and Passey, R. D., *Lancet*, 1953, 2, 1259.

⁵ *Brit. med. J.*, 1957, 2, 34.

found for superphosphates may have a bearing on the observed activities in cattle bones. A number of food-stuffs have been investigated, including milk; human and cow's milk have comparable radioactivity.

It is evident from the natural radioactivity found in the food chain that a few months of average diet suffice to supply an amount of radium equal to that found in the whole body. A large fraction is excreted; however, and the long-term retention is low. One human metabolic study, given in the report, indicates a possible means of obtaining more information on this problem. Results for two other substances might be mentioned; tobacco ash shows some alpha-particle activity and a pharmaceutical product had a high thorium content. Tobacco smoke, however, does not carry off the radioactivity in the tobacco ash,⁴ and pharmaceutical products can form only an exceedingly small part of the food intake. Neither of these reported radioactivities are likely therefore to add significantly to the radium or thorium content of the body. If the radioactivities reported are typical—and they appear to fall in line with measurements in other parts of the world—the radiation dose to bone is likely to be about that already calculated on an average total body burden of about 100 $\mu\mu\text{C}$ of radium.⁵ The alpha-particle activity of the Cornish bone samples would imply that the total dose to osteocytes in living bone, from all the "natural" sources, might be some 50% greater than the soft-tissue dose of 3 r in 30 years. The London samples would imply a dose about 10% greater than the soft-tissue value. Both dose rates lie within the range expected from the radioactivities in bone reported from the U.S.A. and Germany.

Until more is known about the biological effects of very small doses of radiation, it is impossible to estimate quantitatively the biological significance of the background radiation which has been present throughout man's history. If it is supposed that it is not absolutely harmless, its present magnitude must at least be presumed to be tolerable. It is important therefore to gain information about the magnitude of the "natural" radiation dose to the various tissues of the body and to investigate its variation with geographical location. The investigation reported by Professor Mayneord and his colleagues is a further step in this direction.

BUZZERS FOR BED-WETTERS

"Cures" for enuresis date at least as far back as 1550 B.C., when the Ebers Papyrus recommended a concoction of juniper berries, cypress, and beer.¹ Other less pleasant "cures" have included blisters to the sacrum, the lashing of a large frog to the child's waist, mouse pie, the sprinkling of the dried bladder of the sow over the child's bed, an instrument with a steel spike to prevent the child lying on his back, penile clamp, the application of nettles or cantharides to the glans, the application of silver nitrate to the urethral meatus so that micturition will be painful, the closure of the prepuce at night with collodion, and the passage of sounds. An interesting

invention depended on the dissolving by the urine of a tablet closing the end of a rubber tube: when the tablet was dissolved a flood of cold water or a blast of cold air awoke the child with a start. Electrical devices have been used for the "cure" of enuresis for over half a century. In the main they work either by giving the child an electric shock or by sounding a buzzer when urine is passed, thus awakening the child. Several firms now market a device of the latter variety, and writers in Britain, Australia, and the United States have testified to its value. A common type of apparatus consists of a buzzer, with a 6-volt battery, connected to a metallic rectangular gauze mat on which the child lies, preferably without trousers. When as little as one drachm (3.5 ml.) of urine is passed the circuit is closed and the buzzer sounds on the bedside table, awakening the child, who switches it off and then gets up to pass the rest of his urine. It is hoped that in this way a conditioned reflex will be established whereby the child awakens the moment urine is passed, or even before.

Since enuresis is a self-limiting complaint, with in the majority of cases a strong psychological component, paediatricians and others are difficult to convince of the value of any one form of treatment. Many widely differing types of treatment achieve something like a 60% success rate if given with sufficient enthusiasm by the doctor. In a recent paper, however, I. G. Wickes² gives a good account of the success of the buzzer in his hands, though it remains problematical how much of the success was due to the enthusiasm of the author, or to the increased age of the children after some months of treatment, or to the psychological effect of the apparatus rather than to the establishment of a conditioned reflex. Wickes selected 109 consecutive intractable cases of bed-wetting for study. In four cases the parents refused to report progress; in two cases the children refused to use the apparatus; two parents could not manage it; and one child stopped bed-wetting before the apparatus was set up. This left 100 children for study, of whom 81 were boys. Seventy-four were aged 7 to 13, 12 were aged 14 to 17, and only 12 were under 7. Children with enuresis of moderate severity (50–75% wet nights) responded best to this treatment, for 89% of this group became dry during the third month of treatment. Fifty of the 100 children in the whole series responded rapidly and completely; 15 dried up almost completely; 9 improved markedly but slowly; and 26 failed to benefit. Nine of those successfully treated relapsed, but 8 of these again responded rapidly and completely to a further course. Wickes noted striking emotional improvement in those who benefited.

The buzzer device has some disadvantages, which should be recognized. First, it is expensive. The cost of some of the apparatus on the market certainly seems to be excessive, for a good hospital engineer should be able to rig up a machine at one-fifth of the cost of some of those now advertised. The apparatus is somewhat complex, and less intelligent parents may have difficulty in making it work; it can be used only by one patient at

¹ Quoted by Glicklich, L. B., *Pediatrics*, 1951, 8, 859.

² Wickes, I. G., *Arch. Dis. Childh.*, 1958, 33, 160.

a time, and it requires the intelligent co-operation of the child. Wickes does not recommend it for use by children under 7. Lastly, it may take many weeks to establish the conditioned reflex. Nevertheless enuresis is a very distressing condition for parents and psychologically disturbing for children. If all other reasonable methods fail in older children there is much to be said for giving the buzzer a trial.

ARTHRITIS IN ULCERATIVE COLITIS

Arthritis is one of the more common complications of ulcerative colitis. Two representative British series^{1,2} have given figures of 5.4% and 13% respectively, while a recent American series gave a figure of 22%.³ E. G. L. Bywaters and B. M. Ansell⁴ have now published a valuable study of this special form of arthritis based on observations made on 37 patients with the condition. The joints most frequently affected were the knees and ankles, while the finger-joints were less commonly attacked than in rheumatoid arthritis. The toe-joints were affected in four patients, sometimes with involvement of the distal interphalangeal joints, which is rare in true rheumatoid arthritis. Disease of the sacro-iliac joints, indistinguishable radiologically from that seen in ankylosing spondylitis, occurred in six patients.

The characteristic course was of a recurrent mild synovitis, at first attacking one or two joints, which subsided as others were affected. This migratory polyarthritis initially caused the illness to be diagnosed as rheumatic fever in some of the patients. The arthritis was fairly frequently associated with skin lesions, especially erythema nodosum, as noted in earlier studies.^{1,5} The arthritis commonly bore a positive relationship to the colonic symptoms and usually cleared up when the colitis subsided, though this was not invariable. In some patients irreversible changes took place in the joints, with limitation of movement as a sequel. The radiological changes were sometimes the same as in rheumatoid arthritis, but patients with severe or prolonged joint disease might show periostitis and erosions of the joint cartilage, sometimes extensive enough to result in complete loss of cartilage and ankylosis. Biopsy specimens taken from synovial membranes in three patients had histological appearances similar to those seen in rheumatoid arthritis. The Rose-Waaler test was persistently negative in 25 out of 29 of these patients. Among the other four, in one case the test was positive on one occasion but negative on a second; one case maintained a positive test in the complete absence of joint symptoms; while the other two cases, with persistently positive Rose-Waaler tests, were clinically identical with classical rheumatoid arthritis. These serological findings are important in showing that the majority of the patients with both arthritis and ulcerative colitis are not suffering from classical rheumatoid arthritis. In other words, either the arthritis of ulcera-

tive colitis is secondary to the diseased bowel, or ulcerative colitis can be regarded as a generalized disease in which the diseased bowel is only one, though the most important, of the manifestations.

Among the patients who were treated surgically, colectomy (or ileostomy alone) brought about subsidence of the joint symptoms in the large majority, a finding which agrees with previous observations.² Likewise, successful treatment of the colitic symptoms with cortisone and its analogues was accompanied by relief of the arthritis in seven out of the eight patients so treated. The results of surgery are perhaps the strongest evidence in favour of the view that the arthritis of ulcerative colitis is usually no more than a secondary consequence of the diseased bowel.

ACUTE EPIGLOTTITIS IN CHILDREN

Acute respiratory diseases are exceedingly common in children, particularly in winter. The clinical picture varies greatly according to the situation of the lesion, the organism causing it, and the age of the child. Most of these diseases are well recognized, but there is a relatively rare condition in this group which is little known yet which presents a most dramatic clinical picture, often leads to sudden unexpected death, but responds well to prompt treatment. This condition is acute epiglottitis. It seems to be a specific condition almost invariably due to an infection by *Haemophilus influenzae* type B. It occurs in children of all ages, though its peak incidence is at about 4-5 years of age, or rather above that of the commoner acute laryngotracheobronchitis on the one hand and of *H. influenzae* meningitis on the other. It may appear in small epidemics, several cases being seen in one year, and very few in others.

The condition was perhaps first recognized as distinct in France¹ and its first description in the English language came from S. E. Sinclair,² of Yale University, who described ten cases in 1941. Several American reports followed³⁻⁷ describing up to twenty cases in each series. Little has been written on the subject in the British literature. S. de Navasquez⁸ described a single case, and later F. E. Camps⁹ and H. Morris Jones and Camps¹⁰ described a series of cases. These articles, and a recent paper by W. Berenberg and S. Kevy,¹¹ of Boston, give an excellent description of the condition.

The illness follows a typical clinical course and has unique and diagnostic physical findings. Nevertheless, Berenberg and Kevy report that only once was the correct diagnosis made before admission to hospital in their 42 cases, and most of Morris Jones and Camps's 29 cases came to necropsy after being reported to the coroner as sudden unexpected deaths. The onset of the

illness is sudden, with difficulty in breathing, severe sore throat, and fever. There is a degree of shock out of proportion to the short duration of the respiratory difficulty. The illness then rapidly progresses. Twenty-two of Berenberg and Kevy's patients were admitted within eight hours of the onset and three were dead on arrival less than six hours after the first symptoms. Later symptoms include dysphagia, retention of secretion in the nasopharynx, and hoarseness with stridor. The onset of the shock-like state may appear unexpectedly. On physical examination the cardinal sign is the extreme swelling of the epiglottis, which on deep depression of the tongue is seen to be fiery red, bearing a striking resemblance to a bright red cherry obstructing the pharynx at the base of the tongue, though the rest of the pharynx may only show slight inflammation. *H. influenzae* type B can usually be cultured from swabs taken from the epiglottis and was also found in the blood in 11 out of 16 of Berenberg and Kevy's patients so investigated.

The most effective treatment in all series was tracheotomy. Though not always essential, the doctor in charge has to be ready to perform it at a moment's notice. Children with this disease should be taken to hospital without any delay, as the course, if untreated, is usually rapidly disastrous. Five of Berenberg and Kevy's patients died and none of them had had tracheotomy. Supportive and antibiotic therapy is of some help, and chloramphenicol is favoured as the drug of choice in doses of 50-100 mg. per kilogram body weight daily.

THE N.H.S. IN 1957

The customary amount of detailed information on the deployment of National Health Service resources, material and human, is contained in the 254 pages of the Annual Report¹ of the Ministry of Health for 1957. The report appears earlier this year than it has done since the N.H.S. came into being. The total cost of the Service, £585m., was about £50m. more than for the previous year, and about £29m. of this £50m. was accounted for by an increase in cost of the hospital and specialist service. Some four-fifths (£468m.) of the total cost was met by the Exchequer, and the remainder was met by local rates (£24m.), by charges to patients (£28m.), by superannuation contributions and transfer from the values (£28m.), and by the contribution from the National Insurance Fund (nearly £37m.). Since September, 1957, the latter source of income has been replaced by a separate fund set up under the provisions of the National Health Service Contributions Act, to which patients pay double the former weekly amount and which in a full year will bring in roughly £80m., thus reducing the proportion of 80% of the cost borne by the Exchequer in 1956-7 to an expected 76½% in 1957-8.

The number of prescriptions dispensed fell by about 21m. compared with the previous year, but the cost rose by over £4m. to £60,851,903, and the average cost per prescription rose from 4s. 11.57d. to 5s. 10.48d. It is estimated that the corticosteroid drugs accounted for

9.7% of the cost of the ingredients of prescriptions, and the advent of the more expensive prednisone and prednisolone in February, 1957, had a marked effect on this item in the drug bill. Antibiotics, by far the most expensive category of drugs, accounted for 19.94% of the total ingredient cost.

The number of patients treated in hospital rose by some 54,000 to 3,793,000, but by the end of the year about 440,000—9,000 more than a year earlier—were awaiting admission. Disorganization caused by the influenza epidemic may well have been partly responsible for this disappointing lengthening of the queue, which had moved along at a record speed in 1956. Those waiting for general surgery and ear, nose, and throat surgery accounted for more than half the total waiting-list, and about one-eighth were gynaecological cases. But this waiting-list position varied markedly in different regions, being highest in Oxford but actually improving in Manchester and Liverpool. The number of in-patients treated was 29% greater than in 1949 and this was achieved with only 6% more beds than were available at the beginning of the Service. £18m. was allocated for capital development in 1957-8, and during the year work began on new hospitals in Hensingham in Cumberland, Swansea, Swindon, and Welwyn. The number of consultants employed was 6,902, compared with 6,739 in the previous year and 5,649 in 1950.

The number of general practitioners practising as principals in England and Wales increased by 261 to 19,343, of whom 12,962 were working in partnerships. The average number of patients per doctor remained much the same at 2,273. Hearings by medical service committees of complaints against doctors and subsequent recommendations by executive councils to the Minister were fewer. In 243 cases, out of a total of 328, no breach of the terms of service was found. No doctor's name was removed from an executive council list; disciplinary action in the form of withholding money was taken in 31 cases, and 38 warning letters were sent.

A rising birth rate was reflected in an increase in activity of the domiciliary and welfare services of local authorities. Domiciliary midwives attended 255,747 confinements, 8,104 more than the year before. In 205,934 (81%) of these cases a doctor was booked, and a doctor was present at delivery in 44,878 of them. Visits by home nurses increased from 24,652,655 to 25,053,813. Some of this increase may have been due to the influenza epidemic, but attendance upon the elderly was mainly responsible. Likewise the aged and chronic sick continued to make the greatest demand on an expanding domestic help service. 1,222,136 children under 15 were vaccinated against poliomyelitis in 1957, and a further 1,754,744 were registered and awaiting vaccination at the end of the year. Only 43% of infants were vaccinated against smallpox and only 48% immunized against diphtheria.

We record with regret the death at Philadelphia on August 16 of Dr. Chevalier Jackson, whose notable contributions to bronchoscopy won him honours all over the world. He was 92 years of age.

¹ Rice-Oxley, J. M., and Truelove, S., *Lancet*, 1950, 1, 607 and 663.

² Brooke, B. N., *ibid.*, 1956, 2, 532.

³ Kiraner, J. B., Sklar, M., and Palmer, W. L., *Amer. J. Med.*, 1957, 22, 264.

⁴ Bywaters, E. G. L., and Ansell, B. M., *Ann. rheum. Dis.*, 1958, 17, 169.

⁵ Bergen, J. A., *Ann. Intern. Med.*, 1929, 3, 335.

¹ Lemierre, A., Meyer, A., and Laplane, R., *Ann. Méd.*, 1936, 39, 97.

² Sinclair, S. E., *J. Amer. med. Ass.*, 1941, 117, 170.

³ Alexander, H. E., Ellis, C., and Leidy, G., *J. Pediat.*, 1942, 20, 673.

⁴ Du Bois, P. G., and Aldrich, C. A., *ibid.*, 1943, 23, 184.

⁵ Miller, A. H., *Laryngoscope (St. Louis)*, 1948, 58, 514.

⁶ Davis, H. W., *J. Kans. med. Soc.*, 1947, 48, 105.

⁷ Rabe, E. F., *Pediatrics*, 1948, 2, 559.

⁸ De Navasquez, S., *Brit. med. J.*, 1942, 2, 187.

⁹ Camps, F. E., *Proc. roy. Soc. Med.*, 1953, 46, 281.

¹⁰ Jones, H. M., and Camps, F. E., *Practitioner*, 1957, 178, 223.

¹¹ Berenberg, W., and Kevy, S., *New Engl. J. Med.*, 1958, 258, 870.

¹ Report of the Ministry of Health for the year ended December 31, 1957, 1958. H.M.S.O., London. Price 12s. net.

WHY ARE MEDICAL JOURNALS SO DULL?

BY

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Medical journals are dull; I do not think there is any doubt about that. There are many causes of their dullness; some are curable and some incurable. I do not separate them: this is a short study of the pathology, not a dissertation on the prophylaxis and treatment, of the condition.

Wrappers and Covers

Their wrappings are drab and difficult to remove, so the journals accumulate on our desks in inconvenient piles and roll on to the floor. There is little incentive to make the effort of opening them. When opened they have a strong tendency to roll themselves up again.

The covers are as drab as the wrappers. There is nothing on the cover to distinguish one copy from another or to titillate the clinical appetite. There is in some journals a table of contents on the outside page, but the titles are so discouraging that they provide very little incentive for reading the journal, especially to a man already weakened by the effort of unwrapping and correctively re-rolling the twisted pages. In other journals the table of contents is hidden among the first few pages of advertisements. Advertisers pay more if their wares are inserted half-way through the programme, as in commercial television, and so while hopefully scanning the contents one is interrupted by a vasodilator or a purgative. With the *Proceedings of the Royal Society of Medicine* I have quite often missed something because an advertisement made me think I had finished the list of contents.

Titles

Many of the titles are unattractive. Without going in for sensationalism an author can try to make his title allure as well as inform. A medical journal is an open market where each salesman must cry his goods if he wishes to get an audience at his stall. A poor title dulls the clinical appetite, whereas a good title whets it. I have called this article "Why are Medical Journals so Dull?" I do not claim this title is specially good, but it is better than "A Study of the Negativistic Psychomotor Reactions induced by Perusal of Verbalized Clinical Material." Titles such as "A Trial of 4,4-Diethyl-hydro-balderdashic Acid in Acute Coryzal Infections" are far better changed to "A New Treatment for Colds."

An important addition to the title should be the author's name, which may attract or repel according to the reputation he enjoys; but medical articles to-day appear to be often written by committees, and this multiple authorship is highly discouraging to readers. Ten men cannot write an article any more than ten men can drive a car. The interest evoked by an author's name is diluted by listing all his advisers.

Wanting in Colour

So much for the cover. Now for the inside. The paper is often of poor quality, and coloured pictures are almost unknown. I realize it is economically impossible that this should be otherwise, but medical journals contrast so glumly with the glossy productions of the big drug houses or with women's weeklies.

The advertisements in medical journals are essential to add revenue, but they add little else and seem far less exciting than the advertisements in lay weeklies. Prosperous people

in brightly coloured dresses sipping expensive drinks in luxurious liners provide us with happy daydreams of holidays we cannot afford. Advertisements in medical journals are quite the reverse: elderly men in shabby pyjamas hurrying along the passage with urinary frequency. They are not attractive; nor are the other afflicted persons pictured there with tension, hypertension, insomnia, and pain. Humorous advertisements in medical advertising are rare; it might be cheering to see a strip cartoon of the doctor whose practice dwindled because of night starvation but rose with dramatic success after Horlicks; or the physician who found his failure to be elected to Fellowship was due to his not using Amplex.

In short, there are many factors which dull the prospect of reading a medical journal even before the letterpress is reached: the wrapping, the unwrapping, the titles, the authors, and the advertisements. There are additional psychological deterrents—the feeling of duty: "I ought to read this, for my exams; for my edification; to keep up with my houseman; because my patients will read it in the *Reader's Digest*; or because George will ask me what I think of it. Duty, if one is aware of it, is usually a deterrent, but it is also associated with the idea that a lot of what you don't fancy does you good.

A Tedious Duty

Now for the letterpress itself. It is inevitable that editors have to accept a certain amount of junk both to fill their papers and to avoid giving offence to eminent medical men. For many doctors the achievement of a published article is a tedious duty to be surmounted as a necessary hurdle in a medical career. You have got to get over it, just as you have to dissect a dogfish for the first M.B.; you don't like it, but it's got to be done. Though the subject of an article is important it is not much to do with its dullness. I believe if a man has something to say which interests him, and he knows how to say it, then he need never be dull. Unfortunately some people have a desire for publication but nothing more. They have nothing to say, and they do not know how to say it. They want to be seen in the *British Medical Journal* or the *Lancet* because it is respectable to be seen there, like being seen in church. They would stand no chance of publication in lay magazines, but the number of medical magazines is so large that every dull dog has his day. Often there seems to be a spate of articles on the same subject; for example, intervertebral disks were all the rage some years ago, whereas hiatus hernia is much in the news to-day. Other subjects, especially in the correspondence columns, flower, like cacti, every two or three years; for instance, discussions on herpes zoster and chicken-pox, or on the correct use of "tropic" and "trophic."

Good Presentation

The dullness of an article depends much on its presentation—that is, the way it is set out, the order in which the facts are put, and the way the diagrams or pictures are arranged. It is astonishing what a difference this makes. For example, here are two ways of setting out one case. A man was crushed by a bombed building, injuring his diaphragm. He consequently developed a right diaphragmatic hernia which resulted in dyspepsia from visceral displacement. Surgical repair of the hernia relieved his symptoms.

That account is factual and accurate, but not especially interesting. Here is the same case as I heard it described by the surgeon at a meeting of a clinical section. He operated on a man who had symptoms of duodenal ulcer, and to his chagrin was unable to deliver the duodenum. At length his exploring hands disappeared into a large hole in the right diaphragm, where he found much intestine. There was no duodenal ulcer. He then reviewed the chest x-ray film and found that the alleged thickened pleura was really hernia and that gas could be (and should have been) recognized in it. As soon as the man came round from the operation a fresh history was taken, and it was found that

the pain was nothing like ulcer pain; it had no periodicity (it had been caused by the duodenum being stretched across the lumbar spine). Also, the history of the crush injury was elicited; until then it had not been discovered. The surgeon concluded: "The moral is that one ought to take a history before the operation rather than after it."

You will agree that this second version is live; the first was dead. The first was chronological and factual, yet was tidied up so much that there was no interest left: it had the dullness of a sieved diet.

May I mention a recently published case of my own, "A Woman with the Stiff-man Syndrome"? Here I wrote the account of events not in chronological order but in logical order, starting with my reading an annotation on this syndrome, then my realizing I had seen a case of it ten years drome, then a search for the lady, followed by a re-previous view of the notes, and finally a description of her behaviour at a clinical meeting. I thought this would make the article more alive. This device of telling a story by starting in the present and darting to the past and back is far from original, yet to my surprise I received a large number of approving letters and telephone calls praising the way the article was written. I did not know so many people minded about presentation. The amount of comment produced when trouble was taken to make the presentation as interesting as possible suggests that the average contribution may be rather dull in presentation and that a lively commentary shines like a good deed in a naughty world. I am sure many people writing for medical journals would take more trouble if they knew how much difference it made.

To refer to an article of my own in the above paragraph may suggest I am immodest. That is a risk of using the first person. Yet avoiding "I" by impersonality and circumlocution leads to dullness, and I would rather be thought conceited than dull. Articles are written to interest the reader, not to make him admire the author. Over-the-conscientious anonymity can be overdone, as in the article by two authors which had a footnote, "Since this article was written, unfortunately one of us has died."

An important factor in presentation is the use of diagrams, charts, tables, and so on. I often find that I cannot understand diagrams in medical journals even when I try very hard. I take several minutes identifying the ordinates and sorting out the different types of hatching and shading and their interpretation. Then I usually find I have been looking at Fig. 1 instead of Fig. 2. A diagram should be used only if it makes something easier to understand. The purpose of a diagram is not to crowd as many facts as possible into the smallest space.

Style

Style is what matters most; grammar, syntax, spelling, and punctuation are only useful conventions; they matter very little, nor need we disapprove strongly about improper unions between Greek and Latin or we would have to say dicycle instead of bicycle. What *does* matter is when doctors write what Ivor Brown calls "pudder" and Sir Ernest Gowers calls "gobbledygook." They clog their meaning with muddy words and pompous prolixity; they spend little time in seeking the shortest, neatest, and plainest way of putting down their meaning. Quiller-Couch, A. P. Herbert, Ivor Brown, and Sir Ernest Gowers have done a great deal to encourage good writing, but I think Sir Ernest Gowers's *Plain Words* is the best of all. Unfortunately those who need it most read it least, because anyone taking trouble to buy a book about using English will probably take trouble in writing it: style is largely a matter of taking trouble, though many people wrongly regard it as a gift. The people who write badly do not seem to realize they do, and so do not buy this admirable book.

Here is a sentence from a medical journal: "Experiments are described which demonstrate that in normal individuals the lowest concentration in which sucrose can be detected by means of gustation differs from the lowest con-

centration in which sucrose (in the amount employed) has to be ingested in order to produce a demonstrable decrease in olfactory acuity and a noteworthy conversion of sensations interpreted as a satiety associated with ingestion of food." All the author meant was: Experiments are described which show that normal people can taste sugar in water in quantities not strong enough to interfere with their sense of smell or take away their appetite.

Lastly, length. Medical articles should, like after-dinner speeches, finish before the audience's interest has started to wane. I finish now, pointing out that this paper, like the talk on which it is based, is only intended to provoke discussion. It solves no problems; it only poses them. It is incomplete, inaccurate, and probably irritating; but I hope—and I have spent many hours trying to achieve that end—that it is not dull.

STOOL-GAZING

BY

S. LEVIN, M.B., M.R.C.P.Ed., D.C.H.

Johannesburg

Jack Sprat could eat no fat.—Nursery rhyme.

This cryptic line gives us no reason for Jack's inability to eat fat. In tracing the origin of this ditty, however, we learn that the term "Jack Sprat" was used in the sixteenth and seventeenth centuries to denote a dwarf. Could it be that some prophetic individual had anticipated Samuel Gee (1888), and had unwittingly described coeliac dwarfism? Did a high-fat diet upset Jack Sprat's bowel habits? Did it cause diarrhoea?

The stools are like the skin, being readily visible, frequently examined, accessible to study and scrutiny, subject to loathsome and malodorous diseases, and filling the subject and onlookers with horror and disgust.

A Disappearing Art

To a discerning physician it is clear that the art of stool-gazing is rapidly passing into oblivion. Indeed, the last half-century has seen a phase of stool scrutiny in clinical and social paediatrics the magnitude of which should not permit of its passing without notice and without epitaph. Until very recently infants' stools had been studied with a devotion paralleled only by the passionate zeal with which the Babylonians studied the liver and divined the future therefrom. The ancients cast an inquiring glance even at the stools. Aristotle, for example, held that meconium (Gr. *mekon*—poppy) was the substance responsible for keeping the infant asleep *in utero*. Throughout history various preparations of stools have been used for medicinal purposes (*Drekapotheke*). But it is only in the last fifty to seventy years that divination by stool has become widespread in the medical fraternity. "In no branch of paediatrics," writes Fischer (1928), "has so much progress been made in recent years as in the study and interpretation of infant feces."

In the autumn of 1950, during my first house job in paediatrics, I was introduced to the art of stool-gazing. Every Friday morning the medical staff congregated in the sluice-room, where a stool specimen in a labelled diaper was placed before us by the nurse in charge. All the infants were represented by their stools. These were solemnly studied, spread out with a spatula, colour, curds, and consistency noted, and a decision was made regarding a change in the infant's diet. Perhaps the sugar content of the feed was reduced, the water concentration altered, the protein changed, and the formula was thus "tailored" to fit each particular infant. Thus were digestive difficulties

dealt with. In the words of Southworth (1907): "When difficulties arise, a trial is made of a new mixture, which is poured in at one end of the infant's digestive tract, to be submitted to the mysterious alchemy of complex and dimly outlined digestive processes, and the outcome is anxiously awaited at the other end to spell success or failure."

The first timid and tentative steps in stool-gazing were taken in Europe some 70 years ago when Biedert began to take notice of feeds and faeces, the "intake-output complex." In the 1910's and 1920's the cult, then graced by the term "clinical coprology," reached its zenith, particularly on the Continent. There was preoccupation with the stools almost to the exclusion of the infant who passed them. Truby King (1918), for example, agreed with the dictum that "the first question in almost every disease in children should be, 'What are the motions like?'" Indeed, he agrees that "if we could keep the motions always normal, we should have very few or no delicate children."

To-day the threescore years and ten of the stool-gazing fraternity is all but over. It is the end of an era, but not quite the end. Many nurses, for example, are still much concerned with the condition of the stools, and even intelligent mothers are terrified of "green diarrhoea," and change an infant's feed at the slightest sign of a green stool. Some unfortunate infants are fed on black tea or glucose-water for days on end, for no other reason than that their stools are greenish or loose. Mothers not only believe that their offspring must have satisfactory daily evacuations, but the popular press, intent on selling various nostrums, fosters this delusion. "Don't forget," warns an official Canadian Government booklet, "that a baby's bowels need regular attention" (Couture, 1950). Rather like the regular lubrication needed by an automobile engine. "The poor intestines," wails Bergen Evans (1947), "victims of a thousand theories, are convulsed by poisonous drugs, drenched with mineral oils, and lacerated by roughage until they frequently abandon all effort to function." Truby King insisted on a daily bowel movement with a fervour so intense that its necessity might have been inscribed on the very Tablets of the Law handed down on Sinai. Hill (1922) was prepared to allow an infant a latitude of 48 hours. To-day the public still has difficulty in understanding a doctor who evinces little interest in a baby's stools.

Philipp Biedert (1847-1916) was the first to study milk in relation to infant nutrition. He gave great impetus to consideration of the food-faeces relationship, the "intake-output complex." Presently the various dyspepsias, indigestions, intolerances, and intoxications held sway throughout the paediatric world. Biedert believed that the casein of cow's milk was largely indigestible and gave rise to casein curds in the stools of infants who were not thriving. He therefore developed "rhamgemente" (cream mixture) in 1883, this substance having but 1% protein.

Minor Shrines

Further observations on stools indicated that "casein curds" were in fact made of fat rather than protein. Early in the 1900's Czerny and Keller confirmed this, and blamed the indigestibility of fat for "Milchnährschaden" (milk injury). An enormous clinical edifice was erected based on the alleged menace of fat, this citadel all but tottering to-day. At various times excess of carbohydrate, salts, and protein were also held as being deleterious to infants and being responsible for various types of indigestion and dyspepsia. Many physicians worshipped at these minor shrines. The laity still fear sugar in an infant's diet, somehow linking it with diarrhoeal stools. Sugar dyspepsia has been thought to give rise to loose, frothy, sour-smelling stools. Firm remnants of such conceptions are still to be found in many paediatric textbooks. A recent popular textbook for students (Sheldon, 1955) has five pages devoted to an account of carbohydrate, protein, and fat indigestion and their characteristic stools, these factors being dealt with in such a convincing manner that one is almost tempted to believe that such pathological conditions exist.

While excess of protein has been thought to occasion constipated stools, excess of fat has sown confusion in the clinical ranks. Some authorities blame it for causing both diarrhoea and constipation—and this, moreover, in the very same breath, the very same paragraph. In this category there are, for example, Brennemann (1923, p. 639), Morse (1926, p. 158), Cautley and Paterson (1929, p. 40), and the official publication of the Ministry of National Health and Welfare of Canada (Couture, 1950, p. 149). Paterson and Newns (1955) have the good grace to uphold one view on page 70, and to assert the contrary view on another (p. 113).

Modern views in fact stress the opposite of that believed by earlier generations of paediatricians. Trouble occurs, not from having too much of any particular constituent, but too little. The whole concept of "tolerance" for food is based on very shaky foundations, as is evidenced by the perfect ease with which most infants deal with "solid food" even when but a few weeks old. When intolerance does occur in the infant, as likely as not it will be due to a specific sensitivity to a protein, such as lactoglobulin (Davidson and Burnstine, 1957).

Changing Views

An account of changing views on the oral management of diarrhoea has been dealt with in another paper (Levin, 1958). The study of the physical state of diarrhoeal stools (clinical coprology) held many of the earlier paediatricians in thrall. In the presence of diarrhoea, endless discussions revolved about what exactly in the diet was excessive, irritating the gut, and could thus not be tolerated by the infant. As an example of all-embracing obfuscation, the following extract (Fischer, 1928) would be hard to beat: "A new conception of the various food elements shows that the opinion of ten years ago regarding the dangers of high fat has been modified, and the possibility of a protein or casein element being the disturbing factor suggested. Modern science has proved beyond a doubt that one reason why the fat or casein disagrees is due to the presence of milk sugar; hence we to-day regard the carbohydrate and salt as the disturbing element in many cases, rather than the fat or casein." With such confusion about the noxious element in milk, it is not surprising that all constituents were often restricted in the treatment of loose stools, and infants were starved (indeed, still are) sometimes for days on end. Moreover, insult was added to injury by the common administration of a cathartic; and enemas to help clean out the poisonous stools were also given, thus exposing the infant to collapse from electrolyte imbalances.

Yet even from the beginning some hardy and sceptical souls raised objections to clinical coprology, to the prognostications based on stool-gazing, and to the methods of treatment based on the appearance of the stool.

As early as 1917, Grulee averred that he did not give castor oil for diarrhoea. Morse (1926), in all fairness, thought it only right to mention that some paediatricians regarded clinical coprology as a waste of time. Edwards A. Park (1923) decried the practice of starving infants merely because of loose stools; so did Hess (1930); and also Jeans and Marriott (1947), who wrote: "When attention is focused on the digestibility of the food and character of stools the energy needs are often overlooked." Wright (1934) stated: "The overemphasis on the study of the stools is a myopic method of estimating disturbances of nutrition in infancy."

The earlier views of Finkelstein (1910's) indicted carbohydrate and salts as causing dyspepsia in infants. He therefore devised a (protein) milk in which the concentration of these two constituents was greatly reduced. By decreasing the concentration of soluble salts (sodium and potassium) he hoped that the relatively higher proportion of insoluble salts of calcium and magnesium would combine with fat to make firm insoluble soaps and thus give bulk to the stool. Of course, the low concentrations of sodium and potassium did not do much to help sick infants who were already lacking these ions following on loss via vomiting

and diarrhoea. Moreover, one lesson has still not been learnt by the "low-fat feeders," and it is this: the consistency of stools is largely dependent on saponification of fat and production of insoluble soaps, and that one cannot make soap without fat any more than one can make bricks without straw (Goldbloom, 1957).

Conclusion

The final crushing blow to clinical coprology is the undoubted fact that the study of stools is now largely in the realm of laboratory investigation. The textbook by Moncrieff and Evans (1953), for example, has two pages devoted to "Faeces in Children"; they are not to be found in the chapter on feeding, however, but under the heading of "Clinical Pathology." So that clinical stool-gazing has now left the province of the paediatrician and has entered the domain of the biochemist and bacteriologist.

It is altogether fitting and proper that we should recognize the end of the allotted span of threescore years and ten to the clinical cult of coprology; and that we should dispatch the remains of this cult to the limbo of forgotten things. The era of the stool-gazers and stool-diviners is past.

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EFFECTS OF ATOMIC RADIATION UNITED NATIONS REPORT

In a leading article last week (p. 433) we commented on the recently issued Report of the United Nations Scientific Committee on the Effects of Atomic Radiation. We print below a brief summary of this report and of a statement about it published by the Medical Research Council.

When the United Nations committee was set up in 1956 it decided to examine the matters falling within its field of competence under the following five main headings: (a) genetics, (b) the effects of irradiation by internally absorbed isotopes and the effects of external radiation, (c) natural radiation levels, (d) exposures during medical procedures and occupational exposures, and (e) environmental contamination. After describing the basic physical concepts—types of radiation and units of measurement—and basic biological concepts—including the somatic and genetic effects of radiation—the report examines the natural and man-made sources of radiation. As to the latter, more than 80% of the genetically significant dose from diagnostic x-ray exposure is contributed by six or seven procedures (those involving the region of the lower abdomen and pelvis), but these procedures constitute only about 10% of all examinations. "For countries with an extensive use of x rays, the average annual marrow dose of the population can be estimated to range beyond 100 mrem per person. This figure is very close to the *per capita* marrow dose from natural radiation. . . . A reduction in dose might be achieved

by a further consideration by the medical profession of the circumstances in which x-ray diagnosis is appropriate. This could be facilitated by statistical information on the importance of each examination chosen for the reduction of any specific morbidity. Administrative co-ordination between authorities who require that certain examinations be made in the routine health surveillance of whole populations or special groups, such as schoolchildren, students, employees, could well be improved."

Contamination of the environment by radioactive fall-out as a result of nuclear explosions is examined in detail. Extensive information on the strontium-90 and caesium-137 concentrations in soil, plants, animal and human foods, and in human beings was received by the committee, which concluded that there were no practical methods of preventing the entry of these radioisotopes into the human body once they had been released into the environment.

Radiobiology

On the subject of fundamental radiobiology the report states that "the succession of events which take place between the time of irradiation and the appearance of recognizable effects is very intricate. . . . The lack of fundamental knowledge of normal cell structure and function is in our opinion the major factor limiting progress in radiobiology." The major problems on which radiobiological research is needed include: (1) the nature of the primary damage to cellular structures and the pathways of expression of this damage; (2) the dose-effects relationships at low dosages; and the mechanisms of chemical protection and recovery.

The chapter on the somatic effects of radiation covers physical factors, general pathology and special pathology, including such possible delayed effects as shortening of the life-span and the production of cancer. "Clinical and experimental evidence show that where the total body is irradiated, leukaemia is the most probable end-result among the various forms of malignant disease." After calling for continuing research in all aspects of radiation, the report states: "At the present time, due to the fact that delayed somatic effects of radiation are not exactly known, it must be recognized that the exposure of human populations to increasing levels of ionizing radiation may cause considerable and widespread somatic damage."

The genetic effects of radiation are considered in a short chapter, backed up by a much longer technical appendix. A dose of between 10 and 100 rads per generation would probably be required to double the natural mutation rate in human populations. "About 4% of all births are affected with hereditary disorders, some one-quarter of which appear to be at least largely determined by single gene differences. On this basis, an increase in the mutation rate would eventually result in a directly proportional increase in a part of this 4%, amounting to more than one-quarter, but less than the whole of it."

From world-wide averages the committee has computed the estimated dose from different radioactive sources under two headings—genetically significant dose and *per capita* mean marrow dose. Varying figures are given for environmental contamination depending on if and when weapon tests cease.

In its general conclusions the committee states that all applications of x rays and radioactive isotopes used in medicine for diagnostic purposes and for radiation therapy are for the benefit of mankind and can be controlled. Radioactive contamination of the environment resulting from explosions of nuclear weapons constitutes a growing increment to world-wide radiation levels. This involves new and largely unknown hazards to present and future populations; these hazards, by their very nature, are beyond the control of the exposed persons. The committee concludes that all steps designed to minimize irradiation of human populations will act to the benefit of human health. In an attempt to assess the possible effect of natural and of fall-out radiation in causing leukaemia, tumours of bone, and major genetic effects, the committee has prepared the accompanying table. After describing the wide gaps in knowledge about the biological effects of radiation, the

Estimates of Certain Possible Annual Consequences of Radiation Received by World Population from Certain Sources

Consequence	World Population Assumed (in Millions)	Natural Occurrence Assumed Per Year	Source of Radiation		
			Natural Radiation	Fall-out from Weapon Tests	
				Tests Stopping in 1958	In Equilibrium After Prolonged Continuation of Tests
Leukemia:					
If threshold 0 rem	3,000 5,000	150,000 250,000	15,000 25,000	400 to 2,000*	— 5,000 to 60,000
If threshold 400 rem.	3,000 5,000	150,000 250,000	0† 0†	0‡ —	— 0§
Major genetic defects	5,000	700,000 to 3,000,000	25,000 to 1,000,000	**	500 to 40,000

* Maximum rate during peak period. An estimated total of less than 25,000 to 150,000 would ultimately occur.

† Unless individual bone-marrow dose exceeds mean value by a factor of 60.

‡ Unless individual bone-marrow dose exceeds mean value by a factor of 80 to 500.

§ Unless individual bone-marrow dose exceeds mean value by a factor of 5 to 60.

** A total of 2,500 to 100,000 would occur over subsequent years.

report concludes: "The advance of research in all these fields depends upon appropriate training of scientific workers."

MEDICAL RESEARCH COUNCIL'S COMMENTS

Within six days of the publication of the report of the United Nations Scientific Committee, the Medical Research Council had prepared and published a statement¹ on it. For this expeditiousness Lord Limerick, the chairman of the M.R.C., pays tribute, in his introduction to the statement, to the committee responsible for it—the same committee as had been appointed to report² on the hazards to man of nuclear and allied radiations, under the chairmanship of Sir Harold Himsworth. In the opinion of the M.R.C. committee the U.N. report is "both a valuable account of present knowledge in this field and an important contribution to the difficult problem of its assessment." In general, the U.N. report has strengthened and amplified the tentative conclusions and predictions of the two earlier reports, that of the M.R.C. and that of the United States National Academy of Sciences.³

Somatic and Genetic Effects of Radiation

On the fundamental problem of the relationship between radiation dose and the effect which may be produced on human populations, the M.R.C. statement agrees with the view that for every small increment of exposure to radiation there is a small but proportional increment in the frequency of mutations in the germ cells that will manifest themselves as genetic changes in future generations, and that there is no threshold dose below which no such effect occurs. But, the statement says, scientific opinion is still divided as to whether a threshold dose exists below which there will be no induction of leukaemia or other forms of cancer. Though the U.N. committee plainly accepted this, nevertheless the M.R.C. committee felt there was a predisposition in the report "to favour the view that the induction by radiation of such long-term somatic effects as leukaemia and cancer is a process comparable to that of induction by radiation of genetic mutations . . . this view tends to tinge the interpretation of subsequent data." The statement emphasizes that it is not possible at the present time to decide whether there is or is not a threshold dose concerned in the induction of leukaemia and cancer, "and the only scientific attitude to the problem at present is one of suspended judgment."

On that part of the U.N. report concerned with the somatic effects of radiation the M.R.C. statement indicates only relatively minor differences in points of view. The M.R.C. committee was, for instance, surprised to learn from the report that a temporary drop in the level of white blood cells had been observed after a single dose of radiation as small as 250 mr—in the opinion of the committee doses at least 50 to 100 times larger were required to produce unequi-

vocal effects. The committee also thought that the sentence, "Malformation and other pathological conditions have been observed following exposure of pregnant women to accidental and therapeutic irradiation and to diagnostic procedures, e.g., pelvimetry," was unduly alarming—no evidence being available that the doses of radiation used in diagnostic procedures have produced congenital malformation in the child.

The M.R.C. committee is now prepared to agree with the American estimate that the genetically significant dose from diagnostic radiology may be as much as 100% of the natural background radiation in countries with extensive medical facilities.

In accepting the estimate of the U.N. report that over a period of 30 years the genetically significant dose to the reproductive organs from radiation resulting from weapon tests could be 0.06 rem or 0.12 rem (depending which of two assumptions regarding the scale of future tests was chosen), the M.R.C. statement points out that these estimates should be considered against the dose of 3 rem which would, on the average, be received from the natural background radiation over the same period.

The M.R.C. committee agrees with the conclusion of the U.N. report that the average concentration of strontium-90 in the bones of those living on a "plant-type" diet may be up to 5 to 6 times that in the bones of those on a "milk-type" diet. Elaborating this, the committee explains that the cow is, as it were, interposed as a partial filter between vegetation, which is contaminated with strontium-90, and the human body. In countries where, for instance, rice is the staple food there is no such filter.

Concluding the statement, the M.R.C. committee emphasizes that it was in no disagreement with the U.N. report on any major piece of information or concept.

New Appliances

AN ADJUSTABLE BED

Dr. A. C. E. BREACH writes: An engineer and I, a retired medical practitioner, set ourselves the task of designing at moderate cost a piece of equipment which would relieve much of the discomfort associated with long confinement to bed. We have sought to satisfy four requirements which we regard as essential: (1) a back support sloping at the right angle; (2) a support for the buttocks and thighs, so inclined as to counteract the tendency to slip down and to transfer the downward thrust of the body from the sacrum to the buttocks; (3) a support for the legs and feet, inclined so as to allow the knees to be comfortably bent and the weight of the legs to be spread over the largest surface possible rather than concentrated upon the heels; and (4) means whereby the patient on his own initiative and without assistance can vary his position at will.

A specially designed bedstead of drawn-steel tube is mounted upon standard castors. Upon this is pivotally supported the adjustable bed consisting of three rectangular frames—the "back frame," the "seat frame," and the "leg

frame"; these frames are hinged one to another. In the rest position they are aligned parallel with the floor as an ordinary bed. They are covered with a suitable material to give a flat surface, upon which rests a standard "flocupillo"-type mattress (6 ft. by 3 ft. by 4 in. (180 by 90 by 10 cm.)). This mattress may itself be sectioned, but in practice this seems to be unnecessary.

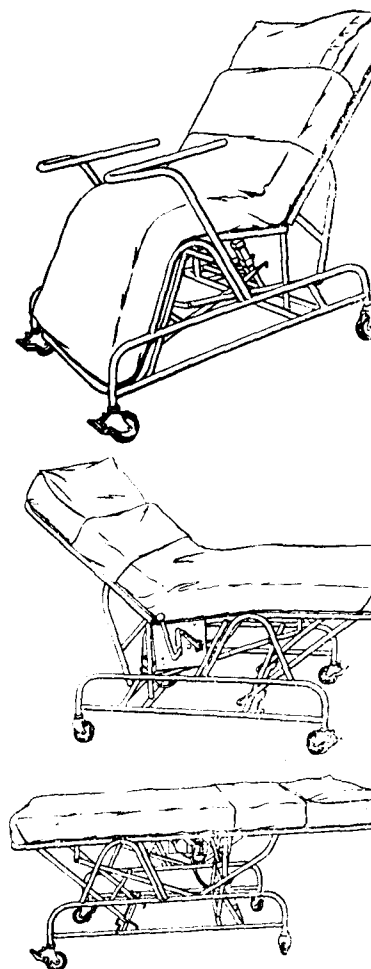
The frames are connected beneath the bed by a series of paired link-rods, so arranged that an interrelated harmonic movement is secured between the three frames. Thus, upward tilting of the back frame results in a progressive downward movement of the adjacent end of the seat frame, whilst at the same time the foot end of the leg frame swings downward about its pivotal axis. It will be seen from the line drawings that this movement may be continued to the point at which the patient is sitting upright with his feet ready to step off on to the floor. Strong detachable handgrips are provided to help him in and out of the bed (they also serve as a rest for a bed-table), and the bedstead has been so designed that there is no foot-bar to obstruct the patient as he walks away.

Provision is also made to enable the nurse to fix the leg frame in the horizontal position, while leaving the back and seat frames free to move in harmony.

Two models have been designed. In model A (illustrated) movement is effected by a

small electric motor mounted on the bedstead. Two push-buttons are provided for the patient's use in any convenient position. One raises the back, the other lowers it; movement ceases when the button is released. Model B has been designed for cases where an electric supply is not available or where it is thought desirable for therapeutic reasons that the patient should take active measures for his own comfort. Movement is effected by means of a small hand-pump operating a hydraulic ram mounted on the bedstead.

In addition to promoting the general comfort of the patient, the inventors consider that this apparatus provides the following specific advantages: (a) The orthopaedic patient can adjust his position, day or night, to give maximum comfort and can vary it at will. (b) The tendency to pressure sores should be much reduced. (c) Convalescence should be accelerated by early movement, greater comfort, and the inspiration of independent action. (d) Where necessary, change of position of the anaesthetized, unconscious, or helpless patient may be effected without manual lifting by one nurse by finger pressure. (e) The out manual lifting by one nurse by finger pressure. (e) The load on the nursing staff should be much reduced, since



(Continued at foot of next column)

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Nilergex (Imperial Chemical Industries Ltd.).—Nilergex, or isothipendyl, is another antihistamine drug. Its chemical structure, 10-(2-dimethylaminopropyl)-9-thia-1:10-diazanthracene, resembles that of promethazine, but with a second nitrogen atom introduced into the phenothiazine nucleus. But, whereas promethazine is strongly sedative and long-acting, nilergex is reported to cause less drowsiness than any other antihistamine drug—for example, in only 5 out of 602 patients in an American trial. However, direct clinical comparison with other drugs has not been made. It has a relatively short action, and when administered orally in 4-mg. tablets or as a syrup it must be given 3 or 4 times a day. Tablets containing 12 mg., with a specially coated inner core, are intended to give sustained action for 12 hours.

N.H.S. basic price: 100 4-mg. tabs., 33s. 4d.; 100 12-mg. tabs., 18s. 4d.; syrup, 500 ml., 11s. 8d.

Triostam (Burroughs Wellcome and Co.).—Sodium antimonyl gluconate, as amorphous white powder, standardized to contain 36% of trivalent antimony. The principal advantage of this trivalent antimonyl compound over sodium antimonyl tartrate in the treatment of schistosomiasis is that its toxicity is low. The nausea and vomiting so common in patients receiving sodium antimonyl tartrate very seldom occur in those receiving triostam, but unfortunately the relapse rate following full courses of the latter is very much higher than that following courses of sodium antimonyl tartrate, and, like it, it must be administered intravenously. It is not therefore the drug of choice if the aim is to eradicate infection entirely, for which purpose there is nothing superior to sodium antimonyl tartrate. Unfortunately, however, treatment with sodium antimonyl tartrate necessitates admission to hospital and close medical supervision. There is thus a place for triostam for controlling symptoms and for reducing the worm load in communities in the tropics where treatment on an out-patient basis only is practicable.

N.H.S. basic price: 6 ampoules, 6s. 7d.

Entobex (Ciba Laboratories Ltd.).—4:7-Phenanthroline 5:6-quinone (Compound 11925C) in tablets of 50 mg. This drug has only very recently been placed on the market and very few results of clinical trials with it have been published. The manufacturers, however, report that *in vitro* it has amoebicidal action at a dilution of 1 in 16,000 and is also effective against various bacteria, including *Staphylococcus aureus*, *Streptococcus faecalis*, *Escherichia coli*, and *Salmonella typhi*. It appears to be relatively free from toxic effect in animals, 100 mg. per kilogram having been given to rat daily for 21 days, following which histological examination of the internal organs revealed no abnormalities. In man also side-effects have so far been limited to nausea and vomiting.

Until further experience with this amoebicide is obtained it is doubtful whether it is wise to use it for routine purposes, but it is of interest as an experimental therapeutic substance.

N.H.S. basic price: 100 tabs., 39s.

(Continued from preceding column)

even the heaviest patient can be adjusted in position with lifting. (f) The aged are encouraged to retain a measure of independence. (g) A number of special medical and surgical needs have been anticipated in the design. (h) Nursing of the sick and the aged in their own homes should be made easier, especially if beds of this type could be made available on loan or hire.

[This adjustable bed is marketed by Egerton Engineering, 1, Walters Yard, Bromley, Kent.]

¹ Medical Research Council, *Statement on the Report of the United Nations Scientific Committee on the Effects of Atomic Radiation*, 1958. H.M.S.O., London. Price 1s. net.

² *The Hazards to Man of Nuclear and Allied Radiations*, 1956. H.M.S.O., London.

³ *Biological Effects of Radiation*, 1956. Washington.

area. It has been requested that this card, with relevant details added, should accompany any patient sent up for admission who is known to have been treated with steroids, chlorpromazine, or any other drugs the general practitioner considers should be made known to the hospital consultant. One case escaped this net. A very ill patient with ulcerative colitis, under treatment in one department of this hospital, perforated, and was transferred to another department for operation that night. She died, without recovering consciousness, of a fulminating peritonitis. Three explanations of this case are possible. (1) The case was hopeless from the start—most probable. (2) Insufficient cortisone was given during operation. (3) The patient was "cortisone sensitive," as has been described in certain kinds of experimental animals where the mildest infections rapidly become overwhelming if the animal is undergoing steroid therapy. So far it is believed that man does not normally belong to this group, but of course our knowledge of the long-term effects of steroid therapy is still in its infancy.—I am, etc.,

Chesterfield.

H. E. POOLER.

Sweet Tooth and Decay

SIR,—Your leading article (*Journal*, August 2, p. 293) so admirably stresses the most important factors in the causation of dental caries that I only diffidently criticize it. You imply, perhaps unintentionally, that erosion caused by acid drinks is often a predisposing factor, but this is not orthodox teaching. On the contrary, such acids stimulate salivation and may therefore have a protective effect, and erosion rarely occurs at the contact points or in the occlusal pits, where most caries begins, and is not nearly so common as caries is on the buccal surfaces.

To condemn round-the-clock eating of all carbohydrate foods is too sweeping. Untreated vegetables and fruit, except bananas, can be exonerated, and there is little evidence against rice, macaroni, or cooked whole vegetables. Chewing-gum, like sugar cane and other fibrous foods, may even be beneficial, and sorbital is a sweet carbohydrate that does not readily ferment; sweets made from it are advertised in the *Journal of the American Dental Association* and sold with the claim "safe for teeth." The foods to be condemned are those which leave deposits of concentrated starch or sugars, or sugars in solution, stagnating in the mouth after eating.

Confectionery frequently consumed is likely to remain popular despite all educational effort. Is it necessary, however, that it should lack such qualities of texture, consistency, and content of roughage and water as render other fermentable carbohydrate foods not only wholesome but also succulent? Is it not conceivable that "texturization" of confectionery could restore the originally natural conformity between what tastes good and what is good for us? Such an invention to make popular food more wholesome, together with fluoridation to do the same to water, might bring caries immunity to the masses whose appetites triumph over prudence.—I am, etc.,

London, S.W.10.

R. B. D. STOCKER.

Depressive States

SIR,—Dr. Gerald Garmany's contribution on the above subject (*Journal*, August 9, p. 341) is of considerable interest, and especially his conclusion that "the distinction between these three forms of depression [endogenous, reactive, and involuntal] and particularly between the reactive and endogenous varieties, is an unreal one." With this latter conclusion of Dr. Garmany's I am in whole-hearted agreement, and I am also in agreement with his further conclusion that "constitutional predisposition and the incidence of stress factors appears to be much the same in these groups." But, in view of the above findings, it is not easy to understand Dr. Garmany's apparent reluctance to give

E.C.T. in what he earlier called "reactive depression," but which he later states means only a "mild" depression.

In my experience, the most "mild" depression, perhaps expressed only by a little tearfulness and beginning disturbed sleep, reacts as promptly to E.C.T. as the most severe depression, but usually much fewer E.C.T.s are required. If one withholds E.C.T. from these cases, what can one give? Sedatives and reassurance? Some years ago that was all one could give, and not infrequently one found that it did not work, or, if it did, only with great tediousness and distress to the patient and his family—and not inconsiderable stress to the psychiatrist. (On clinical grounds alone it is almost impossible, in my opinion, to eliminate the risk of suicide in even the most apparently "mild" depression.) If such cases are reluctant to come into hospital for the necessary one to three weeks' treatment, E.C.T. can be given in the out-patient department. In such cases I usually asked the patient to report fasting at 9 a.m., and to remain in the hospital for lunch. One can then make sure that they do not suffer from any significant confusion or amnesia before allowing them to travel home.

Dr. Garmany dislikes leucotomy, but I am sure he will admit that there is a place for it when all other measures have obviously failed. In the latter category I would include a prolonged course of insulin coma therapy, which, in my experience, may have a profoundly beneficial effect in recurrent and resistant manic-depressive conditions, and also in some paranoid conditions. For "anxiety states" (by which I presume Dr. Garmany means uncomplicated "anxiety hysteria"), Dr. Garmany rightly withholds E.C.T., which in any case would be quite valueless. But he does not mention suggestion, to which, if the diagnosis is correct, these patients should immediately respond.—I am, etc.,

Pinner.

ROBERT THOMPSON.

Childhood Malignancies

SIR,—I have read with great interest the paper by Dr. Alice Stewart and her colleagues on a survey of childhood malignancies (*Journal*, June 28, p. 1495). If one believes rightly that myelocytes in leukaemia grow locally from the reticuloendothelial apparatus and other connective tissues, the whole question is reduced to the problem of malignant changes induced by local radiation of x rays, either for diagnostic or therapeutic purposes, everywhere in the body. It is unnecessary to assume that the bone marrow must be irradiated in leukaemia, which would need a bigger dose to penetrate the bone than is used in diagnostic radiology as a rule.—I am, etc.,

Cordoba, Argentine.

P. BUSSE GRAWITZ.

Halothane Concentration

SIR,—There appears to be an attempt to defend what must surely be a retrograde step—namely, the use of a Rowbotham bottle in a circle absorption system. I have shown (*Journal*, May 17, p. 1180) that this practice trebles the resistance in a circle system to a figure of 13 mm. Hg using an 80-litres-per-minute gas flow. It should be borne in mind that in the event of coughing or straining gas flows of up to 600 litres per minute may occur. Dr. Herbert C. Newman (*Journal*, June 14, p. 1417) estimates that the work of breathing is increased by 15% by the bottle, after assuming that respiratory patterns are similar in anaesthetized and conscious subjects. It is generally held that inspiration is shortened during surgical anaesthesia, so that an increase of 30% might perhaps be a more appropriate estimate.

The quiet breathing that usually occurs during halothane anaesthesia is used as an excuse for the practice, but this has its own dangers. Dr. F. R. Gusterson (*Journal*, June 7, p. 1356) quotes a patient with a minute volume of 3,600 c.c., a low figure even by the endotracheal route, suggesting respiratory acidosis. Some absorption systems do not function efficiently at such low volumes. I reproduced the

conditions described using a Coxeter-Mushin Mk. I unit, fresh soda-lime, and spirometric control. The inhaled mixture analysed by the B.O.C. analyser contained 2% carbon dioxide.

There is only one thing to be said in favour of this use of the Rowbotham bottle, and that is that it is virtually incapable of delivering a lethal concentration of halothane vapour; otherwise the larger bottle mentioned by Dr. C. G. Blakeley (*Journal*, July 26, p. 249) would clearly be more suitable. If, however, the anaesthetist is content to use an unknown concentration of the vapour, almost the same conditions as those supplied by the Rowbotham bottle can be achieved by placing 20 c.c. halothane in the standard ether vaporizer on a circle system, having first unscrewed and removed the copper baffle. But halothane tends to ruin the apparatus.

At this stage in the evolution of halothane anaesthesia I suggest that what is required is an economical method of using the drug, but with a check on the concentration used. I have been using such a method for some time now with satisfactory results. By a simple modification of the standard "trilene" bottle a known concentration of halothane is delivered with nitrous oxide and oxygen at a fresh gas flow of 1-2 litres per minute into an absorption system. Employing halothane in a concentration of 2%, the consumption is about 10 c.c. per hour, at a cost of around 10s. I will offer this for publication shortly.—I am, etc.,

Chislehurst.

REFERENCE

PROCTOR, D. F., *Dis. Chest*, 1952, 22, 432.

JOHN BULLOUGH.

Anorexia Nervosa

SIR,—I read with interest Dr. E. Williams's remarks (*Journal*, July 26, p. 190) on the treatment of anorexia nervosa by intubation. In this unit we have given protein-fortified milk feeds by intragastric drip, the patient receiving 2,000-3,000 calories daily. Even with this method the patient requires constant supervision; the drip may be disconnected and milk poured down the sink or else vomited. This behaviour is if the patient is allowed up to toilet. This behaviour is the central issue in anorexia nervosa: food to such patients is intolerable, and to avoid eating every conceivable device is used—even to the death. I know of one patient who when admitted in *extremis* whispered, "You won't make me eat, doctor, will you." It is this repugnance for food which has led many investigators to see a psychological aetiology upon which specific treatment could be based. Other psychological factors have to be taken into account. It is possible for the nursing staff to become demoralized in the presence of these patients, who evoke considerable anxiety and hostility by their refusal to eat. Attitudes initially therapeutic eventually become punitive. The detriment of the patient's condition, unless the physician is prepared to discuss each individual case with the nursing staff and give all possible support.—I am, etc.,

Manchester, 13..

LINTON GRIMSHAW.

SIR,—In his article on anorexia nervosa (*Journal*, July 26, p. 190), Dr. Eirian Williams appears to imply two important opinions although he never makes either of them explicit. (1) anorexia nervosa is a somatic disorder, with no important psychological aspects; (2) tube-feeding is not merely symptomatic treatment, but is also curative. These opinions are at variance with current views on the subject and require strong proof.

Certain points should be noted in regard to Dr. Williams's material. (1) The follow-up periods of the treated and untreated groups are not comparable, and in the treated group two patients (cases 52 and 53) have had hardly any follow-up. The average follow-up period for the untreated group was almost four times that of the treated group. (2) The seven untraced patients, and the patient whose relatives

refused to give information, should be omitted, but Dr. Williams seems inclined to regard them as non-recoveries in the untreated group. (3) It is not clear that he uses the same criteria for recovery in the treated as in the untreated group, for he classifies as "well" a 15-year-old schoolgirl who is truanting from school, but not case 38, who is symptom-free and has regular periods, but is "undernourished." This handling of the material causes a bias in favour of the treated group.

Even if no correction is made for this bias, Dr. Williams's figures are as follows. *Recovery*.—"Treated" Patients: "Well," 6; "Not Well," 1. "Untreated" Patients: "Well," 19; "Not Well," 27. $\chi^2=3.2$ (using Yates's correction for continuity). This value fails to reach significance at the 0.05 level of probability. *Mortality*.—"Treated" Patients: Alive, 6; Dead, 1. "Untreated" Patients: Alive, 37; Dead, 9. These figures are very little different from random expectation. Dr. Williams has therefore failed to prove that tube-feeding benefited his patients in the long run.—I am, etc.,

Dundee.

JAMES H. BROWN.

SIR,—In the article "Anorexia Nervosa: A Somatic Disorder" (*Journal*, July 26, p. 190), Dr. E. Williams has expressed some views and made certain points which need comment. The author calls anorexia nervosa primarily a wasting disease and a somatic disorder. He produces no valid evidence for this, and, moreover, the fact that the patient deliberately avoids eating and actively resists feeding casts grave doubts on the author's suggestions. He says that confusion in treatment of this disorder is due to the mystery surrounding its aetiology, which was at one time explained in superficial but understandable terms. I do not believe there is any mystery about its aetiology—indeed, there is confusion about it, and this is a sad reflection of our ignorance about the illness. But, while awareness of one's ignorance can be heuristically stimulating, acceptance of superficial and unfounded, though easily understandable, explanations may have the reverse effect.

The author is right in drawing attention to the urgency of treatment and the dangers of marked wasting leading to death. Although intubation has been successful, it is clear that fair success has also been achieved in patients who did not receive this treatment. Lately rauwolfia alkaloids (reserpine) appear to have proved promising in dealing with not eating and weight loss. They deserve a trial even though they have no deterrent value. Speaking of treatment by psychiatrists, the author says, "Psychiatrists almost without exception consider psychotherapy the appropriate treatment." I do not know on what experience or authority this statement is based, which is in any case not in accordance with facts. The author discusses the works by Kay and Leigh,¹ who do not think psychotherapy the suitable treatment. Use of rauwolfia alkaloids for anorexia is another example. This, however, does not mean to imply that psychotherapy is invalid.

Lastly, the author appears disturbed that the treatment of this disorder has strayed into the realms of psychiatry, and he is trying to make a case against this situation. Among the causes he gives for this straying are the discouraging results of treatment based on general medicine principles, and the tendency of anorexia nervosa sometimes to simulate psychoses. As for the former, I do not know how the principles of treatment in psychiatry differ from the principles of general medicine—I should have thought that they were the same. Secondly, simulation of psychoses in anorexia nervosa is only occasional.

In conclusion this appeal seems not only unwarranted but a dangerous one, because it reflects a thinking aimed at artificial division of illness into somatic and psychological. The overlapping influence of somatic, psychological, and environmental factors in the causation of cures of disease is so vast and varied that any approach short of a multi-dimensional one is not only likely to be of disadvantage to the patient but dangerous to one's own thinking.—I am, etc.,

Coulson, Surrey.

N. H. RATHOD.

REFERENCE

¹ Kay, D. W. K., and Leigh, D., *J. ment. Sci.*, 1954, 100, 411.

Apathy About Public Health

SIR,—In an annotation on shoe-fitting fluoroscopes (*Journal*, June 14, p. 1404) certain Home Office requirements for their continued use were quoted. It implies that old, possibly dangerous, machines may be used for yet another five years, until July 1, 1963. To have a shoe-fitting fluoroscope or not has been discussed already.^{1,2,3} The important fact remains that Dr. E. D. Dyson² carried out his observations on well-constructed, adequately screened machines, but what of others? These can carry on apparently for the next five years. And no doubt they will be used by many customers.

I have recently attended a course of social medicine from which it would appear that official and public apathy occurs all too frequently. The Children Act of 1908, para. 15, requires the use of fireguards on open fire grates where there are children under the age of 7. However, to fix guards on electric, gas, and oil fires was not made law until the 1953 Heating Appliances (Fireguards) Act.

A Royal Commission on Tuberculosis, sitting in 1901–11, published interim reports in 1904 and 1907 from which it became clear that human and bovine tubercle bacilli were morphologically the same. In 1909 an appendix was issued describing the risk of human infection via the milk of a tuberculous cow. This was confirmed in the Commission's final report published in 1911. Further recommendations were made suggesting the prohibition of tuberculous persons in dairies.

The General Powers Act, 1907, had given the L.C.C. the right to examine the milk supplies for London. In a report of the M.O.H. to the L.C.C. for 1909, quoted in *The Times* of July 13, 1911, it was stated that 10.4% of random milk samples proved to be tuberculous. Although the supply of diseased milk could be stopped going to London there was no law to prevent the tuberculous cows being disposed of to another owner.

By 1911 there was abundant evidence of the danger of tuberculous milk. And in 1914 the Milk and Dairies Act was passed. This prohibited both the sale of milk from tuberculous cows and the employment of tuberculous persons in dairies. It was to be put into effect in 1915. The Milk and Dairies (Consolidation) Act of 1915 consolidated various enactments relating to milk and dairies, and as a result of the Great War, 1914–19, the Milk and Dairies (Postponement) Act, 1915, was passed, stating that the Act should be put into effect not later than one year after the end of the war. Yet in 1922 further legislation, the Milk and Dairies (Amendment) Act, postponed it until 1925, which was fourteen years after the final report of the 1901–11 Royal Commission.—I am, etc.,

Edinburgh.

J. K. STUART BELL.
Medical Student.

REFERENCES

- ¹ *Brit. med. J.*, 1950, 2, 565.
- ² *Ibid.*, 1956, 2, 269.
- ³ *The Hazards to Man of Nuclear and Allied Radiations*, Medical Research Council, 1956. H.M.S.O.

Electrified

SIR,—The experience described by Mr. L. H. Pimm (*Journal*, August 9, p. 390) is familiar to me. In the performance of hundreds of formal medical examinations a year I have come to expect it to occur perhaps once in three months and in the manner described, except that in my case the gap bridged by the spark is so small as to give the impression that it coincides with touch. Being unable to explain the phenomenon, it is my custom to ignore it when it occurs, but once, when the contact was finger to chin, the patient observed, "Good heavens, was that you?" And on another, quite recent, occasion the spark discharged from my finger-tip to the patient's bare shoulder, causing him to jump. On asking him why he had jumped he replied that "something pricked me." These reassurances confirmed the reality of the sensory and auditory impressions I had received.—I am, etc.,

Deal.

W. B. ROANTREE.

Prednisone and Nasal Allergic Disease

SIR,—Since a previous letter by one of us (H. J. S.) was published in the *Journal* of February 16, 1957 (p. 398), on the use of oral "prednisone" in the treatment of chronic nasal allergy and polyposis, planned courses of treatment have been completed in a further 28 adults who could all be said to be allergic veterans. The drug was given in tablet form, a typical course being 5 mg. three times daily for 1–2 weeks and then a minimum maintenance dose for a variable period. The length of treatment varied from 3 to 12 weeks, the average being 8 weeks. In many patients the maintenance dose was found to be only 5 or 2.5 mg. daily. Side effects were mild and occurred in only two patients. One developed an erythematous rash on the face accompanied by frequency of micturition and some abdominal distension. The other patient was temporarily nauseated, but without other symptoms or signs.

The average duration of follow-up after completion of treatment has ranged from 3 to 8 months. Out of the 28 patients treated, 22 showed marked subjective and objective relief during treatment; and of these, 14 have relapsed after variable periods, leaving eight patients in whom relief has so far persisted. It is felt that, despite a high rate of relapse, the rapid response to small doses of oral "prednisone" by the majority of patients with severe nasal allergy justifies its use in selected cases. A full report is to be published in the *Journal of Laryngology and Otology*.—We are, etc.,

H. J. SHAW.

B. P. SCRIVENER.

London, W.C.1.

Human Factor in Diagnosis

SIR,—Dr. C. P. E. Elliott-Binns is to be congratulated upon his excellent article on the human factor as a cause of delay in diagnosis in general practice (*Journal*, August 2, p. 271). Since the patients he describes are presumably his own, he is to be particularly congratulated upon his fearless honesty in describing them so clearly. There are several observations I would like to make in an endeavour to orientate the article still more clearly. Non-general practitioners should not assume that the good general practitioner may be evaluated by the alacrity with which he diagnoses disease causing structural change. Although it is to be hoped that he will recognize these diseases at the earliest opportunity, it is necessary to remember that the family doctor has continued care of the whole person—not specific care for a physical disease. The human factor, which Dr. Elliott-Binns points out is important, is of such supreme significance in general practice that it is essential that a good general practitioner shall have become conscious of it and shall have attempted to adapt himself to it.

May I suggest that three principles to follow are: (1) Never to "dabble" with patients or illness. If the doctor is confronted with an apparently trivial illness in irritating circumstances (and this is a common experience), such as Case 2 in the article, a safety system should automatically be put into operation. This may be to take a deep breath, re-enter the house, sit down, pause, and examine the affected part carefully: alternatively, it may be to arrange to see it at the next visit (and to place the onus for remembering upon the patient). In general, time is saved and irritation avoided by giving thorough attention to the aspect of the patient rather than superficial attention to much of him. For example, a careful history alone may be superior to a casual one incorporating shoddy examination. Similarly, thorough examination of the chest alone may be superior to casual examination of the whole patient. (2) To exercise special caution with friends, relatives, social contacts, and "untouchables." If the doctor finds that the human factor causes him embarrassment or impairs his efficiency in attending such people, he should make special efforts to overcompensate his natural reaction, or alternatively refuse, with necessary explanation, to attend them. (I know a hospital sister whose carcinoma of rectum was diagnosed late because her attendant was reluctant to make a rectal examination.) (3) To attempt to synthesize in each patient the personal relationship to him (which is essential) with the impersonal detached understanding of him.

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CORRESPONDENCE

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Obituary

H. A. SANDIFORD, M.C., M.B., D.P.H.

Brigadier H. A. Sandiford, who died suddenly at his home at Windsor on August 13, aged 66, was the first medical director of the Commonwealth Medical Advisory Bureau and of the International Medical Advisory Bureau of the B.M.A. He retired from this appointment at the end of last year on reaching the age limit. Before joining the staff of the B.M.A. he had had a distinguished career as a regular officer in the R.A.M.C., culminating in his appointment as the first Director of Army Psychiatry at the War Office. At B.M.A. House he quickly established himself in the affections of his colleagues, and, being the fortunate possessor of an outstandingly genial personality, he added to his many friends through his efforts on behalf of the overseas visitors who consulted him at the Bureau.



Hugh Arthur Sandiford was born at Manchester on May 26, 1892, and was educated at Manchester Grammar School and at the University of Manchester, where he graduated M.B., Ch.B. in December, 1914. In the following month he entered the R.A.M.C. for service in the first world war. He was awarded the Military Cross in 1917 in circumstances officially described as follows: "He took up a position immediately behind the front line during an attack and dressed the wounded in the open. He displayed great coolness and gallantry under heavy artillery fire, working in an exposed position for forty-eight hours." Sandiford decided to make the Army his career, and for fifteen years or so was employed in all branches of clinical medicine and in general medical administration. He took the Cambridge D.P.H. in 1925, and as a hygiene specialist he was, from 1933, successively instructor at the Army School of Hygiene, Deputy Assistant Director of Hygiene at Peshawar, Assistant Director of Hygiene at the War Office, and Deputy Director of Hygiene in the Eastern Command. In the assessment of physical fitness he had a wide experience, and he was one of the first to grasp the importance of devising efficient methods of selection. His last military appointment gave him an opportunity to display his ability in this respect. The second world war had run half its course when, in 1942, he was invited to assume the post of Director of Army Psychiatry at the War Office. In his case it was more than just filling an appointment: he had to create the whole structure of which he had been nominated as the first director. In this complex and difficult task he was highly successful. Although not trained to be a psychiatrist, he had acquired in the course of his career a good knowledge of psychiatry and its social applications.

An extremely hard worker, very painstaking over detail, he never lost sight of the wood for trees. As Director of Army Psychiatry he had to establish liaison with the Emergency Medical Service, the Board of Control, and the medical superintendents of civil hospitals, and during his period at the War Office from 1938 to 1946, when he retired from the Army, he worked in close contact with many of the senior medical officers of the Dominions and Allied medical services. He had a very keen mind and was a shrewd judge of character, but his kindly manner and

Lastly, I think that Dr. Elliott-Binns, in trying to establish his case, has been unnecessarily hard upon himself, and in some of the cases he describes the disease was doubtfully possible of diagnosis earlier: in one, the hospital doctors also had difficulty. I think those of us who can see (and we are growing in numbers daily) the extreme importance of the human factor in general practice should labour to avoid overstatement of our views. We should attempt to integrate this factor into the accepted framework of the medicine we were taught to practise in hospital. Dr. Elliott-Binns has shown clearly that our problem as family doctors is the synthesis of these two strong and sometimes conflicting forces. It is only by writing about them, clarifying and discussing them, that the synthesis will be achieved, and to the great benefit of our patients.—I am, etc.,

M. H. S. BOUND.

St. Peter Port, Guernsey.

Psoriasis of the Mouth

SIR,—Dr. W. W. Gunther, of Newcastle, Australia (*Journal*, August 2, p. 327), asks if it is not possible that some cases of lichen planus of the mouth could have been psoriasis. Psoriasis of the mouth, although not very common, is also not very rare. At the Royal Dental Hospital mon, is also not very rare. The oral of London we see quite a number of these cases. The oral lesions more often than not attack the upper surface of the tongue and look very much the same as the lesions of the skin—i.e., the central scale with the surrounding reddened ring spreading outwards—and usually occur in conjunction with the general skin condition. Lesions also occur on the buccal mucosa and are not quite so typical, making it possible to mistake them for lichen planus. It is my experience that some form of irritation—jagged tooth or ill-fitting denture—originates the condition. These cases are treated in the electrotherapy department by means of concentrated actinic rays (the titanium arc lamp) with most satisfactory results.—I am, etc.,

London, W.1.

ROBERT LEAVER.

Coudé Catheter

SIR,—In volume 6 of the winter number of *The Leech*—the journal of the Cardiff Medical Students' Club—there appeared an article on Emile Coudé, 1800–70, a surgeon of Niort, France, who, it was alleged, invented, and in 1835 published an account of, the coudé catheter. This biography was written in a serious and restrained vein, and was replete with two references, one to the autobiography of Emile Coudé, and another to *Le Mois Medical* for a description of the invention. In addition, the article contained a reproduction of a woodcut purporting to be a likeness of the inventor.

We have been able to prove that the whole of this article is a fabrication, and the references are fictitious. To expose this deception is of practical importance. As a result of this hoax, a number of pages of the 11th edition of *A Short Practice of Surgery* that were passed for press have had to be reset in as far as the capital "C" of Coudé is concerned, and biographical footnotes to Emile Coudé deleted. To save others from falling into this mire, we hope that you will publish this letter. The coudé catheter was invented by Louis Mercier, 1811–82, the eminent Paris urologist, so well known for his description of the coudé ureteric bar. Mercier announced the invention of the coudé catheter in 1836 and of the bi-coudé catheter in 1841. Being translated, *coudé* (the adjective) means bent; *coudé* (the noun) means elbow.—We are, etc.,

HAMILTON BAILEY.

W. J. BISHOP.

Editor, *Medical History*.

A. CLIFFORD MORSON,

President, *Société Internationale d'Urologie*.

Sholden, Kent.

friendly nature made him the most approachable of men. He was respected and liked by all who worked under him, as well as by those who worked with him. In 1933 he was appointed an officer of the Venerable Order of St. John of Jerusalem, and a few months before he retired from the Army he was appointed an Honorary Physician to the King.

In 1947 the British Medical Association decided to establish an Empire (now Commonwealth) Medical Advisory Bureau to assist members of the profession coming to Great Britain from the Dominions and Colonies for postgraduate study and other purposes. Out of well over 100 applicants for the post of medical director of the new bureau, Sandiford was selected. With so many applications to consider, the work of the Staffing Committee was by no means easy; but subsequent events proved its choice to have been an exceptionally wise one. Once again Sandiford was asked to start from scratch and to create a department, and once again he proved to be the man for the task. With his splendid gifts for organization and enviable capacity for getting on well with all sorts and conditions of men, he took the work of establishing the Empire Medical Advisory Bureau in his stride, and soon developed a service which as time went on became of increasing value—a service which included advice on postgraduate courses and diplomas, examinations, hospital appointments, part-time employment, visits to hospitals and clinics, medical registration, and accommodation. His help in connexion with accommodation was of particular value, especially during the early years of the Bureau's existence, when the housing problem in the United Kingdom was most acute. The pamphlet he prepared containing a summary of the regulations for diplomas and courses of instruction in postgraduate medicine obtainable in the United Kingdom was a most useful one and is much used by the deans of medical schools in the Commonwealth and elsewhere. His help and advice to correspondents and those who visited his office will be remembered by many with real gratitude.

Sandy's friendliness and good nature shone like a bright light over the Bureau's "At Homes" to overseas visitors. At these functions, as in his career in general, his wife gave him most valuable and devoted support. They had three children, and their family life was of the happiest. Their son, Dr. R. H. Sandiford, is in practice in Newport in the Isle of Wight, and one of their two daughters, herself a trained psychologist, is married to Dr. T. Grygier, head of the department of clinical psychology and research at Banstead Hospital.

Mr. A. M. A. MOORE, chairman of the Commonwealth Medical Advisory Bureau, writes: The sudden death of Brigadier H. A. Sandiford so soon after his retirement has brought great sorrow to a host of friends throughout the British Commonwealth. With his passing the medical profession is deprived of a very distinguished member, and many doctors have lost a loyal and good friend. Ten years ago, after a distinguished career in the R.A.M.C., he was chosen from over 100 applicants for the post of director of the newly formed Empire Medical Advisory Bureau. During the presidency of Sir Hugh Lett the Council of the Association decided to establish an advisory bureau to assist members of the medical profession coming to this country from the British Commonwealth for postgraduate studies, and it was left to Brigadier Sandiford to build up this new department. His Army experience of organization was to prove of the greatest value in this work, and in a very short period he succeeded in building up the framework of the bureau as we know it to-day. He was a delightful colleague with whom to work, and the members of his staff came to regard him with the greatest affection. His work brought him into the closest contact with Sir Hugh Lett and with Mr. L. R. Broster, who were the first two chairmen of his management committee, and he spent much of his time developing friendly contacts with the leaders of the medical profession and with the universities in this country. In addition, he developed the International Medical Advisory Bureau, which provides a useful service

for doctors from other countries. At the time of the Hungarian tragedy Brigadier Sandiford was given the responsibility of organizing the relief service provided by the B.M.A. for the many refugee Hungarian doctors who came to Britain. He also served on the Lord Mayor's committee dealing with this problem and developed the keenest personal interest in these unfortunate doctors, whom he was able to help in a great many ways. In all his work for the Bureaux, which has brought so much good will to this country from members of the medical profession abroad, Sandy was loyally assisted by his very charming wife, known to so many friends as Prue, and our heartfelt sympathy goes out to her in the tragic loss she has sustained. In the Bureaux Sandy has left a monument by which he will always be remembered.

Dr. D. P. STEVENSON, Deputy Secretary of the B.M.A., writes: The news of Brigadier Sandiford's death so soon after his retirement from the Headquarters staff of the Association has come as a very sad blow to his many friends at B.M.A. House. Sandy—as he was known to us all—joined the Headquarters staff in March, 1948, as the first director of the Empire (now Commonwealth) Medical Advisory Bureau, and immediately set about his new task with characteristic drive and enthusiasm. The annual reports that he made on the work of the Bureau are themselves evidence of how this new venture of the Association has helped to cement friendship between doctors in this country and those overseas, and its success was largely due to Sandiford's outstanding personality and leadership. At Headquarters Sandy will always be remembered as a friendly colleague whose charm, cheerfulness, and enthusiasm for the work he was doing were an inspiration to us all. It is tragic that after such devoted service to his profession his retirement should be cut so short, and we extend our deepest sympathy to his widow, his son, and his two daughters.

G. R. H. writes: It is no secret that in the last war senior regular Army medical officers did not always inspire affection and respect among civilian specialists serving in the R.A.M.C. under their direction. It is not surprising, therefore, that when Sandiford was appointed as the first Director of Army Psychiatry many psychiatrists were critical of the choice of a regular officer without specialist experience for the job. But those of us who had the opportunity of working closely with him realized rapidly how wise Sir Alexander Hood's choice had been. In leaving an Assistant Directorship of Army Hygiene to become the first Director of Army Psychiatry Sandiford gave up a career that would have taken him to the top of his specialty, but what his own specialty lost Army psychiatry gained. He was not only a good "public health man" but a wise and shrewd administrator of a clinical service who set out to give the clinician the opportunity to do good work. More than that, working with him was for many of us the first close contact we had had with the practitioner of preventive medicine. It had a lasting effect on the viewpoint of many of us, and was one of the important influences which contributed to the growth of interest in recent times in the social and preventive aspects of psychiatry, although he was much too modest to have realized it. He was a calm, gentle, friendly man, who remained unruffled by crises, yet was capable when necessary of a firmness and determination which one might not have suspected until one had provoked it. I am sure that all who worked closely with him in the early days of Army psychiatry will think of him, as I do, with admiration and affection.

Mr. D. C. BOWIE writes: It is sad that Brigadier Sandiford was not spared longer to enjoy the period of retirement in his new house to which he had looked forward and which he would have enjoyed so much. It was after the war that I found him installed as Medical Director of the British Medical Association's Empire (later Commonwealth) Medical Advisory Bureau. The Bureau had many facets to its activities and very many overseas medical men and women

have had cause to be grateful to the organization he built up so painstakingly for help and information of all types, but it was in the field of postgraduate medical education that I came into formal contact with him. The details of our numerous consultations do not matter, but the fact that he established a co-operative relationship with an academic body such as the British Postgraduate Medical Federation as he did with other university bodies in the United Kingdom showed that he was alive to academic values as well as to the day-to-day needs of his medical visitors. In turn, he had a store of information and knowledge of people all over the country which were most valuable to medical visitors who wanted to see something of medical practice of all kinds during a holiday visit to this country and whom we were able to refer to his capable hands. I was often privileged to enjoy the hospitality of the Bureau when he was Director at its regular parties, when he sought to bring together and make welcome visitors from overseas and representatives of the profession in the United Kingdom, and it always was a pleasure to see his obvious interest in and knowledge of his guests. On these occasions he was most ably and charmingly aided by his wife, who will have the sympathy of a multitude of people in the untimely loss she has sustained.

Dr. J. J. GARD, Chief Medical Officer, Australia House, writes: All Australians who have been privileged to meet and appreciate the admirable qualities of the late Brigadier Sandiford during his 10 years' association with the Commonwealth Medical Advisory Bureau will be grieved to learn of his passing. His friendly welcome, personal charm, and genuine interest in the welfare of those who sought the assistance of the organization will be long remembered. One must pay tribute to the splendid liaison that the Bureau under his guidance has established with the various institutes, colleges, and faculties which has contributed so much to the advance of postgraduate education. Under his personal guidance the organization has contributed greatly to the welfare of overseas postgraduate visitors. He has rendered generous assistance in the pressing problems of accommodation and assimilation. His own personal efforts so ably assisted by his staff in arranging introductions to fellow students and prominent members of the profession in Britain by those periodical social gatherings has greatly contributed to the successful accomplishment of the aims of the organization. I have on several occasions been privileged to be a guest at these functions and have a sincere personal appreciation of Brigadier Sandiford's magnificent contribution to the development of medical education and mutual understanding between practitioners from every part of the British Commonwealth.

Sir KENNETH GOADBY, K.B.E., M.R.C.S., L.R.C.P.
L.D.S. R.C.S.

Sir Kenneth Goadby, who died at Walton-on-the-Hill, Surrey, on August 10 at the age of 85, was both medically and dentally qualified. During the early part of his career he was a bacteriologist with a special interest in oral hygiene. Later he became an expert on industrial poisoning. For many years past he had practised as a physician in Harley Street.

Kenneth Weldon Goadby was born at Gravesend, Kent, on March 7, 1873, the son of the Rev. J. J. Goadby, and was educated at Henley-on-Thames Grammar School and at the University Extension College, Reading. He received his medical training at Guy's Hospital, qualifying first as a dental surgeon by taking the L.D.S. of the Royal College of Surgeons of England in 1896. Four years later he obtained the M.R.C.S., L.R.C.P., and in 1901 he took the D.P.H. of the University of Cambridge. From 1899 to 1902 Goadby worked as a bacteriologist at Guy's Hospital, and in 1900 he was awarded the John Tomes Prize of the Royal College of Surgeons of England for original dental research worthy of special recognition. From 1902 to 1912 he was

lecturer in oral hygiene at the London School of Hygiene and Tropical Medicine. In 1904 he was appointed lecturer in bacteriology at the National Dental Hospital, and in 1907 delivered the Erasmus Wilson lecture on pyorrhoea alveolaris, and in 1911 a Hunterian lecture on the association of diseases of the mouth with rheumatoid arthritis and certain other forms of rheumatism, both before the Royal College of Surgeons of England. When the British Medical Association met at Oxford in 1904 he acted as one of the honorary secretaries of the Section of Dental Surgery, and he served as a vice-president of the same section at the Annual Meeting of the B.M.A. at Exeter in 1907.

In 1913 Goadby was appointed medical referee for industrial poisoning in the County of London. He had previously reported to the Home Office on the operation of the Phosphorus Rules for match factories, and he was a member of the departmental committee which investigated the causes and pathology of lead poisoning. During the first world war he was honorary bacteriological specialist for vaccine therapy at the Royal Herbert Hospital, Woolwich, and a member of the War Office committee for the study of tetanus. At this time he published several papers describing the results of his research on the bacteriology of war wounds. He was also a member of the advisory committee to the Secretary for Mines at the Board of Trade on conditions in metalliferous mines. For his services during the war he was appointed K.B.E. in 1918. His publications included *Mycology of the Mouth* (1903), *A Manual of Industrial Lead Poisoning* (with T. M. Legge) (1912), and *Diseases of the Mouth and Oral Mucous Membrane*, the fourth edition of which appeared in 1931. A former president of the Scientific Film Association, he served as a member of the B.M.A.'s Film Committee in 1951.

Sir Kenneth Goadby married Constance Eva, daughter of Mr. G. Olding, in 1898, and had one son, who is a physician at St. Thomas's Hospital.

M. A. SMITH, M.R.C.S., L.R.C.P.

Dr. M. A. Smith, who in the early years of this century was medical officer to the British Legation at Bangkok and physician to the Court of Siam, died at his home at Ascot on July 24, aged 82. A zoologist of international renown, he was an authority on reptiles, being first president of the British Herpetological Society.

Malcolm Arthur Smith was born in 1875 and was a medical student at Charing Cross Hospital, qualifying in 1898. After holding the posts of house-physician and house-surgeon at Charing Cross he went out to the Far East, first to Singapore and then to Bangkok, where he was medical officer to the British Legation and physician to the Court of Siam. His knowledge of the reptiles of the Far East was prodigious, and he was one of the leading British herpetologists. His book, *The British Amphibians and Reptiles*, is the standard work of reference on the subject, and he published a great number of papers in zoological and other journals. He described his years in Bangkok in a book which appeared in 1946.

Dr. Smith returned to Britain in 1925 and worked for a time at the Natural History Museum. The first president of the British Herpetological Society, he was editor for some years of the *Zoological Record* and zoological secretary of the Linnean Society.

Dr. H. A. REID writes from Penang: Dr. Malcolm Smith, who was generally recognized as the foremost world authority on sea-snakes, was in his 80th year when I had the privilege of first meeting him. At a memorable lunch in his charming Ascot house he recalled with fascinating clarity his earlier work some 40 years previously when he was physician to the Court of Siam and the British Legation at Bangkok. A keen naturalist, he had already contributed a number of distinguished papers on reptiles of the Far East, when he paid special attention to the sea-snakes. He visited many remote fishing villages in Thailand and made a large

collection of sea-snakes which he presented to the British Museum (Natural History). Subsequently he visited all the great museums of the world, collecting information for his classical monograph on the sea-snakes published in 1926. His collection of prepared sea-snake skulls—also presented to the British Museum (Natural History)—must be the finest in the world. A most unassuming and charming man, he retained his intellectual vigour to the last. His writing and conversation were delightfully clear, precise, and to the point. His book on the reptiles of the Far East (Volume 3, *Serpents in the Fauna of British India, Ceylon and Burma including the whole of the Indo-Chinese subregion*.—*Reptilia and Amphibia*, 1943, London) was another classical work—unfortunately now out of print. His death is a great loss to zoology and to his many friends throughout the world.

GEORGE HALL, M.D., F.R.C.S.C.

Dr. George Hall, who was in general practice at Montreal for very many years, died there on June 20. He was 85 years of age.

George Hall was born at Ethel, Ontario, in 1872, and was educated at Riverside School, Montreal High School, and at the University of Bishop's College. Graduating M.D., C.M. from the University of Montreal in 1896, he held the post of house-physician at the Western General Hospital, Montreal, and then came to Great Britain, obtaining the Scottish triple qualification in 1898. A year as an assistant in general practice at Pitlochry, Perthshire, followed, before he returned to Canada to establish himself in general practice at Point St. Charles, in the province of Quebec. Later he moved to Montreal. For some years he was demonstrator in histology and lecturer in physiology in the University of Bishop's College. In 1905 he was granted the degrees of M.D., C.M. *ad eundem*, of McGill University. His chief interest in his long professional career lay in the field of obstetrics, and for many years he examined in the subject for the College of Physicians and Surgeons of Quebec. It was as an obstetrician that he was admitted a Fellow of the Royal College of Physicians and Surgeons of Canada in 1945. A keen member of a number of local medical societies and of the British Medical Association and the Canadian Medical Association, he had the gratification of being presented to the annual general meeting of the C.M.A. in 1955 as the senior member for Quebec.

P. C. FENWICK, C.M.G., M.D., F.R.C.S.Ed.

Dr. P. C. Fenwick, who was director of the radio-therapeutic department of Christchurch Hospital, New Zealand, for a quarter of a century, died on July 5.

Percival Clennell Fenwick was born in London in 1870, the son of Dr. Samuel Fenwick, and was educated at University College, London, receiving his clinical training at St. Thomas's Hospital. He qualified M.R.C.S., L.R.C.P. in 1894 and obtained the London M.B. in the following year. Elected F.R.C.S.Ed. in 1900, he was granted the M.D. degree of the University of New Zealand in 1908, having previously been granted the degrees of M.B., Ch.B. *ad eundem*. After qualification he held the appointments of junior (later, senior) obstetric house-physician at St. Thomas's Hospital and clinical assistant at Brompton Hospital and the Evelina Hospital for Children, and he then acted as a ship surgeon for a time. In 1895 he was appointed assistant resident medical officer at Christchurch Hospital, New Zealand, becoming surgeon in the following year. From 1899 to 1902 he served in South Africa as a surgeon captain in the 2nd New Zealand contingent, and towards the end of hostilities was plague officer at East London. For his services he was awarded the Queen's medal with four clasps. He also acted as war correspondent for a New Zealand syndicate. He was in private practice at Wanganui from 1902 to 1906, and thenceforward until 1924 at Christchurch, where, from 1912 to 1924, he was honorary surgeon to the hospital, then becoming honorary consulting surgeon. He introduced the

use of radium to New Zealand medical practice, and in 1924 founded the radiotherapeutic department at Christchurch Hospital, of which he was in charge from that year until 1948. Serving throughout the first world war, with the rank of colonel, in Egypt, France, and Belgium, he was also in the first New Zealand boat to land at Gallipoli, leaving with the evacuation party. From 1916 to 1919 he commanded New Zealand general hospitals in England, No. 3 at Codford and No. 1 at Brockenhurst. For his war services he was appointed C.M.G. in 1916. Returning to New Zealand after the war, he was assistant director of medical services of the Southern Command in the Dominion from 1922 to 1926, and honorary surgeon to the Governor-General from 1925 to 1930. Soon after he settled in New Zealand he became an honorary life member, lecturer, and examiner of the St. John Ambulance Association, and from 1929 to 1937 was honorary chief commissioner of the Boy Scouts' Association in the Dominion. He was also a lay canon in Christchurch cathedral, and a justice of the peace. He was the author of *A History of Christchurch Hospital*, published in 1924, and *A Review of the Radium Department*, which appeared in 1927. He married Miss Nona E. Wright in 1903 and had one son and one daughter. Mrs. Fenwick died in 1938.

A. J. ORCHARD, M.B., C.M.

With the death of Dr. A. J. Orchard, Christchurch, New Zealand, has lost another well-known medical man. He had been in practice there for nearly sixty years, and died at Calvary Hospital on July 11 at the age of 83.

Albert John Orchard was born at Elmore, a country town in the State of Victoria, Australia, but moved to New Zealand with his parents in 1886. From Christchurch Boys' High School he entered Edinburgh University as a medical student, and graduated M.B., C.M. in 1896. He then returned to Christchurch, where he was in practice until a few weeks before his death and where he was formerly honorary surgeon to the public hospital. During the first world war he served as a captain in the New Zealand Medical Corps in England and at the front. When he returned to civilian life he became a foundation member of the Christchurch Returned Services Association, and for many years was one of the association's medical advocates before the War Pensions Appeal Board. A prominent member of the Methodist Church, he was for a long time chief medical officer of the church's supernumerary fund board. Keenly interested in cricket and, in later life, in bowls, he was president of the East Christchurch cricket club for fifty years: in fact, he was the club's only president from its foundation until his death. Genial and generous by nature, he gained many friends not only among his colleagues but among his patients also. The doyen of his profession in Christchurch, he gave of his best at all times, and his passing has deprived the community of the services of a dependable practitioner of the old school. His many years of practice were officially recognized in 1956, when he was appointed O.B.E. in the Birthday Honours list. He is survived by four sons and three daughters and his sister, Dr. Ethel A. Orchard, who is in practice in Christchurch. Two of his sons, Dr. David E. Orchard and Dr. Geoffrey Orchard, have followed him into the medical profession, and the latter was in partnership with his father.

G. F. LONGBOTHAM, M.B., C.M.

Dr. G. F. Longbotham died at his home at Middlesbrough on August 2. He was 87 years of age.

George Francis Longbotham came of a medical family, and was born at Seaton Carew, in County Durham, on November 9, 1870. He spent his boyhood in Middlesbrough, where his father was in practice and medical officer to what has now become the General Hospital. After going to Epsom College, where his love of athletics became apparent, and after a brief spell of training as a mining engineer, he graduated M.B., C.M. at Edinburgh University in 1892 at

the age of 21. He then held the appointment of house-surgeon at the North Riding Infirmary, Middlesbrough, receiving at the end of four years the unusual distinction of being presented with an illuminated address. After experience as an assistant in various practices, he started in practice in Middlesbrough, where he was to work for the rest of his career. He was appointed surgeon to the North Riding Infirmary, and played a considerable part in the organization and surgical work of the Carter Bequest Hospital, a small hospital open to all practitioners. When the Middlesbrough Maternity Home was opened he became its first consultant.

B. W. writes: By the death of Dr. Longbotham, Tees-side has lost one of its best-known and respected practitioners. In addition to running a busy practice, he did a large amount of surgery and obstetrics. He read widely and knew the works of Smellie well, and kept up to date. He was the first person in Middlesbrough to remove tonsils, he went to Manchester to see Fothergill do his repair operation, and he was doing lower-segment caesarean sections long before the operation was accepted everywhere in this country. In the first world war he served as surgical specialist at Catterick. He was particularly interested in the work of the Middlesbrough Maternity Home, and presented some of the equipment used there. He showed great kindness to his patients in the grim days of the Tees-side depression. Carrying on his surgical and obstetrical work up to quite recent years, he shared with his partners in the work of his large general practice up to a few months ago. He was a typical example of the best type of the old school of practitioner, hard-working and self-reliant, operating on patients in their homes if that seemed advisable. Though he saw clearly that times had changed and that more specialization had become necessary, he did not take kindly to some modern trends in medical practice. Finding relaxation in sport and athletics, he was a keen supporter of Association football in Middlesbrough, and up to quite recently attended athletic meetings and entertained visiting athletes. He found great pleasure in the athletic achievements of his sons, and his family life was a happy one, though he was saddened by the death of his wife a few years ago after a long illness. His son, Dr. Basil Longbotham, is well known in Middlesbrough, and continues in the family practice.

H. M. BERNCASTLE, M.R.C.S., L.R.C.P.

Dr. H. M. Berncastle, who died on August 4 at the age of 91, was formerly medical superintendent of the Croydon Mental Hospital (now Warlingham Park Hospital).

Herbert Melbourne Berncastle, the son of a doctor who had at one time practised in Croydon, was born on August 4, 1867, in Sydney. Before becoming a doctor in what he used to refer to as his "salad days," he followed a seafaring career. He trained in sail, obtaining a Board of Trade first mate certificate in 1890. He and the late Dr. Stephen Rowland were probably the last medically qualified holders of the square-rigged certificate. During the South African War he was the master of a vessel engaged in transporting troops to South Africa. At the age of 26 he became a medical student at Guy's Hospital, from which he qualified in 1899. After holding the post of house-surgeon at the Essex County Hospital at Colchester, he joined the medical staff of the Croydon Mental Hospital in 1903 as assistant to Dr. E. S. Pasmore, the first medical superintendent. On the death of Dr. Pasmore in 1927 Dr. Berncastle was appointed medical superintendent, a post he worthily held for eight years until his retirement in 1935.

W.H.S. writes: Dr. Berncastle will be remembered as being one of the kindest of men and a delightful person to know, possessing as he did originality of ideas and being an excellent raconteur. He maintained his interest in the Warlingham Park Hospital throughout his long retirement, and, indeed, until only two years ago, when increasing infirmity made this no longer possible, regularly attended the annual dinners. At the age of 90 he contributed an interesting article to the *Guy's Hospital Gazette* in which he

gave what he regarded as his secret of longevity. His wife died while they were living for a while during the second world war at Bournemouth, and he leaves three sons.

H. SINIGAR, M.D.

On August 8 Dr. Harry Sinigar died at his home at Gerrard's Cross in his 88th year. Many years ago he was asked by a friend whether his rather unusual surname was English. To this he replied, "Well, my people have been in Dorset for the last 700 years, to my knowledge," and went on to explain the origin of the name. They had been for centuries hereditary wardens at the Abbotsbury swanneries, and the Norman-French *cygne-garde* had been anglicized to Sinigar. His startling blue eyes, ruddy complexion, and blonde colouring suggested Saxon origin.

Harry Sinigar was born on August 27, 1871, in Birmingham, where his father, George Wintle Sinigar, was a corn merchant. From King Edward's School, Aston, he went on to study medicine at the old Mason's College, Birmingham, before the creation of the University; there he won an entrance scholarship. Thence he went to University College, London, and from there took the London M.B. with honours in 1895, having already qualified M.R.C.S., L.R.C.P. in 1893. He proceeded to the M.D. in 1898 and to the D.P.H. in 1902. He was house-surgeon at the Queen's Hospital, Birmingham. Then he became medical officer at the St. Marylebone Infirmary, now St. Charles's Hospital, Notting Hill. Here he attained the grade of deputy superintendent, but resigned to begin general practice at Southall, Middlesex. Eventually he was appointed a regional medical officer of the Ministry of Health. Essentially modest and unassuming, his friends knew that he was a practitioner of much more than average competence. For many years he lived at Gerrard's Cross, after his retirement; his garden and a game of bridge were his principal recreations. He was a staunch supporter of both the chief medical charities: Epsom College, especially, has reason to deplore his decease. He was unmarried.

P. P. DEBONO, O.B.E., M.D., F.R.C.S., D.P.H.

Dr. WILLIAM SPITERI writes: Professor P. P. Debono, whose obituary was printed in the *Journal* of August 9 (p. 392), was my colleague and treasured friend from childhood. We went to the same school and university in Malta together and we obtained our M.D. about the same time. Always a very zealous student, with a splendid memory and intelligence as well as wisdom, he passed with flying colours after two years the three-year course in science preparatory to the academical course of medicine, a feat never tried before. Peter Paul was always top dog at school and also at the university. At the final examination for the M.D. he came first with another colleague of ours, Dr. P. Xuereb. I tender my heartfelt sympathies to Mrs. Debono and all other relatives.

J. L. SHELLSHEAR, D.S.O., M.D., M.S.

Sir GORDON GORDON-TAYLOR writes: To the excellent obituary notice of Professor J. L. Shellshear which appeared in the columns of the *B.M.J.* of August 16 perhaps I may be permitted to add a further short tribute. Your correspondent alludes to "his infectious keenness in his department" in Hong Kong, but this was equally manifest in Sydney at the close of the 1939-45 war, and there must be many young surgeons of the many H.M. ships gathered in Sydney Harbour who still remember with gratitude how he threw open to them the doors of the anatomical department of Sydney University, and even held classes for those whose eyes were directed towards the distant goal of the Primary Fellowship in London. I have in my possession specimens of the notes which he issued to the young surgeon-lieutenants and lieutenant-commanders for their instruction. Till the

close of his life he retained a paternal interest in the anatomy department of Sydney, and only some months ago wrote to me of the great improvements in the teaching there under Professor MacIntosh. Not unnaturally he was proud of his beautiful city, and several lantern slides which he sent me of its harbour are in my hand as I write this farewell to my old friend "Joe" Shellshear.

Medico-Legal

A MISUNDERSTOOD PRESCRIPTION

[FROM AN EXPERT IN FORENSIC MEDICINE]

In February of this year a man of 64 was admitted to hospital for treatment of his hypertension. The routine for such cases was to give them, in the first instance, tablets of "ansolysen" (pentolinium tartrate). The senior house officer therefore wrote on the patient's treatment card "Ansolysen 40 mg. t.d.s." The method of administration was not otherwise stated. Of the two sisters in charge of the ward, one was on holiday and one off duty on the evening of February 13. The staff nurse on duty had no previous experience of treatment with ansolysen and, finding no tablets of ansolysen in the place where drugs for the ward were usually kept, but seeing a bottle of liquid ansolysen, she decided to give the drug by intramuscular injection. She accordingly injected 40 mg. of ansolysen at 6 p.m. Five minutes later the patient complained of abdominal discomfort and dizziness, his blood pressure could not be recorded, and, although treatment with mephentermine and noradrenaline did in fact raise his blood pressure to recordable levels for a short time, he died some six hours later.

Post-mortem examination showed the presence of a recent red blood clot, two inches (5 cm.) from the origin of the anterior branch of the left coronary artery. The pathologist gave the cause of death as coronary thrombosis following the administration of a hypotensive drug. In addressing the jury the coroner said: "You may think it is not beyond the bounds of human ingenuity that doctors give clearly and concisely which way a drug is to be used." The jury returned a verdict of death by misadventure.

Comment

The abbreviation "t.d.s." for *ter die sumendum* is an expression with which doctor, nurse, pharmacist, and many a lay person are perhaps all too familiar—the literal translation is, of course, that the drug should be "taken," not "given." Historically these abbreviations were used as instructions to pharmacists who translated them into English for the information of the patient, presumably to maintain the air of mystery and intellectual superiority of both professions. It is probably asking too much to expect a nurse to know the precise meaning of this abbreviation, and the suggestion of the coroner was that the further abbreviation "tab." should have prefixed the prescription and that this might have prevented the accident. On the other hand, if she was in doubt, the nurse could have asked the house officer, who was readily available, and also she did not know, as she should have done, that after 5 p.m. she could still obtain from the pharmacy drugs needed in the ward.

This case is another example of those misunderstandings which account for so many iatrogenic disasters—mega units are mistaken for thousands of units of penicillin, ounces of paraldehyde are confused with drachms, pure adrenaline is used instead of a dilution of 1 in 1,000. With the complete replacement of the Apothecaries' Weights and Measures by the Metric System, it is possible that even more confusion may occur in the future, and the time may well have come seriously to consider rationalizing the instructions for the administration of drugs.

The responsibilities of nurses are much greater now than 20 years ago, partly as a result of the introduction of potent new drugs, many of them given by injection. Ought we, then, to add to the unavoidable risks of therapy by clinging to traditional but possibly confusing abbreviations when writing prescriptions, or worse still by coining new ones? Is it not high time, in fact, that instructions for treatment were always written in plain English, and abbreviations altogether avoided?

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on August 2 the degree of D.M. was conferred on G. A. Rose, and the degree of B.M. on M. A. Pratelli.

The Medical Scholarship for 1958 has been awarded to Edmund Neville Hey, Scholar of Magdalen College, and the Theodore Williams Scholarship in Physiology for 1958 to William Ronald Aylett Muntz, Scholar of Worcester College.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly Comitia of the College, held on July 31, the President, Dr. Robert Platt, was reappointed the College representative on the governing body of the British Postgraduate Medical Federation; Dr. S. W. Davidson on the council of King's College, Newcastle upon Tyne (University of Durham); and Dr. R. E. Lane the representative of the three Royal Colleges and the Society of Apothecaries of London on the Industrial Health Advisory Committee for three years. Dr. C. E. Newman was appointed the College representative on the advisory board of education of the Royal College of Nursing.

Sir Russell Brain was appointed Harveian Orator and Professor A. Kekwick Bradshaw Lecturer, both for 1959.

The following Lecturers were also appointed: For 1959, Lumleian, Professor E. J. Wayne; Goulstonian, Professor W. S. Peart; Oliver-Sharpey, Dr. P. L. Mollison; Lloyd-Roberts, Sir Kenneth Clark; Humphry Davy Rolleston, Professor J. F. Brock. For 1960, Croonian, Professor D. E. Denny-Brown; FitzPatrick, Dr. K. D. Keele; Watson Smith, Dr. F. R. Bettley; Marc Daniels, Professor J. W. Crofton.

Dr. Saul Adler was admitted, *in absentia*, to the Fellowship of the College.

It was announced that the Murchison Scholarship for 1958 had been awarded to Dr. Lionel G. Whitby.

Licences

Licences to practise were conferred upon the following 125 candidates who had passed the final examination in medicine, surgery and midwifery of the Conjoint Board and who have complied with the by-laws of the College:

A. R. Adamson, R. Allay, A. J. R. Anderson, A. L. Ansdell, J. T. Aroney, J. S. Bailey, E. A. Bamgboye, J. E. Banatvala, M. D. Beagley, L. S. Bernstein, W. H. Bevan-Thomas, G. A. Bewley, W. M. Bodger, P. R. Brass, R. C. Bredday, P. D. G. Briggs, F. H. Brindle, M. H. Brooke, F. T. Brough, M. H. Bull, R. W. Burt, L. J. Burton, W. D. Callum, I. G. Carnegie Brown, I. G. Christie, P. W. Clements, D. L. Common, D. Connan, Edith M. Cooke, J. C. Couve de Murville, P. A. Cullum, T. O. Dada, Pauline M. H. Davidson, N. A. De Heer, Edna M. Dunn, A. J. Earl, R. J. Earlam, D. J. Eilam, R. C. Evans, R. J. Evans, R. E. Fallowfield, M. Fisher, H. J. L. Francis, P. Fursdon, H. A. Garfinkel, P. B. Garland, P. M. Geipke, J. M. Goyder, J. Grant, R. S. Greenwood, J. S. Grimshaw, A. C. Halliwell, J. D. Hardcastle, D. C. Harvey, A. L. Hovenden, Anne T. Irvine, Anne Jacques, S. A. Janmohamed, I. N. L. Johnston, Jane M. Jones, Winifred N. Kaine, N. B. Kirkland, Hilda Koilpillai, L. Kwasny, Andrea M. D. Langford, R. Larizadeh, N. K. Leiper, D. W. Lewis, C. M. Liassides, P. O. Liebling, M. Lindsey, Marion R. List, T. A. Lloyd-James, A. M. Lush, D. B. Macadam, B. J. T. McAvo, C. E. Macdonald, J. W. Mack, K. V. Mellor, D. Mercer, A. R. Molyneux, Pauline S. Monro, H. G. Morgan, G. Moses, I. S. Muir, M. Y. Najjar, A. I. Nwabueze, N. W. Oakley, K. A. Olafinuhan, E. O. Olorin, S. B. Oni, B. A. Oni-Okpaku, E. H. Osborn-Smith, J. D. Owen, Glenys R. Packer, N. D. Parkin, M. G. O. Parrish, B. Pitt-Payne, D. Powell, J. N. Powell, E. B. Raftery, M. J. Ramsden, D. J. Richards, J. M. R. Ridley, R. K. Saksena, N. Sakaraya, M. A. Sasson, D. C. L. Savage, M. Segal, R. I. D. Simpson, Margaret R. Skelton, B. R. T. Smith, J. M. Stephenson, J. M. Taylor, Geraldine Thomas, J. B. Traherne, W. J. Trowell, G. L. Tullett, F. N. Udeh, A. C. Upjohn, S. K.-C. R. Villavarayan, Daphne M. Ward, P. H. Waterfield, W. F. Whimster, R. Yeo.

Diplomas

The following diplomas were conferred jointly with the Royal College of Surgeons of England:

DIPLOMA IN ANAESTHETICS.—K. C. Ararwala, A. A. A. Al-Uzri, B. R. Baliga, F. E. Bennetts, E. P. Berwick, F. R. Bhupalan, Maryrose, E. Brewerton, P. Brine, E. F. Brooks, Georgina D. Brown, T. H. L. Bryson, J. G. Camilleri, W. F. Carpenter, G. Cartmel, Pamela Channon, F. B. N. Clarke, A. J. Clement, E. Clissold, R. J. H. H. Colback, C. F. Conway,

Marian H. Dadaczynski, J. P. Davie, I. B. Denny, G. R. Dow, T. Dowell, A. J. F. Eberle, N. L. Edmond, H. J. Ellis, Myrtle Farquharson, E. L. Fischer, F. Fisher, Freda W. Fleming, J. W. Gamble, D. N. Ganguly, M. A. Gilbert, Heath P. Gillespie, G. B. Gillett, J. A. M. Goodwin, B. G. H. Grant, A. Gupta, M. Haase, R. L. Hargrove, Pamela A. Harris, Sylvia K. Hepton, E. Holmes, Bridget A. Jepson, H. W. F. Jones, Margaret L. L. Jones, Olive C. Jones, S. A. Kabir, K. R. Kamath, N. Kaplan, S. A. Khan, P. F. Knight, R. F. Knight, J. R. Lawrance-Owen, M. G. Leonard, R. N. Lewis, J. G. Lindsay, J. H. L. Lloyd-Thomas, J. N. Lunn, A. J. McDonald, H. McIntyre, T. D. M. McNeill, Frances M. McQuitty, S. W. McVicker, J. Mackett, R. E. Maclaurin, H. A. Maher, I. M. J. Mair, Ma Shu Poh, K. Mustafa, M. L. Nene, B. E. Ohmacht, G. D. Parbrook, D. A. Patelle, Audrey M. Peeling, P. A. Pelham, Margaret E. Pickering-Pick, W. M. Pillow, Lora Y. Pratt, P. B. W. Price, D. Proctor, A. Rieck, Brenda K. Rimmer, R. S. Ritchie, Pamela D. Roberts, Anna I. Robertson, Sheila J. B. Robertson, R. H. Robinson, D. Saltoun, Betty V. Scott, R. O. Selby, H. W. Stark, J. G. Thomson, L. G. von Thomann, Alice van Waterschoot, H. J. White, Anne M. Wilson, G. R. V. Worrall, P. R. Wykes, Ming-Hon Yeung, R. Zeeher.

DIPLOMA IN CHILD HEALTH.—J. T. Binless, D. G. Cottom.

DIPLOMA IN INDUSTRIAL HEALTH.—P. G. Cannon, J. K. Chakravarti, A. J. Hibell, P. G. W. A. Lommerse, H. F. McElligott, M. A. Malik, A. C. Reith, M. M. Tint, J. de M. Vink.

DIPLOMA IN LARYNGOLOGY AND OTOTOLOGY.—L. R. Agrawal, B. Alam, A. A. Anderson, P. J. Batchelor, P. G. A. Bloomer, R. C. Bloomfield, J. T. Buffin, R. M. C. Butler, S. R. S. Chandrasekhar, G. W. S. Choa, M. G. Cox, T. J. Crowe, C. E. Gabriel, D. P. Ghosh, D. J. Godfrey, A. N. Goshennin, R. L. Gupta, P. C. Leeson, B. Livesey, M. B. Stanton, Brenda L. Stather-Dunn, J. B. Walker.

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ROYAL COLLEGE OF SURGEONS OF ENGLAND

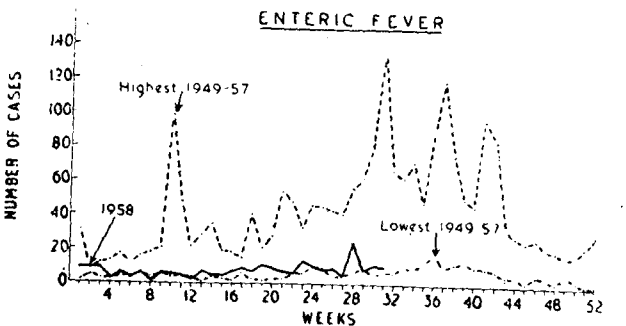
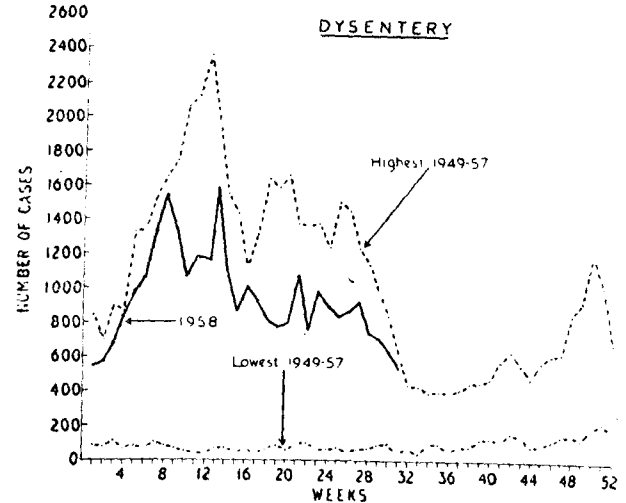
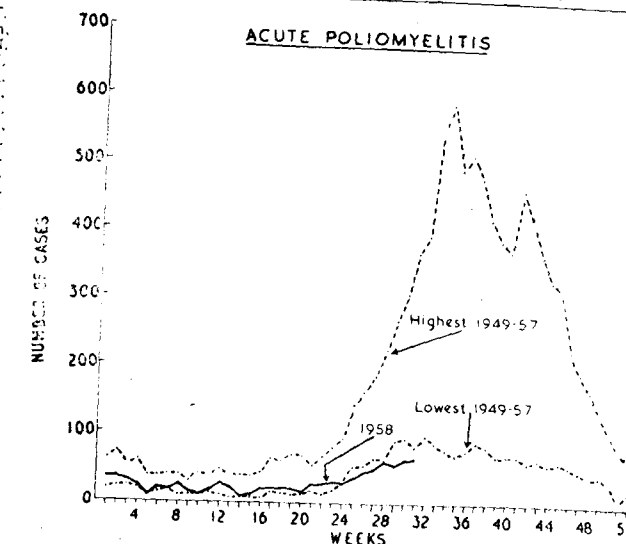
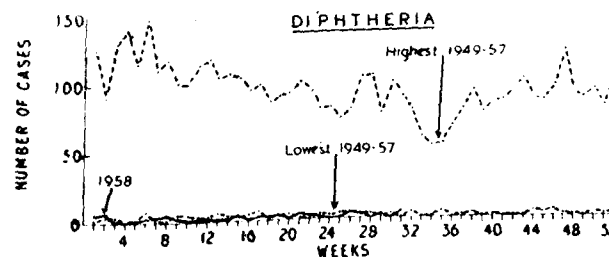
At a meeting of the Council of the College held on July 31 with Sir James Paterson Ross, President, in the chair, a diploma of Fellowship was granted to Padmanabhen Narendran, of the University of Madras.

Diplomas in Anaesthetics, in Industrial Health, in Laryngology and Otology, in Medical Radiodiagnosis, in Medical Radiotherapy, in Pathology, in Psychological Medicine, and in Public Health were granted jointly with the Royal College of Physicians of London to the successful candidates whose names are printed above in the report of the meeting of the Royal College of Physicians of London, also held on July 31.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus ----, the figures for 1958 thus —. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending August 9

Infectious diseases were notably less prevalent in England and Wales during the week ending August 9 than in the previous week. Falls in the number of notifications included 142 for scarlet fever, from 552 to 410; 102 for whooping-cough, from 709 to 607; 721 for measles, from 6,299 to 5,578; 169 for dysentery, from 536 to 367; 18 for acute pneumonia, from 168 to 150; and 90 for food-poisoning, from 261 to 171.

Notifications of acute poliomyelitis rose by 8, from 65 to 73. The paralytic cases increased by 14, from 37 to 51; while the non-paralytic cases fell by 6, from 28 to 22. The largest returns of acute poliomyelitis were from Yorkshire West Riding, 18 paralytic and 3 non-paralytic cases. The majority of these cases were in Leeds C.B. 8 and Halifax C.B. 3. Lancashire notified 10 cases (Manchester C.B. 3, Liverpool C.B. 2).

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Hypotensive Drugs in General Practice

Q.—What hypotensive drugs are suitable for use in general practice, and what are their respective indications?

A.—Any of the newer hypotensive drugs may be used in general practice, but the ganglion-blocking agents present some practical difficulties in view of their side-effects and the necessity for frequent observation and control of dosage. Of the drugs which do not act by producing ganglion blockage, reserpine is a useful, but mild, hypotensive agent which exerts its best effects in combination with a powerful ganglion-blocking agent such as pentolinium. It also has a sedative action which is useful in nervous and apprehensive patients. Minor side-effects such as nasal congestion and diarrhoea may occur, but in a few cases serious mental depression may result, and patients should be warned to discontinue the drug if they become depressed. It should not be given to patients with a history of mental instability. Occasionally tremor and rigidity of striatal type may develop. Patients with heart disease should be instructed to restrict their intake of salt when taking reserpine, as the drug tends to cause salt retention and may thus aggravate or precipitate congestive heart failure. The dose should never exceed 0.25 mg. three times daily. Reserpine is suitable for use in patients with uncomplicated hypertension of mild or moderate severity which is aggravated by anxiety, or for potentiating the action of a ganglion-blocking agent. Reserpine alone is quite ineffective in controlling severe, complicated, or malignant hypertension, and should not be used for this purpose.

Of the ganglion-blocking agents, hexamethonium, pentolinium, or mecamlamine may be used, but their side-effects and the phenomenon of increasing tolerance make initial treatment difficult and time-consuming. Hexamethonium has little place except in the treatment of acute hypertensive emergencies. The injection of 5–10 mg. will often relieve acute hypertensive left ventricular failure by rapidly reducing the blood pressure, and may also be of value in the treatment of acute hypertensive encephalopathy. Pentolinium and mecamlamine are used by mouth in the treatment of severe hypertension complicated by hypertensive vascular disease, such as heart failure, and in malignant hypertension. Treatment is best begun in hospital, where the nature of the hypertension can be fully investigated and treatment guided by frequent blood pressure readings. In the initial stages tolerance develops, and the dosage has to be steadily increased day by day until stabilization has occurred. Treatment is then usually continued at home. Ganglion-blocking agents exert their maximum effects in the upright posture, so that the blood pressure falls on standing up. This postural hypotension is of great importance in the control of high blood pressure, and provides evidence that the ganglion-blocking agent is really working. Some postural dizziness is to be expected in most patients, and other side-effects include dry mouth, constipation, and difficulty in accommodation and in micturition. The most important of these is constipation, which if allowed to go unchecked may lead to ileus, particularly when mecamlamine is used.

Recently the diuretic chlorothiazide has been used to potentiate the effects of mecamlamine, permitting effective blood pressure control with smaller dosage and fewer side-effects. Potassium supplements are essential, as chlorothiazide causes potassium depletion due to urinary loss. Mecamlamine should not be used in elderly patients with severe cerebral vascular disease or renal insufficiency, as it may precipitate acute dementia.

The requirements of ganglion-blocking agents are diminished by dehydration and fever, and thus dosage may have to be reduced if the patient develops an intercurrent infection. For full details of the use of hypotensive drugs the questioner is advised to consult a recognized textbook on the subject.

Psoriasis of the Nails

Q.—A woman with long-standing generalized psoriasis has recently developed pigmentation of the nails of both hands. What can be done to mask the discoloration?

A.—It is presumed that the discoloration of the nails referred to is the brownish-yellow discoloration produced by psoriasis of the nails. Psoriasis of the nails sometimes responds to x-ray treatment, but when the skin lesions have been present for many years it is doubtful whether radiotherapy or any other treatment will have much effect. Discoloration may be, of course, very largely masked by applying nail varnish. If the patient does not like the conspicuous colour of red nails she may apply nail varnish base followed by ordinary colourless nail varnish. This is often used as a means of concealing "milk spots" in the nails, and may well be sufficient to hide the lesions of psoriasis.

Transporting Liquid Oxygen

Q.—What are the hazards of transportation of liquid oxygen by road in the event of a collision spilling the contents?

A.—Liquid oxygen in the crude state has a boiling point of -180°C . When spilled the liquid rapidly evaporates. The major hazards when spilled under the conditions specified would be from burns, either from fire or from splashes with the cold liquid. There is no appreciable toxic hazard. The greatest risk is from fire, and precautions should be taken to prevent exposure to naked lights, etc.

The problems raised by the transport of liquid oxygen have been a subject of much research by chemical and safety engineers and an extensive bibliography exists. Inquiry shows that there has not yet been an incident in which liquid oxygen has spilled out and caused a serious fire during transit. This is doubtless owing to the special method of construction of the road containers.

Tobacco Mosaic Virus

Q.—Is the tobacco mosaic virus communicable to man, and, if so, is it ever pathogenic?

A.—No instance of transmission of tobacco mosaic virus to man has ever been recorded. The widespread distribution of this virus in nature would have provided ample chances for its potential pathogenic role to be observed.

Collected Articles from the "British Medical Journal"

The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

Emergencies in General Practice (26s. 9d.).

Refresher Course for General Practitioners, Volumes 2 and 3 (26s. 9d.).

Clinical Pathology in General Practice (22s. 3d.).

Any Questions?, Volumes 2 and 3 (8s. 3d. each).

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BRITISH MEDICAL JOURNAL

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CITRATE INTOXICATION

A CLINICAL AND EXPERIMENTAL STUDY

BY

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For many years the sodium salts of citric acid have been used as anticoagulants in blood for transfusion. For the most part it has proved safe to infuse into humans the quantities of citrate contained in stored blood. However, reports of citrate overdose in man. Citric acid forms weakly dissociated salts with divalent cations (Hastings *et al.*, 1934) and its untoward effects are generally attributed to the depression of ionization of such cations in the extracellular fluid, particularly calcium. The excitable tissues of the body are susceptible to such a depression, the effects on cardiac muscle being the most important.

Wexler *et al.* (1949) studied newborn infants with erythroblastosis receiving exchange transfusions of citrated blood. In the course of the transfusions the plasma citrate rose from normal levels of 2 to 3 mg. to 60 to 120 mg./100 ml. In some cases there was associated tetany or convulsions relieved by the infusion of calcium.

Electrocardiographic changes in the course of exchange transfusions were observed by Furman *et al.* (1951) in six infants, four of whom showed muscle tremors and two lengthening of the QT interval. These changes were reversed by intravenous calcium gluconate. Gustafson (1951) observed muscle tremors but no changes in the QT interval in eight infants receiving exchange transfusion. Ames *et al.* (1950) also failed to detect significant E.C.G. changes in infants with plasma citrate levels of up to 53 mg./100 ml.

In adults there have been two extensive investigations: those of Bunker *et al.* (1955) and Howland *et al.* (1957). The former workers studied 130 patients receiving citrated blood, generally in the course of surgery. They calculated the depression of plasma ionized calcium due to citrate from the measured total plasma calcium, protein, and citrate, using the equations of Hastings *et al.* (1934) and McLean and Hastings (1935). The calculated ionized calcium was used to correlate clinical and biochemical findings. At rates of blood infusion of about 500 ml. in 15 minutes the rise in plasma citrate and the depression of ionized calcium was greater in those patients with liver disease than in the remainder. Thus, of the 28 patients in whom the calculated plasma ionized calcium fell below the normal range—that is, less than 0.8 mM/kg. H_2O —17 suffered from liver disease. 2 underwent surgery involving interference with liver

circulation (pancreaticoduodenectomy with portal vein resection, resection of thoracic aortic aneurysm), and 4 had resection of abdominal aortic aneurysms, the surgical details not being given. One patient underwent craniotomy under induced hypothermia to 25.8°C . Those patients with the lowest ionized calcium levels had associated hypotension, in some cases reversed by intravenous calcium chloride.

Howland *et al.* (1957) established normal values for plasma citrate in man (0.80 ± 0.8 mg./100 ml.) and in women (1.08 ± 0.9 mg./100 ml.). By infusion of acid-citrate-dextrose solution (A.C.D.) rapidly into patients they were able to show large increases in plasma citrate with accompanying lengthening of the QT interval, though without detecting tetany or hypotension. They also studied 77 patients receiving citrated blood under anaesthesia and found good correlation between the rate of blood infusion and the plasma citrate level, without, however, observing untoward effects from the raised plasma citrate.

Apart from the above reports, the literature of citrate intoxication in man includes a few incompletely documented cases in which citrated blood was implicated as a cause for cardiac dysrhythmia—for example, Hubbard *et al.* (1956) and Argent (1957).

In summary, it appears from the clinical reports that there may be a marked elevation of the plasma citrate level by the infusion of citrated blood under certain circumstances: in exchange transfusions in infants, and on other occasions when blood or plasma is infused rapidly, particularly in the presence of disease or impaired blood supply of the liver. The signs which have been attributed to citrate intoxication are muscle-twitching or convulsions in the unanaesthetized patient, E.C.G. changes, particularly lengthening of the QT interval leading to cardiac asystole, arterial hypotension resistant to further blood transfusion or pressor agents, and possibly prolongation of clotting-time.

It is surprising, in view of the widespread use of citrated blood and the above reports of toxicity, that the fate of infused citrate in humans is not yet completely known. Salant and Wise (1917), using the rather inexact method of citrate estimation available at the time, studied the fate of brief infusions of citrate into animals. They noted that of an infused dose 4 to 13% was excreted in the urine in rabbits, 30% in cats, and 40% in dogs. They confirmed the previously observed effects of muscle-twitching, convulsions, and cardiac and

respiratory arrest. They also noted that blood itself had little or no power to destroy citrate. Martensson (1940), using a similar infusion technique, found that in the rabbit 4 to 8% of a dose was excreted in the urine, in the cat 27 to 43%. From perfusion experiments he came to the conclusion that the liver had little or no ability to destroy citrate, the kidney a marked ability—results at variance with the work of Sjöström (1937), who obtained nearly complete clearance of citrate from the perfusate in one passage through the perfused liver, and at variance with observations of Bunker *et al.* in man. One conclusion which can be drawn from the animal experiments is that there is a marked species difference in the behaviour of infused citrate.

In this paper we present four clinical cases demonstrating greatly raised plasma citrate levels following the infusion of blood under various circumstances, and an account of some work on the elimination of infused citrate from the plasma in dogs and man.

Material and Methods

The blood used for transfusion was that supplied by the National Blood Transfusion Service. Each 540-ml. bottle contains 1.75 g. of citrate expressed as citric acid.

For the estimation of plasma and urinary citrate the method of Natelson *et al.* (1948) was used, modified to extend the range. Plasma citrate levels are reported as mg./100 ml. of citric acid. Plasma calcium was estimated

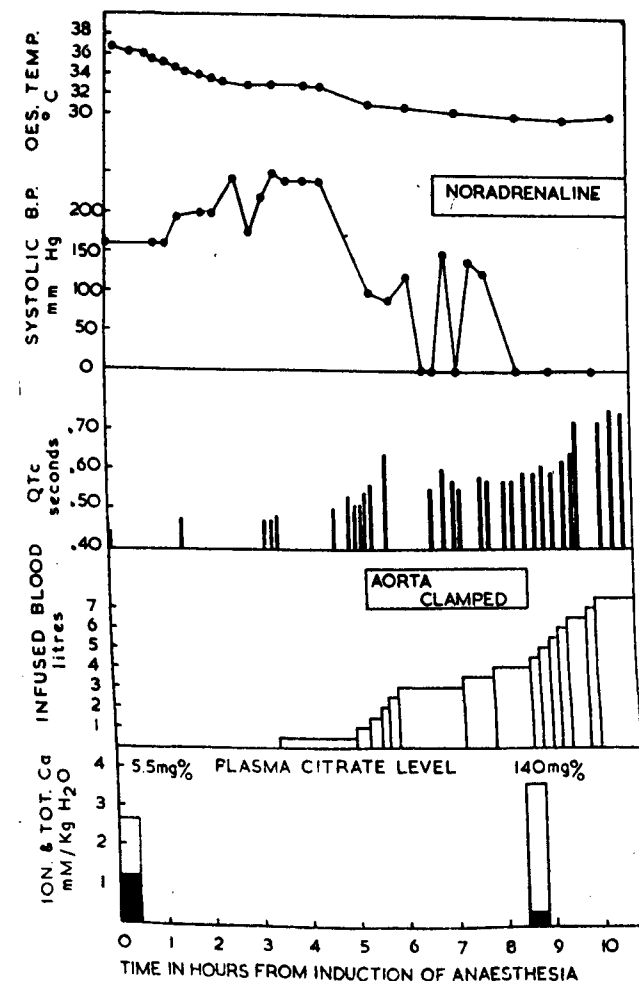


FIG. 1.—Changes in oesophageal temperature, blood pressure, QTc interval, plasma citrate, total and ionized calcium in Case 1. Amount of infused blood is shown in 0.5-litre blocks, and duration of aortic clamping and of noradrenaline infusion is indicated.

by the method of Sobel and Sobel (1939). It was found that plasma citrate levels of up to 250 mg./100 ml. did not interfere detectably with calcium estimation, provided the oxalated plasma was allowed to stand for 12 hours at 4° C. before centrifuging. Ionized calcium was calculated from the equations of Hastings *et al.* (1934) and McLean and Hastings (1935). It is realized that this method does not give precise values, but it gives the only measure of ionized calcium in the presence of citrate that is at present available.

Other biochemical estimations were made by methods previously reported from this laboratory (Wynn and Houghton, 1957; Wynn and Ludbrook, 1957). Blood samples were either arterial or were taken from a vein distant to the site of infusion.

The QT interval on the E.C.G. was corrected for heart rate by the formula $QT/\sqrt{R-R}$ and expressed as QTc.

A blood balance by a method of swab weighing was carried out on these patients undergoing surgery.

Clinical Investigation

Case 1

A man of 55 was operated on under induced hypothermia to 29.8° C. for an aortic thrombosis extending up to the level of the renal arteries. Early in the operation 2.2 l. of blood was infused in one hour (1.4 mg. citrate/kg./min.), exactly replacing blood lost. Systolic blood pressure fell from 240 to 100 mm. Hg (Fig. 1). It was noted that on the E.C.G. the QTc interval lengthened from 0.44 to 0.64 sec. (Fig. 2). Calcium gluconate (1 g.) was given at this stage intravenously.

Arterial clamps were placed across the aorta above the renal arteries and on both common iliac arteries for some three hours during the resection of the affected aortic segment and insertion of a homograft. After release of the clamps there was further haemorrhage and 3.25 l. of blood was given in 1.4 hours (1.5 mg. citrate/kg./min.). Blood pressure became unrecordable in the extremities and remained so despite more than complete blood replacement and the infusion of noradrenaline. The QTc interval became lengthened to 0.70 sec., there was excessive oozing from the wound, and the patient died in ventricular fibrillation after receiving 7.5 l. of blood (26 g. citrate). The infusion of 2 g. of calcium gluconate during this latter period was without effect.

An arterial blood sample had been taken prior to the induction of hypothermia, and a further sample was taken during the second phase of rapid blood infusion. Analysis of these samples showed that during this latter period, when citrate was being given at the rate of 1.7 mg./kg./min., the citrate level rose to 140 mg./100 ml., the total calcium from 10 to 13.6 mg./100 ml., while the calculated ionized calcium fell from 1.2 to 0.35 mM/kg. H₂O. The plasma total protein, sodium, potassium, and chloride remained essentially unchanged. The blood pH fell from 7.44 to 7.32.

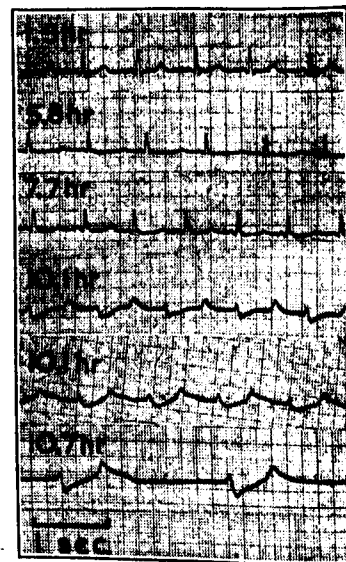


FIG. 2.—E.C.G.s (lead I) in Case 1 at various times after induction of anaesthesia (see Fig. 1). Note temporary lengthening of QT interval during rapid infusion of blood at 5.8 hours, and grosser changes from 10.1 hours.

It seemed probable to us that citrate intoxication played an important part in this patient's death. We therefore performed plasma citrate estimations on blood samples collected from other patients undergoing operation under hypothermia.

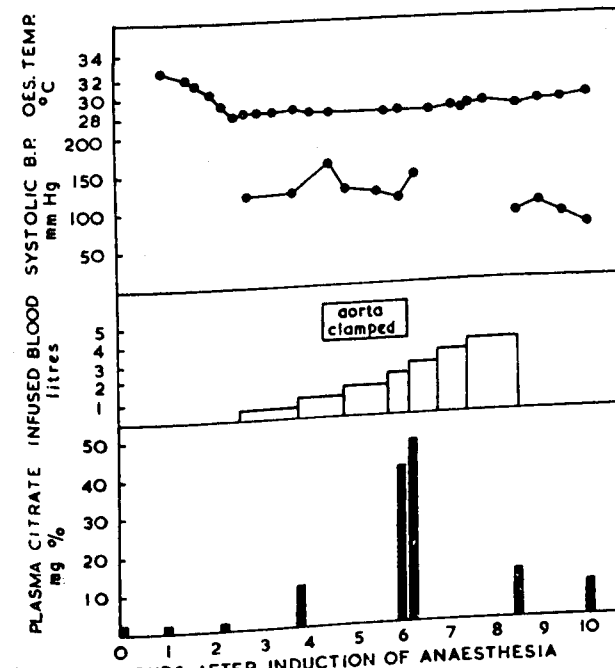


FIG. 3.—Changes in oesophageal temperature, blood pressure, and plasma citrate in Case 2. Amount of infused blood is shown in 0.5-litre blocks. Duration of aortic clamping is indicated.

TABLE I.—Summary of Observations on Case 2. Time Periods are Those Between Arterial Samples, Taken Before Blood was Given, Before Aortic Clamps were Applied, During Clamping, and After Release of the Clamps (See Fig. 3)

	Period Before Clamping (1-2 Hour)	Period During Clamping (2-4 Hour)	Period After Unclamping (2-4 Hour)
Citrate infused (g.)	1.75	5.5	5.5
Rate of citrate infusion (mg./kg./min.)	0.4	0.6	0.6
Arterial plasma citrate at end of period (mg./100 ml.)	11	41	13
Plasma citrate clearance* (%)	65	20	70

* See Discussion.

Case 2

A man of 35 had a syphilitic aortic aneurysm situated in the region of the eleventh to twelfth thoracic vertebrae. At the operation the aorta was clamped above and below the aneurysm, at a level above the coeliac axis. From Fig. 3 aneurysm, at a level above the coeliac axis. From Fig. 3 and Table I it may be seen that, despite the fact that there was no period of rapid blood infusion, at the end of the period of aortic clamping the plasma citrate level had risen to 41 mg./100 ml., and immediately after release of the clamps to 48 mg./100 ml. During an equal period following release of the clamps with an identical rate of citrate infusion the plasma citrate fell to 13 mg./100 ml. The infusion of the plasma citrate remained close to oesophageal temperature throughout.

Case 3

This patient was a woman of 44 with a thrombosis of the abdominal aorta extending up to just below the renal arteries. Under hypothermia (28° C.) a bypass homograft was inserted from the aorta above the coeliac axis to the left external iliac artery. By application of a Crafoord clamp to the aorta it was possible to perform the upper anastomosis without interrupting the aortic blood flow. During 30 minutes after the clamps were released 1,100 ml. of blood was infused (1.9 mg. of citrate/kg./min.). The

plasma citrate rose to 39.5 mg./100 ml. and the calculated rate of citrate removal from the plasma was 65% of normal (see Discussion). There was an associated lengthening of the QTc interval from 0.53 to 0.63 sec., but no significant hypotension.

Case 4

A man of 24 underwent partial hepatectomy for a haemangioma of the liver with associated cirrhosis. Induced hypothermia to 29.5° C. was used. Preoperatively the only defect in liver function detected was a bromsulphthalein retention of 25% after 45 minutes. In the course of the operation the hepatic artery was clamped for 90 minutes. During this period the blood pressure fell, and it remained

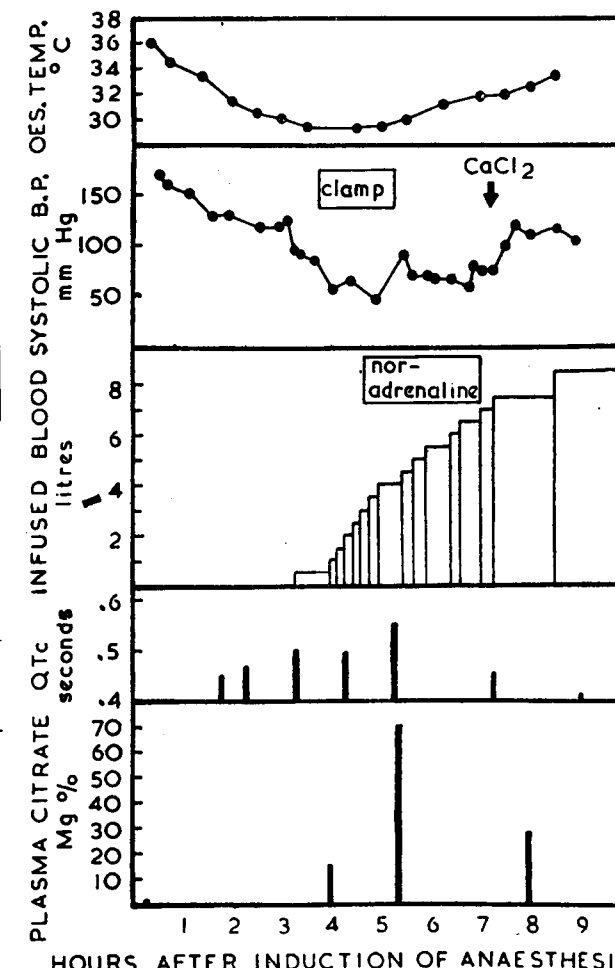


FIG. 4.—Changes in oesophageal temperature, blood pressure, QTc interval, and plasma citrate in Case 4. Amount of infused blood is shown in 0.5-litre blocks. Duration of hepatic arterial clamping and of noradrenaline infusion and time of injection of 10 ml. of 10% CaCl₂ are indicated.

TABLE II.—Summary of Observations on Case 4 (see Fig. 4)

	Pre-operative	15 min. After Clamping Hepatic Artery	15 min. After Unclamping Hepatic Artery	24 hr. Later (1 hr. Post-op.)
Oesophageal temp. (°C.)	37	29.5	29.5	32
B.P. (mm. Hg)	120	85	50	110
Rate of citrate infusion (mg./kg./min.)	0	0.4	1.2	0.85
Plasma citrate (mg./100 ml.)	1.6	14.7	70	28.1
Plasma citrate clearance† (%)	—	42	23	42.5
Total plasma Ca (mg./100 ml.)	8.8	8.2	11.0	14.5*
Total plasma Ca (mM/kg. H ₂ O)	2.35	2.20	2.90	3.80
Calculated ionized Ca (mM/kg. H ₂ O)	0.90	0.70	0.50	1.30

* 45 minutes after CaCl₂ infusion. † See Discussion.

low for the remainder of the operation (three hours) despite complete replacement of measured blood loss and the infusion of noradrenaline (Table III and Fig. 4). An intravenous injection of 10 ml. of 10% calcium chloride was followed within a few minutes by a rise in B.P. to 110 to 120 mm. Hg.

Experimental Investigation

1. Citrate in Stored Blood and Plasma

It is known that in normal human blood the citrate ion is virtually confined to the plasma (Natelson *et al.*, 1947). In recently collected citrated blood it was possible to show that at least 98% of the added citrate remained in the plasma. In such blood at 4° C. there was, over a period of three weeks, a progressive fall in plasma citrate concentration to 92% of the original level, but whether this represents metabolic destruction of citrate or a movement into the red cells was not determined.

2. Metabolism of Infused Citrate

When citrate is infused intravenously over a brief period, and the plasma citrate level is measured at intervals following the infusion, there is a very rapid fall of plasma citrate during the first few minutes, which slows until the normal plasma level is regained after about 60 minutes (Mårtensson, 1940; Fig. 7). This rapid disappearance of citrate from the plasma is due to three mechanisms: distribution throughout at least the extracellular space, excretion in the urine, and metabolic destruction.

Bunker *et al.* (1955) observed, as we have, that the plasma concentration after a brief rapid infusion does not exceed that which would be attained if the infused citrate were rapidly distributed in the extracellular space.

In order to eliminate the distribution factor in experiments to determine the rate of metabolic destruction, we have used steady rates of infusion of A.C.D. It was judged that a steady state had been reached with regard to distribution when the plasma citrate and urinary excretion of citrate were constant in successive 10-minute periods. When this steady state is reached, the rate of clearance of citrate from the plasma (excretion plus metabolic destruction) equals the rate of infusion. If the rate of citrate infusion, the plasma citrate, and the urinary excretion of citrate is known, the rate at which citrate is metabolized may be calculated.

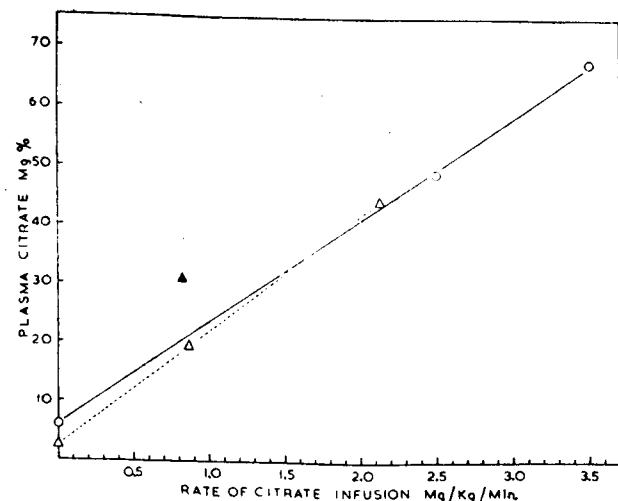


FIG. 5.—Relation in two dogs between rate of citrate infusion and plasma citrate concentration. Open circles: dog 1, normal body temperature. Open triangles: dog 2, normal body temperature. Closed triangle: dog 2, hypothermia to 28.5° C. (oesophageal) (see Table III). Each point represents mean value from three plasma samples taken at 10-minute intervals.

Relation of Plasma Citrate Level to Rate of Citrate Infusion.—In both dog and man the rise in plasma citrate was directly proportional to the rate of infusion (cf. Bunker *et al.*, 1955; Howland *et al.*, 1957) (see Figs. 5 and 6). At comparable rates of infusion (1 mg./kg./min.) the elevation of plasma citrate was much higher in the dog (20 mg./100 ml.) than in the human (12.5 mg./100 ml.) (Figs. 5 and 6).

Urinary Excretion.—In the dog at widely differing rates of infusion more or less constant 44% of the infused citrate was excreted in the urine (limits 43 to 48%) (Table III). In normal unanaesthetized man under similar conditions only 18 to 20% was excreted, the remainder being presumably metabolically destroyed. The urine-plasma concentration ratio ranged from 74 to 100 in the dog and from 14 to 25 in the human.

Metabolic Destruction.—It follows from the above that, in man, metabolic destruction is more important as a means of removing citrate from the plasma than in the dog. For a given elevation of plasma citrate the rate of metabolic destruction in man is about twice that in the dog, weight for weight.

Effect of Hypothermia in the Dog.—This was studied in the dog by first determining the rate of metabolic destruction of citrate at normal body temperature, as described above, then repeating a previous rate of infusion in the same animal with its temperature lowered by surface cooling (Table III and Fig. 5). The results show that for the same rate of infusion the rise of plasma citrate was 65% greater in the hypothermic dog, and at equivalent plasma citrate levels the rate of metabolic destruction was 42% lower.

Effect of Hypothermia in Man.—It was not feasible to study this effect by steady infusion. Instead 1.5 g. of citrate was infused in 20 minutes and the fall in plasma citrate followed during the succeeding 40 minutes in three patients before and during hypothermia for carotid disobliteration. A typical result is shown in Fig. 7, demonstrating a similar qualitative effect of hypothermia in man to that in the dog.

Sub-hepatic Temp. °C.	Citrate Infused (mg./kg./min.)	Plasma* Citrate (mg./100 ml.)	Citrate Excreted (mg./kg./min.)	Excreted %	Urine/Plasma Conc. Ratio	Citrate Destroyed (mg./kg./min.)
37.2	0.86	19.5	0.39	45	74	0.47
37.1	2.12	44.6	0.92	48	96	1.20
28.5	0.83	30.5	0.36	43	100	0.47

* These plasma figures are the mean values of determinations made on three samples obtained at consecutive 10-minute intervals. The values did not differ from the mean by more than $\pm 2.5\%$.

Effect of Hypothermia in the Dog.—This was studied in the dog by first determining the rate of metabolic destruction of citrate at normal body temperature, as described above, then repeating a previous rate of infusion in the same animal with its temperature lowered by surface cooling (Table III and Fig. 5). The results show that for the same rate of infusion the rise of plasma citrate was 65% greater in the hypothermic dog, and at equivalent plasma citrate levels the rate of metabolic destruction was 42% lower.

Effect of Hypothermia in Man.—It was not feasible to study this effect by steady infusion. Instead 1.5 g. of citrate was infused in 20 minutes and the fall in plasma citrate followed during the succeeding 40 minutes in three patients before and during hypothermia for carotid disobliteration. A typical result is shown in Fig. 7, demonstrating a similar qualitative effect of hypothermia in man to that in the dog.

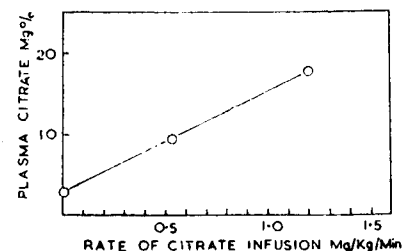


FIG. 6.—Relation in a normal man between rate of citrate infusion and plasma citrate concentration. Each point represents mean value from three plasma samples taken at 10-minute intervals.

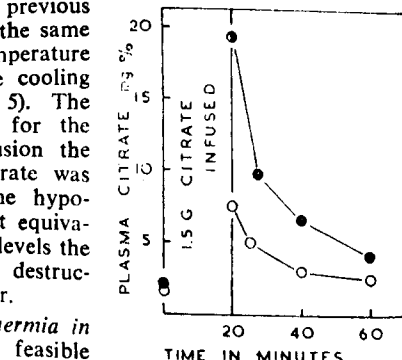


FIG. 7.—Fall in plasma citrate concentration in a patient following the infusion of 1.5 g. of citrate in 20 minutes. Open circles: normal body temperature. Closed circles: hypothermia to 30 to 32° C. (oesophageal).

Discussion

In the previous section we have defined some of the factors which, during the transfusion of citrated blood, affect the removal of citrate from the plasma and govern its concentration therein. We have found that the rise in the plasma citrate level produced by a steady infusion of citrate is proportional to the rate of infusion. Bunker *et al.* (1955) and Howland *et al.* (1957) have also observed this straight-line relationship (in patients receiving citrated blood). At a citrate infusion rate of 1 mg./kg./min., the elevation of plasma citrate we obtained was 12.5 mg./100 ml. Calculations based upon the data of Bunker *et al.* give a figure of 11 mg./100 ml., and Howland *et al.* reported 8 mg./100 ml.

When the rate of blood transfusion is known, and has been of sufficient duration to allow a steady state to be approached, the difference between the observed and predicted plasma citrate levels allows us to calculate the approximate rate of plasma citrate clearance (excretion plus metabolic destruction) as a percentage of normal, using our results relating the rise of plasma citrate to the rate of infusion (Fig. 6).

With the use of this information it is possible to predict the approximate elevation of plasma citrate produced by a given rate of blood infusion, and to detect and roughly quantitate any defect in the rate of plasma citrate clearance in a patient.

It is difficult to define a dangerous plasma citrate level, but from the observations of Wexler *et al.* (1949), Bunker *et al.* (1955), and ourselves a level of 50 mg./100 ml., giving in a normal person a calculated plasma ionized calcium of about 0.5 mM./kg. H₂O, may be considered at least undesirable. In a normal adult this corresponds to a steady rate of citrated-blood infusion of about one bottle (540 ml.) per five minutes, a rate rarely achieved in practice. It is noteworthy, however, that Argent (1957) and Hubbard *et al.* (1956) have each published an account of a patient undergoing cardiac surgery, during which this rate was attained and in whom ventricular standstill and fibrillation occurred respectively, with reversion to normal rhythm by means of a calcium injection.

It would appear, then, that except at excessively rapid rates of blood infusion some defect in plasma citrate clearance is necessary to produce dangerous levels of plasma citrate. In Fig. 8, in 27 of the 28 cases of which Bunker *et al.* give details, the plasma citrate level is plotted against the rate of citrate infusion and compared with the straight line we have derived for normal man—for example, Fig. 6.

It may be seen that three points deviate grossly from this line. These three patients in fact died during or shortly after surgery with signs consistent with citrate intoxication. They had respectively a resection of a thoracic aneurysm and graft, a pancreaticoduodenectomy and resection of portal vein, and cirrhosis of the liver with bleeding oesophageal varices. Five other points represent patients with a calculated plasma citrate clearance

of less than 50% of normal, while the points representing the remaining patients, many of whom suffered from liver disease, fall more or less along the line of normality.

In Fig. 9 points representing our four patients are similarly plotted. Case 1, in which the blood supply to the liver, kidneys, and lower limbs was impaired for some three hours, shows a gross deviation from normal, and the patient died in circumstances suspicious of citrate intoxication. Case 4, with a hepatic haemangioma and associated cirrhosis, shows a gross defect in plasma citrate clearance immediately after the hepatic artery had been clamped under hypothermia for 90 minutes. This patient had unexplained hypotension reversed by intravenous calcium chloride. From Cases 2 and 3 points are derived showing the effect of hypothermia alone—the plasma citrate clearances are between 65 and 70% of normal at 28° C., a figure consistent with that obtained in the dog for a similar temperature reduction (65%).

Case 4, with pre-existing liver disease, showed a rather lower plasma citrate clearance (42%) under hypothermia. It thus appears that high plasma citrate levels are unlikely to occur with citrated blood transfusion in normal humans, except where the rate of transfusion is extremely rapid (greater than 1 pint (540 ml.) per five minutes in an adult, or during rapid exchange transfusion in infants).

In metabolically abnormal patients, with liver disease, anuria (in view of the fact that some 20% of infused citrate is excreted), or rendered hypothermic, or when there is impairment of liver circulation or application of clamps to the thoracic or high abdominal aorta, the ability to clear the plasma of citrate may be so impaired as to make high plasma citrate levels a real danger. The recognition of the signs of citrate intoxication presents a difficulty, for hypotension may be both the cause for and the effect of rapid transfusion, and, unless a blood balance has been kept, citrate intoxication may be overlooked. The E.C.G. changes from the hypocalcaemia produced by a high plasma citrate concentration—in particular lengthening of the QTc interval, progressing to asystole—may have many other explanations, from hypothermia to hyperkalaemia. Muscle-twitching or convulsions from hypocalcaemia do not appear to occur in the anaesthetized patient, and excessive oozing from the wound is more likely to be due to replacement of the blood volume with stored blood than to a citrate effect.

However, if there are good grounds for suspecting that a high plasma citrate level is the cause of otherwise unexplained hypotension or cardiac dysrhythmia, the logical remedy is the administration of calcium. We prefer to use calcium chloride rather than calcium gluconate, on the ground that the former is more completely ionized. The correct dose can be assessed only by the slow (0.5–1 ml./min.) intravenous injection of 10% calcium chloride, until a response is seen in the blood pressure or on the E.C.G., or until 10 ml. has been given.

Prevention is possible in planned surgical procedures when blood may have to be given rapidly, and when one or more

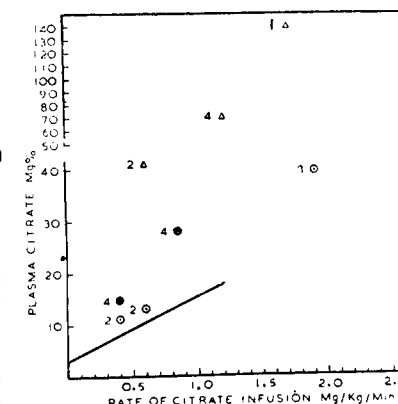


FIG. 9.—Relation in man between rate of citrate infusion and plasma citrate concentration. Numbered points represent Cases 1 to 4. Dotted circles: hypothermia alone. Closed circles: hypothermia plus impaired liver function. Triangles: hypothermia plus interference with liver blood supply. Note the change in scale of plasma citrate concentration.

of the circumstances which depress the rate of clearance of citrate from the plasma are present, by having available blood collected without the use of citrate. Heparin may be used—though this is often undesirable, particularly in vascular surgery—or blood may be collected over an ion-exchange resin (Walter, 1950). The use of commercial packs for the latter purpose has been satisfactory in our hands, though they are expensive and the blood may be safely stored for only about 10 days.

Summary

High plasma citrate levels occurred during the infusion of citrated blood into four patients undergoing surgery under hypothermia. One patient died with signs attributable to citrate intoxication.

A linear relationship between the rate of infusion of citrate and the rise in plasma citrate level was demonstrated in normal man and dogs. For each 1 mg. of citrate infused per kg. per minute the rise was about 20 mg./100 ml. in dogs and about 12.5 mg./100 ml. in humans.

By using a constant infusion technique it was shown that in dogs some 40% and in man some 20% of infused citrate was excreted in the urine, and the remainder was metabolically destroyed.

In both dog and man hypothermia to 28 to 29° C. was shown to reduce the rate of metabolic destruction of citrate by 30 to 40%.

From our findings it would seem that the infusion of citrated blood at less than about 1 pint (540 ml.) in five minutes in an adult is unlikely to cause a dangerous rise of plasma citrate, provided that the rate of citrate metabolism is not reduced.

Circumstances which impair citrate metabolism in patients are discussed.

We thank Professor C. G. Rob for his encouragement of this study, and Mrs. P. Simpson for her invaluable biochemical assistance. Our thanks are also due to the Ionic Research Unit, Physiology Department, University of Melbourne, and to the Joint Standing Research Committee of St. Mary's Hospital, for grants towards Mrs. Simpson's expenses.

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The Ministers of Agriculture and Health and the Secretary of State for Scotland have considered the revised Report of the Food Standards Committee on Copper. They accept the view of the Committee that the consumer will be adequately protected if limits for the copper content of foods which are consistent with good commercial practice are observed and that, in the absence of any new developments, it is unnecessary to give statutory effect to the recommended limits. With certain exceptions these are: beverages ready to drink, 2 p.p.m.; other foods, 20 p.p.m.

SOME AETIOLOGICAL ASPECTS OF CORONARY HEART DISEASE

AN INDIAN POINT OF VIEW BASED ON A STUDY OF 867 CASES SEEN DURING 1948-55

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In a few years' time two centuries will have passed since Heberden described the syndrome of angina pectoris, yet the aetiology of coronary heart disease remains undetermined. Western writers seem to believe that the so-called "material civilization" of the West is responsible for the increased incidence of this disease in their countries and that Asiatics are far less prone to fall victim to this malady. Arnott (1954) says: "Coronary heart disease is one of the main causes of disability and death in the United States, Canada, Britain, Northern Europe, Australia, and New Zealand, and these are all countries which, nationally speaking, derive more than 30% of the food calories from fat. On the other hand, areas like southern Europe, Africa, India, and the Orient in general have diets the fat of which contributes less, usually much less, than 20% of the calories. It is difficult to be certain that atheroma and coronary heart disease are much less in these countries. The extent and standards of medical, biochemical, and pathological work are, generally speaking, much inferior, while the vital statistics of the populations at risk are less clearly defined. Nevertheless, while the evidence is not of the same quality as in the materially more favoured countries, it is uniformly consistent with the conclusion that the diseases are comparatively very uncommon."

Views in an editorial in the *Lancet* (1955) on the subject of coronary disease are thus expressed; "Beside this we have to set the fact that clinicians with experience in the East have long held that the disease is rarer in Asiatics than in Europeans—to an extent that cannot be wholly explained by the Europeans having longer lives. Support for this opinion comes from pathological studies showing that the inhabitants of the Japanese island of Okinawa have little atheroma or coronary-artery disease. In Africa the post-mortem findings of Higginson and Pepler at Johannesburg indicate that severe atheroma is far less common among the Bantus than in American and European hospitals."

In India, publications on the incidence of coronary diseases have been rather few. In recent years prevalence of coronary disease has been pointed out by some Indian authors (Vakil, 1949, 1954; Malhotra, 1951; Samani, 1956). For the present communication we have collected the data of 867 cases of coronary disease seen by us, so that the readers in other countries may be presented with the available picture of this disease in India.

The presented data go to show that coronary disease forms a big group in the cardiac population of this part

of India, and, whereas several of the aetiological factors observed run true to descriptions by Western authors, there are some local factors that may provide material for further thought.

Clinical Material

The series consists of 867 cases of coronary disease that occurred during a period of seven years (1948-55) amongst a total of 3,054 cardiac patients seen by us. These cases, shown in Table I, include patients admitted to general and private wards as well as those examined in the cardiology clinic. Private cases seen in his consulting-room by the senior author (R. P. M.) are also included. Thus it is a fair cross-section of all classes of patients.

TABLE I.—Distribution of Cases Into Hospital and Private Classes

	Males	Females	Total
Hospital class	511	95	606
Private	243	18	261
Total	754	113	867

TABLE II.—Age at Presentation

	Below 30	30-39	40-49	50-59	60-69	70-79	80+	Total
Males	3	31	122	300	186	102	10	754
Females	0	5	21	41	37	7	2	113
Total	3	36	143	341	223	109	12	867

TABLE III.—Age at Time of Onset of Symptoms

	Uncertain	Below 30	30-39	40-49	50-59	60-69	70-79	80+	Total
Males	2	5	53	193	300	138	55	8	754
Females	0	1	6	31	50	18	7	0	113
Total	2	6	59	224	350	156	62	8	867

Age.—As seen in Tables II and III the maximum incidence of the disease is in the 50-59 age group. This age group is the same as that reported by Friedberg (1950) from America, but is one decade younger than the 60-70 age group reported by other Western authors (Parkinson and Bedford (1928) from England, Levine and Brown (1929) from America, and Cassidy (1946) from England). In India Vakil (1949, 1954) reported the maximum incidence between 40 and 50 years, a group one decade younger than our group. In recent years cardiologists as well as general physicians have become fully aware of the occurrence of coronary disease in the young, and this is true of Indian patients as well. Table III shows that 7.5% of cases got their disease before the age of 40. In an earlier community study an incidence of 7% amongst the younger age group was reported (Wig and Malhotra, 1951). Vakil (1949), from Bombay, reported 41 cases (16% of his 250 patients)—a much higher percentage than ours.

Sex.—There were 754 males and 113 females in our series. It is a well-recognized fact that in the West females suffer much less than males from coronary disease. The exact cause of this comparative feminine immunity remains undetermined. Sex ratios varying between 4.2 to 1 and 6.6 to 1 have been mentioned by different Western workers (Clawson, 1941; Bland and White, 1941; Parkinson and Bedford, 1928). In our series the ratio is 6.7 to 1. It may be of some interest to mention that in India women lead a comparatively much more sheltered and indoor type of life, their main occupation being household work, yet the ratio between males and females so far as the incidence of coronary disease is concerned is more or less the same as seen in countries where women rub shoulders with men in all walks of life.

Social and Economic Status

The patients were divided into three classes according to their socio-economic status. The upper class included patients from well-to-do and professional classes such as business magnates, lawyers, doctors, engineers, landlords, or high-salaried Government officials. Their income levels were over Rs. 500 a month. The middle class included people with income levels between Rs. 100 and 500 a month—for example, clerks, schoolteachers, shopkeepers, or middle-class farmers. People with income levels below Rs. 100 per month, such as labourers, factory workers, poor farmers, small shopkeepers, etc., were classified as poor. The females were classified according to the economic status of the family.

Table IV shows that about 91% of the cases came from the upper and middle classes. One cannot draw any conclusion, for the obvious reason that upper and middle classes are more enlightened to seek medical advice readily.

TABLE IV.—Classification of Cases According to Socio-economic Status

	Upper	Middle	Lower	Total
Males	114	573	67	754
Females	6	95	12	113
Total	120	668	79	867

Occupation.—It is believed that professional classes who lead a "chair-borne life" show a higher incidence of coronary disease than those who earn their living by hard physical work (Stocks, 1951; Morris *et al.*, 1953). We classified our patients into three main groups according to the physical activity involved in a particular job. This is shown in Table V. It may be of interest to mention that people who had to earn their living by hard physical

TABLE V.—Distribution of Patients According to Physical Activity Involved in Their Profession

	Sedentary	Average	Hard	Total
Males	425	292	37	754
Females	11	102	0	113
Total	436	394	37	867

activity formed a negligible proportion in this series (4.3%). But these people were mostly poor, and were less likely to seek medical advice readily.

Urban Versus Rural Distribution of Patients

Of the 867 cases, 123 came from rural areas and 744 from towns and cities. Table VI shows their distribution.

In spite of the fact that patients from rural areas formed a mere 14% of our series we cannot conclude for certain that the disease is less prevalent in people belonging to places remote from modern civilization. Patients from

TABLE VI.—Rural and Urban Distribution of Patients

	Rural	Urban	Total
Males	105	649	754
Females	18	95	113
Total	123	744	867

villages come to the town hospitals only when they are severely disabled with congestive heart failure or when their physical activity is seriously curtailed owing to severe effort angina. Brief or mild episodes of coronary disease remain unnoticed. The same is true of sudden deaths. It would be worth while finding out whether the disease is really less common among people who live away from modern civilization. There are areas in this country where the mode of life continues to be what it was in the

contact with the tumour projecting between two papillary muscles. On trial, it was quite easy to push the tumour upwards a short distance. The index finger of the other (left) hand was then put into the atrium by releasing the clamp in the usual way, and the finger-nail was pushed into the tumour pedicle. This separated fairly easily and smoothly from the interatrial wall, while the ventricular or right finger pushed the tumour upwards. Withdrawal of the left index enabled the right finger to push the tumour upwards and into the hole in the left auricle, acting as a cork from inside. The auricular hole had to be enlarged by about 2 cm. with the nail of the left index finger. The tumour popped out of the hole like a cork, followed by a small gush of blood. The assistant, standing ready with the auricular clamp, grasped the auricle at the first attempt, and little blood was lost. A more dignified exit could easily have been made if the tumour had been pushed less forcefully. The auricle was then closed with a continuous suture by the assistant. The right index was removed from the ventricle while the purse-string was tightened: there was no blood loss from this. During the separation of the mass the carotids were compressed in the neck by the anaesthetist.

While the auricle was being closed the opportunity was taken to feel the mitral valve cusps from below, and no nodules or other abnormalities were found. The heart beat continued regular throughout, and only a slight weakening occurred after the sudden blood loss. The wall of the ventricle was normally thick, and showed no sign of hypertrophy or dilatation.

Post-operative recovery was peaceful for the first 10 days: the patient got up on the third day and was discharged on the ninth day. Two days later, however, she had a right pulmonary embolus associated with pain in the left calf and was readmitted to hospital. After 13 days of anticoagulant treatment she was discharged and no complication has since occurred. In December the heart sounds were normal and have not changed since then. When seen 18 months later she was completely well, and had regained her exercise tolerance and lost all other symptoms. The heart sounds were normal, the heart looked normal on radiology, and the left atrium had shrunk to a normal size. The E.C.G. showed a Q wave in lead I and an inverted T wave in leads V5 and V6.

The specimen was an egg-shaped mass measuring 6 by 5 by 4 cm. It was shiny and smooth, with a rough area at its upper end, 2 cm. in diameter, where it had been detached. On section it was grey and semi-translucent, with darker areas of old haemorrhage.

Histology showed an amorphous mucoid matrix with a few stellate cells with spindle-like processes. There were a few elastic and muscle fibres in the mass, and a few developing capillaries. The surface was endothelial, covering a fibrous layer continuous over the whole tumour. There were some areas of old haemorrhage.

Comment

In reviewing the operation, certain points arise. The direction of approach—from the front of the patient (who was lying on her right side)—happens to be L.F.'s usual stance, and was the easier in this case: the right index finger in the left ventricle and the left finger in the auricle allowed a clear view for the assistant, standing behind the patient, to place the auricular clamp with his left hand from behind forwards, towards the pulmonary artery. If the surgeon were to stand behind the patient, and had to put his left index in the ventricle and his right in the auricle, the assistant would be hampered in putting on the clamp. During such an operation the surgeon should, if necessary, change position and place himself in front of the patient.

The myxoma is always larger than the index finger, since it is large enough to obstruct the mitral valve and produce symptoms; the auricular hole will therefore always be closed when the tumour has been jammed into it, and when the

left index is removed no bleeding will occur. The hole will need enlarging to allow removal of the mass. The enlargement should be done in the direction in which it is easier to apply the clamp, and this is probably backwards, above and parallel to the AV groove, and about $\frac{1}{2}$ in. (1.3 cm.) away from it. The hole should be enlarged gradually, until it is seen to be just big enough to let the tumour squeeze through: the purse-string should be opened as required to allow space for the incision, or, if no purse-string is used, the edges can be caught with forceps. The tumour is pushed out either by the internal finger or by squeezing it out gently with the clamp, or both. The inside finger should not be removed until there is no further danger of the tumour slipping back or of breaking.

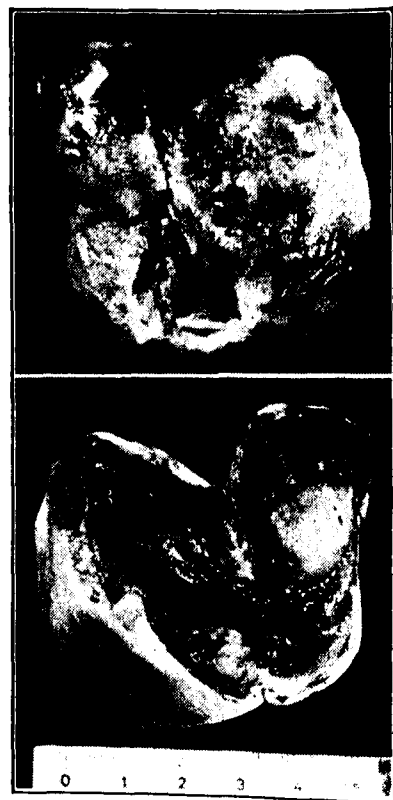
Extraction is done slowly, and the intraventricular finger can judge when the incision is large enough by exerting gentle pressure *a tergo*: it can be kept between the mitral cusps as long as is necessary, since it will always be smaller than the valve orifice, which usually takes two fingers and has, in any case, been occupied by the tumour. The outside hand can prevent a too sudden explosive ejection of the tumour and may itself grip the edges of the auricular hole and partly or entirely close it. If the procedure is done slowly and gently, fragments will not be torn off and the carotids need not be compressed for a longer time than is needed to detach the tumour from the inter-auricular septum.

In our case the mass was easily cut off the inter-auricular septum by the gloved finger-nail; if the pedicle had been too tough for this, Brock's valvotomy knife would have served the purpose. The septum was left smooth and normally elastic, and gave no impression of there being a tumour growing from the septum.

Discussion

The gross physical characters of the myxoma are fairly constant in essentials, the appearance, size, and shape being due to moulding and compression of the tumour by the heart muscle, and by the mitral valve, which it accurately fits. In fact, in all the cases described, the tumour is large enough and of such shape as to obstruct the blood flow and almost to fill the left atrium, whatever its size. This is beautifully shown in the angiocardiograms of Goldberg *et al.* (1952) and Goldberg and Steinberg (1955), in which two hearts are shown, containing myxomata, one of them twice the size of the other.

The tumour is smooth, shiny, roughly egg-shaped, lobulated at its lower end, and in reported cases measures from 10 by 6 by 4.5 cm. (Mahaim, 1945a) to 4 by 4 by 2 cm.: a



Two views of myxoma removed at operation, split and folded open. The site of attachment is clearly seen.

number of small non-occlusive ones have been found by chance. Its upper end is attached to the atrial septum above the postero-medial end of the anterior mitral cusp, about the site of the foramen ovale. It hangs through the mitral orifice into the left ventricle, impinging on the musculi papillares and the ventricular wall; its lobulations correspond to the irregularities of this contact. It occurs much less commonly on the right side of the heart, attached at the same place, on the fossa ovalis; it has never been described as occurring in both auricles at once, nor has a projection been seen through the atrial septum; and perforation of the septum by tumour is unknown.

Opinions differ whether the mass is a myxoma or an organized clot, but we are not discussing the controversial problem of its origin. It is covered with endothelium and a subendothelial fibrous layer, both continuous with the surface layers of the atrial wall. Van Buchem and Eerland (1957), in a case diagnosed and treated by them, say that the "pedicle was easily detached from the septum," and that at necropsy "the site of the myxoma was only indicated"; both facts suggest that we are not dealing with a true growth of the septum. A number of surgeons have cause to regret the ease with which the tumour can be detached. No other simple tumour has such a frail pedicle. In the present case however, the pedicle was firm.

When the tumour has grown to over 3 cm. in diameter pieces may break off and form emboli in the brain (Mills and Philpott, 1951), aorta (Likoff *et al.*, 1954), spleen, etc. The histological appearance of the embolus is characteristic enough to be identified with certainty. Even to the naked eye the grey semi-translucent jelly with a smooth surface is so different from the rough brown surface of the ordinary blood clot that the origin of the embolus can be immediately recognized. Embolism is relatively common, and may be large, blocking the aortic bifurcation: in true mitral stenosis an embolus that can get through the narrow orifice is very unlikely to block the aorta. Sudden enlargement of the tumour by bleeding into its substance may precipitate obstruction and pulmonary oedema or a severe "peripheral arterial syndrome" with gangrene of the toes, fingers, nose, etc. (Mahaim, 1945a).

The consistency of the myxoma is usually described as "rubbery" and fairly soft; in the present case the finger could be pushed into it if moderate force was used, but it was elastic enough not to break up or to form fragments.

Signs and Symptoms

Myxomata have been found in patients of all ages between 3½ and 68 years, and of both sexes. In some cases the history has been a relatively short one, and this may be a useful though not decisive point in the distinction from mitral stenosis. In one of Goldberg and Steinberg's (1955) cases there was a history of 23 years.

Other symptoms are those of mitral stenosis—namely, dyspnoea on effort, tiredness, nocturnal dyspnoea, haemoptysis, syncopal attacks, peripheral arterial syndrome (Desbaillets *et al.*, 1953).

The signs are those of mitral stenosis: much has been made of the fact that they are variable, sometimes being those of mitral incompetence and at other times of mitral stenosis. This variability has been particularly associated with posture, but this association has not been clearly defined in most of the reported cases: it would be expected that on lying on the back signs of mitral incompetence would be produced, and on leaning forward those of mitral stenosis. In hardly any of the reported cases has this been emphasized; but Mahaim (1945b) mentions two patients in whom a systolic murmur appeared, one in decubitus and the other on sitting up. In the first patient a pre-systolic murmur appeared on sitting up. Further, it must be remembered that in true mitral stenosis the signs are sometimes variable at different times and in different positions, and especially variable is the systolic murmur. This systolic murmur is sometimes attributable to tricuspid incompetence.

A point to remember is that the axis of the mitral valve, and the direction of the blood flow from the left auricle to the left ventricle, are forward and only slightly downwards, and certainly not in line with the axis of the trunk. With the patient lying on his back the blood stream and the tumour are pointing very nearly straight upwards. A blood flow even as low as 2 litres a minute would make it very unlikely that the tumour could slip back against it, even when aided by gravity.

It is possible, however, that each ventricular systole might push the mass backwards into the atrium, and the tumour may even allow a certain amount of regurgitation of blood by preventing the cusps from closing properly (Zinsser and Johnson, 1953). This may account for the appearance of strong systolic pulsation seen against the oesophagus by van Buchem and Eerland, and considered by them to be strongly suggestive of the diagnosis. Paradoxical pulsation has otherwise been discredited both as a positive sign of mitral regurgitation and as a negative one against mitral stenosis.

Seven pre-operative diagnoses have been made (Goldberg *et al.*, 1952; Zinsser and Johnson, 1953; Goldberg and Steinberg, 1955; Soboff and Zatzuchni, 1956) by means of angiocardiology, and no doubt this method will discover many more. But it has not usually been clear on what grounds angiocardiology has been recommended. We have tried to point out the fallacies in all the diagnostic points, and suggest that many cases will occur in which angiocardiology has not been done and the surgeon will be surprised. Goldberg and Steinberg (1955) give four indications for angiocardiology: (1) signs of mitral stenosis not dating from birth in young children; (2) absence of cardiac difficulties until the onset of intractable heart failure; (3) inconstancy of mitral murmurs; and (4) episodes of syncope or cyanosis on change of position. These four points are of value, but certainly the third and fourth are misleading. However, as angiocardiology becomes easier and more reliable (Soboff and Zatzuchni, 1956), myxomata will no doubt be discovered more often, and differentiated from mural and ball thrombi.

In 1952 Goldberg *et al.* described the case of a child aged 3½ in whom the tumour was diagnosed by angiocardiology; at operation the heart stopped before the pericardium was opened. The auricle was incised and the tumour removed by spoon and pituitary rongeur. The heart action was started again, but lasted only a few hours.

Crafoord operated successfully on a patient by means of the extracorporeal pump and oxygenator, as reported by van Buchem and Eerland (1957). The tumour was the size of a "small orange."

Brock (1956) has proposed and practised the approach to the myxoma through the right auricle, excising a circle of interatrial wall with the tumour pedicle, pulling out the tumour and stitching up the hole, with an arrested circulation under hypothermia. Eerland, also using hypothermia, removed a myxoma by making an incision in the left atrium as well as in the left auricle, and pushing the tumour in the atrial hole. After dividing the pedicle "the tumour was kept floating and pressed against the site where the left atrium was to be incised. The latter procedure was performed with the left hand. . . ." In both Brock's and Eerland's cases the patients succumbed to the complications of hypothermia. Chin and Ross (1957) succeeded in one case by carrying out Brock's suggestion, again under hypothermia. A few other cases of unsuccessful operative removal of myxoma of the left atrium have been reported (Goldberg *et al.*, 1952; Clowes *et al.*, 1954; Brock, 1956).

Ventricular cardiectomy produces ventricular fibrillation more easily than does the auricular approach; but it must be added that this danger is related to ventricular hypertrophy, fibrosis, and ischaemia, and a normal or thin ventricular wall carries little risk. The approach to the mitral valve through the ventricle is used by Logan (personal communication) in cases of difficulty in performing mitral

valvotomy, and he finds it satisfactory. In the present case, as in all cases of mitral obstruction, the muscle was normal and produced only an occasional extrasystole when cut and stretched.

When the tumour is discovered during a mitral valvotomy, one alternative treatment is to stop the operation and repeat it later with the help of hypothermia or cardiac bypass. In one such case the patient died two days after the first operation (Jones and Julian, 1955). Another alternative is to start immediately with hypothermia, but this involves considerable reorganization, whichever method of cooling is to be used. The third alternative is proposed in this paper.

Summary

A case of successful excision of an atrial myxoma is described.

It is shown that the symptoms and signs are almost indistinguishable from those of mitral stenosis, and that most cases will be discovered unexpectedly during the course of mitral valvotomy.

A simple method of dealing with the situation is described: this avoids having to abandon the operation with the intention of performing open cardiectomy later, under hypothermia or with the cardiopulmonary bypass. Abandoning the operation is in itself a danger; and open cardiectomy is less safe than the operation described.

The method consists of pushing up the myxoma with a finger through a small hole near the tip of the left ventricle; at the same time the index finger of the other hand, through a hole in the atrium, divides its pedicle, and guides it towards the auricular hole. While it is pushed through the hole it acts as a cork, and the auricle is clamped behind it as it falls out.

It is pointed out that the left ventricle in all cases of mitral obstruction is not hypertrophied or ischaemic, and an incision into it carries little risk.

We thank Dr. Wagner, who discussed the histology and aetiology; the South African Institute for Medical Research (Pneumoconiosis Research Unit) for the photographic reproductions; and Mr. Crawshaw, assistant to one of us (L. F.).

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Following the reorganization in 1955 of the Bexleyheath club for mentally handicapped children into an independent club for children with any type of mental or physical handicap, a committee for youth clubs for the handicapped was set up in 1956 to promote other similar clubs. By January this year a chain of clubs was formed in north Kent, and 17 new clubs had opened in London and the south-eastern counties. The campaign has now spread to four other counties, nine new clubs have opened, and 17 districts are organizing facilities. These clubs aim to socialize and educate handicapped children and give parents an opportunity of regular contact, and to dispel misconceptions and old wives' tales by acting as a focal point of local interest in mental handicap. The Bexleyheath club has 23 members, age range being 10-33 years, with mental ages of 3-9.

CHRONIC MIDGUT ISCHAEMIA

BY

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Arterial thrombosis secondary to atherosclerosis is initially of limited extent. The surgical exploitation of this pathological finding is now accepted as justifiable, and direct surgical treatment by thrombo-endarterectomy or by the insertion of a graft, either as a replacement or as a shunt, gives better results than any other form of palliative therapy (Martin and Gaylis, 1957; Mavor, 1957). In most cases the atherosclerotic occlusions so treated have been in the aorta, its terminal branches, and the lower-limb arteries (Rob, Eastcott, and Owen, 1956; Martin and Gaylis, 1957). More recently it has been shown that atheromatous narrowing of the internal carotid artery can be successfully dealt with by direct surgery, and the ischaemic cerebral symptoms relieved (Rob and Wheeler, 1957).

Similar opportunities for surgery may exist in relation to the superior mesenteric artery, where for a time severe narrowing or local thrombosis may precede more extensive occlusion and infarction of the bowel. Although the symptoms resulting from such chronic midgut ischaemia have been described previously (Klein, 1921), their treatment by direct surgery on the superior mesenteric artery is now more apparently feasible. Accordingly it appears justifiable to recall the clinical picture and describe two recent cases.

Case 1

A man aged 49 was first seen because of lower abdominal pain. Four months previously he had a sudden onset of severe lower abdominal pain. This was associated with vomiting, and the next day he passed three or four dark fluid stools. The severity of the pain subsided after several days, but some pain remained present daily. This pain, situated in the lower abdomen, was continuous in nature and aggravated by a heavy meal, particularly of meats or fats. He had no abdominal colic, no night pain, and no back pain. Occasionally after a large meal he vomited. During this period he tended to be constipated, but since the original episode had had two episodes of diarrhoea, each lasting a few days. His appetite was poor and he lost 21 lb. (9.5 kg.) in weight in four months.

On examination he was a thin man of good colour. There were no findings of significance in the abdomen. Rectal examination was negative. Stool benzidine examination was positive. Haemoglobin was 92%, and a barium-meal and follow-through examination showed no abnormality.

He was seen twice during the next three months. Diarrhoea had become more persistent and he passed two or three stools daily. These were watery but well coloured. The abdominal pain persisted, being present every day. There was no further vomiting. Weight loss continued, the total loss over seven months being 35 lb. (15.9 kg.). On one occasion rectal examination revealed soft yellowish faeces which suggested fat malabsorption. Fatty acids were present on examination. Stool benzidine examination continued to be positive, and a further haemoglobin estimation was 90%. Barium enema showed no abnormality.

Seven months after the onset of symptoms and while awaiting admission to hospital for investigation, he entered as an emergency case, complaining of severe abdominal

pain. For the previous six days he had constant lower abdominal pain of great severity. He vomited brownish material several times. He had had no adequate bowel movement over the previous five days, although he had passed some dark fluid faeces from time to time. The abdominal pain and vomiting had increased over the previous 24 hours, and abdominal distension had become apparent.

On examination he was emaciated and suffering severe pain. The blood pressure was 160/100 mm. Hg, and the pulse rate 90 a minute. His extremities were cold, there was peripheral cyanosis, and venous filling was poor. Other significant findings were restricted to the abdomen, which was distended. There was slight lower abdominal tenderness, but no rigidity and no palpable mass. The abdomen was tympanitic on percussion and quiet, with occasional high-pitched bowel sounds on auscultation. The bladder was not distended and the rectum was empty.

The patient was given 10,000 units of heparin and intravenous therapy was begun. A Ryle tube was passed and 120 ml. of dark-brown fluid aspirated from the stomach. At laparotomy the small bowel (excluding the duodenum), caecum, and ascending colon were gangrenous. Peritonitis was well established. There was no pulsation in the superior mesenteric artery, which appeared thrombosed from its origin. No definitive surgical procedure was undertaken. The patient died eight hours later.

Post-mortem Findings.—The only abnormal findings were related to the abdomen. The peritoneal cavity contained a small amount of blood-stained serous fluid, and the entire small bowel and proximal half or thereby of the large bowel were necrotic. This extensive infarction of the bowel was due to thrombosis occluding the orifice of the superior mesenteric artery. In addition to the recent thrombus at the orifice, there was just inside the orifice an older organized layer of thrombus which was partly occluding the

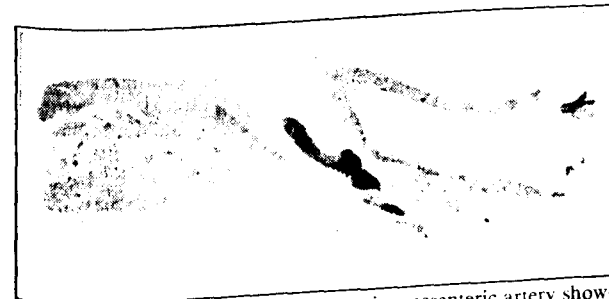


FIG. 1.—Case 1. Section through superior mesenteric artery showing lumen just distal to origin narrowed by atheroma and occluded by fresh thrombus.



FIG. 2.—Case 1. Section showing wall of atheromatous superior mesenteric artery and lumen containing unorganized thrombus. (×32.)

vessel wall (Figs. 1 and 2). Beyond this the artery was free of atheroma and contained only post-mortem clot. The abdominal aorta was healthy.

Case 2

A man aged 46 had suffered from abdominal pain for the previous nine weeks. This pain was of sudden onset. It was very severe, was felt in the epigastrium, was unrelated to meals, and was associated with nausea and vomiting. It persisted in severity over several days, along with nausea and vomiting. The vomit was never obviously brownish or blood-stained. Anorexia was complete, largely owing to the intractable nausea. Diarrhoea was present, the stools being watery and well coloured.

Over several weeks the epigastric pain became less severe, although it was often worse after meals. The faeces became progressively lighter in colour and the diarrhoea persisted, becoming, along with abdominal pain, his main complaint.

Two weeks before admission to hospital some improvement had occurred in his condition. Abdominal pain, although present each day, was much less severe, and there was no further vomiting. Diarrhoea, however, was still present, and weight loss had continued, reaching 49 lb. (22.2 kg.) over the nine-weeks period.

His past history revealed symptoms of duodenal ulcer lasting 21 years. About a year previously a partial gastrectomy had been carried out. For some months after this operation he had postprandial umbilical discomfort following large meals, occasionally associated with eructations and diarrhoea. During the week prior to admission to hospital he developed a fissure-in-ano.

On examination he showed evidence of recent weight loss. Blood pressure was 130/90 mm. Hg and pulse rate 78. There were no significant findings on examination. The abdomen showed no abnormality apart from a right paramedian scar.

The following investigations were undertaken. Blood picture: haemoglobin, 97%; white cells 8,000 (normal differential); platelets, plentiful; red cells, normal; E.S.R., 17 mm. per hour. Urine: no abnormality. Stool: culture negative; undigested fat globules, and a considerable excess of fatty acids; benzidine-positive. Blood urea, 38 mg./100 ml.; serum alkaline phosphatase, 24 units; serum bilirubin, less than 0.2 mg./100 ml.; plasma proteins, 6.56 g./100 ml.; serum amylase, 200 mg./100 ml.; thymol turbidity, 3 units. X-ray examination of chest, negative; cholecystogram, negative; barium enema, negative; barium-meal examination: gastrectomy evident, normally functioning stoma, and no evidence of anastomotic ulcer; some tendency to delay in emptying of proximal jejunum. In view of the excess fat in his stool a fat-balance test was attempted, but had to be discontinued because of intense pain due to his fissure-in-ano.

During this period in hospital his general condition improved. The abdominal pain subsided, although he continued to have diarrhoea and pass rather pale and greasy-looking stools. His main complaint was related to his anal fissure. This was injected with some relief.

After five weeks in hospital he was sent home with a view to being readmitted for fat-balance studies. While at home his condition remained unchanged. He felt unwell and weak, and suffered umbilical and lower abdominal pain almost daily. This was often severe—a constant grinding pain which did not radiate. It was made worse by meals, so much so that he often refused to eat. There was no vomiting. Diarrhoea persisted, several stools being passed each day. The consistency of the stool was fatty and "undigested-looking"—pale, greasy, and floating on the surface of the water. He lost a further 10 lb. (4.5 kg.) in weight.

Seven weeks after discharge he was readmitted to hospital. There were no significant findings on examination except that the left femoral pulse was noted to be weaker than the

Methods and Treatment

Clinical.—All the patients were males within the 19–30 age group. They were seen before admission, when a history was taken and a physical examination made. A throat swab was taken at the same time. Thereafter patients were examined daily by one of us (P. J. T.), when each patient was asked whether or not his throat felt sore and his answer recorded. The degree of injection, oedema, and exudate was noted. Oral temperatures were taken at four-hourly intervals until the temperature had been normal for 24 hours, and thereafter twice daily. The clinical criteria for discharge were symptom-free, afebrile, and a clean throat. A throat swab was then taken, and the patient left hospital next morning provided that no haemolytic streptococci had grown overnight. If this organism was found the patient was retained in hospital and given a three-day course of phenoxymethylpenicillin regardless of his previous treatment. No patient was allowed to leave hospital until his throat swab had been found clear. Two further throat swabs were taken at weekly intervals, and on all these three occasions urine was tested for proteinuria.

Cases were treated by one of three methods on a non-selective basis for a minimum of three to four days: (1) soluble aspirin tablets, 10 gr. (0.65 g.) four-hourly in 40 cases; (2) sulphatriad tablets, 4 g. stat. and 1.5 g. four-hourly in 37 cases; (3) phenoxymethylpenicillin tablets, 120 mg. eight-hourly in 39 cases. Patients in the last two groups also received soluble aspirin. All patients remained in bed until their temperature had been normal for 24 hours. Patients were allocated into treatment groups alternately, depending solely upon the order in which they were admitted to hospital—an administrative list beyond our control.

Results

Clinical features were very similar to those noted in our previous paper and in other descriptions of the illness. Those patients admitted on the first two days were more ill than those admitted on subsequent days. Injection of the throat was seen in every case, together with a variable amount of oedema. Exudates were seen in those with tonsillar tissue. 17 had a temperature of 99° F. (37.2° C.) or less, although they had a sore throat. Four others did not complain of sore throat. Scarlet fever developed in 31 cases (see Table).

Laboratory Findings.—Every patient had a throat swab taken on admission, and 65 (56%) were found to carry *Streptococcus pyogenes*. Of seven cultures sent to the Streptococcal Reference Laboratory, four were Lancefield group A and three were group G.

Comparison of Treatment Groups.—108 patients were admitted to the trial having had the unselective course of treatment without amendment until they were clinically fit for discharge from hospital. No distinction is made between those with positive or negative throat swabs on admission. This is because the outbreak showed all the characteristics of a food-borne infection and there was no clinical difference between the two groups: aspirin, 35 cases; sulphatriad, 35 cases; phenoxymethylpenicillin, 38 cases.

Of the many methods available for assessing the efficiency of treatment we have selected four: duration of "soreness" of the throat, duration of fever, length of stay in hospital, and the carrier rate.

Duration of "Soreness" of the Throat.—The answers received from daily questioning of patients are shown in Fig. 1; it is clear that there was no difference between the three groups.

Duration of Fever.—Fig. 2 shows that there was no difference between sulphonamides and aspirin, while penicillin showed a slight difference on the third day only, although it is not statistically significant (difference/standard error=1.6).

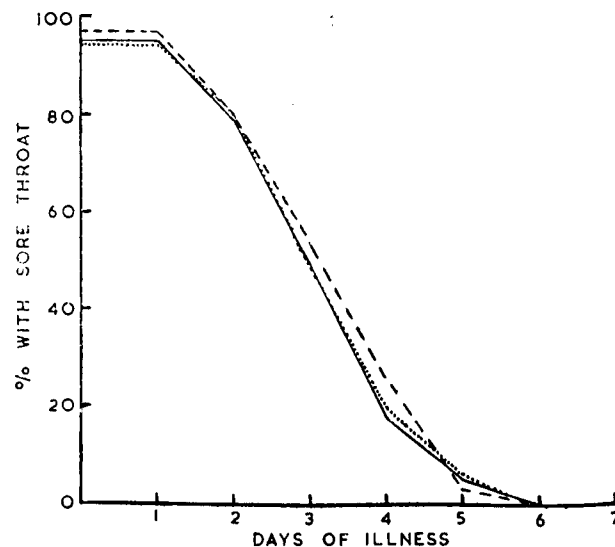


FIG. 1.—Duration of sore throat. Aspirin,; sulpha, ----; penicillin, ———.

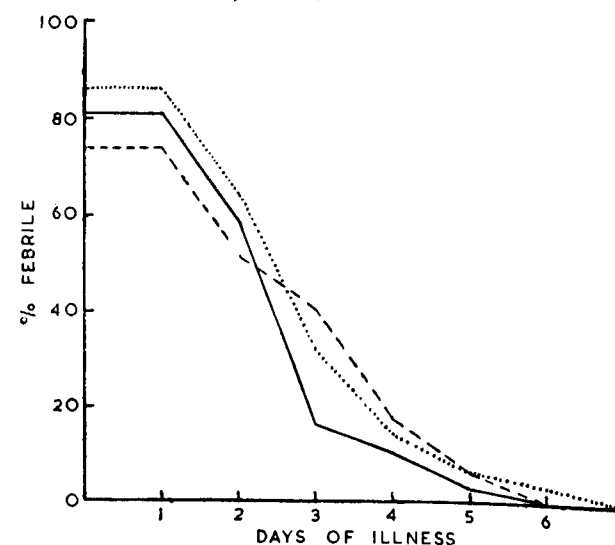


FIG. 2.—Duration of fever. Aspirin,; sulpha, ----; penicillin, ———.

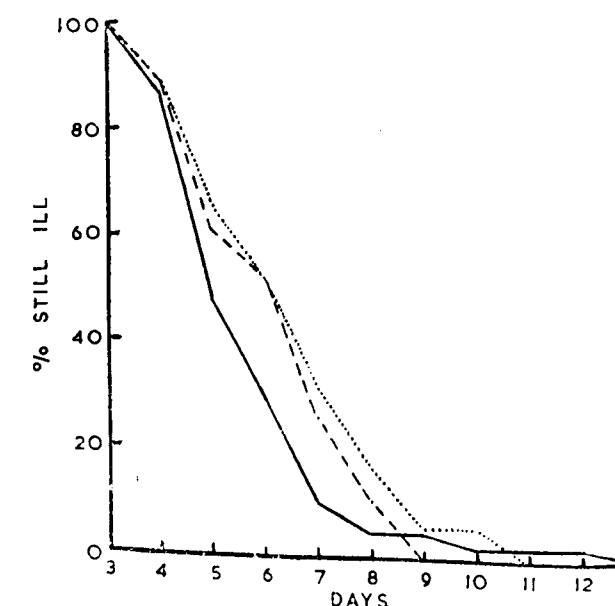


FIG. 3.—Days in hospital to clinical discharge. Aspirin,; sulpha, ----; penicillin, ———.

Length of Stay in Hospital.—In the present epidemic, when patients with a positive throat swab were kept in for a further three days, this figure is dependent upon two factors: clinical recovery and bacteriological normality. The latter factor depends on the carrier rate of the treatment concerned, and Fig. 3 represents the time taken for clinical recovery alone. Here again there was no difference between the sulphonamide and aspirin groups. Those patients treated with penicillin, however, showed a tendency to recover more quickly, but this did not become significant until the seventh day (difference/standard error=2.15).

Positive Throat Swabs following Treatment.—Only 10 patients were found to have a positive throat swab after clinical recovery: penicillin, 1 case (2.6%); sulphatriad, 1 case (2.8%); aspirin, 8 cases (22.8%). The difference here is self-evident. The overall carrier rate two weeks after discharge was 6.9%.

Complications.—No cases of rheumatic fever or acute nephritis were discovered. Two cases of mild otitis media as evinced by injection of the tympanic membrane were discovered on admission, but these had settled by the next day. Two patients had brisk diarrhoea lasting one day only, and examination of stools did not indicate dysentery.

Discussion

The present trial has shown that neither sulphatriad nor oral penicillin reduced the duration of soreness of the throat. The only positive finding was the fact that they both reduced the number of positive throat swabs following treatment. In what is perhaps the most important assessment—namely, the duration of the illness as a whole—the results showed only a slight but significant reduction with the use of oral penicillin. The duration of fever was slightly less in those patients on penicillin, although the difference was not statistically significant.

The length of the illness is usually the resultant of three factors: cessation of fever, the disappearance of pain, and, in all patients under medical supervision, a reasonably normal appearance of the throat. We have shown that the first two factors are independent of treatment. It is well recognized that, in cases of sore throat, people with tonsils have more visible exudate. It has also been shown that the more visible exudate is associated with a higher re-presentation of tonsillar tissue (Bloomfield and Felty, 1923; Taylor and McDonald, 1958).

Penicillin kills the pathogens more quickly than symptomatic treatment, thereby hastening the recovery of the throat to a normal appearance, thus shortening the illness.

It has been claimed that a further indication of the value of a given treatment may be obtained from an examination of its more obvious failures (Chapple *et al.*, 1956). Of the eight patients who were taken out of the trial because their treatment had been altered, five had received aspirin alone, two sulphonamides, and one penicillin. While this may seem to suggest that aspirin was the least effective form of treatment, this is not necessarily the correct conclusion.

The results of previous trials suggest that there seems to be little difference in the symptomatic effects of penicillin whether the infection is considered to be streptococcal or not (Chapple *et al.*, 1956).

It may well be that tonsillitis is often a double infection of viruses and bacteria. This may be the reason why penicillin has no strikingly beneficial effect in the treatment of tonsillitis.

Summary

A food-borne epidemic of 116 cases of streptococcal tonsillitis, including 31 cases of scarlet fever, is described.

A controlled trial using sulphonamides and oral phenoxymethylpenicillin is presented.

The results suggest that oral penicillin has no beneficial effect on the soreness of the throat but speeds the recovery of the normal appearance of the throat, the lowering of temperature, and the duration of illness.

We thank the Director-General of the Royal Air Force Medical Services for permission to publish. We also thank Dr. R. E. O. Williams, of the Streptococcus Reference Laboratory, and Dr. J. C. McDonald, of the Public Health Laboratory Service, for helpful advice and criticism in the compilation of the paper.

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HAEMOGLOBIN "NORFOLK": A NEW HAEMOGLOBIN FOUND IN AN ENGLISH FAMILY

WITH OBSERVATIONS ON THE NAMING OF NEW HAEMOGLOBIN VARIANTS

BY

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In a survey of blood used for transfusion in Singapore it was noted that the blood of a young Englishman contained two haemoglobins, one with the electrophoretic properties of haemoglobin A and one other, amounting to 27%, which was moving faster than A on paper electrophoresis using barbiturate buffer of pH 8.6. By comparison with eight AJ specimens—one from Africa (Dr. J. Stijns), three from Indians (Dr. A. B. Raper; Dr. L. D. Sanghvi, and Mr. P. K. Sukumaran), one from Indonesia (Dr. Lie-Injo Luan Eng), and three from Chinese in Singapore—it was established that the electrophoretic mobility of the fast component on paper at pH 8.6 was similar to, although slightly faster than, that of haemoglobin J.

There was no haematological or clinical abnormality. When the young man's immediate family in England was examined it was found that his mother possessed only haemoglobin A, and that his father and his younger brother were also carriers of this new haemoglobin variant in the same proportion. The family is of Norfolk farming stock and so far as they are aware they are purely English. Thus this is the first observation in an English family of an abnormal haemoglobin. Neither the father nor the brother of the propositus was anaemic, and a full haematological investigation of the father yielded normal values only; in particular there were no target cells and no abnormal osmotic fragility; the haemoglobin A₂ fraction was not increased.

Investigation of the New Haemoglobin

The new variant from the Norfolk family was only just distinguishable from haemoglobin J on paper electrophoresis at alkaline pH—moving slightly faster (Fig. 1). However, whereas haemoglobins A and J do not separate on chromato-

graphy (Huisman and Prins, 1955), there was a distinct separation between A and the present haemoglobin by this technique (Fig. 2). Huisman, Noordhoek, and da Costa (1957) stressed their inability to separate haemoglobins A

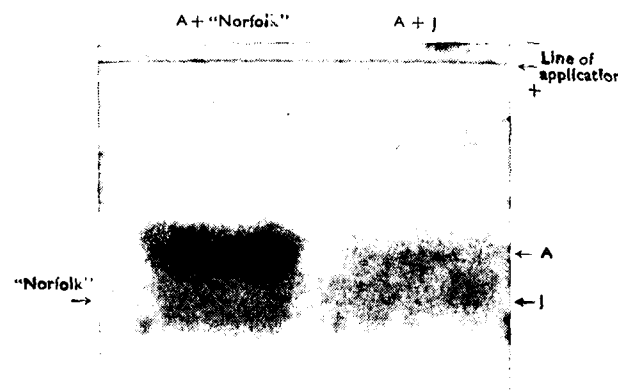


Fig. 1.—Filter paper electrophoresis, pH 8.6. Haemoglobin "Norfolk" moves similarly to, but slightly faster than, haemoglobin J.

and J, using a range of buffers from pH 5.7 to pH 8.5 of widely varying concentrations. It could be argued that the new haemoglobin is only a minor variation of haemoglobin J. However, if the routine method of investigating haemoglobins was that of column chromatography and not paper electrophoresis a similar argument could be raised against differentiating haemoglobins J and K, which do not separate on chromatography but differ on paper electrophoresis at alkaline pH.

Haemoglobins A and J do not separate on paper electrophoresis at pH 6.5 or pH 7 (cacodylate buffer). The present haemoglobin showed some slight spreading under these conditions, though there was no perfect separation. There was no separation at all on starch electrophoresis at pH 6 (citrate buffer) (Fig. 3). There was no denaturation when the haemoglobin was kept frozen for several months, and when it was treated with alkali (Singer, Chernoff, and Singer, 1951) it was fully denatured. The solubility of the ferrohaemoglobin in Itano's (1953) test was 1.7 g./litre of 2.58 M phosphate buffer. The visible and ultra-violet spectra of the carboxyhaemoglobin were identical with those of haemoglobin A.

Summary of Properties of the New Haemoglobin.—(1) Moving slightly faster than J and considerably more slowly than "Bart's" and N on paper electrophoresis at pH 8.6 (barbiturate buffer). (2) Showing some slight separation on paper electrophoresis at pH 6.5 and pH 7 (cacodylate buffer). (3) Not separating from haemoglobin A on starch electrophoresis at pH 6 (citrate buffer). (4) Separating from haemoglobin A on column chromatography on "amberlite IRC-50" at pH 6 (citrate buffer). (5) Being denatured in the conventional test for alkali resistance. (6) Being resistant to cold denaturation. (7) Having the same carboxyhaemoglobin spectrum in visible and ultra-violet light as haemoglobin A. (8) Showing in a 27% mixture with haemoglobin A a solubility of 1.7 g./litre in 2.58 M phosphate buffer. (9) Being present in a father and two of his sons. (10) Producing no haematological abnormality in the trait carrier.

Electrophoretically abnormal haemoglobins must be rare in Britain. Matthias (1958) examined 500 unrelated British out-patients at St. Bartholomew's Hospital in London without discovering one abnormal haemoglobin. The propositus

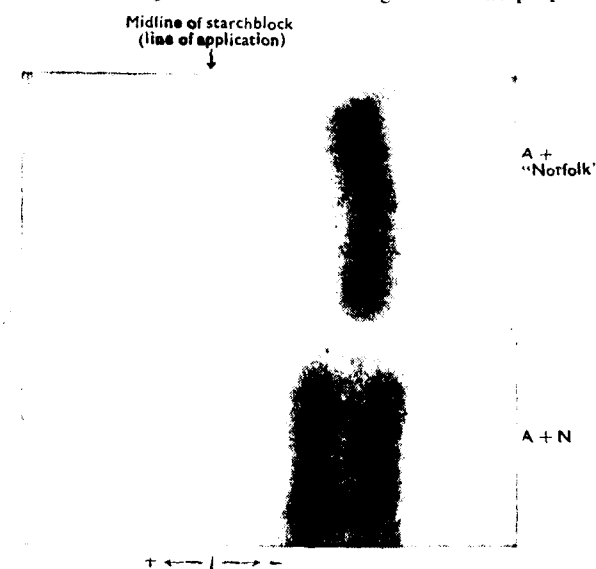


Fig. 3.—Starch electrophoresis, pH 6, of haemoglobins A+N (below) and A+"Norfolk" (above) respectively. N clearly separates and moves behind A at this pH. There is no separation of A and "Norfolk."

is the only one of 2,550 Britons examined in Singapore to show an electrophoretically abnormal haemoglobin—his serial number was 2105.

Naming of the New Haemoglobin

It is becoming increasingly difficult to separate the various haemoglobins by paper electrophoresis, and the application of more than one technique is required for their identification. In 1953 a number of workers interested in abnormal haemoglobins met and proposed that haemoglobins should be designated by letters of the alphabet in order of their discovery (Statement on Hemoglobin Nomenclature, 1953). The proposals of this committee found universal acceptance.

This method of naming new haemoglobins was practicable only so long as they were discovered in small numbers. There soon arose difficulties, however, when different haemoglobins were given the same letter by their discoverers. Thus Cabannes and Buhr (1955) called a new haemoglobin I, a letter which Rucknagel, Page, and Jensen (1955) had used for their haemoglobin which they had originally called H, not realizing that H was the name of a new haemoglobin discovered by Rigas, Koler, and Osgood (1955). Cabannes and his colleagues (1956) next selected the letter J, only to discover that J had been claimed for another haemoglobin by Thorup, Itano, Wheby, and Leavell (1956). The next available letter K was finally adopted.

Recently two different designations have been given to what is almost certainly the same haemoglobin when Ceppellini *et al.* (1958) named a pigment associated with haemoglobin A₂ haemoglobin A₂' and Masri *et al.* (1958) described it as A₄.

One way out of this dilemma was pointed by Robinson, Zuelzer, Neel, Livingstone, and Miller (1956). They provisionally named two haemoglobins after their place of origin, Liberia I and Liberia II, until they were finally identified as haemoglobins N and K respectively. This example has been widely followed.

It is more than likely that the pace of discovery of haemoglobin variants will increase rather than slacken. In the absence of a central organization the allocation of letters by individual research workers risks confusion.

During the last year we were faced three times with the problem of naming a haemoglobin. For the first, haemo-

globin L (Ager and Lehmann, 1957), we wrote to a wide circle of interested research workers and obtained universal approval for the use of this letter. When we wanted to designate the haemoglobin which we called Q (Vella, Wells, Ager, and Lehmann, 1958), we repeated this procedure and had to take into account what we could discover about haemoglobins awaiting designation. We therefore used the letter Q, although at the time of our submitting the paper for publication neither N, O, nor P had yet been publicly allotted. It was obvious that such a way of naming a haemoglobin could not continue, so that when it came to naming an abnormal foetal haemoglobin found in an infant at St. Bartholomew's (Bart's) Hospital in London we followed the example of Robinson and his colleagues (1956) and called the new pigment haemoglobin "Bart's" (Ager and Lehmann, 1958). For the same reason we have now decided to name the present haemoglobin the "Norfolk" type and will leave it to international agreement at a future date to allot a final designation.

An additional complication is that new techniques may demonstrate that haemoglobins thought to be identical by present-day methods are in fact different. Itano (1956) has drawn attention to the contradictory findings from different laboratories on the solubility of haemoglobin C and questioned whether there were not two different haemoglobins both with the electrophoretic properties of haemoglobin C. No fewer than three different haemoglobins have been discovered by comparing the peptides resulting from tryptic digestion of haemoglobins which by the conventional techniques had been identified as D (Benzer, Ingram, and Lehmann, 1958).

Should these haemoglobins now be called haemoglobins D₁, D₂, and D₃, or should only one of them be called D, and if so which, and the other two R and T? If one realizes that the differences between haemoglobins A, S, and C consist as Ingram (1957) and Hunt and Ingram (1958) have shown in there being one different amino-acid in each of some 300 forming the two chains of the globin molecule, and that these differences are due to the action of one single gene, it becomes clear that there is an almost indefinite number of permutations and possible variants of haemoglobins—far outnumbering the letters of the alphabet.

Eventually it will be possible to designate the haemoglobins by their amino-acid sequence, but some *ad hoc* measure for an interim classification will have to be taken. To start the discussion we suggest a scheme which first divides the foetal haemoglobins from the adult variants, these latter being grouped according to their electrophoretic mobilities on paper at pH 8.6. This technique and this pH are the most widely used and separate from haemoglobin A all known adult variants except haemoglobin M. The adult variants could be divided into six groups, depending on their distance from the line of application after electrophoresis. The groups could be named I, II, III, etc., or they could have the name of the first haemoglobin discovered within the group.

Foetal variants

F, "Fessas and Papaspyrou," "Bart's."

Adult variants

- "Slow" haemoglobins:
 - Group I or C group: C, A₂', E-A₂, O.
 - Group II or S group: S-D and variants of D.
 - Group III or G group: L-P, G, Q.
- Group IV or A group: A-M.
- "Fast" haemoglobins:
 - Group V or J group: K, J, "Norfolk," N.
 - Group VI or I group: I, H.

Within each group the haemoglobins could be numbered according to their mobility, or when they have the same mobility they could be given—according to the time of their discovery—the additional letters a, b, c, etc. Thus haemoglobin L, G, and Q would be "G group" 1, 2, and 3 respectively. Since P moves at alkaline paper electrophoresis with the same speed as L, L and P would be respectively

"G group" 1a and "G group" 1b. If after such a scheme was adopted a haemoglobin was discovered which moved, say, between haemoglobins E, A₂, and O ("C group" 3 and "C group" 4), it would then have to be classified as "C group" 3/4. If it was possible to place a haemoglobin between the hypothetical pigment "C group" 3/4 and O ("C group" 4) it could be designated "C group" 3/4/4.

Foetal

F, "Fessas and Papaspyrou," "Bart's"

Adult

Group I or C group	"C group"
C, A ₂ ', E-A ₂ , O	1, 2, 3a, 3b
Group II or S group	"S group"
S-D and its variants	a, b, etc.
Group III or G group	"G group"
L-P, G, Q	1a, 1b, 2, 3
Group IV or A group	"A group"
A-M	a, b
Group V or J group	"J group"
K, J, "Norfolk," N	1, 2, 3, 4
Group VI or I group	"I group"
I-H	a, b

When a new haemoglobin is discovered it can safely be allotted to one of the six groups, but a digit should only be assigned after full comparison and international agreement. It is obvious that it would remain the general practice to refer to the common and well-known haemoglobins by their present names—S, C, D, E, etc.—but the more obscure pigments might well be labelled by giving the group a digit, and, if necessary, with the digit a small letter.

We should like to emphasize that it is not our intention to propose here a new nomenclature or classification of the human haemoglobins, but merely to suggest a scheme which might serve as a basis for discussion. To use these designations without prior wide agreement would confuse rather than clarify the situation.

Summary

A new haemoglobin resembling haemoglobin J but not identical with it is described. It has been found in a purely English family. It is named the "Norfolk" type. The difficulties of naming new haemoglobins are discussed, and a scheme is suggested which might help to avoid confusion.

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There is no indication in the literature that *P. ovale* has ever been proved to be responsible for allergic symptoms. Yet here is a fungus to which the skin should have unique opportunities of becoming sensitized. It was determined, therefore, to carry out a systematic survey of allergic patients for evidence of positive skin reactions and clinical responses to this organism.

Skin Testing.—The method of skin testing in use in the clinic is to prick through a drop of the extract at a concentration equivalent to 20,000 Noon units. Most of the

If the 38 patients positive to *P. ovale* are re-examined it is found that half of them have reactions equal to or larger than that of the histamine controls. Table IV analyses their

The rash in the cases with eczema occurred not only on the head and neck but also, in some of them, on the arms, chest, back, and thighs.

Particular care is needed in the selection of shampoos, as several patients in addition to Case 1 have become sensitized to them. Patch testing should always be done before using a fresh preparation and on the first sign of increased irritation.

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NYLON HAIR-NET DERMATITIS

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It is not widely known that nylon hair-nets may cause dermatitis. From the United States, however, Anderson (1950) reported several examples and Barton (1950) added another. In this country two cases were described among six patients also sensitive to dyed nylon stockings (Calnan and Wilson, 1956), and there have been three subsequent reports (Beck, 1957; Calnan, 1957a, 1957b).

Whereas the nylon fibre itself is probably inert, dermatitis may result from sensitivity to resin finish in which the net is coated, to the rubber band which keeps the net in place, and to the dye with which the net is coloured. Most cases are thought to be due to the dye, which is generally of the azo group, a chemical configuration notorious for its capacity to sensitize the skin. None of Anderson's cases of hair-net dermatitis developed dermatitis from nylon stockings, and the two patients described by Calnan and Wilson did not contract the rash from their stockings for over a year after the onset of the hair-net dermatitis.

Clinical Features

The pattern of dermatitis from hair-nets is distinctive enough when complete and uncomplicated. Often, however, the picture is only partially complete and is closely if not indistinguishably imitated by a constitutional seborrhoeic eczema; it may also be complicated by additional areas of dermatitis. Lastly, the patients rarely suspect that their trouble is caused by a hair-net, and it is only in recent

years that we ourselves have become familiar with the condition.

Three principal contact sites are involved—behind the ears, the nape of the neck, and the hairline on the forehead. Retroauricular dermatitis is the commonest, and occurs in almost every instance. It affects the adjacent part of the scalp and may spread down the occipital hair margin to become continuous with patches over the nape of the neck

(see Fig.). The upper half of the ears may show a vesicular dermatitis on both the outer and the inner aspects. Such involvement should make one particularly suspicious of a hair-net contact. Suboccipital and nuchal dermatitis is frequent in women as a manifestation of a seborrhoeic eczema or a neurodermatitis. When due to hair-net sensitivity it is virtually identical with the constitutional condition. Nuchal dermatitis was present in almost every case. A linear dermatitis of the upper forehead and hairline zone was seen in only six patients. It may be so slight as to be missed or disregarded, but when seen has great diagnostic value in the presence of dermatitis of the nape and retroauricular areas. One patient had a striking linear zone of dermatitis under the chin and on the sides of the neck from a hair-net which was tied under the chin with tapes.

The typical pattern may be complicated by areas of eczema or dermatitis elsewhere on the body. In 11 instances dyes of similar nature appeared to be responsible, while in five cases the dermatitis was caused by sensitivity to unrelated substances (Table I). Nine patients had additional areas of dermatitis (Table II) for which we could not find a precise cause.

TABLE I.—Other Sensitivities

Case No.	Related Sensitivities		Unrelated Sensitivities
	Positive	Negative	
1	Stocking		
5	Petticoat strap		
6	Petticoat strap; stocking		Lipstick
7	Stocking		
8	Watch-strap		
9	Stocking		
10		Stocking	
11		Sulphanilamide	
13		Stocking	
14	Black nylon gloves	Black nylon brassiere	
15	Hair dye; paratoluenediamine		Nickel
16	Stocking		
18			Rubber glove and shoe; mercaptobenzthiazole
19	Hair dye; stocking; paratoluenediamine; yellow nylon blouse	Pink nylon nightdress	Nickel and rubber; mercaptobenzthiazole
21			
24	Stocking		Nickel

TABLE II.—Areas of Associated Dermatitis

Case No.	Skin Involved
4	Whole scalp and nasolabial areas
8	Face
13	Front of chest
14	Elbow flexures
16	Arms
17	Wrists; eyelids
21	Elbow flexures
23	Groins; perineum; axillae
26	Front of chest and elbow flexures

The severity of the dermatitis is usually subacute, consisting of erythema and scaling. It may be moist and exudative behind the ears, and occasionally on the back of the neck. Small vesicles may be found on the tips of the ears and along the hair margin. In one case there was an extremely severe local reaction associated with a widespread petechial eruption closely resembling the rash due to carbromal sensitivity.

Hair-net dermatitis may be persistent or intermittent, according to the frequency with which the net is worn. Some patients wear it for only a few hours after a visit to the hairdresser, while others wear their net regularly.

The age of onset in our cases (Table III) appears to be late when compared with other instances of allergic contact sensitivity, such as nickel (Calnan, 1956) and lipstick (Calnan and Sarkany, 1958). This finding may well have no great

TABLE III.—Age of Onset in 27 Cases of Hair-net Dermatitis

Age	No. of Cases	Age	No. of Cases	Age	No. of Cases
20-9	1	40-9	5	60-9	8
30-9	3	50-9	8	70-9	2

significance from the point of view of allergy, as hair-nets are more often worn by older women, and relatively seldom by younger women with short hair styles.

The duration of the sensitivity when first seen varied from three weeks to seven years. Most patients gave a history of some months. One must admit, however, that a number of cases were not diagnosed for long periods after their first attendance at hospital.

There was no evidence of an atopic diathesis; none had had atopic eczema, and only one patient had hay-fever.

Patch Tests

All the patients except one were patch-test positive to the nylon portion of the hair-net. The one exception (Case 24) was allergic to the rubber of the elastic band but not to the nylon. When patch testing with the rubber, one must take great care to remove all trace of the nylon thread, which is usually wound round the elastic.

In our cases, hair-net sensitivity from the nylon part was always attributable to the dye, and patch tests usually gave an acute vesicular reaction at 48 hours. A single case gave a negative reaction at 48 hours, but was positive when read 48 hours later.

No routine cross-sensitivity tests with the "para" group were done, but patients were tested with any substances which were suspected of causing their other patches of dermatitis. The results are shown in Table I. It can be seen that 11 patients (40%) showed cross-sensitivity dermatitis—a striking illustration of the importance of this phenomenon. Not all patients reacted to chemically related substances, and five cases showed additional unrelated sensitivities.

It is extremely difficult, if not impossible, to trace the precise dye used in a particular patient's hair-net. We have reason to suppose that they are usually azo-dyes, of which there are a large variety. We have patch-tested a number of our patients with paraphenylenediamine, and a red, yellow, and blue azo-dye, and the results are shown in Table IV.

TABLE IV.—Patch Tests to Dyes

Case No.	Paraphenylenediamine	Azo Dyes		
		Red	Blue	Yellow
1	++	+	+	++
2	++	+	+	++
4	+	+	+	++
6	+	+	+	++
7	+	+	+	++
8	+	+	+	++
9	+	+	+	++
10	+	+	+	++
11	+	+	+	++
12	+	+	+	++
13	+	+	+	++
14	+	+	+	++
15	+	+	+	++
16	+	+	+	++
17	+	+	+	++
18	+	+	+	++
19	+	+	+	++
20	+	+	+	++
21	++	+	+	++
22	+	+	+	++
23	+	+	+	++
25	+	+	+	++
26	+	+	+	++
27	±	+	+	++

These particular chemicals are employed in dyeing nylon stockings, but we have no proof that these were the actual dyes used on the hair-nets worn by any of our patients.

Discussion

The fact that we have been able to collect 27 cases within 18 months suggests that this is not a rare condition, and we think it likely that many cases go undiagnosed. The rash produced by sensitivity to nylon hair-nets so closely resembles one of constitutional origin that several of our cases were incorrectly diagnosed when first seen. In spite of increased experience we cannot always distinguish the two conditions by clinical examination alone, and it is essential

that every patient presenting an eczematous rash of this pattern should be asked if she wears a nylon hair-net. If she does so, she should be patch-tested against it. The fact that a patient can wear nylon stockings with impunity does not necessarily invalidate the diagnosis, as many of our patients were able to wear nylon stockings without getting a rash. Even those who did develop a stocking dermatitis did not do so until several months after the onset of their hair-net dermatitis.

One of our cases was sensitive to the rubber band, while the remainder gave positive patch tests to the material of their hair-nets. When tested against a routine batch of azo-dyes used for dyeing stockings, they gave positive reactions, usually to the yellow or red, but occasionally to the blue dye. Although we were unable to obtain the actual dyes used on the nets, we consider that hair-net dermatitis results from sensitivity to the dye in the majority of cases. When the nylon net was discarded, even if replaced by a silk or hair one, the rash cleared. The skin returned to normal after an interval varying from a few weeks to several months.

Summary

Twenty-seven cases of nylon hair-net dermatitis are reported.

Although closely resembling that of seborrhoeic eczema, the uncomplicated rash has a characteristic pattern.

With one exception, sensitivity to the dye appeared to be responsible.

We thank all members of the staff of St. John's Hospital for Diseases of the Skin who referred cases to us; also Dr. Sydney Thomson and Dr. David Williams for allowing us to investigate their cases.

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SUCCESSFUL TWIN PREGNANCY
AFTER TREATMENT OF MALIGNANT
ESSENTIAL HYPERTENSION

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The benefits resulting from the introduction of lumbo-dorsal sympathectomy and hypotensive drugs in the treatment of malignant essential hypertension are well recognized (Northfield, 1948; Smithwick, 1951; Rosenheim, 1954; Smirk, 1954; Smirk, Doyle, and McQueen, 1954; Pickering, 1955). It is, however, often impossible or impracticable to maintain the blood pressure at normal levels in some patients following one or other of these methods of treatment, although hypertensive symptoms may be relieved, papilloedema may resolve, and progressive renal damage may be arrested. Such patients then resemble those with benign essential hypertension; they may remain free from symptoms, but are still apt to develop cerebrovascular or cardiac complications. In addition, women of childbearing age may suffer the risks of hypertensive pregnancy.



The following report describes a case of malignant essential hypertension first treated by sympathectomy. Hypertension, persisting after sympathectomy, was then controlled with hypotensive drugs and the blood pressure was maintained within normal limits during the greater part of a successful twin pregnancy.

Case Report

A married woman aged 27 was admitted to the Dorset County Hospital in January, 1954, complaining of blurring of vision and retro-orbital pain in the left eye for a few days. She gave no past or family history of renal disease. She was found to have gross bilateral papilloedema with exudates and flame-shaped haemorrhages, more marked in the left retina. Her blood pressure was 260/200 mm. Hg. A diagnosis of malignant hypertension was made, and after treatment with rest in bed and hexamethonium bromide all her symptoms resolved, her blood pressure fell to 200/130, and she was discharged in March.

In April she was admitted to the London Hospital. At that time she was still taking oral hexamethonium bromide. Her blood pressure was 280/150 and there was bilateral papilloedema with retinal exudates, but no haemorrhages. A few discrete enlarged lymph nodes in both posterior cervical triangles and a palpable tip of spleen were also noted.

Investigations on admission gave the following results. Hb, 85% (12.6 g. per 100 ml.); E.S.R., 6 mm. in one hour; blood urea, 39 mg. per 100 ml. Maximum urine urea concentration, 2.88 g. per 100 ml. Catheter specimen of urine: cloud of protein but no casts or excess red cells. Intravenous pyelography and perirenal insufflation of oxygen showed normal excretion of dye and normal renal and adrenal outlines. Excretion of noradrenaline in a 24-hour specimen of urine was normal. Chest x-ray examination showed normal-sized heart and no pulmonary lesion. The diagnosis was essential hypertension in the malignant phase.

During the next few weeks further enlargement of the cervical glands and spleen was noted, but she remained asymptomatic and afebrile. Repeated blood counts and chest x-ray films were normal and her blood Wassermann reaction was negative. A cervical gland biopsy showed reticulum-celled hyperplasia with a slight increase of plasma cells and focal fibrosis. This was thought to be probably due to chronic inflammation, but a reticulosis could not be excluded. The glands have since decreased in size and the spleen has only occasionally been felt. With rest in bed and oral hexamethonium bromide her blood pressure varied between 160/110 and 230/160 in the supine position. The response to treatment was not considered satisfactory, and in July and August, 1954, bilateral thoracolumbar sympathectomy (T 5 to L 3) and splanchicectomy was performed. Before operation her blood pressure varied between 210/150 and 270/220. After operation there was only a slight fall in her blood pressure, and three months later it was 195/110 in the supine position. A biopsy of the right kidney at the time of operation showed medial hypertrophy of all arterioles with marked subintimal hyalinization but no fibrinoid necrosis. Of 28 glomeruli, six were completely hyalinized, six had shrunken tufts with marked capsular fibrosis, and the remainder showed focal necroses and capsular adhesions. There was focal collagenous increase in the interstitial tissue with patchy tubular atrophy. These changes were thought to be the result of hypertension rather than of primary renal disease.

During the next two years she received no hypotensive therapy and remained well apart from slight shortness of breath on exertion and an occasional frontal headache when fatigued. She worked as a full-time schoolteacher. She wanted children, but was advised against pregnancy. On her annual visits to the London Hospital out-patient department her blood pressure was about 210/130 with a slight postural fall. A cloud of protein persisted in her urine. The optic disk edges remained blurred and the physiological

cups could not be seen, but the papilloedema had resolved. The retinal arteries remained tortuous, and many new vessels appeared around the disk margins. Haemorrhages and exudates were no longer to be seen (see Fig.).

In November, 1956, at her annual visit to the out-patient department, she thought she was two months pregnant (L.M.P. September 18; E.D.D. June 25, 1957). A 24-hour rat pregnancy test was positive, and she was admitted for consideration of termination of pregnancy. On examination her blood pressure was 220/135 in the supine position. The fundi were unchanged and her visual acuity was (R) 6/5 and (L) 6/6. Her urine still contained a cloud of protein.

Investigations in December, 1956, showed: Hb, 92% (13.6 g. per 100 ml.); blood urea, 36 mg. per 100 ml.; maximum urine urea concentration, 1.5 g. per 100 ml.; E.C.G. left axis deviation. Chest x-ray examination showed no cardiac enlargement.



Right optic fundus, March 19, 1957. Optic disk flat, but edges blurred and physiological cup not visible. Many new tortuous vessels around the disk margins.

It was considered that the chances of a live birth were small and that there was a risk of further hypertensive damage if the pregnancy was allowed to continue; termination was therefore recommended. However, the patient and her husband were both keen to allow pregnancy to continue with a trial of hypotensive therapy. It was finally decided that termination in a symptomless and reluctant patient might have an adverse psychological effect, and, as the results of strict hypotensive therapy in pregnancy were not yet clearly established, she was allowed to continue under careful supervision.

She began treatment (12 weeks pregnant) with reserpine, 0.25 mg. three times a day, mecamlamine, 1.25 mg. four times a day, and phenobarbitone, $\frac{1}{2}$ gr. (32 mg.) twice a day. No salt was added to her food and she was at rest most of the day. Within a few days her urine became free of protein and it remained so throughout her pregnancy. Her blood pressure fell, and during the next month it remained at about 139/95 when supine and 130/80 when standing. The highest levels recorded were 190/120 when supine and 160/110 when standing. In January, 1957, she was discharged from hospital on the same treatment. At 18 weeks her uterus was noted to be unduly large, and radiography confirmed twin pregnancy. During the following weeks her weight rose excessively and her blood pressure slightly. In February (22 weeks) her blood pressure was 160/100 when supine and 140/100 on standing. The dose of mecamlamine was increased to 2.5 mg. three times a day. However, there was no significant fall in her blood pressure, and in March (26 weeks) she was readmitted for observation. During the next 10 weeks she was allowed out of bed for toilet purposes only. She remained well apart from minimal dyspnoea and very occasional hypotensive symptoms on standing. Her blood pressure fluctuated considerably, but was usually about 135/90 when supine and 120/80 when standing. The highest levels recorded were 200/140 when supine and 170/110 when standing. Her weight gain was

not excessive, and an increase of 32 lb. (14.5 kg.) from the eleventh to the thirty-sixth week was regarded as normal for a twin pregnancy. There was no oedema and her blood urea remained normal. Lower-segment caesarean section at about 36 weeks was contemplated, and at 34 weeks an x-ray examination of the abdomen was made to estimate the foetal size and maturity. This showed both foetuses to be presenting by the vertex, with the placenta situated in the upper posterior part of the uterine wall. The absence of any lower femoral epiphyses suggested that the foetuses were not more than 36 weeks at the maximum.

At the 36th week of pregnancy (May, 1957) the membranes ruptured spontaneously. Following a first stage of four hours' duration, during which the patient had no pain, two live female infants were delivered by forceps under general anaesthesia (nitrous oxide, oxygen, trichlorethylene, and ether). A normal third stage followed, with the delivery of a healthy binovular placenta. The first twin, weighing 3 lb. 2 oz. (1,430 g.), cried spontaneously at birth and was of good tone and colour. The second twin, weighing 4 lb. 6 oz. (1,985 g.), showed marked blue asphyxia at birth, with little response to pharyngeal suction, intragastric oxygen, and intravenous nalorphine hydrobromide. Normal respiration was finally established some 20 minutes after delivery following intubation and aspiration under direct vision, combined with artificial respiration. During the puerperium, trials were first made with mecamlamine, 2.5 mg. three times a day, and reserpine 0.25 mg. twice a day, separately. Neither produced a sustained fall in blood pressure, and in the fifth week mecamlamine, 2.5 mg. twice a day, was combined with reserpine, 0.25 mg. twice a day, and her blood pressure dropped to a steady level of about 150/100 when supine. In the third week of the puerperium her blood urea was 30 mg. per 100 ml., maximum urine urea concentration 1.27 g. per 100 ml., and creatinine clearance 81 ml. per minute. She remained asymptomatic, gradually increasing her activities until she was up through-out the day breast-feeding and caring fully for her twins. Both infants thrived; after a short period of tube feeding they were later breast-fed on demand. On discharge from hospital, aged 6 weeks, the first twin weighed 4 lb. 11 oz. (2,125 g.) and the second 5 lb. 11 oz. (2,580 g.).

Discussion

Pregnancy in patients with essential hypertension in the malignant phase is rare, and before satisfactory treatment was introduced termination was always recommended (Fishberg, 1954). There is no record of a successful pregnancy in an untreated patient. There have been several reports of pregnancies following sympathectomy. Newell and Smithwick (1947) reported 14 cases, three of which had had malignant hypertension. Two of these were described as having pyelonephritis also. The blood pressure was only slightly raised at the onset of their pregnancies, which occurred nine months, one year, and four and a half years after sympathectomy. One of these pregnancies was uneventful; one patient had no rise in blood pressure during pregnancy, which was terminated by caesarean section; and one had a surgical induction at the 38th week following increasing hypertension and proteinuria.

Peet (1948) reported 34 pregnancies in 28 women following sympathectomy. None are described as having had malignant hypertension. Eighteen had maintained normal blood pressure levels after operation and before pregnancy, slightly raised at the onset of their pregnancies, which occurred nine months, one year, and four and a half years after sympathectomy. One of these pregnancies was uneventful; one patient had no rise in blood pressure during pregnancy, which was terminated by caesarean section; and one had a surgical induction at the 38th week following increasing hypertension and proteinuria.

d'Abreu (1953) described four cases of successful pregnancy after sympathectomy. Again none had hypertension in the malignant phase prior to operation.

The use in pregnancy of hypotensive drugs, including mecamlamine and pentolinium tartrate with or without rauwolfia alkaloids, has not yet been adequately reviewed. Hexamethonium and pentolinium tartrate are perhaps more

effective in the treatment of pre-existing hypertension in pregnancy than of "toxaemic" hypertension (Morris, 1953; Blair, 1954; Townsend, 1955). Hydrallazine hydrochloride should theoretically have special value as a hypotensive agent, since it increases renal blood flow, but it has a toxic effect resembling disseminated lupus erythematosus (Morrow, Schroeder, and Perry, 1953). Veratrum alkaloids have been shown to produce acute reduction of blood pressure and to improve the outlook for the mother more than the child in the presence of "toxaemia" (Morris, 1955).

The risks to mother and foetus in pregnancy when there is pre-existing hypertension are well known; but the long-term effect on blood pressure of pregnancy in such cases is still not clearly defined (Browne, 1947; Chesley and Annitto, 1947; Chesley, Annitto, and Jarvis, 1947). Multiple pregnancies are known to predispose to hypertensive "toxaemia" more frequently than single pregnancies (Brews, 1953). Our patient risked complications in pregnancy due to pre-existing hypertension, and her chances of an added "toxaemia" were increased by the twin foetuses. It cannot, however, be claimed that the treatment during pregnancy prevented additional "toxaemia," the development of which is unpredictable in any individual patient.

The ease of maintenance of normal levels of blood pressure in this patient with small doses of mecamlamine and reserpine was striking. This successful combination of sympathectomy with hypotensive drugs has been observed by one of us (J. H. R.) in other patients. Although sympathectomy for severe hypertension has been employed less in recent years, it still has a place in the treatment of patients with malignant essential hypertension in whom large doses of hypotensive drugs are ineffective or produce severe side-effects but who are fit enough to withstand the operation. If necessary, smaller doses of the drugs may be tried afterwards.

The neonatal asphyxia of the second twin was probably not related to the mother's treatment, and it would appear that the hypotensive drugs had no ill effects on the infants (their blood pressures were not recorded). It has been observed that hexamethonium passes freely into the amniotic fluid, and swallowing of the fluid has been suggested as being responsible for neonatal deaths by Morris (1953), who described the treatment of 26 pregnant women with hypertension. There were 7 stillbirths and 19 live births, with 7 neonatal deaths (within eight days). There is no information available yet about the transference of mecamlamine across the placenta.

Summary

A successful twin pregnancy 33 months after the mother had undergone bilateral thoracolumbar sympathectomy for malignant hypertension is described. Hypertension persisting after the operation was controlled with mecamlamine and reserpine.

We thank Lord Evans and Mr. Alan Brews, under whose care this patient was treated at the London Hospital, and Professor Clifford Wilson for their help in the preparation of this paper.

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Summary

Direct anti-globulin tests on the red cells from fresh clotted blood from 100 cases of malignant disease gave negative results. Positive results were obtained if the specimens were stored overnight at 4° C.

Indirect anti-globulin tests on the sera from some of these cases gave positive results against fresh group O rhesus-positive cells at 4° C. only, but this was abolished by previous absorption of the serum with secretor saliva. It was considered that the antibody involved was the incomplete cold auto-antibody described by Dacie (1950). Possible reasons for the discrepancy with other workers are discussed.

My thanks are due to Dr. J. Stewart and Dr. L. A. D. Tovey, of the Bland-Sutton Institute, and to Dr. A. E. Mourant and Dr. D. Parkin, of the Lister Institute, for their help and encouragement. Appreciation is also expressed to Dr. J. S. Campbell, of the Aberdeen Blood Transfusion Service, for supplying the goat anti-globulin serum.

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Medical Memorandum

Caeco-colic Intussusception Following Appendicectomy

In 1953 Cleland found records of only five cases of intussusception in the immediate post-operative period following appendicectomy, and to these he added a personal case. A further case is here recorded.

CASE REPORT

A boy aged 10 was admitted to hospital on December 8, 1956, with a history of abdominal pain for 18 hours and the signs of acute appendicitis. Appendicectomy was performed the same evening through a muscle-splitting incision, and an acutely inflamed appendix, wrapped in omentum, was found, together with some free turbid fluid. The appendicectomy was carried out with the customary ligation of appendix stump and purse-string invagination, without carbolizing the base, and the abdomen was closed without drainage.

Recovery was at first uneventful, and an enema was given on the fourth post-operative day with a good result, but on the fifth evening he was seen because of a sudden attack of severe colicky pain, which made him cry out and draw up his legs in each spasm. On examination the general condition was good, pulse and temperature were normal, and the abdomen was soft between spasms, with no distension. Palpation over the ascending colon seemed to induce painful spasms and guarding, but no mass could be felt. Bowel sounds were slightly increased. Rectal examination was negative. Two hours later he vomited, but was easier, and soon went to sleep.

At 7 a.m. the next day he had a recurrence of the severe pain, and he vomited again, though his general condition was unchanged and pulse and temperature were still normal. However, inspection of the abdomen showed fullness on the right side, while palpation suggested a vague mass in the upper right abdomen, and induced severe pain and spasm. Bowel sounds were increased. The lower rectum contained constipated faeces, and inspection of the finger-stall revealed a small fleck of blood-stained mucus, more evident when wiped on to a piece of lint. A clinical diagnosis of intussusception was made. A portable scout x-ray examination

of the abdomen was made, but it added no further information. A white-cell count was 13,500 per c.mm.

At operation 14 hours after the onset of symptoms, through a right paramedian incision, a few ounces of clear yellow free fluid was found and the diagnosis of intussusception confirmed, the apex having reached the middle of the transverse colon. Reduction was at first easy, but towards the end the ensheathing layer serosa split, and required oversewing. The whole was quite viable and little altered in colour, except for the apex. The small bowel was noted to be only slightly distended. The apex was the previously inverted base of the appendix, and in the final reduction a little pus exuded from the centre of the purse-string, while the caecum for 2 cm. round was firm with oedema and reddened. The pus was let out and mopped away, and a little penicillin-sulphathiazole powder applied. No attempt was made to fix the caecum to the parietes, and the abdomen was closed without drainage.

Post-operatively, intravenous N/5 glucose saline was given, 1 pint (570 ml.) six-hourly for 48 hours, and fluids only by mouth were continued to four days, when solids were started. Tetracycline, 250 mg. six-hourly, was given with the intravenous fluid, then changed to 125 mg. six-hourly by mouth for three further days, in view of the abscess found at the appendix stump. On the third day the child developed a right lower lobe collapse, which readily cleared with intensive physiotherapy. Three weeks after the second operation he returned home. He has since been seen twice at the out-patient department and has been well, with a good appetite, regular bowel action, and no chest complaint; both wounds were soundly healed.

COMMENT

In the seven recorded cases, including the present one, the age of the patient has been between 4 and 28 years. With one exception (on the twelfth day), the onset has been remarkably constant at about the fifth post-operative day.

The difficulty in diagnosis has been stressed by previous writers. Slight post-operative colic is not unusual some days after abdominal operations, but the severity of the intussusception colic was striking. Abdominal palpation is rendered difficult by the recent tender wound, though a mass was felt in four of the seven cases. Cleland stated that the absence of haemorrhage from the bowel seemed absolutely constant, but this is refuted by the present case.

In four recorded cases and in the above one a small abscess was present in the space enclosed by invagination of the appendix stump. Such abscesses have been noted at post-mortem examination soon after appendicectomy for acute disease, and it seems likely that they occur in many more instances never recognized. Cases have also been recorded where such an abscess ruptured into the abdomen, with the appearance of a ruptured viscus.

The rarity of intussusception is interesting in view of the "tumour" which must frequently be created by the oedema surrounding the invaginated and infected appendix stump on so many occasions. The infective element seems important, as no case has been recorded following a "cold" appendicectomy.

These possibilities give support to the view that, except where the stump is friable and insecure, careful ligation alone may be wiser than the added purse-string.

I thank Mr. H. E. Lockhart-Mummery for permission to publish this case and for his advice and encouragement.

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Reviews

CELL BEHAVIOUR

The Life and Death of Cells. By Joseph G. Hoffman. (Pp. 288. 35s.) London: Hutchinson Scientific and Technical Publications. 1958.

To produce a scientific book that holds the attention of the general reader from cover to cover is something achieved by few research workers. But to write with engaging enthusiasm, yet with all the wiles and devices of modern biophysics, about the complicated behaviour of normal and malignant cells must be a unique achievement. Here are some of Joseph G. Hoffman's chapters: "What is Life?"; "Automation in Cells"; "Variations and Mistakes"—an exciting survey of chromosome counts and chromosome breakage; "Cancer Cells"—which begins with the provocative sentence, "Cancer is a disease of organization, a cell mistake in tissues where the number and growth of cells is precisely regulated"; "Submicroscopic Fibres"—concerned with collagen and fibres of tissue cells, bacteria, and algae; "Games of Chance"—we are initiated into statistical mechanics before considering cell multiplication by the so-called Monte Carlo method; and "The Importance of Death." I especially enjoyed the exciting account of physical forces that govern the organization of molecules both outside and within cells. The discussion of van der Waals's forces is masterly. Biology seems to be aiding pure chemistry almost as much as chemistry is helping biology in this field. No doubt many of the author's views will not be acceptable to all cancer research workers, but at least they will arouse vigorous discussion, which is something to be thankful for nowadays. I strongly recommend this delightful book to readers who enjoy the unusual. A few references to assist further reading and some well-planned diagrams would have been acceptable. The index is adequate, but the price is far too high. ROY CAMERON.

HAEMORRHAGIC DISEASES

Haemorrhagic Diseases. By Armand J. Quick, Ph.D., M.D. (Pp. 451; illustrated. 70s.) London: Henry Kimpton. 1957.

Any book written by so distinguished a haematologist as Professor Quick must attract attention. Haemorrhagic disease is a subject which has long interested him, and his disease is a subject which has long interested him, and his many previous publications are summarized and expanded in this book. Divided into seven chapters, it includes a historical review, the theories of blood coagulation and its role in haemostasis, and the hypoprothrombic states dependent both upon pathological conditions and on drugs. Haemophilia, pseudohaemophilia, purpura, and telangiectasia are also fully discussed, and there are chapters on afibrinogenemia and hyperheparinaemic states. Venous thrombosis is nicely summarized in a short section. Finally a selection of laboratory techniques is given, especially emphasizing those devised by Quick and his colleagues.

This book is bound to cause controversy, as not all Quick's hypotheses are acceptable to other experimental haematologists. To parody Abraham Lincoln, "You can satisfy some of the people all the time, and all the people some of the time, but you cannot satisfy all the people all the time," and this gives a very real picture of the present state of blood-clotting research. Thus, though individual readers of blood-clotting research. Thus, though individual readers may disagree with parts of this book, yet it is an excellent exposition of Quick's beliefs and a serious contribution to haematology. During a life devoted to blood diseases he has seen many rare conditions, and his clinical observations are excellent. The general get-up and printing of the book are uniformly good, but there are too many spelling and small factual errors which give the appearance of carelessness in compilation and proof-reading. The very considerable bibliography is arranged at the ends of the individual

chapters, and there is no general author index. This is a book for the qualified haematologist rather than for the student. H. PAYLING WRIGHT.

RELATIONSHIP BETWEEN LIVER AND BRAIN

Liver-Brain Relationships. By Ian A. Brown, M.D., Ph.D. (Pp. 198+xiii; illustrated. 50s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

It is certainly convenient to have the complicated and expanding problems of liver-brain relationships discussed in an impartial and clear fashion within the compass of a tidy monograph. The clinical, morbid anatomical, and biochemical aspects of the subject-matter are of considerable interest to physicians. What was not so very long ago yet another clinico-pathological rarity—mysterious, incurable—has now on analysis proved to hold more important biochemical mechanisms. Still more wonderful, this unpromising morbid process would seem to turn out to be reversible—to some extent, at any rate. Neurologists who approach the problem of the liver-brain axis from the angle of Wilson's disease, and internists who deal with the hepatic comas, will unite in finding this volume of some interest and assistance. Unfortunately, in a presumed scientific approach where scrupulous accuracy in nomenclature is to be expected, there are many misspellings—for example, Bromwell, Walsh, Luthy, Lowy, Gyorgy. But most disturbing of all is a recurring reference to a certain Cambridge professor of anatomy whom the author terms Glissonii. Confidence in the exactitude of the rest of the volume is somewhat shaken. MACDONALD CRITCHLEY.

PRACTICAL MIDWIFERY AND GYNAECOLOGY

A Practical Handbook of Midwifery and Gynaecology for Students and Practitioners. By W. F. T. Haultain, O.B.E., M.C., B.A., M.B., B.Ch., F.R.C.P.Ed., F.R.C.S.Ed., F.R.C.O.G., Clifford Kennedy, M.B., Ch.B., F.R.C.S.Ed., F.R.C.O.G., and J. L. Henderson, M.D., F.R.C.P.Ed. Fifth edition. (Pp. 410+x; illustrated. 30s.) Edinburgh and London: E. and S. Livingstone. 1957.

It is five years since the latest edition of this popular book was published. The authors, well-known figures in the obstetric world of Edinburgh, have thoroughly revised the present edition. The section on "The Infant and Infant Feeding" has been rewritten, and there are new chapters on the difficult subject of the Rh factor and also on psychology in obstetrics—a chapter that is particularly apposite in view of the increasing emphasis that is being placed on the emotional aspects of pregnancy. The style is synoptic, and thus the busy practitioner will find reference easy and rapid. But it is difficult to reconcile, in a book of this character and compass, the inclusion of descriptions (and illustrations) of gynaecological operations which a general practitioner will not be called upon to perform. However, this is a criticism that can be applied to many textbooks written for medical students and general practitioners. The views expressed are conventional, and their presentation will appeal especially to final-year students. For those who wish for a simple and lucid vade-mecum in obstetrics and gynaecology this book can be safely and unhesitatingly recommended. W. C. W. NIXON.

HOST-PARASITE RELATIONSHIPS

Host-Parasite Relationships in Living Cells. A Symposium sponsored by the James W. McLaughlin Fellowship Program, University of Texas—Medical Branch, Galveston, Texas, April 27, 1956. Compiled and edited by Harriet M. Felton, M.D. (Pp. 245+xix; illustrated. 50s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

This volume is a report of the proceedings at a symposium held in Galveston, Texas, on April 27, 1956. There were eleven participants, eight of whom contributed papers. One session was devoted largely to the morphology of the host cell and of bacteria as revealed by the electron microscope,

and of cells in tissue cultures inoculated with viruses; these three contributions by E. W. Dempsey, C. E. Georgi, and J. T. Syverton are beautifully illustrated. A long paper by R. A. Good is entitled "The Morphological Basis of the Immune Response" and includes a valuable review of the development of knowledge about the site of formation of antibodies; the incrimination of the plasma cell is supported by copious evidence from the clinical field relating the gamma-globulin content of the blood with the numbers of these cells in the body. A thoughtful paper by R. J. Dubos deals with the interrelationships of host and micro-organism, and one by M. G. Sevag on similar lines concentrates on the properties of the micro-organism which confer pathogenicity. The authors of these and other papers finally engaged in a round-table discussion at the end of what must have been a most exhausting although stimulating day. This and other discussions are reported apparently verbatim, including trivial remarks and reference to other contributors by such names as "Charlie" and "Jerry." The subject of this symposium is so fundamental and in many ways obscure that the speakers inevitably posed more questions than they answered, but their contributions make up an interesting, and at many points illuminating, review of it. The papers conclude with sometimes extensive lists of references.

L. P. GARROD.

TREATMENT OF BLADDER TUMOURS

Bladder Tumours: A Symposium. By Mitchell Brice II, M.D., and eleven others. (Pp. 92+vii; illustrated. 32s.) Philadelphia and Montreal: J. B. Lippincott Company. London: Pitman Medical Publishing Co., Ltd. 1957.

Tumours of the bladder give rise to one of the most depressing problems in surgery. In spite of the introduction of a number of new methods of treatment the prognosis still remains poor. Any advance in the treatment of these tumours is likely to be small and slow. The importance of having a basic standard from which to judge such advances is obvious, and the authors of this symposium from three well-known New York institutions have combined to give such a baseline. One of the main difficulties in assessing the value of various types of treatment of bladder tumours is the wide variations in pathological classification which have been adopted in different clinics. In this book these tumours have been classified by a combination of histological grading following Broders's plan and a classification depending on the stage of penetration of the bladder wall and metastatic spread. Throughout it is shown how closely related are these two classifications and that the prognosis runs parallel to both. A valuable series of untreated bladder tumours has been collected, and this series forms a very salutary standard with which to compare other forms of treatment. The treatment of bladder carcinoma by perurethral local excision and fulguration is shown to have been mainly confined to localized and low-grade cancer, and in such it apparently prolongs survival, removes a great deal of bladder irritability, and stops haematuria; but if hydronephrosis is present the tumour is probably of a higher grade than was expected, with a corresponding impaired prognosis. The results of partial cystectomy are shown to be reasonably satisfactory for low-grade and non-penetrating carcinomata, but leave much to be desired in the treatment of high-grade and late-stage cancers. Similarly it is shown that total cystectomy which removes only the bladder but leaves much pelvic connective tissue and lymphatics yields results in the case of high-grade carcinomata which must be improved. This indicates the trend towards more radical surgery for the higher-grade and more widespread cancers. A detailed description of a radical total cystectomy in which all the pelvic cellular tissue is excised with or without the rectum is given, and the results of the first 100 cases are recorded. This operation is considered to be a definite improvement upon simple total cystectomy. Finally the surgical treatment of cancer of the bladder is discussed and summarized.

This symposium is a very valuable contribution to the treatment of cancer of the bladder by collecting large series

and evaluating statistically the various methods of treatment. For not only will it be found invaluable for those surgeons who require statistics for comparison with those of new methods of treatment, but it will be found most stimulating reading for any surgeon who has to treat this most resistant disease.

J. E. SEMPLE.

THE RORSCHACH TEST

Perceptualists. A Fundamentally Reworked, Expanded, and Systematized Rorschach Method. By Zygmunt A. Piotrowski, Ph.D. (Pp. 505+xvii; illustrated. 47s.) New York and London: Macmillan Company. 1957.

Hermann Rorschach was a Swiss psychiatrist of undoubted brilliance who died in 1922 at the early age of 38. From Freud he acquired understanding of psycho-analysis; from Jung an interest in psychodiagnostic procedures and in typological studies of personality. Rorschach's main contribution—as is well known—is the ink-blot test that has come to bear his name. This method he evolved gradually as an empirical research tool, and was careful to specify that its theoretical foundation was in no sense complete. Although its validity has been questioned in some quarters, the method has proved of real, if limited, usefulness in psychiatric diagnosis and in the appraisal of certain aspects of personality. Dr. Piotrowski now endeavours to claim for the Rorschach method the status of a science in its own right, to which he gives the clumsy title of "perceptanalysis." It is difficult to see what is gained by such a claim, which would quite certainly have been disowned by Rorschach himself. Although scientific principles may be applied in the design of any psychological test, the results do not for that reason constitute an addition to scientific knowledge. In many cases, indeed, their apparent objectivity is deceptive. In the case of the Rorschach test, even the results are doubtfully objective, and there is certainly no theory of personality sufficiently well established to endow them with scientific validity. Why not simply treat the method, as did Rorschach, as an empirical technique of heuristic value in psychological medicine?

It is only fair to add that Dr. Piotrowski has made a sincere and careful study of the Rorschach method, based upon his own extensive experience and the findings of other workers. This will be of interest and value to clinical psychologists and others concerned with the minutiae of Rorschach interpretation. It is doubtful, however, whether his treatment of scoring problems will displace that of Klopfer and Kelly, which is widely followed in this country. None the less, Dr. Piotrowski's book is a solid and thoughtful contribution to the technical literature and can be recommended to all who feel the fascination of Rorschach's original experiment.

O. L. ZANGWILL.

The fascination of retreading the paths of history or romance can be compelling. Some may be content to walk the Pilgrims' Way from Winchester to Canterbury, but others, answering a more adventurous call, must break right away and follow in the footsteps of Livingstone through the jungles of Africa or of Marco Polo over the desolate expanses of Asia. Sir John Elliot, chairman of the London Transport Executive, has reserved for himself a small corner of this particular historical field, and very rewarding it has turned out to be. In *The Way of the Tumbrils* (Max Reinhardt, London; price 18s. net) he records his detailed and scrupulous researches in those areas of Paris where the main events of the French Revolution took place and where it is still possible to find traces of the men and women who played the leading parts in that extraordinary drama. With an informed and sympathetic pen he writes of those who lived, worked, declaimed, plotted, were imprisoned, died, and were buried in revolutionary Paris—among them the king and queen, Charlotte Corday, Marat, Danton, and Robespierre. Furnished with a useful plan and a brief outline of the Revolution, this book is the satisfying outcome of one professional man's hobby. There are no dry bones of history about it, for every page reflects the author's manifest enthusiasm for his subject. Anyone with a few days to spend in Paris would find it a pleasantly unconventional addition to the standard guide-books.

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ASPIRATION OF FOOD AND VOMIT

In view of the way the respiratory and alimentary tracts cross each other in the pharynx, it is a constant source of wonder that aspiration of food is not an everyday occurrence. The anatomical conformation of the pharynx and larynx and the beautiful, though complicated, mechanism of swallowing effectively seal the larynx, preventing aspiration in ordinary circumstances. Should this mechanism fail for an instant, the extraordinarily sensitive protective reflexes guarding the larynx and air passages see to it that any foreign material, even a crumb, that gets into the trachea is quickly coughed out by the most vigorous efforts of which the subject is capable. Now evidence is accumulating that in circumstances other than "normal"—and these abound in medical practice—

aspiration is much more common than is realized. That aspiration can be responsible for death in patients made unconscious by drugs or disease, when the normal protective reflexes are depressed, has long been known. A. M. N. Gardner¹ directs our attention to other cases of hitherto inexplicable deaths and complications which may well have been due to aspiration. Perhaps the two most noteworthy fields of medicine in which these cases occur, though there are many others and hardly any is exempt, are paediatrics and anaesthesia. For infants, the aspiration of a large quantity of milk (the "milk embolism" of Marie²) may be immediately fatal, particularly if they are feeble. Even repeated small aspirations—not at all infrequent in ill or feeble infants—may give rise to a variety of complications depending on the nature of the material aspirated. In anaesthetized patients aspiration of the contents of the stomach is still a major cause of death.³ A full stomach, so common in patients with intestinal obstruction and in women in labour, with pharyngeal and oesophageal sphincters paralysed by relaxants, and reflexes depressed with barbiturates, form a combination particularly conducive to regurgitation and aspiration.

¹ Gardner, A. M. N., *Quart. J. Med.*, 1958, 27, 227.
² Marie, J., Sorlingo, P., and Hébert, S., *Sem. Hôp. Paris*, 1947, 23, 1335.
³ Edwards, G., Morton, H. J. V., Pask, E. A., and Wylie, W. D., *Anaesthesia*, 1956, 11, 194.

The evidence that aspiration had occurred before death, even though perhaps agonal, rather than after death, is usually taken to be the presence of gastric contents in the bronchi and lungs at necropsy. To test this belief, Gardner placed barium sulphate in the stomach immediately after death. Radiographs taken at necropsy 24–48 hours later showed barium in the lungs in 7 out of 10 bodies. The validity of such a fundamental means of proof as necropsy has therefore been shaken, and for this evidence to be acceptable in future measures must have been taken immediately after death to prevent post-mortem gravitation of gastric contents into the lungs. Gardner went on to investigate the frequency with which aspiration takes place in life. Barium was placed in the drinks of patients after abdominal operations. In 10% barium reached the lungs. That this was due to aspiration of food and not vomit was shown by the rarity of the occurrence when the drinks were placed in the stomach by tube. The diagnosis that aspiration has occurred in these circumstances is just as difficult during life as it is after death. Staining of the sputum, coughing after drinking, pyrexia, tachycardia, and hypotension are all suspicious findings.

Aspiration is clearly a hazard of illness rather than of health and is particularly liable to occur when feeding recumbent patients who are old, ill, and perhaps even narcotized. Prevention lies in insisting on drinking being carried out in a sitting position only. For cases in which this is impossible the common hospital feeding-cup appears to need redesigning, or drinking through a straw might be substituted for it. Gardner points out that the shape of the spout of the standard hospital feeding-cup "enables fluid to be poured into the mouth and down the trachea of a recumbent patient, and the hooded top, by concealing from him both the quantity and orientation of the fluid, ensures that he is taken by surprise."

Aspiration of food or vomit is an important event in any circumstances. In the surgical wards it is probably responsible for some cases of post-operative chest disease, while in the medical wards it may yet emerge as an important aetiological factor in some common pulmonary diseases. Outside hospital, aspiration may kill at all ages, and in a variety of circumstances: the feeble infant in its cot, the heavy feeder intoxicated with alcohol on his couch, and the epileptic in the street, are but a few examples. Any case of otherwise inexplicable death should be suspect, and aspiration as a factor carefully excluded. However, if the diagnosis of aspiration is to be made at necropsy, it is worth bearing Gardner's work in mind. Pathologists will no doubt study his experiments and results with particular interest.

any treatment has real prospect of lasting success once irreversible vascular changes have occurred in the kidneys or other vital organs. Effective hypotensive therapy in malignant hypertension has to be started at the earliest possible moment if life is to be saved.

Total adrenalectomy may have an appeal on the grounds that an operation can produce a cure without dependence on hypotensive drugs which are difficult for the patient and physician to manage, but after the operation patients are wholly dependent on adrenal cortical replacement therapy, and on achieving a critical balance between the hazards of hypertension on the one hand and of adrenal cortical failure on the other. Arnott and his colleagues consider that total adrenalectomy should not be attempted unless medical measures have failed, and never employed in the presence of frank renal failure. But it may offer a reasonable hope of cure of severe hypertension if drug treatment has failed.

DRY LABOUR

For generations "dry labour" has had the connotation of long and tedious travail; but not now. To-day premature rupture of the membranes is not regarded as a disadvantage, provided it does not betoken disproportion or malpresentation. This view is upheld by the findings in an investigation by M. N. Bainbridge and his colleagues from University College Hospital, London, into the effect of rupture of the membranes on length of labour.¹ A total of 3,750 consecutive deliveries, 62% of them in primigravidae, were analysed, omitting only multiple pregnancies and those ended by caesarean section. The cases were divided into four groups according to the time of rupture of membranes. The first group contained all those cases in which labour was induced by amniotomy; the second group comprised those in which the membranes burst spontaneously before or at the very outset of labour; the third group was of those in which the rupture occurred during the first stage of labour; and the final group was confined to those in which the membranes were intact until at least full dilatation of the os. The analysis showed clearly that both in primigravidae and in multigravidae the first stage of labour was shorter in the first two groups—that is, when the membranes ruptured or were ruptured at or before the onset of labour. Moreover, this advantage accrued without there being any adverse effect on the duration of the second stage or on the incidence of forceps delivery, manual removal of the placenta, or post-partum haemorrhage. No evidence was found that rupture of the membranes before labour increased the rate of genital sepsis, but it has to be noted that all patients in this series who were undelivered 24 hours after the rupture were given antibiotic therapy. Nor was foetal distress more common, but the exclusion of all labours terminated by caesarean section, which might in some cases have been indicated by foetal distress, casts some doubt on the validity of this finding.

¹ Bainbridge, M. N., Nixon, W. C. W., and Smyth, C. N., *J. Obstet. Gynaec. Brit. Emp.*, 1958, 65, 189.
² Embrey, M. P., *ibid.*, 1953, 60, 37.
³ Eastman, N. J., in *Williams' Obstetrics*, 1956, 11th ed., p. 423. Appleton-Century-Crofts, New York.

Bainbridge and his colleagues did not investigate the effect of delay in the onset of labour following rupture of the membranes, but M. P. Embrey² has presented an interesting report on this aspect. He found that delay in the onset of labour after spontaneous premature rupture of the membranes increased the length of labour; so that with a 24-hours interval the incidence of prolonged labour was increased by half, and with a 72-hours interval it was doubled. More important was his finding that if labour did not start within 48 hours of rupture of the membranes the foetal mortality was doubled, while a 96-hours latent period trebled the foetal loss. N. J. Eastman³ showed that a distinction must be made according to whether the foetus is mature or premature at the time of spontaneous premature rupture of the membranes. In mature babies he found a perinatal mortality of 1.7% when the latent period before the onset of labour was less than 48 hours, but four times as much (6.8%) when the interval was more than 48 hours. It follows that, if the baby is adjudged mature, steps should be taken to stimulate the onset of labour in the baby's interest. In premature babies, however, Eastman found that the perinatal loss was determined largely by the degree of prematurity. When, therefore, there is premature spontaneous rupture of the membranes and the pregnancy is still some weeks before term, the mother is best admitted to hospital so that if labour does follow quickly the baby can enjoy the readily available facilities of the premature nursery; but uterine action is not stimulated, in the hope that the pregnancy will continue—as it often does—until the foetus is larger and more likely to survive.

RELAXATION

Later generations looking back on the 1950's may well think that one of the more overworked fashions of the decade is relaxation. A leading banker returning from his Riviera holiday is "bronzed and relaxed"—at least if popular with the newspapers. A Cabinet Minister appearing on television gives a "relaxed performance"—or so his supporters will declare. Relaxation is thus a term of praise; your friends have it and your enemies do not. There may be an insignificant minority who would rather see their public men looking eager, alert, enthusiastic, even occasionally in these times worried, but to the great majority of right-thinking people a "relaxed" man is one who has an easy mastery of men and affairs.

In contrast, this mythology delineates an unrelaxed man: he is a business executive who is always on the go, and he suffers from anginal attacks, hypertension, arteriosclerosis, and possibly peptic ulcers. Or, as R. E. Lee and R. F. Schneider,¹ of New York, put it: "In relatively recent press reports, several writers have highlighted a close association between cardiovascular disease and the strains of executive responsibility." To test the truth of this hypothesis, Lee and Schneider defined an executive, found 1,171 men fitting the definition, and compared them with 1,203 non-executives, of whom 563 were women. The comparison covered an average

¹ Lee, R. E., and Schneider, R. F., *J. Amer. med. Ass.*, 1957, 167, 1447.
² Asher, R. A. J., *Brit. med. J.*, 1947, 2, 967.

period of five years and was made on data gathered by taking medical histories and doing physical examinations. These included urine analyses, complete blood counts, chest radiography, and electrocardiography. The results are described as "surprising," for the data revealed "no increase in incidence of either hypertensive or arteriosclerotic disease in the executive class." In fact, arteriosclerotic disease was significantly less frequent among the executives than among the control subjects of comparable age in the same office building. As the authors point out, there are several possible explanations of this, one of them being that success is partly dependent on health, or "the healthier go higher." Again, so far from relaxing when off duty, the executives, owing to their wider interests, are apt to throw themselves into hobbies, and "the benefit that may be derived from such endeavours has been emphasized repeatedly." In the end relaxation may turn out to be about as lethal as too much rest in bed.²

SEEING

"The Emergence of Vision in the Animal World" was the title chosen by Sir Stewart Duke-Elder for the Lister Oration which he delivered earlier this year at the Royal College of Surgeons and which has now been published.¹ The story of how animals came to see is a fascinating one, and no one can speak with greater authority on this subject than the author of *The Eye in Evolution*, which is soon to appear as the first volume of a *System of Ophthalmology*, the successor to Sir Stewart's famous *Textbook of Ophthalmology*.

To most of us seeing is such an important part of our subjective world that it is hard to think of a purposive movement occasioned by light without imagining that the living organism has in some sense perceived the light and reacted accordingly. Without the "perception" of brightness the flower would not grow towards the light. Anyone discussing the emergence of vision must consider light reactions, if not of plants, at least of protozoa, worms, insects, and so on up the animal scale, and must either take some attitude as to "what they really see" or else remain entirely factual and simply describe the stimulus-response patterns observed—denying in the last resort any knowledge of perception in his fellow men. Sir Stewart has taken the more imaginative line, and his descriptions at each stage are illuminated by enlightened speculation as to what the animal might be expected to be "seeing." The first stage of vision is the development of motor taxis, an automatic rigid reaction to light probably not associated with any consciousness. Very primitive animals move to or from a light, insects such as ants and bees move in fixed relation to the sun's rays, and such movements may be built up into complex patterns. In the migration of birds the direction and height of the sun appear to be of great importance, suggestive of a highly developed motor taxis. But it would be unsafe to imply that these were the only sensory cues from which the bee or bird must work out its direction. If we had not got a rudimentary sense of smell the performance of a dog on

the scent would be not merely astounding, it would be incredible. It is hard to know what range of sensory information other animals possess if we lack it entirely.

The second stage of vision is perceiving. This is associated with a brain of sorts and first emerges in worms, which can be trained to respond appropriately to a stimulus in the form of light. In worms there is no image formation, but a new and important feature has arisen. The effect of the light stimulus can be stored in the brain, so that instead of a rigid motor taxis actions may be modified in the light of experience. If it is supposed that such modification of behaviour could not have occurred unless the stimulus was perceived, then perception is to be inferred. This is the stage of vision which ranges from that of the worm to that of the dog. It is specialized for movement, form, and colour with the insect, the octopus, and the vertebrate eyes—all exceedingly different in their development but much the same in their general use.

The final stage Sir Stewart calls "imaginative vision," and it is associated exclusively with the primates. In the same way that the second stage depended upon the beginnings of a brain, so the third stage required the "almost explosive development of the forebrain," with which it was intimately associated. Life in the tree-tops brought some freedom from the swarm of predators on terra firma, but there were severe penalties up there for insecure foothold. Excellent vision and a good sense of space were essential in quick movement among the branches, but animal smells became far off and less important. Man's ancestor left the ground with a nose-brain and four paws: he came down with eye-brain and two hands. And with that brain and those hands he was inquisitive, artistic, and creative. But, as Sir Stewart concludes, "in assessing the potentialities of human progress in the next 10 million years, or indeed of human survival, we must remember the snag that the apes threw sticks and stones while we throw atom bombs."

MULTIPLE SCLEROSIS IN CHILDHOOD

The diagnosis of multiple (or disseminated) sclerosis is essentially clinical, for, though in about two-thirds of cases there are abnormalities in the cerebrospinal fluid, these are not specific for the disease. The clinical diagnosis rests, in relapsing and remitting cases, which form the majority, on the occurrence of episodes of neurological dysfunction at scattered intervals in time. In some cases the symptoms and signs at the onset of the disease suggest widespread lesions, and the clinical diagnosis can then be made with reasonable certainty. Sometimes the initial symptoms and signs point only to a single anatomical lesion, and in this type of case the diagnosis becomes established only when other episodes occur later. Even with a monosymptomatic onset, the pattern of evolution and remission of the neurological disorder may often suggest the diagnosis, though in practice this is rarely made with confidence before adult

¹ McAlpine, D., Compston, N. D., and Lumsden, C. E., *Multiple Sclerosis*, 1955. E. & S. Livingstone, Ltd., Edinburgh and London.
² Gall, J. C., Hayles, A. B., Siekert, R. C., and Keith, H. M., *Pediatrics*, 1958, 21, 703.

³ Müller, R., *Acta med. scand., Suppl.* 222, 1949.
⁴ McAlpine, D., and Compston, N. D., *Quart. J. Med.*, 1952, 21, 135.

⁵ Duke-Elder, S., *Ann. roy. Coll. Surg. Engl.*, 1958, 23, 1.

"Cognizance should be taken of the names of closely related substances and where desirable the name should reflect this relationship."

"The names should be distinctive in sound and spelling and should not be liable to confusion with names already in use."

"Names which are difficult to pronounce or remember should be avoided."

"Names used in the *United States Pharmacopoeia*, *New and Nonofficial Remedies (Drugs)*, and *International Non-proprietary Names* should receive preferential consideration."

In giving preferential consideration to existing non-proprietary names, and so avoiding the international confusion which may arise if a second name is adopted for the same drug, the Commission has found it preferable in some instances to accept such a name in spite of its defects. For example, the names chlorotrianisene, diphenylpyraline, and tripeleminamine were issued by the American Medical Association and widely used before the drugs were sold in Britain. Although the Commission was critical of these names, the balance of advantage lay in accepting them as Approved Names.

3. The Report states (para. 43) that "at present a year or two may elapse before an approved name is formulated for a new drug. During this period doctors get into the habit of prescribing the new preparations by their trade names . . ."

It is exceptional for a long period to elapse between the appearance of a new drug on the English market and the publication of an Approved Name. Approved Names for new drugs of English origin are usually available by the time the drug is placed on sale and indeed the Approved Name is generally available before the drug is distributed.

During the past five years, nearly 60,000 copies of lists of Approved Names have been circulated by the Commission, but wide advertisement is the most potent factor in establishing the names of medicinal products and it is manifestly not a function of the Commission to advertise Approved Names in the manner or on the scale adopted for trade names. Copies of supplementary lists of Approved Names are supplied to some hundreds of correspondents at home and abroad and they are published in many professional journals.

4. The Committee states in para. 46 of its Report that "we consider also that before putting a new drug on the market manufacturers should be encouraged to ask the British Pharmacopoeia Commission to give it an Approved Name. As soon as that has been done, the approved name should appear on labels and advertising literature for proprietary preparations as prominently as the trade one."

Over many years it has been the practice of most British manufacturers to approach the Commission for an Approved Name for a new drug before placing it on the market. For such products the Approved Name is usually available whilst the substance is undergoing trials and before it is generally released for sale. The Commission has no control over the manner in which Approved Names are used by manufacturers on labels and in advertising literature.

5. The Committee expresses the opinion (para. 44) that "some of the principles of nomenclature now in force may well be inappropriate to-day," and recommends that the Commission be asked to review these principles. It is difficult to comply with this request unless a more specific statement is provided.

The Report makes no reference to a number of important considerations that apply in the selection of Approved Names, such as the international aspects including the non-proprietary names issued by the World Health Organization, and by the American Medical Association for many drugs that appear in England only after a period of use in the United States. Indeed, most drugs introduced on the English market have had a period of use in the United States or elsewhere in association with a non-proprietary name, and unless overriding considerations apply it is undesirable to coin a second non-proprietary name even when the estab-

(Continued at foot of next column)

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Glyped (Imperial Chemical Industries Ltd.).—This contains 25% glyceryl triacetate in an emollient cream base. It is recommended for skin infections due to fungi, particularly tinea pedis and tinea cruris. The active principle in this preparation is claimed to be the free acetic acid which is liberated with glycerol in the skin when esterase, an enzyme present in the skin itself, hydrolyses the glyceryl triacetate. The amount of acid thus liberated is automatically controlled, since the enzyme esterase is deactivated when the acid reaches a certain concentration and recovers its activity when the acid becomes sufficiently diluted by diffusion through the tissues.

No untoward reactions resulting from the therapeutic use of this substance have so far been reported, and it appears to be effective in treating those infections which respond well also to other widely used preparations—for instance, tinea pedis infections due to *Trichophyton mentagrophytes* and *Epidermophyton floccosum*, and tinea capitis due to *Microsporum canis*. It is not so effective in tinea pedis due to *T. rubrum*, and is ineffective in candida infections ("moniliasis") of the skin.

N.H.S. basic price: 25-g. tube, 3s. 11d.

Sytron (Parke, Davis and Co. Ltd.).—This is a cherry-flavoured syrup containing 380 mg. of sodium ironedetate (iron chelate of monosodium ethylenediaminetetra-acetic acid), equivalent to 55 mg. of iron in 8 ml. It is recommended for the treatment of iron-deficiency anaemia in doses of 2 teaspoonfuls thrice daily after meals, children according to age receiving $\frac{1}{2}$ –1 teaspoonful.

There are two indications for the use of this preparation by patients who need to take iron in a liquid form: (1) it is pleasantly coloured and flavoured and might be acceptable to those few who "cannot take iron"; and (2) it is more suitable for those patients in whom other oral iron preparations produce intractable constipation. This substance produces diarrhoea in about 25% of patients treated with it—more commonly than with other iron preparations. In a few patients it produces a satisfactory laxative effect.

N.H.S. basic price: 16 fl. oz., 15s. 7½d.

(Continued from preceding column)

lished name falls short of the Commission's desideratum. Approved Names are applied not only, and primarily, in the writing of prescriptions but also in scientific articles appearing in journals with world-wide readership, for reference purposes, and in the labelling of products in accordance with legal requirements including purchase tax and poisons regulations. Approved Names are also of great value in indicating to prescribers and pharmacists that the same drug is being described under more than one trade name. Attention is also drawn to the problems which arise in relation to existing names, especially those registered as trade marks. It has been a frequent experience that a proposal for what would appear to be an admirable short name must be discarded in favour of a more complicated one because, on the authoritative advice received by the Commission from the Patent Office, the short name is held to conflict with a trade mark registered in this country.

The Commission offers this statement in the hope that it may dispel any misunderstanding which the Report may have created, and that it may help towards a better appreciation of the origins and purposes of Approved Names.

D. M. DUNLOP,
Chairman.

T. C. DENSTON,

Secretary,
British Pharmacopoeia Commission, 1953-8.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Annual Meeting of Royal College of Surgeons of England

SIR,—I am grateful to you for allowing me to use this opportunity of bringing to the notice of the profession that the College is holding its Annual Meeting this year on September 26 and 27 in Cardiff. As you know, the College has recently adopted the policy of holding meetings from time to time in provincial centres, and the first of these was held in Manchester in 1955. The purpose of the Council in holding these meetings is to bring the College closer to its provincial Fellows and Members and to enable them to take part in some of its activities. The Council is particularly anxious that Members of the College shall join us at this meeting, and any other diplomates will of course be very welcome. Fellows have already been notified individually. The meeting will consist of a reception at Cardiff Castle, kindly given by the Lord Mayor and Council of Cardiff, and a subscription dinner, both on Friday, September 26. Tickets for the dinner (two guineas each) and tember 26. Tickets for the dinner (two guineas each) and the invitations for the reception can be obtained from the Secretariat of the College, but the numbers for both events are limited and early application is necessary. On Saturday, September 27, the morning will be devoted to scientific exhibitions and surgical operations arranged by a fork mittee at the Cardiff Royal Infirmary, followed by a fork lunch, kindly given by the Board of Governors of the United Cardiff Hospitals. In the afternoon, at 2.30 p.m., the statutory annual meeting of Fellows and Members will be held in the Reardon Smith Hall, and this will be followed by the conferment of the Honorary Fellowship of the College on Sir Russell Brain, Bt., who will afterwards deliver a lecture on "The Cervical Spine."

The Council hopes that this meeting will prove to be as successful an event as was the meeting in Manchester, and we trust that our colleagues in Wales will make a special effort to attend.—I am, etc.,

J. PATERSON ROSS,

President,

Royal College of Surgeons of England.

Prevention of Lung Cancer

SIR,—I would like to support Dr. E. R. Nye (*Journal*, August 9, p. 389) in his suggestion that a campaign should be especially directed to children and young adults. With this end in view, the Central Council for Health Education has already distributed 171,800 leaflets to local authorities for use in schools as well as 84 sets of display material also designed to appeal to the older schoolchild, and over two million bookmarks for use in public libraries. We have evidence of great interest in this topic in schools, and several meetings of head teachers have been organized, some of them being addressed by medical officers of health and others by a member of the Central Council for Health Education staff.

The subject of smoking is highly charged with emotion and involves an underlying motivation of some complexity. This means that fear of cancer alone will not necessarily cause a change of attitude towards the habit. These factors must be taken into account in the personal and direct educational efforts which are required to supplement the publicity already referred to. The fundamental questions are: At what age do young people start smoking and why? The latter is answered in part by the tobacco advertisers themselves. The prestige motive, and personal identification with an admired figure, either real or fantasy, characterizes all such advertising to-day.

All this confirms the teenager in his belief that the non-smoker is the odd man out. Part of our task, therefore, is

to create a public opinion which discounts the importance of smoking as a condition of social acceptability, as well as discrediting the popular assumptions that tobacco has a therapeutic effect. A good deal of research would be necessary before we can achieve this aim, but a promising start has been made in the U.S.A.¹

With reference to Dr. Nye's remarks about middle-aged men who are "almost beyond redemption," it should be remembered that Doll and Bradford Hill² showed, in a study of 40,000 medical men and women, that the mortality from lung cancer amongst smokers was three times that amongst men who had given up the habit more than 10 years previously. The average ages of these two groups were 44 and 42 respectively, which suggests that men in the late twenties and early thirties still have a chance of avoiding lung cancer during the next 10 years. This is additional justification for a campaign directed to the public at large, and we should not allow the idea to become prevalent that a number of middle-aged men who have smoked heavily all their lives could not still benefit from the effect of giving it up.—I am, etc.,

A. J. DALZELL-WARD,

Medical Director,

Central Council for Health Education.

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¹ *Lancet*, 1958, 2, 250.

² Doll, R., and Bradford Hill, A., *Brit. med. J.*, 1956, 2, 1071.

Anorexia Nervosa

SIR,—Much of what we know on the subject of anorexia nervosa came from Guy's Hospital, yet Dr. D. Stafford Clark's letter (*Journal*, August 16, p. 446) is disappointingly carping and non-contributory. In his first sentence he derides my limited penmanship, in his second he shows pique at my choice of title, and in his third introduces wide and intangible issues which are altogether irrelevant. But in dealing with the treatment of anorexia nervosa his letter illustrates some points which deserve further comment. According to his chart, nine of his thirteen patients were discharged while still under 8 st. (50.8 kg.) in weight—yet he blithely admits that the total average time in hospital per patient was five months. One was detained for eight months and another for ten months. Surely this almost amounts to a study of the natural history of the disease and is no cause for complacency over the merits of psychotherapy any more than it extols the salubrious air of the York Clinic. And what of the patient (Case 1) who was discharged weighing only 5 st. 13 lb. (37.6 kg.)? Had he nothing more to offer and does he not accept the possibility that she may have died or gone elsewhere? Is Dr. Stafford-Clark so completely reassured that because "readmission is always available . . . there is no reason to assume an unfavourable result . . ."? In patients of this nature who are slowly committing suicide are we to stand by with hands behind our backs lest we be accused of "assault upon the patient"?

The act of intubation, according to Drs. M. Sim and R. W. Tibbetts (*Journal*, August 16, p. 447), is an expression of sadism by the doctor in response to the patient's over-determined masochism. But was Ryle a sadist to perfect his tube, and are we all guilty of a sinister duality of purpose when we show interest in the acid content of the stomach? In expressing horror at the thought of introducing food by this method Dr. Stafford-Clark, Dr. Sim, and Dr. Tibbetts show remarkable ignorance of modern day-to-day medical and surgical practice. Admittedly some of the seven patients in my series at first objected. The game, after all, was up. But their objections were overcome not with physical violence but with verbal persuasion, sometimes gentle, sometimes firm. The tube was invariably introduced by a member of the nursing staff on the conscious patient in the presence of twenty-seven others, not forcibly under barbiturate narcosis by a pack of purposeful warders in the seclusion of an observation ward. One was perverse (Case 14) and removed the tube on the first occasion, submitting finally only when offered psychiatric treatment as an alternative. But can this violent reaction against intubation

before fair trial be entirely due to timidity—surely it does not stem from covetousness?

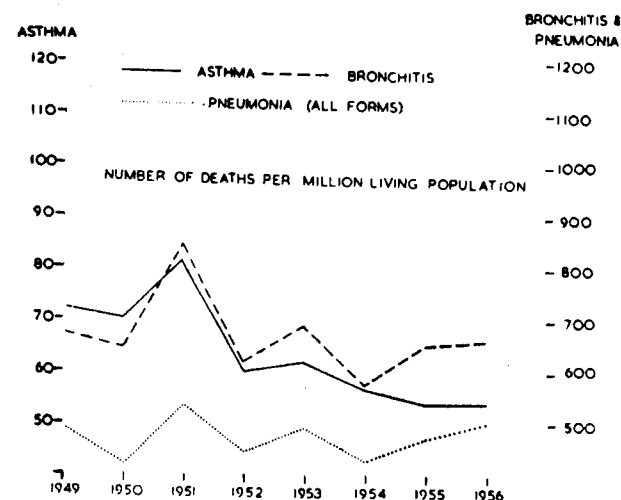
In conclusion, and at the risk once more of being tendentious, of course anorexia nervosa is initially psychogenic, but its symptoms are aggravated and others develop as a result of malnutrition. With renourishment and on return of physical well-being so may these symptoms sometimes disappear, and the most elegant way to achieve renourishment is by intubation. If Dr. Stafford-Clark must have his unifying principle it is that reassurance, encouragement, explanation, and other expressions of kindness are expected of us in our relationship with all patients we are privileged to treat. Usually this goes without saying and in the case of anorexia nervosa it has been said so many times before.—I am, etc.,

London, E.1.

EIRIAN WILLIAMS.

Treatment of Asthma

SIR,—In the *Journal* of May 17 (p. 1166) there was a leading article on "Steroids in Treatment of Asthma." On the bottom of the page, left-hand column, was the statement, "But deaths from asthma suddenly increased in 1951 by nearly one-half, and this increase has been maintained.



This is the period when steroid therapy had been in vogue." From the accompanying graph of deaths from asthma, together with the deaths from bronchitis and pneumonia, England and Wales, taken from the Registrar-General's figures, it can be seen that there was indeed an increase in the deaths from asthma in 1951, which was accompanied by an increase in the death rates from bronchitis and pneumonia, but that since then there has been a marked fall in the death rate from asthma. This conflicts with the statement that "... this increase has been maintained." Your writer states, "There is no proof that steroid therapy is the cause of the sudden rise, but the figures are alarming."

I agree with your writer that "steroid therapy is undoubtedly a most valuable method of treatment for severe chronic asthma and status asthmaticus" and I regret what appears to me to be a misstatement and the suggestion that steroid therapy may possibly have caused this increase. The suggestion from this graph to me is that steroid therapy may possibly have been responsible for the reduction in the number of deaths, but it is as yet too soon to form any conclusions.—I am, etc.,

Llandaff, Cardiff.

D. A. WILLIAMS.

SIR,—As the co-author of a paper¹ on the value of "asmapax" in the treatment of asthma, I was interested to read your notes in "To-day's Drugs" concerning this product (*Journal*, June 28, p. 1541). The writer of this note does not seem to appreciate that ephedrine in a resin-bonded form has a sustained 12-hour action. When he states that

ephedrine in a resin-bonded form may prolong the total duration of action he is incorrect. The operative word should be "does." Various papers¹⁻⁷ reporting the chemical and laboratory evidence to support this statement have appeared recently in the medical press. The writer also states, "Bromvaletone is included presumably for its sedative action. . . ." As bromvaletone is a sedative and hypnotic, and has no other action, the reason for its inclusion in asmapax would seem to need no qualification. Furthermore, asmapax in my experience is the only available sustained action drug for the treatment of asthma. If taken regularly as reported in the paper¹ already mentioned, asmapax is more of a curative drug and too useful to be considered only, as the writer of these notes remarks, as yet another combination of antispasmodic and sedative drugs intended for the symptomatic treatment of this disease.—I am, etc.,

Birmingham, 18.

D. M. MUSTARD.

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Prevention of Rheumatic Fever Recurrences

SIR,—Professor E. G. L. Bywaters and Dr. G. T. Thomas (*Journal*, August 9, p. 350) discuss the use of penicillin preparations for the prophylaxis of recurrences of rheumatic fever. This article stated, "Injections of benzathine penicillin have been advocated by some as preferable to penicillin by mouth. Though this method ensures that prophylaxis is carried out, it is difficult to impose a regime of weekly injections on children in the knowledge that this must be continued for years." The authors then go on to quote, in part, from the further report of the Rheumatic Fever Committee of the Royal College of Physicians, 1957.

This might lead some readers to assume that weekly injections were recommended by that Committee, but this is not so. The actual wording of the appendix dealing with prophylactic use of benzathine penicillin is as follows:

(iii) If for any reason oral prophylaxis cannot be given over a particular period, an intramuscular injection of 1.5 mega units (5 cc.) of benzathine penicillin will protect the child for one month.

To underline this recommendation for monthly or, at most, fortnightly injections, the second report of the Expert Committee on Rheumatic Diseases of the World Health Organization speaks in this way.¹ "Prophylaxis with penicillin by mouth (100,000–200,000 units of benzylpenicillin twice a day) or by injection (1,200,000 units of benzathine penicillin intramuscularly once a month) has proved somewhat more effective than prophylaxis with sulphonamides." The appendix on prophylaxis with benzathine penicillin from the same report (Annex 3, page 27) recommends benzathine penicillin 1,200,000 units once a month or 600,000 units twice a month.—I am, etc.,

London, N.W.1.

B. W. CROMIE,
Medical Adviser,
John Wyeth and Brother Ltd.

REFERENCE

- Wld Hlth Org. techn. Rep. Ser.*, 1957, No. 126, 10.

Haemorrhage from Superficial Varix

SIR,—Whilst agreeing with the sentiments of Mr. W. W. Woodward (*Journal*, July 19, p. 166) in deploring casual reassurance of the varicose vein sufferer against the chances of a varicosity bleeding, I must point out that the first-aid treatment by direct pressure which he recommends is neither the simplest nor the most efficient. Surely the teaching is that the first step in the treatment of venous haemorrhage is elevation of the part. My letter is prompted by an enlightening experience I had shortly after qualifying which

proved to me very forcibly that treatment by direct pressure alone could end in a fatality.

In the middle of a public lecture I was attending I suddenly heard a sound as if a tap had been turned on and water was running on to the wooden floor. There followed the sound of someone getting up a few rows behind and leaving the hall, whereupon the sounds mentioned ceased. Even when, shortly afterwards, the famous call for "a doctor in the house" was made, I was unable to connect the incidents. Noticing a crowd gathering outside the door at the back of the hall, I shyly crept out. A man of about 40 was sitting in a chair surrounded by a pool of blood. He was extremely pale and quite unconscious, being only retained on the chair by the efforts of a friend. Persevering, if probably inexperienced, attempts at first-aid were being applied in the form of local pressure over a bleeding varicosity. But the haemorrhage, although abated, was obviously continuing. Against the protests of the friend I got the unconscious man off the chair on to the bloody floor, and lifted the bleeding leg in the air. I was as relieved as the onlookers to see that this treatment produced an immediate cessation of the haemorrhage, rapidly followed by a return of the patient to consciousness.

I therefore suggest to Mr. Woodward that the best advice to give to a patient with vulnerable varicosities is not to lie apply pressure directly to the bleeding point but to lie down and lift the leg up in the air. This instruction is probably more easily remembered, tainting of the bizarre, and also considerably more easily executed if the patient happens to be alone. I might add that this instruction should also be given to every patient undergoing an out-patient operation involving ligation of varicose veins, as the haemorrhage from a slipped ligature can be equally catastrophic.—I am, etc.,

D. G. CHAMBERS.

Nicosia, Cyprus.

A New Syndrome in Alcoholics

SIR,—Your annotation (*Journal*, August 2, p. 297) discusses Dr. L. Zieve's report¹ on a heretofore unrecognized syndrome associated with alcoholic fatty liver and cirrhosis, with jaundice, hyperlipaemia, and haemolytic anaemia as the essential features (features, incidentally, sometimes also seen in cases of viral hepatitis in the recovery phase). The illness is reported to improve rapidly once the drinking stops, hyperbilirubinaemia and hypercholesterolaemia receding over a few weeks. Hepatic function, "usually mildly disturbed" in this syndrome, "improves rapidly."

That disturbances of liver function in alcoholics are often reversible in nature is also evident from results of studies of blood chemistry carried out as a routine procedure in of about 350 patients of Warlingham Park Hospital. Though there was only rarely clinical evidence of liver damage, approximately half of these patients showed, on admission to hospital, an abnormality in at least one test out of a battery of five different tests. Most patients showed abnormalities in several tests, though each test by itself had abnormal results in a minority of patients only. Most often positive was the bromsulphthalein clearance test—i.e., in one-third of the 66 cases in whom it was carried out—and of those patients in whom the battery of tests also included the B.S.P. clearance test, three-quarters showed abnormal results in at least one test. On retesting the 350 patients about six weeks later after a period of abstinence (and on a vitamin-supplemented full diet) the results of these tests were markedly improved, incidentally, was portion of cases. Similar improvement, incidentally, was often noted in blood pyruvate and co-carboxylase tests.

However, neither alcoholics admitted to mental hospitals in this country² nor those forming the basis for Dr. Zieve's report can be considered a representative sample of a total population of alcoholics. For example, cirrhosis of the liver is said not to occur in more than 8% of "chronic alcoholics,"³ but was detected by liver biopsy in 15 of Dr. Zieve's 20 patients. Jaundice was present in every one of Dr. Zieve's patients, but must be rare in an unselected sample of alcoholics. No case of jaundice was seen among the patients admitted to the Warlingham Park Hospital alcoholic unit, though hyperbilirubinaemia (above 0.5 mg.%) was found in 6.5%, and a positive Schlesinger's test obtained in one-third

of these patients on admission (in 10% this reaction was still positive six weeks later). Cholesterol elevation above 500 mg. per 100 ml. was observed in three-fifths of Dr. Zieve's patients. Among 350 Warlingham Park Hospital alcoholics, approximately 15% showed on admission a low blood cholesterol (below 150 mg.%), 7.7% a high blood cholesterol (above 250 mg.%). As a further 3.4% showed high values in subsequent tests, a total of 11.1% showed hypercholesterolaemia at some time of their hospital stay, in no case, however, reaching a level of 400 mg.%.

The patients forming the basis for Dr. Zieve's report were therefore quite different in many respects from the ones admitted to Warlingham Park Hospital, and no generalizations are possible from such selected samples to conditions in "alcoholics" in general.

While, as your annotation says, "all physicians" are acquainted with the occurrence of liver cirrhosis in alcoholics, it seems unfortunately much less widely appreciated that clinical evidence of liver disease—such as that shown by Dr. Zieve's patients—probably occurs in a minority of alcoholics only and in these only in late phases of the disorder. Among the Warlingham Park Hospital alcoholics two-thirds had at one time or another in the past sought medical advice for physical symptoms associated with their drinking, for the first time at an average age of about 40 years: approximately 10 years after there had first appeared other indications of incipient alcoholism in these patients. Obviously a sample of alcoholics admitted to general hospitals in this country will probably contain a higher proportion of people with definite physical abnormalities. But the emphasis laid, in the teaching of medical students and in the medical press, on the complications of alcoholism rather than on its earlier and essential phases, and the interest shown in new syndromes, however justifiable and important, should not obscure the fact that alcoholism could and should be diagnosed in its early stages and that treatment should be strongly advised long before there is clinical evidence of irreversible physical or mental complications. We acknowledge gratefully the technical work done by Mr. L. G. Coates, Warlingham Park Hospital Laboratory, and the staff of the Mental Hospitals Group Laboratory, Epsom.—We are, etc.,

W. W. KAY.

M. M. GLATT.

Epsom, Surrey.

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Contraception by Inhibition of Ovulation

SIR,—Your annotation (*Journal*, August 2, p. 297) reports favourably on the use of "enavid" as an oral contraceptive, hailing this as "a remarkable step forward." The annotation makes no mention of harm to the foetus should pregnancy result despite the tablet.

It is known (Thiersch¹) that "aminopterin," a drug which has been experimented with as a contraceptive, has in fact produced malformed foetuses. Further, your annotation (*Journal*, July 26, p. 218) refers to foetal malformations produced by progesterone, the substance which was the starting point for the use of enavid and which presumably has a similar action.

Although the compound is described as harmless and "various clinico-pathological investigations brought no undesirable effects to light," it is surely unwise to permit the marketing and widespread use of such potent compounds for this purpose. Careful studies of the effects of doses which fail to prevent pregnancy on the foetus and of the long-term effect of repeated dosage over several years on experimental animals may yet reveal serious ill effects. The use of these tablets in a field trial is not a therapeutic measure although the participants are described as "patients." Such an innovation has very important social implications. Doubts which may be felt as to its permissibility are reinforced by the choice of Puerto Rico as a site for the trial.

A contraceptive "pill" should not be regarded as a cheap substitute for the radical and costly improvement of the standard of living of the underdeveloped countries which is essential for the health of the new generation.—I am, etc.,

London, S.W.17.

BRIAN H. KIRMAN.

REFERENCE

¹ Thiersch, J. B., *Proc. 5th Int. Conference on Planned Parenthood*, 1956, Tokyo.

Complication of Pertussis Immunization

SIR,—In view of the recent correspondence about reactions to immunization against whooping-cough, I feel I should record the two following cases, which occurred within a month or two of each other last year.

Case 1.—A girl of 9 months old, an adopted child, was given her first injection of combined diphtheria/pertussis vaccine. Twenty-four hours later she became feverish, showed signs of cerebral irritation and was admitted to hospital with convulsions. There all investigations proved negative, and after a few days of heavy sedation she made a complete recovery.

Case 2.—Twins, a boy and girl 10 months old, were given 1 ml. each of the triple antigen at 11 a.m. At 6 p.m. the girl became feverish, at 7 p.m. she started to get convulsions and was admitted to hospital early the next morning. Once again all investigations proved negative, but she was seriously ill for several days, having to be kept heavily sedated for over a week, and it was several weeks before she got back to normal. The boy had no reaction whatsoever.

The bottle of antigen was sent to the makers for thorough testing, but it proved to be absolutely satisfactory.—I am, etc.,

Tavistock.

T. M. DAVIE.

Reduction of Fracture-dislocation of Hip-joint

SIR,—I read Mr. D. S. Murray's paper (*Journal*, August 16, p. 427) with great interest and should like to congratulate him on his successes in these two patients. Two years ago I was faced with a similar problem, when a 19-year-old Indian seaman fell 30 feet (9.2 m.) into a ship's hold, and, besides severe injuries to both wrists and elbows and skull, there was a posterior dislocation of the right hip-joint with a transverse midshaft fracture of the right femur, compound from within. Antero-posterior transfixion of the right greater trochanter by a stout Steinmann's pin, as recommended by Ingram and Turner,¹ enabled the dislocation to be reduced surprisingly easily (as Mr. Murray also found). In this patient the Steinmann's pin was grasped by both hands and no other mechanical aid was used. Mr. Murray advocates the help of two assistants for this manoeuvre; in this patient no assistants were available other than an excellent theatre sister. A Kuntscher nail was passed down the femoral shaft immediately after this reduction. Almost two years later the patient has full function of the right hip and knee (personal communication from Mr. S. R. Chandra in Calcutta).—I am, etc.,

Salford.

H. D. W. POWELL.

REFERENCE

¹ Ingram, A. J., and Turner, T. C., *J. Bone Jt Surg.*, 1954, 36A, 1249.

Bacteria in Antiseptic Solutions

SIR,—I read your annotation (*Journal*, August 16, p. 436) on bacteria in antiseptic solutions with great interest, and I am very much surprised that you should conclude that, because of the cases cited, "zephiran" and the other quaternary ammonium compounds are unsuitable for some of the uses to which they are put. The series of *Pseudomonas pyocyanea* bacteriaemias caused by swabs stored in zephiran demonstrates one of the well-known properties of this antiseptic—i.e., that it is adsorbed on to textiles. This property, of course, makes zephiran an ideal agent for sterilizing hospital linen and babies' napkins. However, this attribute makes the technique of storing swabs in such a solution and then using the same solution for skin sterilization an

unsatisfactory one. The zephiran from the solution is adsorbed on to the cotton-wool and therefore the concentration of disinfectant in the solution is lowered to an ineffective level, especially to the most resistant of organisms—that is, *Pseudomonas pyocyanea*. This does not make the quaternaries unsuitable for skin sterilization. If a fresh tincture (which has not been left in contact with textiles) is used, effective skin sterilization is achieved.¹ The recommendations for the use of zephiran take all these factors into account. Thus I think that the proper conclusion should be that in performing sterilization procedures careful attention to technique is important whether quaternaries or any other means, such as the autoclave, are used.—I am, etc.,

Kingston-on-Thames, Surrey.

K. BOHEIMER,
Medical Adviser,
Bayer Products Ltd.

REFERENCE

¹ Gardner, A. D., *Lancet*, 1948, 2, 760.

Misleading Urine Tests

SIR,—Dr. A. Phillips has drawn attention (*Journal*, August 16, p. 448) to one of the few fallacies in the use of the enzyme test strips for urine glucose, namely external contamination with hydrogen peroxide.¹ In a similar fashion, hypochlorites (and household cleansers which contain them) can produce false-positive reactions.¹ Other alleged false-positive reactions referred to this laboratory have proved to be due to the presence of glucose in amounts too small to be detected by Benedict's and similar tests, and no substance occurring naturally in urine has yet been reported as giving a false-positive result. The possibility of contamination of the container by peroxides or hypochlorites (or, indeed, by glucose) must always be remembered.—I am, etc.,

Edinburgh.

S. C. FRAZER.

REFERENCE

¹ Frazer, S. C., *Lancet*, 1958, 1, 166.

Nuclear Sexing

SIR,—Nuclear sexing is a well-established laboratory aid in the diagnosis of sex. The expectations of Moore, Graham, and Barr¹ have been fulfilled. I suspect that full use is not being made of the method in cases where the external genitalia are found to be abnormal at birth. A small piece of amnion placed in surgical spirit (or 95% alcohol) for a few hours provides excellent material for nuclear sexing. It can be stained and examined as a whole mount.

Experience has shown that, in the newborn, it is little better than guessing to attempt to distinguish, by external examination alone, between apparent females with masculine features (enlarged clitoris, etc.) and apparent males with any degree of hypospadias—testes being impalpable. Yet a diagnosis of the sex must be made. The first step in the diagnosis of these difficult and potentially tragic cases should be the preservation of a little piece of amnion in spirit. The nuclear sex could be determined within 24 hours and would probably ensure that the appropriate sex for the child was announced.—I am, etc.,

Newcastle upon Tyne, 1.

JOHN GRAY.

REFERENCE

¹ Moore, K. L., Graham, M. A., and Barr, M. L., *Surg. Gynec. Obstet.*, 1953, 96, 641.

Electrified

SIR,—With regard to the letter from Mr. Lionel H. Pimm and the electric shock he received from a patient (*Journal*, August 9, p. 390), I had a similar experience last year. I was asked to see a patient in bed and he was said to be suffering from influenza. I took his pulse and I was immediately aware of an electric current passing between us. I thought it queer, but said nothing and completed my examination. I then returned to the matter of the electric current, and, on lifting the lower bedclothes, I found his feet

resting on an electric pad, switched on and with imperfect insulation and earthing. Could Mr. Pimm's case have been due to some freak of improper earthing of electrical apparatus?—I am, etc.,

Birmingham, 23.

E. LEWIS BUTLER.

Iron Preparations

SIR,—Dr. C. F. Herridge's comparison of liquid preparations of an iron chelate—ferrous gluconate and ferrous succinate—(*Journal*, July 19, p. 140) was of particular interest as we recently conducted a clinical trial at Saint Mary's Hospitals of another iron chelate—ferrous aminoacetosulphate—in tablet form. This compound has already had promising trials in other countries.^{1,2,3} Fifty pregnant women with iron-deficiency anaemia were treated for at least six weeks with a surprising lack of side-effects. There was no diarrhoea or other gastrointestinal disturbance, although a few patients complained of headache. The haemoglobin levels of patients treated with the chelate rose nearly twice as fast during the first two weeks of treatment compared with a similar group of women treated with an equivalent amount of iron as ferrous gluconate. The haemoglobin levels were also higher in the chelate-treated group at the end of treatment. Full details of this investigation are being published.

Dr. Stuart Carne (*Journal*, August 9, p. 388) draws attention to the relative cost of iron preparations. During our clinical trial we considered the relative costs of treatment and a pricing bureau of the Joint Pricing Committee for England was asked to give the basic and gross costs of various iron preparations in tablet form. The following figures were given.

	Fe per Tablet mg.	Basic N.H.S. Price	Gross Cost to N.H.S.
		s. d.	s. d.
"Fersolate"	60	1 5	1 10
Ferrous gluconate (B.N.F.)	35	1 9	3 6*
"Plesmet"	50	2 8	4 8
"Plesmet"	35	3 8	5 11
"Fergon"	35	3 11	6 2
"Ferromyn"	25	11 11	16 2
"Rarical"			

All prices per 100 tablets.

* Average price—the prices of individual manufacturers vary considerably.

As will be seen, there is an enormous price difference and the advantages claimed for the more expensive preparations hardly justify their greatly increased cost. Plesmet was the brand of ferrous aminoacetosulphate used in our trial, and, although more expensive than the iron preparations we use routinely, appears to be the cheapest chelated form of iron on the market, judging from the advertisements in the medical press.—I am, etc.,

R. F. JENNISON.

Manchester, 13.

REFERENCES

- ¹ Feldman, H. S., and Rummel, W., *Pakis. med. J.*, 1957, 8, 15.
- ² Jørgensen, G., *Arzt. Wschr.*, 1955, 10, 82.
- ³ Pomerance, J., and Gadek, R. J., *New Engl. J. Med.*, 1957, 257, 73.

Beds for the Aged

SIR,—Few would argue with Dr. Arnold B. Cowan's estimation of the need of the elderly for hospital treatment or find his criticism of the existing facilities over-severe (*Journal*, August 2, p. 325). The allocation of more beds for the hospital care of the aged would be only a short-term answer to the problem, unless these beds were properly staffed by nurses, doctors, and ancillary staff. Without proper staffing they would become long-stay beds and individuals admitted to them might become long-stay cases, unfit to return to independence outside hospital or even to enter such sheltered accommodation as a welfare authority hostel. Anyone with experience in this aspect of hospital work knows how tragically easy it is for this to happen.

The problem can be solved not by more beds but by more activity of the existing beds. There are too many inactive beds for the aged in this country and too few properly

trained physicians with the necessary foresight to see what opportunities for the practice of clinical medicine and for research exist for anyone taking clinical charge of hospital beds set aside for the care of the aged. The late Dr. O. Olbrich has left us at Sunderland, Co. Durham, a fine example of what can be done with "An Institution for the Care of the Chronic Sick."—I am, etc.,

Oldham, Lancs.

W. H. LLOYD.

Coudé Catheter

SIR,—I am sorry that Mr. Hamilton Bailey, Mr. W. J. Bishop, and Mr. A. Clifford Morson were dragged so deeply into the mire (*Journal*, August 23, p. 513). Perhaps a perusal of previous issues of *The Lancet* might have made clear the satirical intent of the article on Coudé.

Volume 4, No. 4, contained notes on the lives of Johannes Haemolyticus, or Giovanni Emolitico (1678–1726), and *Staphylococcus* of Alexandria (c. 273–200 B.C.), whose names were said to be enshrined in *Streptococcus haemolyticus pyogenes* and *Staphylococcus aureus*. It is to be hoped that these did not lead to similar confusion among bacteriological historians.—I am, etc.,

Newport, Mon.

PETER BIRKETT,
Formerly Editor, *The Lancet*.

Gluten-free Diets

SIR,—I read with interest the article on "gluten-free diets" by Dr. A. F. Fletcher and Miss Majorie McCricker (*Journal*, August 2, p. 299). As I have been preparing such a diet for my 4-year-old daughter for the past 18 months, I feel the following additions to the list of gluten-free products might be useful to others as well. *Meltis Ltd.*—fudge, new berry fruits, orchard fruits; not turkish delight. *Oxo Ltd.*—oxo fluid (bottles), oxo concentrate (jars); not oxo cubes. *Wilts United Dairies Ltd.*—ice cream mix. *S. Parkinson and Son*—fruit drops, barley sugar, butter-scotch. *Nairn's Oatcakes Bakery*—oatcakes. *Batchelor's Peas Ltd.*—processed and garden peas, baked beans, butter beans, packet peas and fruits; not canned soups or soup mixes. *Lunham Brothers Ltd.*—spam. *Joseph Terry and Sons*—block chocolate, i.e., bitter Oliver Twist and the Devon range neapolitans; not pastilles or crystamints or Easter eggs. *J. S. Fry*—Easter eggs.—I am, etc.,

Salisbury, Wilts.

MOYRA TYRRELL.

X-ray Record Cards

SIR,—In her paper to the Section of Social and Preventive Medicine at this year's B.M.A. Annual Meeting at Birmingham, Dr. Alice Stewart mentioned the difficulty that she and her co-workers experienced in assessing the number of radiographs a particular patient had had taken. Apparently patients' memories are quite unreliable, while case-sheets do not always help, since many patients attend a number of different hospitals and clinics in their lifetime. In the discussion which followed Dr. Stewart's paper I suggested the possibility of issuing personal x-ray record cards to be produced whenever the patient attends an x-ray department.

In its simplest form this would merely give the date, the patient's name and address, with a space for changes of address, date of birth, name of hospital or clinic, type of examination, and the number of films taken (plus the screening time where applicable). Printed on the card would be an instruction to the patient to take it whenever attending a hospital or clinic. In this way not only could the total radiological picture for a large number of patients be built up for future reference, but it would also obviate at a glance unnecessary repeats of procedures already carried out at another hospital or clinic only a short time before. I realize that many people would lose or forget their cards, but a large number (probably the majority) would not. In any case I think the scheme is worth a try. Perhaps a start could be made with the under-forties.—I am, etc.,

Liverpool, 18.

MYER GOLDMAN.

Obituary

CHEVALIER JACKSON, M.D., F.A.C.S.

Dr. Chevalier Jackson, renowned for his work in developing bronchoscopy, died on August 16 in the Temple University Hospital, Philadelphia. He was 92 years of age.

Chevalier Jackson, who was born in Pittsburgh on November 4, 1865, graduated in medicine from Jefferson Medical College in Philadelphia in 1886. Deciding from the beginning of his career to specialize in oto-rhino-laryngology, he became professor of laryngology at the University of Pittsburgh in 1912. Four years later he moved to Jefferson Medical College, where he was first professor of laryngology and later professor of bronchoscopy and oesophagoscopy. Retiring from this appointment in 1930, he remained professor of clinical bronchoscopy at Temple University School of Medicine for a few more years before finally retiring from his teaching posts.



An Honorary Fellow of the Royal Society of Medicine, Chevalier Jackson was honoured by medical organizations all over the world. By the American Medical Association he was awarded the Distinguished Service Medal and Citation in 1940, and he was decorated by several foreign governments.

His son, Dr. Chevalier L. Jackson, went into the same specialty as his father, and is now professor of laryngology and broncho-oesophagology at Temple University Medical School.

We are indebted to Mr. MAXWELL ELLIS for the following appreciation: Safe and routine bronchoscopy and oesophagoscopy are entirely due to Chevalier Jackson. When he first became interested in the subject, nearly seventy years ago, peroral endoscopy was very rarely performed, and then only by one or two extremely courageous and skilful men in Germany and Austria. The instruments were very large and bulky, and there was a definite operative mortality. Pictures in old books illustrating the technique are quite frightening, and it seems impossible to believe that patients would voluntarily submit themselves to this medical form of sword-swallowing. Dr. Chevalier Jackson brought to bear upon the subject a powerful intellect, a gift for mechanical invention, and an untiring and devoted proslitism. There could have been no more single-minded man in the history of medicine. He sighted his goal early in life; he moved towards it unerringly and steadily for over half a century; and in the end he saw his work become an integral part of the practice of medicine.

At the beginning of his career he tooled most of his own instruments, oesophagoscopes in 1890 and bronchoscopes and laryngoscopes 10 years later. Gradually the ponderous instruments used by Killian and Brünings became streamlined into those which most people outside Central Europe still use to-day. Jackson's great technical contributions were the introduction of distal illumination, adapted from the cystoscope, a general lightening of the structure of the tube as well as a reduction in its lumen, and the invention of numerous patterns of forceps to suit the many problems of foreign-body removal which at first chiefly engaged his attention.

In his early days at Pittsburgh he was one of the first physicians to buy an automobile, and in this primitive vehicle, as we would nowadays view it, and with his instruments, almost equally primitive by modern standards, he would undertake any journey in any weather to a patient or to a medical meeting. These early struggles took their toll of his health, and he developed tuberculosis. However, this only served as a spur to his overriding and almost obsessional belief in what he conceived to be his mission, and whilst supposed to be resting in bed he prepared the drafts of his earliest books, historical classics still full of ideas and information. In 1907, *Tracheo-Bronchoscopy, Endoscopy and Gastroscopy* appeared, dedicated to Killian, putting on record the conception of peroral endoscopy as we know it to-day. In 1914, after a second attack of tuberculosis, *Peroral Endoscopy and Laryngeal Surgery* followed, with its clear descriptions of techniques and instruments, and also of the type of training which he considered essential. In addition to technique, this book included a fuller account of many diseases already known and some brought to light for the first time by this means of direct observation. It can rarely be said of a single individual that any discovery was his alone, and this cannot be said of Jackson, as peroral endoscopy had been practised by others before him. But it was certainly his achievement to have made this examination so completely safe that it is now a normal technique acquired by every chest physician and surgeon and laryngologist in the world. Much of Jackson's achievement was made possible by the predilection of American children and adults to inhale or swallow foreign bodies. It seems almost impossible to believe that the work which gained him the Bok prize in 1927 (awarded to the most distinguished Philadelphian citizen) was based on the successful removal of over a thousand foreign bodies of various sorts, sizes, and shapes. Jackson initiated many campaigns trying to educate parents to prevent children inhaling foreign bodies, and he spoke tirelessly on this theme at meetings up and down the U.S.A. He also initiated the passage of a Federal Law regulating the safer manufacture and sale of lye solutions.

His professional career with all its successes too numerous for any one man to recall, so greatly honoured was he by every medical fraternity in the world, gave very little inkling of his private life, and it is almost unbelievable that he ever could have had a private life, so much was his time occupied in the fervour of his work. When I knew him I found it difficult to realize that this famous person of nearly 70 years of age was a human being in many ways like other human beings. The remoteness given to high achievement enveloped him, and there was almost nobody then who could claim any degree of intimacy. He was always "the Chief" to everybody, to be approached with great awe and some inward trembling, and he seemed rarely to unbend. Nevertheless, when approached, he was unfailingly courteous and helpful. He had many obvious mannerisms. Like his French forebears he paid no deference to climate and always wore his formal thick black suit, complete with waistcoat, in any day that Philadelphia could produce, and a temperature in the nineties and a humidity of nearly a hundred would make him relax nothing of his dress. In addition, he always wore cotton gloves to avoid touching anything contaminated, whilst a clean towel was always placed in his hand before he took up a telephone. Even his fruit had to be washed in disinfectant before he would eat it. I never knew him take lunch, and even when joining in the farewell luncheon which always ended his famous "Bronchoscopic Courses" he would sit in the seat of honour slowly sipping China tea while all round him were devouring the usual steak. These and numerous other eccentricities of thought and behaviour added to the difficulty of coming close to him. There seemed to be so little in common between so exalted and dedicated a person and the common herd. But as soon as he got to his home in Schwenksville, thirty-odd miles from Philadelphia, he was

completely different. He had purchased an old water-mill on the edge of a weir together with a mile of creek in the middle of some wild old Pennsylvania countryside, or rather countryside which he had allowed to revert to its original wildness. The mill had been disused for years, but to Jackson nothing mechanical was a mystery, and he soon got it going again. He would throw the huge oak gear-levers into position and all the great hickory machinery would begin turning again as it had done in the past. Nothing delighted him more than to demonstrate the great wooden wheels meshing one into the other, noiselessly and efficiently. In earlier days the mill brought in some much-needed income, as well as providing his electricity.

He built himself an armchair with a wide wooden arm in which he would spend hours writing or sketching. Pictorial art was the other side to his life, and he had an aesthetic perception of unusual quality coupled with a very considerable self-taught technical capacity. He drew and painted simple and natural subjects, and those fortunate enough to possess them will know that his drawings and paintings have real artistic merit. At one time he would send Christmas cards to all his friends printed in colour from a painting he had made specially for the occasion, and these were sought after by the *cognoscenti*. All the illustrations in his books were drawn or painted by himself.

In his relations with his family he was never seen to be outwardly emotional, but it was clear that he studied every detail of their comfort and well-being. This applied also to his pupils, although there again it was not easy to achieve any familiar footing with him. Nevertheless one pupil will never forget the messenger boy on the transatlantic liner calling out his name and presenting him with a radioed telegram the length of an ordinary letter greeting him on his journey to the U.S.A., and explaining the arrangements made for his reception. Acts of real humanity and understanding like this, so deeply cognizant of the apprehensions in a young person's mind in going to a strange country and to a new job, clearly showed his feeling for the common touch.

In spite of his intense absorption in his work, his asceticism, and his abstention from all political and personal topics, few men in any generation have aroused so much feeling among their professional contemporaries, voiced by so much overt criticism. It seemed to me, coming on the scene when the dust had settled on these forgotten parochial controversies, that much must have stemmed from a lack of sympathy, that much must have stemmed from a lack of understanding of his idealism. Furthermore, as Jackson became more and more wrapped in his work he may sometimes have seemed to give less than credit to his predecessors and colleagues. I am convinced this was due to absorption rather than to egotism. The differences may also have widened by the peculiar form of design for living affected by, or natural to, Chevalier Jackson. He taught his surgical art to all who came for tuition, and gave them every help he could to found departments similar to his own. To his more personal assistants he was helpfulness and kindness personified.

It is thus the more to be regretted that, in all the mass of Jackson's writings, he found time only for one short autobiographical record, published in 1938. This, however, is titillating in its allusions. British laryngologists would particularly have liked a more expanded account of his visit to the Golden Square Throat Hospital in 1886.

Chevalier Jackson enjoyed the use of all his faculties until very near his death. He had particularly retained the depth and vigour of his intellect, and I sincerely hope that, in his own way, he savoured to the full the unique and legendary place in medicine which time and his long years had brought to him.

The photograph of Dr. Chevalier Jackson was taken when he was 65 and is reproduced by permission of the Macmillan Company, New York, and of Underwood and Underwood.

STANLEY WORTHINGTON, M.D., D.P.H., B.Hy.

Dr. Stanley Worthington, formerly a divisional medical officer of the Ministry of Health, died on July 23 at the home of his son at Nafferton, East Yorkshire. He was 69 years of age.

Stanley Worthington was born at Newcastle upon Tyne on October 7, 1888. He received his medical training at Durham University and Newcastle Royal Infirmary, and graduated M.B., B.S. with honours, in 1910, proceeding to the M.D. in 1923. After resident posts in Newcastle and Glasgow he entered general practice in Newcastle in 1913, obtaining the D.P.H. and the B.Hy. in the following year. Later in 1914 he joined the Royal Naval Medical Service as a temporary surgeon, serving throughout the first world war, mostly in battle-cruisers. He returned to practise in Newcastle after the termination of hostilities, and in 1920 married Dorothy, the daughter of Dr. E. Barker, of Hull. He held various appointments in the Newcastle area—physician to Newcastle Dispensary and Northumberland Chest Hospital and anaesthetist to Newcastle Dental Hospital. He was chairman of the Newcastle upon Tyne Division of the British Medical Association in 1929–30, and took a very active part in the work of the Newcastle Local Medical and Panel Committee.

In 1931 Dr. Worthington left general practice to join the Ministry of Health as regional medical officer, serving first in Sheffield and then in Leeds. In 1948 he became divisional medical officer for the north-east division, with responsibility for an area extending from Berwick on Tweed to as far south as Derbyshire. When he retired from the services of the Ministry in 1956 the Leeds Local Medical Committee entertained him to dinner and made him a presentation as a small measure of its very real appreciation of his many services to the general practitioners of Leeds and his divisional area, and for his generous understanding of the many problems which beset the general practitioner. Although a servant of the Ministry of Health, most general practitioners looked on him as a friend, though he could be quite tough when required. He and his wife were delightful hosts: their hospitality was noted, and he was never happier than when in his own house surrounded by his many friends. Though small in stature, he had a big heart. He faced a very serious illness after his retirement with the courage which those who knew him well had long appreciated. After a severe operation he did not live an invalid life, but, choosing to live rather than exist, took part in most social activities. He maintained a keen clinical interest in medicine up to the time of his retirement, and was a most regular attendee at all the meetings of the Leeds and West Riding Medico-Chirurgical Society. He was devoted to his wife, his son, Dr. Guy Worthington, and his daughter and their families, and to all these the sincere sympathy of his many colleagues is extended. They mourn the loss of a delightful soul.—J. A. L. V. J.

B. HALLEY STEWART, M.D.

Dr. B. Halley Stewart, president of the Sir Halley Stewart Trust, died at Hadley Wood, Middlesex, on July 30. He was 84 years of age.

Bernard Halley Stewart was born at St. Leonards-on-Sea on May 6, 1874, the younger of the twin sons of Sir Halley Stewart, and was educated at University College School, Hastings, and at Bishop's Stortford. An exhibition in science took him to Jesus College, Cambridge, where he obtained second-class honours in the Natural Sciences tripos in 1896. His early ambition was to be a schoolmaster, but on leaving Cambridge he entered his father's business at Rochester, where he remained for several years. Turning to medicine, he studied at Guy's Hospital and graduated B.Chir. in 1904. Obtaining the Cambridge M.B. three years later, he proceeded to the M.D. in 1911. After graduation he held the appointments of assistant house-surgeon at

Guy's Hospital and clinical assistant at the Hospital for Women, Soho. In 1905 he entered general practice at East Bergholt, Suffolk, but left there after three years to settle at Barnet, where he was a member of a partnership until 1929. In that year an accident and an illness caused his premature retirement, much to the regret of his patients, colleagues, and friends. At Barnet he lived in a house opposite the Congregational church, where his grandfather, the Rev. Alexander Stewart, was minister in 1823. In addition to the work of the practice Dr. Stewart was medical officer to the Barnet Union, having the medical care of the inmates of the old workhouse, which later became known as the Wellhouse Hospital, and performed most of the surgery there. He was also surgeon, subsequently consulting surgeon, to the Barnet Victoria Cottage Hospital, and to other local institutions. During the first world war he served as a medical officer at Lady Guernsey's V.A.D. Hospital at St. Omer, and later as an officer in the R.A.M.C., also in France.

From 1937, when he succeeded his father, until his death he was president of the Sir Halley Stewart Trust. Elected a Fellow of the Royal Society of Edinburgh in 1939, he was also a Fellow of King's College, London, and a member of the delegacy of the college. A governor of Guy's Hospital, St. Bartholomew's Hospital, and the Brompton Hospital until the inception of the National Health Service in 1948, he was also a member of the Asthma Research Council. He was chairman of the Barnet Division of the British Medical Association in 1935-6. On his retirement from practice he went to live at Totteridge, moving to Hadley Wood four years ago. Keenly interested in all kinds of sport, as a young man he excelled at Association football, athletics, and swimming, and, subsequently, at tennis. But for an injury to his knee he would probably have represented Cambridge at athletics and swimming. Until quite late in life he retained the magnificent physique he had developed through his devotion to gymnastics as a young man. He was a vice-president of the Hertfordshire lawn tennis association, the Barnet boxing and hockey clubs, and the Hendon Rugby football club. Outstandingly good at chess, he represented Sussex while still at school, playing at the same time for the South versus the North of England. He married Miss Mabel F. Wyatt at Beckenham on April 11, 1905, and so, three years ago, had the happiness of celebrating the fiftieth anniversary of his wedding. He leaves a widow and two sons and one daughter. One of his sons, Dr. H. C. Stewart, has followed him into the medical profession.

H. L. NEIL, M.B., Ch.B.

Dr. H. L. Neil, who was in practice at Horbury, near Wakefield, for many years, died on July 27 at his home at Holt, Norfolk, after a long illness. He was 70 years of age.

Hugh Loudon Neil received his medical education at Glasgow University, graduating M.B., Ch.B. in 1911. During the first world war he served in the R.A.M.C. in France and Mesopotamia. He began general practice in Horbury in 1920, and remained there for 36 years until ill-health caused his retirement in 1956. He was in partnership with his brother, Dr. George Loudon Neil, until the latter's death in 1950.

A. G. writes: Hugh Neil was a most skilful and conscientious doctor who had wide professional interests. He was particularly interested in child welfare and was for many years associated with the clinic in Horbury. He had also been medical officer of health for the town, and was in charge of the local infectious diseases hospital until its closure in 1948. Like most practitioners of the old school, he was a highly skilled obstetrician. During the second world war he played a prominent part in organizing the first-aid services in the area. He was a kindly, modest man, devoted to his work and his patients, and will be greatly missed. His final illness was a very long and painful one,

which he bore with great courage. In recent years, although he could hardly walk, and every step he took caused him severe pain, he continued to visit his patients until this was no longer possible. He leaves a widow, three sons, and a daughter.

F. E. JOHNSON, M.R.C.S., L.R.C.P.

Dr. F. E. Johnson died at his home at Stanmore, Middlesex, on August 10 after a short illness. He was 67 years of age.

Frank Edwin Johnson was a native of Devonport, where he was born on February 2, 1891. He qualified M.R.C.S., L.R.C.P. from the London Hospital in 1913. Immediately the first world war broke out he joined the R.A.M.C., and while serving as a regimental medical officer in France he was exposed to one of the first gas attacks, before masks were available. As a result his lungs were permanently damaged. After the war he transferred to the R.A.F. and was one of the few medical officers to gain his wings. On his retirement from the R.A.F. in 1946 he settled in practice at Stanmore, where he soon became appreciated by his patients and respected by his colleagues. His unfailing kindness, good humour, and strict sense of duty were outstanding, and his passing is a sad loss to those he served so faithfully and to a wide circle of friends. He leaves a widow and four children. His elder brother, Dr. J. Pratt-Johnson, is well known as a bacteriologist in Johannesburg. —McN. L.

H. J. BEDDOW, M.R.C.S., L.R.C.P.

Dr. H. J. Beddow, honorary consulting anaesthetist to the Hospital of St. Cross, Rugby, died on August 11 at the home of his son at Nymet Rowland, Lapford, Devon, where he had been living in retirement. He was in his 80th year.

Harold Josiah Beddow was born at Ealing on August 20, 1878. From Dulwich College he entered Christ's College, Cambridge, to read medicine, receiving his clinical training at St. Bartholomew's Hospital. Qualifying M.R.C.S., L.R.C.P. in 1907, he then held the appointment of house-physician at Bedford County Hospital before entering general practice at Rugby in 1909. His experience in the first world war, in which he served as a captain in the R.A.M.C. at the 72nd General Hospital in France, aroused an interest in anaesthesia, and on his return to civilian life he was appointed anaesthetist to the Hospital of St. Cross at Rugby. With operations at the hospital becoming more frequent, he gave up more and more of his time to the work, in which his imperturbable nature stood him in good stead. Always spruce in appearance and always cheerful, he will be remembered by his many patients for his unfailing kindness, and by his colleagues at the hospital and in general practice for his willingness to act as anaesthetist at any time of the day or night, and for the quietly efficient way he did this work. A member of the British Medical Association for nearly 50 years, he was a founder member of the Rugby Division in 1927 and chairman from 1934 to 1936. He remained an active member of the Division on the executive committee until just before he retired in 1946. He was also a member of the Warwickshire Local Medical Committee for many years. A typical family physician, he loved to hear from his old patients, whom he always regarded as his friends. He leaves a widow and one son, the Rev. A. J. C. Beddow.

J. B. BISHOP, T.D., B.M., B.Ch.

The obituary of Dr. J. B. Bishop was printed in the *Journal* of August 16 (p. 453).

Dr. PATRICK G. McGRATH writes: Brock Bishop had a tremendous zest for the full life. His interests were wide, and to each one of them, social, professional, and purely

recreational, he gave a full measure of his abundant energy. I saw this mainly in his medical work, where his conscientious attention to every facet of the life of his patients not only paid handsome clinical dividends but earned him the respect and deep affection of patients and colleagues. His devotion to duty did not result in a dreary rigidity, but was clothed in a vivid, flexible human approach; the patients' own attitude and susceptibilities would extract from Brock the formal courtesy of which he was a master, or, through the whole gamut, to a friendly raciness of language which on occasion enlivened his reports as well. The memorial which he would appreciate most is the affectionate smile which comes to every face in Broadmoor at the mention of his name.

FELLOW TERRITORIAL writes: It was with sad surprise that I read of the death of John Brock Bishop, followed by a feeling of pride and gratitude at having had the privilege of his friendship. He had been medical officer to the 51st Heavy Anti-Aircraft Regiment, R.A., T.A. (London), and it was on his promotion to senior medical officer of his brigade in 1939 that we first met. His constant good humour and ready but subtle wit enabled him to fill this post with efficiency and popularity. I later met him during the invasion of Sicily, when he held another staff appointment, and again later during the campaign in Italy, when he held a similar post. At this period we spent together a never-to-be-forgotten leave in Rome, when he was the jolliest of companions. I later called on him at Broadmoor, where he was obviously happy and had found his niche where he could help his less fortunate fellows. "Brock" was a man who walked humbly but nevertheless held firm convictions quietly. He was a gentle man by whose passing the world is poorer.

Vital Statistics

Week Ending August 16

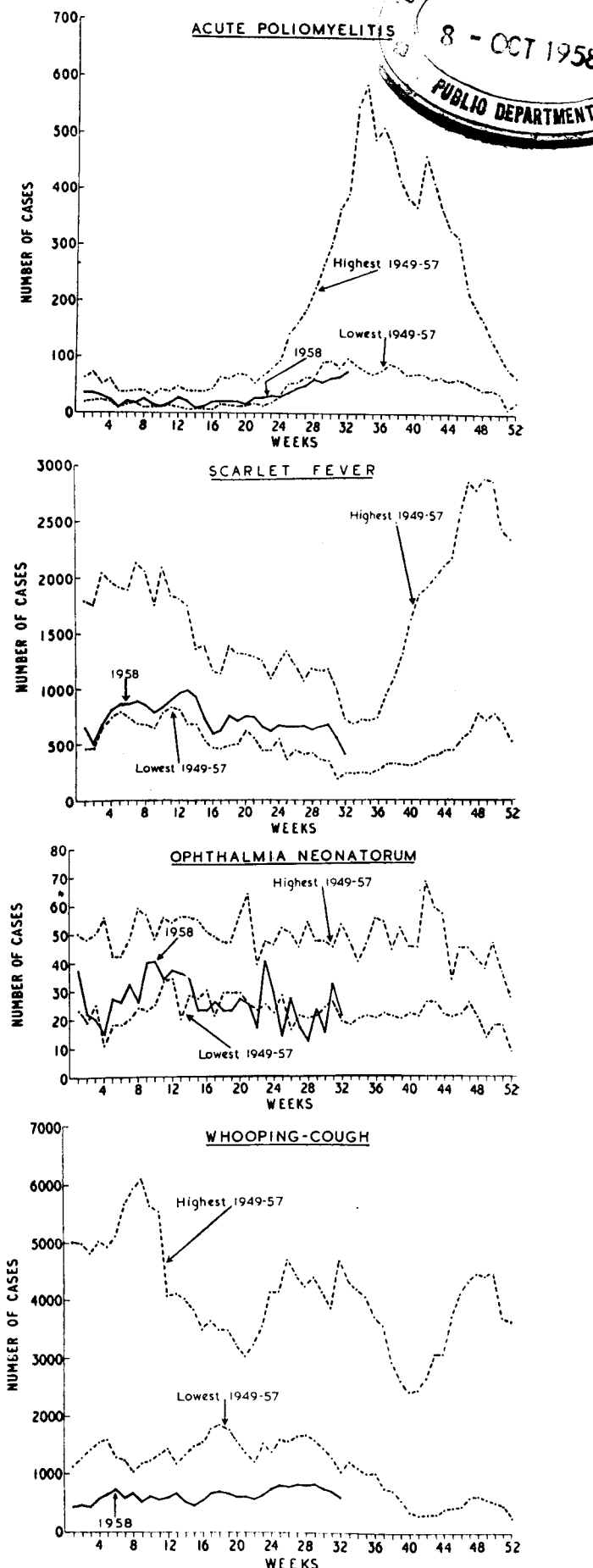
Despite the unseasonable summer weather, infectious diseases in England and Wales remained generally at a low level in the week ending August 16. Increases in the number of notifications were recorded for whooping-cough 106, acute poliomyelitis 13, from 73 to 86, acute pneumonia 33, from 150 to 183, and food-poisoning 116, from 171 to 287. Notifications of the following diseases from fell: scarlet fever 37, from 410 to 373, measles 476, from 5,578 to 5,102, and dysentery 29, from 367 to 338. Cases of paratyphoid fever numbered 5 and typhoid 4, for each of the same as the previous week.

The 86 cases of acute poliomyelitis comprised 57 paralytic and 29 non-paralytic; these were 6 and 7 respectively more than in the previous week. The main centres of infection continued to be Yorkshire West Riding 26 (Leeds 7, Morley M.B. 2), and Lancashire 13 (Manchester C.B. 7, Stretford M.B. 2). In Devon 7 cases were notified, all from Plymouth C.B.

An outbreak of 70 cases of food-poisoning was reported from Hampshire (Basingstoke R.D.).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during 1958 are shown thus ———, the figures for the years 1949-57 are shown thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending August 9 (No. 32) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	3	0	3	0		7	0	1	0	2
Dysentery	367	74	118	4		274	19	100	5	1
Encephalitis, acute	1	0		0		2	0		4	
Enteric fever: Typhoid	4	0	2	0	2	0	0	0	0	1
Paratyphoid	5	2	2 (B)	0		14	2	2	0	
Food-poisoning	171	20	8	2		344	31	16	0	
Infective enteritis or diarrhoea under 2 years										
Measles*	5,578	318	21	6	43	7,929	162	50	31	33
Meningococcal infection	11	1	6	2		20	0	12	2	
Ophthalmia neonatorum	21	1	4	0		33	0	5	0	
Pneumonia†	150	14	80	3		179	12	98	0	
Poliomyelitis, acute: Paralytic	51	0		2	7	183	8		4	31
Non-paralytic	22	0				145	15			
Puerperal fever‡	186	17	9	1		208	30	13	0	1
Scarlet fever	410	26	31	4	18	297	18	47	10	8
Tuberculosis: Respiratory	427	46	84	10		412	53	104	16	
Non-respiratory	72	9	11	2		69	2	12	3	
Whooping-cough	607	33	59	38	14	1,050	43	84	7	15

DEATHS	1958					1957				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	1	0		0		0		0	0	
Encephalitis, acute		0			0	0			1	
Enteric fever	1	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	6	0	0	1	1	0	0	0	1	
Influenza	6	0	0	0	0	0	0	0	0	
Measles		0	0	0	0	0	0	0	0	
Meningococcal infection		0	0			1	0			
Pneumonia	288	21	11	15	2	30	10	11	1	
Poliomyelitis, acute	5	0		0	0	3	0	1	0	
Scarlet fever		0	0	0	0	0	0	0	0	
Tuberculosis: Respiratory	62	7	7	1	0	3	4	1	0	
Non-respiratory		1	0	1	1	1	0	1	0	
Whooping-cough	1	0	0	0	0	0	0	0	0	
Deaths 0-1 year	242	31	23	11	10	29	18	6	6	
Deaths (excluding stillbirths)	7,673	675	447	101	112	595	468	85	122	
LIVE BIRTHS	12,465	1032	912	197	328	1071	957	211	351	
STILLBIRTHS	268	20	26			18	19			

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

Medical News

Smoking and Lung Cancer Propaganda.—The Minister of Health has circularized local authorities asking them to report on what steps they have taken to bring the risks of smoking to the notice of the public. The inquiry follows a circular in June last year in which the Minister asked that information on the dangers of smoking and its association with lung cancer should be disseminated. Local authorities are now asked to say whether they have accepted the need for a propaganda programme. If so, they are asked to report what publicity methods and material have been used, and whether they have been concentrated on special groups and if any of them have been especially effective. An assessment of the public reaction is also asked for.

Medical Art Exhibition at Edinburgh.—During the Joint Annual Meeting of the British and Canadian Medical Associations at Edinburgh from July 20 to 24, 1959, there is to be an exhibition of paintings by members of the two Associations. By courtesy of the governors and principal of the Edinburgh College of Art this exhibition will be held in the Andrew Grant Gallery of the College throughout the Meeting. Accepted work will be limited to approximately 150 exhibits, and should be either oils or water-colour paintings. A prize has been offered for the most outstanding exhibit. Members who wish to exhibit examples of their work on this occasion are invited, in the first instance, to communicate either with Professor B. G. MAEGRAITH, School of Tropical Medicine, University of Liverpool, Pembroke Place, Liverpool, 3; Dr. A. M. RACKOW, Cleve Cottage, Hawk's Hill, Leatherhead, Surrey; or Professor D. E. C. MEKIE, Royal College of Surgeons, 18, Nicolson Street, Edinburgh, 8.

The Lambeth Conference and Family Planning.—The report of the Lambeth Conference of bishops, published earlier this week by the S.P.C.K., includes a section on "The Family in Contemporary Society." Of the three main purposes of marriage defined by the Conference, the procreation of children is mentioned first. The earlier in marriage children are born the better both for them and for their parents. But, the report states, "family planning, in such ways as are mutually acceptable to husband and wife in Christian conscience, and secure from the corruptions of sensuality and selfishness, is a right and important factor in Christian family life. . . . Scientific studies can rightly help, and do, in assessing the effects and usefulness of any particular means, and Christians have every right to use the gifts of science for proper ends." The Conference welcomed the growth of marriage guidance councils, which made an important contribution to the community and deserved Government support. Clergy should be encouraged to offer themselves for training as counsellors. Referring to countries where the increase of population imperils the survival of young and old, the report urges that it is the duty of the better-developed nations to help them to become self-supporting. "Abortion and infanticide are to be condemned, but methods of control (of population), medically endorsed and morally acceptable, may help people of their lands so to plan family life that children may be born without a likelihood of starvation." Any government policy of compulsory sterilization as a means of population control is unacceptable to the Christian conscience. Where conception is prevented by physical or emotional abnormality, the Christian can rightly accept the help of responsible physicians. But, the report continues, "artificial insemination by anyone other than the husband raises problems of such gravity that the committee cannot see any possibility of its acceptance by Christian people."

Overcrowded Prisons.—The "outstanding feature" of the prisons in 1957 was "the steady rise in the inmate population with the consequent return of accommodation

problems." The Report of the Commissioners of Prisons for the Year 1957 (H.M.S.O., 9s. 6d.) states this and adds: "Nevertheless the general health of the inmates was well maintained." The daily percentage receiving medical treatment in and out of hospital was 15.5. This relates to an average prison population of 22,602. The percentages in previous years were: 1956, 15.6; 1955, 14.6; 1954, 13.8; and 1953, 13.9. Large numbers of prisoners contracted Asian influenza, so that, apart from this disease, ill-health seems to have been less prevalent than in the previous year. Deaths numbered 60, of which 47 were from natural causes. Of the remaining 13, 8 were due to suicide, 2 to judicial execution, 1 to a fight with another prisoner, 1 to jumping from a moving car, and 1 to asphyxia in an epileptic fit. Of the 47 deaths from natural causes, 12 resulted from malignant disease. In an attempt to assess the results of psychotherapy, some figures for the Wormwood Scrubs psychiatric unit are given. They suggest that sex cases responded better than non-sex cases (success rates 48% and 37%), and that group psychotherapy was more beneficial than individual psychotherapy (success rates 53% and 42%). It is recognized that the selection of patients may influence the validity of these figures.

Society of Apothecaries.—At a meeting of the Court of Assistants on August 19, the following were elected officers of the society: *Master*, Dr. W. S. C. COPEMAN; *Senior Warden*, Dr. RICHARD R. TRAIL; *Junior Warden*, Dr. CHARLES WHITE.

Carbon Dioxide Danger.—The wet harvest has increased the danger of carbon dioxide asphyxiation among farm workers. The Ministry of Agriculture has reminded farmers that accumulation of wet grain generates the gas in a matter of hours. This can happen in any place where grain is stored, and as the gas is heavier than air it will collect in the pits or ducts of a grain-handling plant.

Winning Flautist.—Dr. W. K. VERNON BERNFELD won the solo flute competition, for the second year in succession, at the eisteddfod held recently at Ebbw Vale.

Lord Webb-Johnson.—A cheque for £20 has been sent to the Royal Medical Benevolent Fund as a result of a collection taken in memory of Lord Webb-Johnson at his old school—the High School, Newcastle-under-Lyme.

COMING EVENTS

Occupational Health.—A short intensive course for general practitioners in occupational health will be held at the London School of Hygiene and Tropical Medicine from September 22 to 26, inclusive. Fees and allowances are provided for National Health Service practitioners on certain conditions. Other practitioners may attend on payment of a fee of 5 guineas. Numbers admitted to the course are strictly limited, and only a few vacancies remain, but applications and requests for further information may still be sent to the Registrar, London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W.C.1.

Space Medicine.—The British Interplanetary Society will hold a symposium on this subject at B.M.A. House, Tavistock Square, London, W.C.1, on October 16-17. The symposium is being organized with the co-operation of the R.A.F. Institute of Aviation Medicine. Full details from the secretary of the Society at 12, Bessborough Gardens, London, S.W.1.

Radioactive Risks.—The Scottish Group of the Nutrition Society is holding a symposium on "Nutritional Hazards Caused by Radioactive Contamination of Foods" in Edinburgh on September 27. Those interested who are not already members of the Society are invited to write for further particulars to Dr. J. DAVIDSON, Rowett Research Institute, Bucksburn, Aberdeenshire.

Chartered Society of Physiotherapy.—Conference on "Work Study—Its Application to the Hospital Service," October 17 and 18, at the Meyerstein Lecture Theatre, Westminster Medical School. Details from the secretary, Tavistock House (South), Tavistock Square, London, W.C.1.

NEW ISSUES

SPECIALIST JOURNALS AND ABSTRACTS

The journals listed below are obtainable from the publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Archives of Disease in Childhood.—Issued six times a year (£4 4s. annually). The new issue, Vol. 33, No. 170, includes:

PAEDIATRICS IN WESTERN NIGERIA. Malcolm Macgregor.
PHLYCTENULAR CONJUNCTIVITIS IN AFRICAN CHILDREN. Harry Stein and Ida Freiman.
HORMONE EXCRETION IN PRECOCIOUS PUBERTY IN GIRLS. R. D. Bulbrook, F. C. Greenwood, and A. H. Snaith.
URINARY EXCRETION OF 17-KETOSTEROIDS IN CHILDREN. Margaret Prout and A. H. Snaith.
THE URINARY EXCRETION OF 17-HYDROXYSTEROIDS IN CHILDREN. R. Gardner and A. Snaith.
THE PROGNOSIS IN JUVENILE OBESITY. A. G. Mullins.
DIABETES INSIPIDUS FOLLOWING TUBERCULOUS MENINGITIS. John Lorber.
DIABETES MELLITUS IN A CHILD SHOWING FEATURES OF REFSUM'S SYNDROME. J. B. Heycock and J. Wilson.
THE POST-NATAL WEIGHT LOSS OF BABIES BORN TO DIABETIC AND NON-DIABETIC WOMEN. James W. Farquhar and Stanley A. Sklaroff.
JAUNDICE AND INFANTILE DIARRHOEA. R. G. F. Parker.
CONGENITAL SPHEROCYTOSIS IN INFANCY. David Butman.
CONGENITAL HEART DISEASE IN ONE OF IDENTICAL TWINS. H. Everley Jones.
THE ELECTROCARDIOGRAPHIC RECOGNITION OF VENTRICULAR HYPERTROPHY IN CONGENITAL CARDIOVASCULAR DISEASE DURING THE FIRST YEAR OF LIFE. J. S. Oldham.
THE DIFFERENTIAL DIAGNOSIS OF RHEUMATIC FEVER. K. A. Hallidie-Smith and E. G. L. Bywaters.
A SMALL OUTBREAK OF NEONATAL MENINGITIS IN A MATERNITY UNIT. Eric McKay and John Smith.
NEONATAL PERFORATION OF THE COLON. Leonard Haas.
BILATERAL PULMONARY AGENESIS. Albert E. Claireaux and H. P. Ferreira.
ATRESIA OF THE OESOPHAGUS WITH COMMON TRACHEO-OESOPHAGEAL TUBE. R. G. Welch and O. A. N. Husain.
PSYCHOGENIC MEGACOLON IN CHILDREN: THE IMPLICATIONS OF BOWEL NEGATIVITY. Philip Pinkerton.
BRITISH PAEDIATRIC ASSOCIATION: PROCEEDINGS OF THE TWENTY-NINTH ANNUAL GENERAL MEETING.

British Journal of Ophthalmology.—Issued monthly (£6 annually). The new issue, Vol. 42, No. 8, includes:

VISUAL DISTORTION IN AMBLYOPIA. M. Pugh.
ATTEMPTED ISOLATION OF THE VIRUS OF TRACHOMA. C. H. Smith, M. J. Gilkes, and J. Sowa.
STAINING OF INCLUSION BODIES OF TRACHOMA AND INCLUSION CONJUNCTIVITIS. M. J. Gilkes, C. H. Smith, and J. Sowa.
TRACHOMA INCLUSIONS AND PENICILLIN. M. J. Gilkes, C. H. Smith, and J. Sowa.
A NOTE ON THE MODE OF ACTION OF TARSORRHAPHY IN NEUROPARALYTIC KERATITIS. P. Sivasubramanian.
CORNEAL "FLAP" INCISION FOR CATARACT OPERATION. A. Gormaz B.
EXPERIMENTAL ELECTROCHEMICAL REMOVAL OF COPPER SPLINTERS FROM THE ISOLATED VITREOUS. T. Krawicz and K. Zagorski.
OCULAR MANIFESTATIONS IN IDIOPATHIC HYPERLIPAEEMIA AND XANTHOMATOSIS. P. K. Thomas and E. B. Smith.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Friday, September 5

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. J. G. Scadding: clinical demonstration.

Sunday, September 7

UNIVERSITY COLLEGE HOSPITAL.—10.15 a.m., lecture-demonstration for general practitioners. Clinical demonstration by Mr. G. L. Buntin: Some Aspects of Cases Suitable for Paediatric Surgery. Meet in front hall of main hospital building.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Hinton.—On July 12, 1958, to Rosalind (formerly Elliott), M.B., B.S., D.Obst., R.C.O.G., wife of Lieutenant-Commander J. D. O. Hinton, R.N., of Overbank, Barclays Bank, Littlehampton, a daughter.

DIAMOND WEDDING

Rawson—Hammond.—On August 24, 1898, William Foster Rawson, F.R.C.S.Ed., F.R.C.O.G., to Helen M. Hammond. Present address: "Clevedon," Park Drive, Bradford, 9.

DEATHS

Adam.—On August 11, 1958, in hospital, Robert Stuart Adam, M.B., Ch.B., of 236, Great Clowes Street, Broughton, Salford, Lancs.
Attenborough.—On August 13, 1958, in St. John and St. Elizabeth Hospital, Grove End Road, London, N.W., Keith Edward Attenborough, M.R.C.S., L.R.C.P., of 1, Mortimer Court, Abbey Road, London, N.W.
Beddow.—On August 11, 1958, at The Rectory, Nymet Rowland, Lanford, Devon, Harold Josiah Beddow, M.R.C.S., L.R.C.P., late of Rusby, Warwick, aged 79.
Golden.—On August 11, 1958, Stanley John Golden, M.B., B.S., F.R.C.S., of 236, Great Clowes Street, Broughton, Salford, Lancs.
Ross.—On August 24, 1958, Henry Ross, C.I.E., O.B.E., F.R.C.S.I., Lieutenant-Colonel, I.M.S. (retired), of The Cottage, Hovingham, York, aged 81.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Standard of Hygiene and Poliomyelitis

Q.—The trend of medical opinion is that the spread of poliomyelitis is probably by faecal contamination. Yet the W.H.O. expert committee's second report¹ associates poliomyelitis epidemics with a general improvement in hygiene and sanitation, and regards a fall in infant mortality below 75 per 1,000 live births as a warning sign. How may these apparently contradictory views be reconciled?

A.—An inverse correlation between the height of the infant mortality rate and the intensity of polio epidemics appears to be true for many countries. It can be explained if the distinction between infection of the alimentary tract with polio virus and paralytic disease is borne in mind. Under conditions of bad sanitation faecal infection probably occurs at a very early age, when maternal antibodies are still present and able to prevent spread of virus from the gut to the C.N.S. Further episodes of oral infection create a solid active immunity, and widespread prevalence of the virus exists in the apparent absence of poliomyelitis as a disease. In highly civilized communities good sanitation prevents faecal infection, so that the first contact with virus occurs in infants, children, or even adults who possess no active immunity and no antibodies to protect the C.N.S. A sparing of infection with polio virus in infants by the hygiene of food and water therefore renders the community more liable to paralytic attacks. Virus is less prevalent but the disease is epidemic.

REFERENCE

¹ Expert Committee on Poliomyelitis: Second Report, *Wld Hlth Org. techn. Rep. Ser.*, 1958, No. 145.

Medical Blood Donors

Q.—Are there good reasons why nurses and doctors who are healthy and between the ages of 18 and 65 should not enrol as blood donors?

A.—Blood donation may produce acute or chronic effects. The acute effects are those, such as mild faintness and giddiness, associated with sudden depletion of blood volume; these effects last for only a few hours and are unlikely to be troublesome unless the donor has to engage in some strenuous task during this period. The chronic effects of blood donation are mainly due to iron depletion, and may be adequately counteracted by taking iron, and are in any case unlikely to be important if the intervals between donations are as long as six months, as is the case in the United Kingdom.

It may be argued that some doctors and nurses lead a particularly strenuous life, and that they should be spared any additional physical burden. Probably they should be discouraged from acting as blood donors, although they should surely be allowed to give blood occasionally (perhaps once a year) if they express a strong wish to do so.

Mortality from Whooping-cough

Q.—What are the causes of mortality from whooping-cough in the very young, and what measures may be taken to prevent or treat these?

A.—In the first year of life, especially in the first three months, babies with whooping-cough are especially liable to asphyxial attacks. Convulsions are also common: these may accompany the asphyxial attacks or they may occur independently and are then presumably caused by toxic damage to the brain. Bronchopneumonia is common, often with pulmonary collapse. Gastro-enteritis is especially dangerous.

Babies with severe whooping-cough need constant observation. If there is any tendency to asphyxial attacks they

should be nursed in oxygen tents or boxes: this, along with sedatives, may lessen the asphyxial attacks and associated convulsions. No treatment seems to be effective for the second type of convulsions: when they are severe and repeated, the child usually lapses into coma. Lumbar puncture is certainly useless: sedatives and anaesthetics may produce some effect and cortisone has been tried, but without convincing results. Bronchopneumonia usually responds to the appropriate antibiotic and pulmonary collapse to postural drainage. Gastro-enteritis may respond to an antibiotic according to the organism responsible, but the condition should be prevented by rigid isolation. Cross-infection is in fact one of the main hazards for the infant with whooping-cough. First-class nursing, with especial attention to maintaining nutrition, is the most important item in the prevention of bronchopneumonia and gastro-enteritis. Once an attack has developed vaccines are, of course, useless.

NOTES AND COMMENTS

"Wind."—Dr. ISAAC EBAN (London, W.1) writes: Your expert's reply ("Notes and Comments," August 2, p. 340) deserves praise in being both correct and to the point. Most of the gas in the bowel, which can be a source of trouble to the diagnostic radiologist, is not intrinsic but extrinsic in origin. In other words, it comes less from the products of digestion than from air which is swallowed. Also, the more apprehensive the patient the more will be the amount of air swallowed. Therefore the sensible thing to do if one wants to keep the bowel gas at a minimum is to "tranquillize" the patient at the beginning of the investigation (this can be done by giving two tranquillizing tablets, preferably crushed) and also to prevent air-swallowing by making the patient bite on a cork during the whole investigation, for this makes swallowing practically impossible. Before doing the latter, it is, of course, advisable to secure the patient's co-operation by explaining to him the why and wherefore of the proceeding. The good results thus obtained can be made even better by the use, on the evening previous to the x-ray investigation, of two "contact-action" tablets, and the use, on the morning of the day of the investigation, of a suppository which acts by "contact" with the rectal mucosa. The gratifying absence or almost complete absence of gas in the bowel resulting from the use of the above technique is especially helpful in intravenous pyelography cases.

Correction.—The report of the discussion on the surgical treatment of congenital heart disease at the Section of Cardiology (July 26, p. 233) omitted a point made by the speakers to the effect that atrial septal defects should be repaired at present in special centres, where the operative mortality was low, and that the appearance of cardiac enlargement or of symptoms was an urgent indication for surgery. Dr. E. M. M. BESTERMAN emphasized that cardiac enlargement preceded symptoms in atrial septal defects and that this was an indication for surgery, regardless of a patient's youth. He mentioned that in a series of 100 cases operated on at the Middlesex Hospital there had been only three deaths.

Collected Articles from the "British Medical Journal"

The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

Emergencies in General Practice (26s. 9d.).

Refresher Course for General Practitioners, Volumes 2 and 3 (26s. 9d.).

Clinical Pathology in General Practice (22s. 3d.).

Any Questions?, Volumes 2 and 3 (8s. 3d. each).

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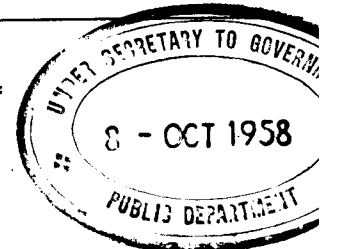
LONDON SATURDAY SEPTEMBER 6 1958

THE EDUCATION OF THE SCIENTIST*

BY

Sir ERIC JAMES

High Master of Manchester Grammar School



Although it is a pleasure and an honour to be asked to speak to doctors on the education of the scientist, it is a pleasure mingled with a good deal of misgiving. First there is the perennial problem, that even the great Wilfred Trotter left unsolved, of whether medicine itself is an art or a science. Secondly, there is the fact that a subject on which everyone is apparently an expert, and on which everyone feels entitled to express an opinion based on his own schooldays thirty years before.

Nevertheless, I am encouraged by the importance of the subject itself. There is no field of education to which it is more worth devoting thought than that of the place of science. This is true because the actual proportion of our ablest pupils who specialize in science has increased considerably over the past few years, and is undoubtedly will go on increasing still further. It is also very important to take account of the fact that as a greater proportion of our national ability is devoted to science it will be increasingly necessary to recruit our administrators and executives from those trained in science rather than the arts, as in the past, and their education thus assumes an ever greater significance.

Rapid Growth of Knowledge

In discussing the education of the scientist it is necessary to remind ourselves from time to time what a comparatively recent problem this presents. It is only a century since the then headmaster of Winchester told the Clarendon Commission on the public schools how impossible it was that scientific subjects should ever become a regular part of the time-table. Since then, and particularly in the last twenty years, we have seen an astonishingly rapid growth, so rapid indeed that nearly two-thirds of our much-expanded sixth forms are studying science in some aspect. The rapidity of this change has considerable bearing on the criticisms that are often made of our scientific education. In so far as they relate, as they so often do, to the critics' own schooldays, they are concerned with a state of affairs that has passed for ever. This great change in the position of science has come about as a result of profound social and economic changes. But more than that, it has come as a result of the pressure of new knowledge.

At no time in man's history has there been a more spectacular growth of knowledge than in the natural sciences in the past half-century, and it is well that we

*The substance of a lecture delivered to the Manchester Medical Society on May 7, 1958.

should remind ourselves of the difficulties this has created for the educator. Compared with the task of, say, Arnold a century ago, our problems in devising a curriculum which shall be an adequate preparation for life are far more difficult. Then a curriculum whose domination by the classics was mitigated only by a little mathematics was sufficient. Now we have had to add a multiplicity of other subjects; we have to take account of the emotional and physical education of our pupils, and we have to prepare our boys and girls ultimately to contribute to the development of knowledge itself. At its deepest level the task of education may be the same, to produce rational and civilized human beings. But the meaning of civilization has broadened, and superimposed on that task is the obligation to produce some individuals who will be able to reach the frontiers of knowledge, even though with every year that passes, those frontiers are becoming more remote.

Real Progress

Having sketched that background, let us turn to a more detailed examination of our subject. First, let us consider the education of the scientist in science. Here, I believe, we can claim real progress. The efforts of science teachers themselves, reinforced by an able and enlightened inspectorate, have encouraged real advances in the quality and quantity of science teaching. We are rapidly moving towards the position in which some science is part of the education of all suitable children from the age of 11. A weakness that is at present too common is that children often have to decide too early whether they wish to specialize in science; but even here we are making progress, and moving towards a situation in which no irrevocable decisions have to be made until 15 or 16. After that age, in the sixth form, it is, as is well known, the custom in English schools to specialize fairly intensively. No aspect of education is more freely criticized than sixth-form specialization; no educational topic is discussed more misguidedly. In fact, a reasonable degree of specialization may be defended on grounds both of educational value and of expediency.

It is good for intelligent boys and girls to devote the major part of their energies to their chosen subjects firstly, because they like doing so. It is a frustrating waste of the energy of youth to make a clever boy learn something merely because it is not what he wants to learn. And even at the age of 17 there is virtue for the abler pupil in getting to grips with quite difficult ideas in his chosen subject. But, apart from these more

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recognized by the Ministry, and there are still many good courses held each year which have not been recognized.

Difficulties in Postgraduate Study

The College of General Practitioners believes that, except in special circumstances, a family doctor should attend at least twenty hours of organized postgraduate study each year. The optimum amount of formal study will vary for each individual, and will depend on many factors, such as the time at his disposal and how great are his opportunities for self-education. It will be likely to fall between the minimum figure set by the College and the maximum that the Ministry is prepared to subsidize. In stressing the importance of attending organized courses we must remember the danger of a practitioner becoming so obsessed by attending courses that his own practice will suffer. The Ministry has been wise to set a maximum subsidy for this type of postgraduate study.

In the questionnaire members of the College were asked to state what they considered to be the main obstacles to postgraduate work. Their replies are listed as follows:

1. Lack of time	75%	1,224
2. Deputizing difficulties	38%	613
3. Distance from courses	32.5%	525
4. Lack of ancillary help	12%	190
5. Lack of practice in studying	8%	130
6. Courses too elementary	5%	81
7. Courses too highbrow	5%	80
8. Family or social commitments	3.5%	58
9. Financial difficulties	2%	29

These answers are interesting enough to be worthy of further comment.

Lack of time and deputizing difficulties are by far the commonest problems mentioned, and it would be valuable to know why this is so. Attending courses for one or two weeks necessitates either the employment of a locum tenent or a partner taking over the work in the practice. While the Ministry will pay for a locum for a single-handed practitioner, it will not do so for a man in partnership. Consequently the doctor in partnership must rely either on the good will of his partners for leave of absence from the practice, or on the good will of his family to let him use part of his holiday for attending a course. There are two simple solutions to this problem: firstly, the inclusion in every partnership and assistantship agreement of a clause allowing for study leave; and, secondly, for the Ministry to pay for a locum when a doctor in partnership attends a course, as is already done in Scotland.

For meetings of clinical societies, extended courses of half a day, a week, or for week-ends, the problem is different. A full visiting-list may make even a few hours' absence from the practice impossible; a single-handed doctor may have difficulty in finding a "stand-in," and the distance from the lecture or meeting may be too great. Encouraging developments for overcoming these difficulties are the increasing number of evening and half-day rota systems that are being set up, and the tendency for general practitioners in areas distant from teaching centres to establish small discussion groups and clinical societies of their own. Experiments in recorded lectures, described elsewhere in this issue by Drs. John and Valerie Graves, should be of great assistance to isolated doctors and to small groups of doctors holding meetings without a guest speaker.

It is disturbing to note in the answers to the questionnaire⁴ that no fewer than 130 doctors confess to lack of practice in studying. Whether this is due to disillusionment and dislike of the work in general practice or to lack of opportunity, it is a challenge to us all to see that general practice is kept interesting and vital, and that entrants to this branch of the profession are provided with stimulating opportunities for study from the beginning of their careers.

The fact that equal numbers of practitioners say that courses are "too highbrow" and "too lowbrow" shows the need for variety and that some indication of the type of course—for example, revision or recent advances—should be made when the course is advertised.

Organization of Courses

Comments in the questionnaire on courses that general practitioners had attended were usually favourable, but some adverse comments were made about either their administration or their content. The importance of good administration cannot be overstressed. Matters such as lectures starting and ending at the advertised time, allowing adequate time for discussion, and the avoidance of long periods when the doctors on the course are kicking their heels and waiting for the next lecture, must be carefully considered. Discussion following a good lecture is often the most valuable part of it, for this is the time when the general practitioner can mention the problems that have arisen in his own practice—points that may not have been considered in the formal lecture, but which may be clarified in the discussion period by the lecturer or by another general practitioner present.

When choosing the programme for a course the organizers should relate their lectures and demonstrations to a general practitioner's day-to-day work, remembering that 90% of this is concerned with the commoner diseases.

A family doctor who attends a general refresher course will hope to review in detail the commoner conditions and also hear in outline of important developments in the treatment of rarer diseases, and something of the work in the more highly specialized branches of medicine. By careful rearrangement of the programmes from year to year it should be possible to cover the whole of medicine over a period of five or six years. When highly specialized subjects are being discussed it is the overall picture rather than detail that interests the general practitioner. Conversely, when diseases which he usually treats himself are being discussed he will want to know minute details of technique. Many subjects are best considered by a group of lecturers—physician, surgeon, pathologist, and radiologist—each of whom can give his point of view. Those who arrange courses are often well advised to invite a general practitioner of experience to help them in planning the course and in opening or closing discussions. He can explain the general practitioner's viewpoint and ensure that subjects are approached from an angle which will interest his colleagues. Perhaps this helping and advising of the organizers of courses is one of the most important contributions that postgraduate education committees of faculty boards can make to organized postgraduate education for the general practitioner.

Many family doctors prefer to attend a course devoted to one particular branch of medicine, either because they are especially interested in the subject or because they feel that their knowledge of it is weak. Courses of two days or a week are already held in subjects such as obstetrics, psychological medicine, anaesthetics, dermatology, paediatrics, chest diseases, and cardiology. The principles that apply to the organization of general refresher courses apply also to these. The organizers must remember that they are teaching family doctors and not young consultants, and the lecturers should concentrate on broad principles rather than detail.

However many formal courses are arranged, there will always be a number of family doctors who wish to make a detailed study of one or two particular conditions, and for whom there is no appropriate course. The College of General Practitioners is fortunate in being able to award several grants each year to these general practitioners so that they may arrange for themselves suitable courses of study in hospitals and clinics.

Summary

If general practice in this country is to maintain its traditional high standard when medical science and thought are expanding so rapidly, it is essential that the family doctor should be given many opportunities to keep up to date. Though much has been accomplished already, there is still a great deal to be done before

young doctors are adequately trained for general practice, and established practitioners can obtain all the continuing education they require.

It has not been possible in this article to do more than mention briefly some of the main problems and offer a few suggestions to solve them. The views expressed are my own, but I am grateful for the help and encouragement of many members of the College of General Practitioners throughout the country.

REFERENCES

- ¹ *J. Coll. gen. Pract.*, 1958, 1, 5; *Practitioner*, 1958, 180, 93.
- ² Fourth Annual Report of the Royal College of General Practitioners, 1956, p. 36; *Practitioner*, 177, Suppl. p. 22.
- ³ *Research Newsletter*, 1957, 4, 151, 242, 329.
- ⁴ *J. Coll. gen. Pract.*, 1958, 1, 36, 171.
- ⁵ *Outlines of General Practice*, Midland Faculty, College of General Practitioners, 1958.

KEEPING INFORMED BY TAPE AND DISK

BY

JOHN C. GRAVES, M.R.C.S., L.R.C.P.

AND

VALERIE GRAVES, M.B., B.S.

Medical Recording Service, College of General Practitioners

The idea of being kept informed by tape and disk arose when we were engaged in the analysis of some of the replies to the questionnaire sent out to members of the College of General Practitioners by the College's Postgraduate Education Committee. We were struck by the number of general practitioners who found difficulty in attending courses because of lack of time, deputizing difficulties, and so on. Many said that "few meetings are held in this area now, as it is not worth getting a speaker to come for just a few people." Why not, then, take the meeting to the general practitioner? We decided to make a trial of recorded talks, which, we thought, would not only bring good speakers to those who would not otherwise hear them but also provide an incentive to hold small meetings, with discussion, often as valuable as the lecture itself.

Argument

It may be said that as reading is quicker there is little point in going to all the trouble of recording talks, but the following points should be considered.

Advantages of Auditory over Visual Education.—The spoken word has more power to command and hold attention, and no skill in printing can reproduce the expression, timing, and emphasis by which a speaker brings home his points—let the reader contrast the speeches of Sir Winston Churchill with their printed replicas—but the speaker must be good. There is no better soporific than a bad lecturer. That this is not just a biased impression is suggested by the observations of Joyce and Weatherall (1957), who found, in comparing different methods of education, that auditory methods were best—even the old-fashioned formal lecture, which was only just beaten by discussion groups, which, of course, use far more time and discussion staff. Diagrams, formulae, and pictures can be understood more quickly and easily if the eye is free to concentrate on them while the ear listens to the exposition.

Dangers of Unsupervised and Unplanned Reading.—Joyce and Weatherall found this method of teaching "consistently least effective" for undergraduates, and for postgraduates the danger becomes greater as the time since

qualification increases. The newer the method of treatment, the more strange it will appear, and the greater the chance of articles on it being ignored in haphazard reading.

False Confidence in Reading.—Many doctors suffer from two delusions: (1) that they always read the journals that they buy; and (2) that they, having read a journal, have not missed anything in it. It is a salutary experience to test oneself on these two points. Gaps in knowledge are most readily brought to light by free discussion between friends and equals.

Geographical and Academic Isolation of the General Practitioner.—It is easy to understand that the general practitioner can be cut off by lack of time or by distance from courses; but academic isolation, though less tangible, is no less real. It includes lack of practice in studying and in arranging thoughts and decisions in an academic way. Working alone, the general practitioner may lose the ability for mental gymnastics, so that the rapid cut and thrust of argument at ward rounds may leave him feeling discouraged and inadequate. We hope that the issue of recordings will encourage him to seek out his neighbours to discuss what they have heard, to read in a more selective way, and perhaps to go on ward rounds with a firmer tread. The ideal recording would not supplant formal postgraduate teaching, but would point the way to a fuller use of it.

Novelty of Education by this Means.—The reaction of the average doctor to paper by post is now almost nil, as any organizer of activities knows to his cost, but it is still difficult to resist the appeal of a recording, which cannot be glanced through, and which requires the setting aside of a proper period for its hearing. (Listening while shaving or driving cannot be too strongly condemned.) But the value of this novelty will be irretrievably lost if it is spoiled by the anticlimax of poor material.

Tape-Recording Already used in Education.—In other fields much use has already been made of this valuable tool. Schools use it for many subjects, not only languages, and it is of great value for blind, deaf, or other handicapped children: the prospect is enormous and still largely experimental. Many authorities are building up libraries of educational recordings. In medicine, many subjects, such as cardiology and psychiatry, are particularly suitable, and undergraduate teaching makes some use of recordings. In the United States of America many varieties of recorded education are available, of which we will mention only the Audio-Digest Foundation, which distributes weekly abstracts of literature on tape to medical subscribers, and the Seminar Kits made by the University of Utah College of Medicine, which are lectures on gramophone disks, with illustrations. Some medical societies overseas which have widely scattered members already make recordings of their meetings for members unable to attend.

The Experiment

We proposed to send out, not abstracts or recordings of previous occasions, but talks specially made for the microphone and for our particular audience. The response to only the first two recordings is described. After those, although the experiment continued and merged imperceptibly into the present Medical Recording Service of the College, the scheme was much modified and the "audience" became much larger.

The Listeners.—These were selected by picking out from the replies to the questionnaire 50 of those College members who had said, for one reason or another, that they had been unable to get to courses. They were by no means a random sample or representative of the College as a whole, but they all wanted to keep up to date. Twenty-seven agreed to take part in the trial. Many of them were from country areas, including some very isolated places, but some were from towns (25% of College members work in rural or semi-rural areas), covering most parts of Great Britain. Five had tape-recorders, the others had long-play record-players.

Material and Method

The first recording consisted of a 15-minute introductory talk describing the experiment, followed by a 15-minute talk on recent advances in virus disease. This subject was chosen as it has a distinct bearing on general practice and is likely to be thought "too technical" in print. Compared with later ones, it was not acoustically a good recording, was read from a script, and was very concentrated. The second also lasted 30 minutes and was a much better recording: an informal talk by a general practitioner on psychiatry in general practice, a subject for which there had been many requests. The talks were first recorded on tape, and, from this, soft disks were cut. (These are similar to commercial L.P. disks except that, being individually cut from shellac, small numbers can be ordered, whereas the more serviceable hard pressings have to be bought by the dozen at least.)

The listeners were divided into four groups: one group of doctors with tape-recorders, and three groups of those with gramophones. The tape or disk was sent to the first member of each group, who was asked to listen as soon as possible, and then post it to the next man on the list, the last returning it to us. In the package were included two envelopes: one, to be read before listening, gave general instructions and a description of the recording; the other, not to be opened until after listening, contained the following questions: (1) Did you find this more, or less, instructive than reading a similar talk? (2) Did you have difficulty in finding time to listen? (3) Be honest—would you have read this kind of article? (4) What length of recording would you prefer? (5) Suggestions for future recordings. (6) Any other comments.

Listeners were asked to reply to these questions in a letter to us when they posted on the recording, which also gave us a clue to its whereabouts. They were asked, if possible, to collect a group of colleagues to join them in listening and discussion.

With the second recording went a different set of questions: (1) Did you find this recording helpful? (2) We shall be making more detailed talks of psychiatry for loan on application—would you like to hear them? (3) How many doctors listened to this talk with you? This recording was sent out only on disk, and to 14 listeners at that time, although very many others have heard it since then, and it was used for the first tape-discussion.

Results

Of the 27 doctors who received the first recording, 18 found the method more instructive than reading, 4 less, and 3 were not sure. Four thought that it was easier to concentrate when listening than when reading, and two thought that the novelty had a lot to do with it.

Twenty-two said that they had not had much difficulty in finding time to listen, and five said it was not so easy. Some added the proviso that it was all right if they had four or five days. (In fact, few kept the recording for more than a few days. One circuit of eight doctors, including postage time, was completed in just over six weeks. During that time about half of the listeners managed to collect others to listen. This was, however, during January-March. Summer circuits are naturally taking much longer.)

Eleven would have read a similar article, 14 would not. But only one actually saw the article in print and read it—a very similar one was in several journals at this time—an example of false confidence in reading.

Thirty minutes was the most popular length.

A long and carefully thought out list of suggestions for future recordings was received, which was very similar to the requests for subjects for courses from the questionnaire replies, with much emphasis on recent advances, and new drugs.

The 14 replies to the second set of questions were uniformly monotonous. All who heard this (second) recording

found it helpful, all wanted to hear more, and 33 other doctors had listened, so that, on an average, each had gathered two or more friends for discussion.

Other Comments.—We were pleasantly surprised by the interest and enthusiasm aroused by this trial. We had many long letters full of every kind of advice, suggestions, and offers of help, besides comments and criticisms. Allowing for kindness towards a new venture, we had the impression that recorded talks would find a willing audience. We noted very soon a difference between the tape-recorder and gramophone listeners—the former being more trenchant, though more constructive, in their criticism, and wanting less formality and more "audience participation," while the latter were more conservative and perhaps less critical.

Conclusions From the Trial**Technical**

From this trial we learned a great deal, which may be summarized thus:

1. Soft disks, although fairly tough, are not equal to ordeal by G.P.O. Many were badly scratched, and after one was returned from the Highlands actually bent we decided to increase the number of our listeners to justify the expense of commercial pressings. Suitable postal containers remain a headache, but we hope to overcome this shortly.

2. Very good quality indeed is required if the recording is to be transferred from tape to disk. Without professional equipment it is impossible to make a good enough recording of a meeting or discussion in a public place, because acoustic conditions are usually bad. We have made many such recordings, but while they are satisfactory enough on tape, they will not do for the disk. We now record entirely, if possible, in ordinary living-rooms, which have the added advantage of putting the speaker more at his ease.

3. We soon found that any formality (such as reading from script) or artificiality of manner was mercilessly exposed by the microphone. To sound right, the talk must be informal, unscripted, almost "armchair." Some speakers can achieve this without effort, some perhaps never, and some rely very much on gesture or expression. One learns to recognize a good microphone speaker, and we are sure that there is a whole new field of talent awaiting discovery.

Non-technical

The response to this short trial encouraged us to believe that there was a demand for recorded talks, and we invited any interested members of the College to join in further experiment. Most of them would be able to listen only to disks, but a surprising number of doctors have tape-recorders, and many of them (like tape-recordists everywhere) have a great deal of energy and enthusiasm, and correspond on tape with others here and overseas. We hope to let them play a really active part in postgraduate education by joining in tape-discussions, recording their own cases for discussion, or by acting as "local correspondents," these being some of the ideas suggested by those taking part in the trial.

The Medical Recording Service at Present

This is now a regular service of the College of General Practitioners to its members, well over 100 of whom are now receiving recordings regularly. They are by no means all "geographically isolated," as many of them come from the great towns. The "circuit" system worked well during the trial and is still used, talks being sent round groups of about 10 members each every other month. Five talks have been completed and many others are in the making. About half are by consultants and half by general practitioners with a special interest or experience, titles and subjects being drawn at first from our original list of requests. Where possible, illustrations accompany the recording, either as duplicated diagrams or transparencies (a small pocket viewer is enclosed) to be studied while listening. For

example, one talk on skin disease is accompanied by a series of 24 transparencies and two diagrams.

Members on our list receive tapes or disks at regular intervals, but they can, on request, have a particular recording again, perhaps for a meeting, as can any other member of the College.

Also available on request to members are a number of recordings which will form the nucleus of our library. These include recordings of notable College occasions such as the James Mackenzie Lecture, and more detailed talks on subjects, such as more advanced psychiatry, which have been asked for by members but may not appeal to all.

The Discussion Tape.—This is a new feature of the service, which is still experimental. Accompanying each recorded talk to listeners with tape-recorders is a blank reel of tape. After hearing the lecture, each listener has five minutes of tape to record his own comments, ask questions, and air his views. This tape will go round a second time so that the earlier speakers can hear the whole discussion—that the earlier speakers can hear the original lecturer will answer the thing. In some cases the original lecturer will answer the questions and round off the discussion before the completed tape goes out again. This is a very popular idea, as even the shyest listener can have his say, without fear of interruption, with as much time as he likes for preparation. The following comments, taken from part of the first discussion tape, give some idea of the response.

"Two colleagues came 12 and 6 miles and felt it well worth while, and we had a stimulating discussion . . . the Medical Recording Service is doing a real service to medicine . . . unenlightened G.P.s can be shown the virtue of joining the College through the virtuosity of its members."

"This was a thoughtful and well-delivered address, and held my interest throughout. . . . The contributions of the others before me were of almost as much value as the lecture."

"My partner and I had a very enjoyable evening listening to the talk and discussing it."

"If I'd been the first . . . I think I'd have said I'd rather have read the lecture, but now I see how much better it would have been if I'd invited other doctors to listen with me. I hate psychiatry and fear mentally upset people, so to make up for it I used to read a lot, but it only made me feel more inferior. This talk has shown me that perhaps I've been approaching the subject in too highbrow a fashion. . . . You've done me a lot of good."

They all described their own problems and asked questions, comparing notes with one another. It is impossible to convey in print the excitement of hearing the voices of doctors, separated by hundreds of miles from the lecturer and from one another, discussing their reactions to a talk and intervals of time, they were together, and it should be remembered that tape, needing no processing and quickly copied, can be sent directly after a lecture or event to listeners anywhere, probably more quickly than it could be put into print.

Plans for the Future

Talks will continue to be sent out at regular intervals, and we shall hope to cover a large field of subjects. Our aim, however, will always be to direct attention to, and stimulate interest in, other methods of education, particularly discussion groups.

We are experimenting with recordings of heart sounds and other subjects, to see whether we can make use of them, as some subjects are more suitable than others, and an enormous amount of research on technical points needs to be done. We hope eventually to build up a comprehensive library for the College, so that any member will be able to obtain an up-to-date talk or course in any subject. Recordings of historical interest to the College will be collected for its archives.

We hope overseas members will be able not only to listen to our recordings, but to send us some of their own, so that real contact can be made with them.

In these ways we hope to advance a step further the work that the College has already done in bringing together its members and giving them a feeling of brotherhood and unity of purpose.

We thank Smith Kline and French Laboratories Ltd. for paying for the production costs of both the original trial and the present Medical Recording Service; and John Hassell Recordings for technical advice and help. Also the countless members of the College of General Practitioners whose enthusiasm and help made the idea become fact.

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**PSYCHOLOGICAL MEDICINE IN
GENERAL PRACTICE****A REPORT PREPARED BY A WORKING
PARTY* OF THE COUNCIL OF THE COLLEGE
OF GENERAL PRACTITIONERS**

A working party of the Council of the College of General Practitioners was appointed to study psychological medicine in general practice, after a request had been received from the Ministry of Health for the views of the College on this subject. It accepted as a definition of *psychology* "The science which deals with the mind and mental processes," and of *psychiatry* "The recognition and treatment of diseases of the mind" (*Stedman's Medical Dictionary*).

First, written evidence was obtained from 27 members of the College who had expressed a special interest in psychology and psychological medicine in a general practitioner's work. Next, details of the teaching of these subjects were sought from all medical schools in the British Isles and from some in the Commonwealth. A draft report was then sent to the Association of Teachers of Psychiatry in Undergraduate Medical Schools, to members of the Psychological Medicine Committee of the British Medical Association, the Royal Medico-Psychological Association, and the Society for Psychosomatic Research, to all members of the Council of the College in the United Kingdom and Eire, to many consultant psychiatrists, and to others.

This report, which has now been submitted to the Ministry's Standing Advisory Committee on Mental Health, discusses the importance of this branch of medicine in general practice, and the types of psychological illness seen by family doctors; it examines the leading part that should be played by all family doctors in this work, and the undergraduate and postgraduate instruction they require; it points out the help that may be given by a general practitioner with a special interest in the subject, and his particular needs at present; and it makes six recommendations.

**Importance of Psychological Medicine in General
Practice**

Every good family doctor must be a good psychologist, for psychological medicine is part and parcel of all general practice. To misdiagnose organic disease has long been regarded as a serious error; it is now appreciated that to miss psychological illness is just as bad and may lead to even greater unhappiness. So much

*Members of the Working Party: Dr. C. A. H. Watts (Chairman); Dr. S. I. Abrahams (London) and Dr. J. H. Hunt (London) (joint honorary secretaries); Dr. Annis C. Gillie (London); Dr. J. P. Horder (London); Dr. Richard Scott (Edinburgh).

of medical teaching is concerned with organs and tissues that students, their teachers, and family doctors sometimes lose sight of the patient as a person whose anxieties, fears, griefs, rages, guilts, and inadequate relationships with other people can, and do, make him ill. When a person brings such a trouble to his doctor, both of them at first may be genuinely unaware that it is related to emotional upset, the significance of which may emerge only during treatment. All medical training should convince students that the person who is ill is as important as the illness from which he suffers, and that the kind of doctor is often as important as the kind of patient he is treating (Bomford, 1958). Psychological illness is one of the most pressing matters confronting the medical profession to-day; in this report only those aspects of it which are of special significance to general practitioners are considered.

The psychological problems which confront family doctors have been listed by the working party. One difficulty in compiling such a list is lack of a common classification; another is that any assessment of their incidence can only be approximately correct. The percentage of people reported with psychological illness in any general practice depends not only on the type of practice but also on the assessor, his diagnostic skill and criteria, and on his attitude towards his patients. Pemberton (1949) found 6.5% and Paulett (1956) 70% over a five-year period, while the generally accepted figure is in the region of 30%. The true incidence is probably more uniform from one practice to another than these studies suggest. The more we attempt to elucidate this subject the more impressed are we by its purely quantitative aspects.

Types of Psychological Illness Seen in General Practice

Psychological illnesses seen by family doctors fall into five main groups, which frequently overlap.

1. Anxiety and Depression from Emotional Stress

All people suffer from transient anxiety and depressive states due to the inevitable bereavements, disappointments, stresses, and strains of life. They usually get over them on their own, helped perhaps by the sympathetic understanding of a relative, friend, or minister of religion. Many symptoms are produced by such emotional upsets, from headaches, insomnia, or palpitations to anything else of which a patient may possibly complain. In children, behaviour disorders—from tantrums to truancy—often take the place of subjective symptoms; their understanding and treatment are an important part of general practice. Every organic illness has its natural psychological component, which may be mild and hardly noticed or severe; some are more likely than others to be accompanied by superadded emotional upset—for example, cancer, venereal disease, arthritis, heart attack, or stroke. Certain symptoms are particularly prone to cause reactive anxiety or depression, such as pain, bleeding, a lump, failing vision, deafness, or infertility. Influenza, sinusitis, and jaundice are sometimes associated with, or followed by, an unusual degree of depression, which also occurs after treatment with certain drugs (sulphonamides, reserpine), and after deep x-ray therapy. Rehabilitation following any serious injury or illness brings its own emotional problems.

2. Constitutional Liability to Anxiety or Depression

When some sensitive and imaginative people are subjected to stress they may develop anxiety or depres-

sive symptoms which last longer than normal. This group embraces not only the weaklings but also many of the outstanding thinkers, leaders, scientists, doctors, teachers, artists, musicians, poets, lawyers, and churchmen of every generation. When stress produces incapacitating symptoms for a long time, or when these develop without adequate cause, there is often evidence of some degree of inherited nervous predisposition. Mild endogenous depression developing insidiously, with symptoms which may be referred to any part of the body, is one of the commonest psychological disorders met in general practice. It gives rise to much transient disability and unhappiness; it responds well to modern treatment; and yet not to recognize it, or to mistake it for organic disease, is possibly the most frequent diagnostic error made in medicine to-day. Some hypochondriacal and obsessional states (with phobias) also fall into this group. Other people suffer from illnesses on the borderline between physical and psychological disturbance—premenstrual tension, spastic colon, ulcerative colitis, asthma, or eczema. The aetiology of these is often partly constitutional and partly bound up with emotional state. It must never be forgotten that mind and body are interrelated and interdependent components of the whole, and that emotional conflict has profound effects on function and physical condition, and vice versa. The constitutional nature of many of these disorders must be clearly recognized. In the present state of our knowledge many of these people have to be supported and managed by their family doctors, rather than cured, so as to make life tolerable not only for the patients themselves but also for their families, neighbours, and all others associated with them.

Mild episodes of stress disorder do not require skilled psychiatric attention, any more than do the slight bruises and strains received in everyday life need the care of an orthopaedic surgeon. When symptoms are severe, however, expert psychological treatment may be wanted. Not every doctor likes this kind of work or is temperamentally suited to it; many have not had appropriate training or experience; and some deliberately avoid it, for they find such patients time-consuming, embarrassing, boring, or just "difficult." Such likes and dislikes apply also to other branches of medicine. Some family doctors, on the other hand, have a special aptitude for psychological treatment which patients soon recognize and appreciate; and much of this work is well within the scope of general practitioners who are interested and have been trained in this subject. Many experienced family physicians, in the past and to-day, have taught themselves the art of how best to handle these patients, often highly successfully. Younger doctors can now be greatly helped by proper undergraduate and postgraduate instruction.

3. Other Constitutional Personality and Behaviour Difficulties

The majority of personality upsets and behaviour difficulties met in general practice lie on the fringe of normality; but they have to be recognized and taken into full account by a general practitioner trying to assess and manage an ill person. When more severe they include antisocial behaviour and delinquency, alcoholism and other addictions, sexual perversion, and hysteria in all its manifestations. Most of these need specialist advice and treatment, but not all can be cured; many of the remainder, when they ask for help, can be usefully supported over long periods by their family doctors.

4. Organic Brain Disease

The management in their homes of patients with psychological symptoms associated with organic disorder of the brain (after head injury, in epilepsy, in mentally subnormal children, arteriosclerosis, cerebral tumours, and so on) is another important part of a general practitioner's work.

5. Psychoses

Schizophrenia, severe manic-depressive psychosis, and the psychotic later stages of many organic cerebral diseases are comparatively rare in general practice; but the unique part that a general practitioner can play in their early recognition may be of supreme importance both to the patient and to his family. Involutional depression and arteriosclerotic senile dementia are by no means uncommon, and may be a heavy burden on a busy doctor, especially in patients who prove uncooperative or suspicious. In future it is likely that a larger proportion of patients in mental hospitals may be helped enough by modern treatment to be returned to their homes under the care of their general practitioners.

Psychological Medicine in the Work of all Family Doctors

In the treatment of people with psychological illness every general practitioner starts with an advantage over the consultant because of his knowledge of his patients and the background against which they live their lives, his accessibility to their families, and the continuity of his contact, perhaps over generations. He is the person best fitted to manage the great majority of psychological ailments. His predecessor, the old-time family physician, with his common-sense approach, did extremely well in this field as confidant, counsellor, and supporter of the families under his care. To-day the general practitioner's opportunities are still unique, patients and to help them psychologically are still unique, especially in country practices where he is part of their environment. He lives among them, and has many close ties with them. He knows their family histories and past histories; he may be present when they are born, married, or dying; he examines them in his surgery or visits their homes when they are sick; he sees them at work and at play; and he knows how they usually behave. In course of time he may learn much about their characters and personalities, troubles and anxieties, sympathies and affections, responsibilities and ambitions, and their habits with regard to smoking, alcohol, and medicines; and he probably knows something about their morals.

A good family doctor, with this background of continuing friendly interest in the lives of his patients, can listen with understanding and consideration while they talk freely about their difficulties. By sympathetic explanation, reassurance, advice, and support, and with suitable medicinal treatment, he can, by himself, help them enormously. The first interview in any illness is often the most important. Sometimes a full physical examination is required before reassurance can be given; although, when the basis of the trouble is clearly emotional, much may be gained by indicating this to the patient at the outset. Expert listening will comfort many worried people; and repeated or extended interviews may perhaps be needed to enable some patients to work through their various problems. This simple psychotherapy and the privilege of this intimate personal doctor-patient relationship, with its mutual trust, affection, and confidence, has always been and will always be cherished by both patients and their family medical advisers. It may take up time which cannot readily be spared; but, if the emotional nature of the illness is not recognized, quite as much time, or even more, may be spent over the years trying to control a hypothetical, non-existent organic disorder.

There are certain limitations to this relationship which should be clearly appreciated. In large town and city practices, with enormous lists and nomadic populations, it is impossible to attain the ideal expressed above; but the better the doctor the nearer he approaches it. However friendly a family doctor may be with his patients, it sometimes happens that they fail to enlarge on their private worries, and keep much deeply hidden for years. The very closeness of a general practitioner to other members of a patient's family or friends, especially if they mingle in the same social set, will often be a bar to the revelation of embarrassing feelings or events which the patient may prefer to discuss with a complete stranger. For instance, a young woman may not disclose frankly a personal difficulty because her general practitioner may be thought to be too nearly identified with the points of view of her parents; she may prefer to take her problem to another. No doctor should feel hurt if a patient decides to discuss a private problem with a more distant, neutral adviser.

The family doctor has many allies in this field, and if he fails to make the best use of them he will provide less than the optimum service to his patients. They include his partners, assistants, and consultants; the patient's relatives, friends, or employer; medical officers of health; psychiatric and other social workers, State-registered nurses, health visitors, midwives, and almoners; domiciliary occupational therapists, physiotherapists, home helps, and citizens' advice bureaux; the clergy, teachers, marriage guidance counsellors, and qualified lay psychologists; duly authorized officers, probation officers, and the local representatives of a great variety of other statutory and voluntary social organizations. Every attempt should be made to link up general practice with these social and other services. Some patients will derive more benefit from them than will others. Everyone realizes that school problems can often be settled by consultation with a teacher, and the educational psychological service can be of great value in managing these difficulties in children. Sometimes it is only the minister of religion who has access to a person's confidence; religious faith can play a large part in helping many people.

The family doctor needs to have more than a nodding acquaintance with this vast army of potential colleagues. He must know something of them all, and develop special skills and techniques in establishing good relations with them, and in working with them as a team. The development of team skills has received much less formal attention in general practice than it has in hospital medicine. A general practitioner should make use of everything and everyone who can help to modify his patient's environment for the better, or at least to mitigate some of the adverse factors in it; to marshal the resources of family and State in order to aid and rehabilitate the patient, and to reintegrate him into the community to which he belongs. A change in a patient's attitude to his social environment or personal relationships is needed far more often than a variation in blood chemistry by the use of drugs; but unfortunately such a change is often impossible, and then a person may need support, perhaps over many years, from his family doctor and the social services. In the development of these team skills the general practitioner can operate most effectively if he retains control and accepts the challenge of responsibility and leadership, taking it upon himself to introduce his patients and interpret their needs to his various helpers. Sometimes it is his duty to protect those under his care from a superfluity of opinions and advice.

Responsibility for mental health in this country, in future, will rest more and more on the general practitioner. A great deal remains to be done before he is skilled enough, and adequately equipped, to do the good work in this field of which he should be capable. There are encouraging signs already of a closer liaison, better understanding, and a new pattern of co-operation between him, his psychiatric specialist colleagues, and a great variety of social agencies. The development of this team-work in the National Health Service will ensure the best use of community resources which have, so far, been inadequately tapped.

We have discussed how much of the family doctor's work is taken up by psychological disorders, many of them on the fringe of normality, and how well he is placed for their prevention, diagnosis, and management. We have pointed out how much good in this field every general practitioner can do himself, and on other occasions how much he and his patients benefit when he co-operates, in a team, with his many potential helpers from the social services. We have shown how advantageous it may be for a group of doctors to have one partner who, though still primarily in general practice, has been specially trained and experienced in this branch of medicine, and how much he can teach his colleagues. With increasing understanding by all general practitioners, and by the public, of the significance of anxiety and stress in health and disease, and with advances in knowledge and skill of succeeding generations of family doctors, the average standard of work in this field should be very much higher in twenty years' time than it is to-day.

Recommendations

We recommend that:

1. In the undergraduate medical curriculum greater emphasis should be laid on normal psychology and on psychological medicine.
2. In qualifying examinations there should more often be a compulsory written question (or its equivalent in the clinical or oral) on the psychological aspect of medicine, and one of the examiners should be interested in this subject.
3. More postgraduate training of general practitioners in psychological medicine should be arranged in all areas.
4. In helping their patients with psychological illnesses more opportunities should be taken by family doctors

THE PHYSICIAN AND HEALTH EDUCATION

BY

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The clinical situation, with its intimate doctor-patient relationship, is a peculiarly appropriate one for health education. Yet it is probably true to say that the physician has not adequately exploited his unusual educational opportunities. There are still far too many people who make relatively frequent use of their doctors but who remain with little knowledge and insight into their own states of health or those of their children. The numbers are legion indeed of those who have done little more than acquire a few esoteric terms to spice their conversations and impress their friends.

The Patient's Viewpoint and Physician's Role

To consult his doctor is, on the part of the patient, usually a decision of surrender. Even with mild complaints he feels that he can no longer carry on alone. Under a threat to his security, his immediate need is not to think for himself but rather to confide in someone who will take over a responsibility he can no longer bear.

The greater his anxiety, the more receptive is he likely to be to an authority and decisiveness that offers to restore

to develop team-work with the ancillary services, to all of which they should have free access; and the Ministry of Health should give more encouragement, and assistance, towards linking general practice with the social services.

5. The Ministry of Health and other appropriate bodies should investigate the possibility of giving more opportunities, and recognition, to general practitioners with a special interest in psychological medicine who have had training and experience in it.

6. In the future development of the National Health Service the fundamental role of the general practitioner, in psychological medicine as in other branches of medicine, should be recognized.

Grateful acknowledgment is made to the 37 psychiatrists and other consultants who have helped the working party in the preparation of this report; to the heads of the psychological departments of all the teaching hospitals in the United Kingdom and Eire, and of some in the Commonwealth; to the members of Council of the College of General Practitioners; and to the following practitioners who have expressed a special interest in psychological medicine and who have given much helpful advice: Drs. F. A. Bevan, T. S. Beveridge, F. M. Brook, J. F. Burdon, J. M. Clow, E. G. Cohen, D. Craddock, W. V. Cruden, J. A. Currie, B. J. Foster, A. Fry, R. N. R. Grant, E. C. Hamlyn, Marjory C. Hogg, P. Hopkins, C. E. Langley, M. J. Linnett, F. A. Lodge, E. V. Mackay, A. U. MacKinnon, M. Marcus, A. Model, J. G. Ollerenshaw, H. S. Pasmore, Jean W. D. Pasmore, R. A. B. Rorie, P. Rowntree, J. A. Taylor, H. E. Thorn, D. Iona Troup, and J. Whitby. The particular thanks of the working party are due to Mrs. D. I. Phillips, who has most patiently undertaken the typing and circulating of many drafts of this report.

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something of certainty and orderliness to his life. Thus, although in one sense he is highly susceptible to suggestion, he is also, paradoxically enough, rather ineducable because the fundamental understanding and insight that marks sound education is not what he primarily wants.

He is seeking essentially a short-cut solution to his problem. His dominating motive is to hand over his troubles to an expert in whom he has some measure of faith. But of this expert's hidden store of skills he has little comprehension, and within limits he is emotionally set for an uncritical acceptance of what he is told.

To this extent he is in psychological continuity with all the patients of medical history who have endowed their healers with magical powers.

The physician thus finds himself in a mould, pre-cast by his patients and by society, and he would be more than human if he did not find the proffered role somewhat tempting. Not only does he himself find it satisfying in the shortest possible time to establish an unequivocal diagnosis and a clear regimen, but it is certainly demanded by his patients.

The physician's conclusions may be medically quite valid, but while he retains too much of the aura of authority he limits more than he need the patient's understanding both of his diagnosis and of his therapy. The patient comes away with that mysterious justification for his future behaviour, both rational and irrational, significantly called "doctor's orders." Thus, once he has had his complaint labelled and has been told to take a tablet at certain times, to change his diet, or to rest more often, this may mean little more to him than the anxiety-relieving rituals of magic to a primitive.

Thus, with the physician in an active dominating role and the patient in a passive dependent one, we have a contradiction of the best educational situations where the learner actively and intelligently participates in solving his own problems and meeting his own needs.

Moreover, the somewhat undignified dependence of the patient often means that, as he recovers and his feeling of independence is restored, while gaining a greater respect for himself, he tends to lose it for his regimen. It is therefore not uncommon to find the patient, in his final stages of recovery, avoiding desirable contact with his doctor and neglecting the advice he received.

The result is that considerable numbers of patients resume their daily rounds as before, having received only a short didactic training in a limited mechanical procedure that has little meaning for them.

Why Educate the Patient?

Of course, we may well ask why the patient should receive a broader guidance and education. After all, he presents a complaint to his doctor and at least his immediate need is met when this is ameliorated.

But it is hard to conceive even of a frankly curative service as being desirably concerned only with cures. Such a feat of purism would be difficult to defend. Curative services may begin with cures, but they surely should not end with them. They are intimately concerned with the future of the patient in respect both of the prevention of disease in the future as well as of the positive promotion of his health. In these respects, at least, the patient has a heavy personal responsibility which he cannot adequately fulfil without education.

Moreover, it is no longer possible for us to take refuge in a theory that with medical advances there shall be revealed more highly specific aetiologies that will enable the physician to treat and prevent disease through technical acts of extraordinary precision with less and less need for personal guidance of the patient.

It is a naive conception indeed that the function of science is primarily to simplify. On the contrary, its function of revealing new possibilities and of vastly complicating our vision of things is of at least equal importance. There is hardly room to-day for beliefs like those of Crookshank's (1920) ingenuous police surgeon, who declared that "bullets are the cause of war, as of murder."

In point of fact, recent advances in medicine have increased immeasurably the stature of emotional, behavioural, and social factors in the aetiology of disease and the maintenance of health. The vital role of human relationships; of emotional adjustment; of habits of sanitation, diet, smoking, drinking, sleep, work, rest, and exercise; of attitudes to and the use made of health and medical services—indeed, of the total pattern of the individual's daily life—has acquired a significance impossible to ignore.

The individual's personal influence on his own health is therefore of unusual importance. He can receive only limited help from the physician who remains narrowly preoccupied with the physical and biochemical aspects of disease and with the immediate technical expert acts he can perform on behalf of his patient. Such an approach misses one of the greatest potentialities of the clinical situation in guiding and educating the patient in his own care.

In the words of Delore (quoted by Mackintosh, 1953): "Over and above each technical act there is a corresponding educational function which doubles the value of the act, prolongs it, increases its efficiency and endows it with real human and social value."

It seems high time, then, that we take more vigorous action to fashion the physician's role in a form more consonant with his possible educational function.

Desirable Steps

To achieve this end there are perhaps two major aspects of patient management that require attention. The first is the need for the physician to develop and exploit a more

psychiatric type of relationship than is at present current. This would include greater opportunities for self-expression by the patient and consequently a more passive and permissive role for the doctor, in which his interventions were not only explanatory but suggestive and co-operative rather than didactic and authoritarian. In such a clinical context his guidance could be more closely related to the felt and expressed needs of his patient. This would enable him to build on the essential foundation of the patient's interpretation of his own problem and not so much on a discrete medical interpretation meaningful only to himself. It would enable him to adapt his guidance more easily to the individual patient's peculiar habits, attitudes, feelings, and knowledge as well as to the particular degree of that patient's emotional rigidity and resistance to change.

Secondly, the physician should be more actively aware of the need to salvage the patient's capacity for independence and to build up his self-reliance and confidence. This is not to say that when the patient appeals for help the physician should throw him back on his own resources, but rather that as early as possible the physician should encourage the patient to feel that he has control over his own destiny and that he has an intelligent role to play in his treatment and in the future care of his own health.

It is in such a context that the patient may be given information to the extent that his motivation and understanding permits—which is somewhat further than most doctors are inclined to assume for most patients. This is, of course, not an entirely easy proposition, for what profession is there whose public prestige is more enhanced by the full-dress regalia of its technical jargon? Indeed, it is probably a need of most physicians that they learn to express medical principles in terms which are both accurate and comprehensible to the increasingly well-educated public of modern times.

If these suggestions are valid it is apparent that the problem of educating the patient is not a matter of simple accretion of an extra element, but rather of a reorientation of the whole clinical situation and of the doctor-patient relationship.

Possible Objections

There are naturally certain objections which may be raised. It might, for example, be said that the busy medical practitioner is at present hard pressed enough—too hard pressed, perhaps—to give each of his patients sufficient time. He would therefore be unlikely to welcome the introduction of procedures which may considerably lengthen his clinical contact with the patient.

To counter this it may not be unreasonable to claim that in many practices short-term palliative treatment, on the one hand, and pressure from numbers of patients whose care and guidance have not been thorough enough in the past on the other, are parts of the same vicious circle.

But even if this was not wholly true, the fact remains that education and guidance techniques are clinical skills like any others. As such they require careful teaching and considerable experience. While the application of the principles by a beginner may appreciably lengthen his clinical contacts, we have no reliable estimate of the short-term, let alone the long-term, implications for time, once the practitioner is really skilled.

Each physician must remain the judge of what he can best do under the circumstances and demands of his practice. In the last resort, however, there is no blinking the fact that some balance (in spite of periodic changes in the centre of gravity) must be found between the needs of time economy and the needs of optimal medical efficiency.

Another objection might be that education of the patient frequently means giving him information which he will misinterpret or which may affect his clinical condition adversely. It is quite obvious that this again is a matter to be decided by the physician with each patient, and is a vital and intrinsic part of his clinical judgment. But in the long run it is hard to defend the withholding of information outside of the exceptional case. Quite apart

from the critical question of whether it is morally defensible, there are essentially practical reasons.

To-day, when people have reached an unprecedented level of literacy and education, and have an almost unlimited access to a wide variety of sources of information about health and disease, this whole objection loses force. Whether we like it or not, patients are going to have their questions answered with varying degrees of accuracy by friends and relatives, by quacks of all kinds, by articles in newspapers and popular magazines, and by commercial advertisements.

It is therefore clearly in the interest both of the physician and of his patient that the latter should not leave his doctor with questions he would like to have asked but did not, or with answers that did not satisfy him. It seems an elementary insistence that the patient is entitled to know all his doctor can tell him and that his doctor is the best person to tell him.

Medical Education

The ultimate solution of the problem, as of many others affecting modern medicine, probably lies in the field of basic medical education. There is to-day a clearly discernible increase in appreciation of the fundamental need of medicine to be systematically moulded into a more human and social discipline and to widen its interest in diseases to include the people and communities that suffer from them.

Medical education may, after all, be designed to produce physicians who not only have the technical knowledge and skills of their craft, who not only see health and disease as a by-product of personal and social life, but who are at once humane and imaginative educators as well.

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SOME POPULAR BELIEFS CONCERNING THE CAUSES OF CANCER

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It is difficult to assess with any precision the present balance of medical opinion on the value of cancer education. A questionnaire circulated a few years ago by the British Empire Cancer Campaign drew replies from only one-quarter of the general practitioners to whom it was addressed, and of these slightly more than half expressed opposition to education of the public concerning cancer (Horder, 1953). More recently, however, it has been shown (Wakefield and Davison, 1958) that a carefully conducted local programme of cancer education can in practice gain the widespread approval of general practitioners. At the same time, the increasing volume of evidence tending to incriminate cigarette smoking as a major factor in the aetiology of cancer of the lung has stimulated the interest of many medical practitioners in the possibilities of education or propagandist activities directed towards a reduction in the incidence of what would appear to be an eminently preventable disease.

The planning of health education in this field, if its desirability be accepted, is likely to be the more effective if it takes account of the prevailing patterns of belief

and habit in the community. In this context, the findings of a recent inquiry, which throw some light on lay beliefs concerning the causes of cancer, with particular reference to the role of cigarette smoking, may perhaps be of interest.

The data presented here were obtained through interviews with a random sample of the adult population of the City of Edinburgh. The background of the inquiry, the sampling procedure, and the response rate have been described elsewhere (Cartwright, Martin, and Thomson, 1958). The inquiry was primarily concerned with popular beliefs concerning tuberculosis, but certain questions about cancer were included in the interview.

General Attitudes Concerning Cancer

Some indication of popular fears of cancer in comparison with other diseases is provided by replies to the opening questions of the interview, in which our subjects were asked what illness they thought was most dangerous for children under the age of 15, for adults under the age of 45, and for adults over that age. Only one person in a hundred mentioned cancer as the most dangerous disease for children, but a quarter and a third respectively thought it was the most dangerous illness for adults below and above the age of 45. In each of these last two groups cancer was the second most frequently mentioned disease; tuberculosis (29%) was specified slightly more frequently for younger, and heart disease (34%) slightly more frequently for older, adults.

There were, however, no indications, at any rate at the level of conscious awareness, of a widespread incidence of what is sometimes referred to as cancerphobia. Less than one-third of the people questioned said in reply to a specific inquiry that they were worried about their own health or the health of any member of their family, and of these the majority were concerned about some illness present at the time. Among those who expressed anxiety about an illness not actually present cancer was the disease most frequently mentioned, but even this was named only by one person in fifty.

When asked which of five selected causes of death was responsible for the greatest number of deaths, 35% of our subjects said heart disease, 32% street accidents, and 27% cancer. Only 5% cited lung tuberculosis and 1% poliomyelitis. Cancer was much more often specified by women (35%) than by men (18%). Asked to estimate whether death or recovery was the more probable outcome in each of the four diseases included in the previous list, the members of our sample were least optimistic about the prognosis for the cancer patient, with three-quarters thinking death the more likely outcome. One subject in five, however, thought that a person who had contracted cancer was more likely to recover than to die.

A somewhat higher proportion, nearly one-third, said they would rather not know if they had cancer, even though, in answer to a later question, only 9% thought the chances of recovery were not improved by early diagnosis. For lung tuberculosis people were apparently more convinced of the value of early diagnosis; only 2% thought it would not improve the chances of recovery, and only one in ten said they would rather not know if they had it.

Beliefs About the Causes of Cancer

In an attempt to discover the pattern of popular beliefs about the causes of cancer, we first asked a general question in which we did not suggest any possible cause. Replies have been classified into various groups in Table I.

The cause most frequently suggested was knocks, bumps, or bruises; then in descending order of frequency came smoking; air pollution, fumes or dirt; inheritance; and tiredness, worry, overstrain, or frustration. The popularity of the belief that trivial injuries may cause cancer provides an interesting example of the psychological process referred

TABLE I.—Causes to Which Cancer is Attributed

Knocks/bumps/bruises	25%
Smoking	22%
Air pollution/fumes/dirt	14%
Inheritance from parents	8%
Tiredness/worry/overstrain/frustration	4%
Replies connected with food	4%
Infection	1%
Others	19%
No opinion	34%
Sample	554 = 100%

to elsewhere as "reduction to the familiar" (Cartwright *et al.*, 1958)—the tendency to relate the aetiology of major diseases to simple, everyday conditions; a parallel and even more widely held belief is that tuberculosis develops from neglected colds.

Only 1% of those questioned spontaneously mentioned infection as a "cause" of cancer, but when asked specifically about this another 12% said they thought it was possible to "catch cancer from other people." Rather similar questions were asked about the inheritance of cancer. This had already been mentioned spontaneously by 8%, and another 25% replied positively when asked about this specifically; one-third of these gave unqualified replies, and the remainder said that they thought a tendency to contract cancer could be inherited.

Members of the sample who had not previously mentioned smoking were asked whether they had heard that some doctors and scientists thought that people who smoked were more likely to get cancer than people who did not smoke; more likely to get cancer than their own opinion. The results are shown in Table II. Although most people had heard of the relationship, more than one-third of them thought that smokers were not more likely to contract cancer than non-smokers.

TABLE II.—Beliefs of 554 Persons About Smoking as a Cause of Cancer

Smoking mentioned spontaneously as a cause	75%	22%
Has heard of possible relationship	39%	78%
Has not heard of possible relationship		
Thought smokers more likely to contract cancer	30%	78%
Thought smokers not more likely to contract cancer	36%	
No opinion	12%	

Variation in Beliefs with Age, Sex, and Social Class of the Individual

Appreciably more men than women mentioned air pollution, fumes, or dirt as a cause of cancer (22% against 8%), and slightly more men than women mentioned smoking spontaneously. However, when they were asked specifically about smoking the proportion of men who thought smokers were not more likely to get cancer than non-smokers was 41% compared with 32% for women. Rather more women than men mentioned knocks as a cause of cancer (28% compared with 22%).

When we consider variations with age we find that the proportion suggesting knocks as a cause of cancer increases with the age of the person, rising from 18% for those aged 21-34 to 33% for those aged 65 or more. In contrast the proportion mentioning air pollution declines with age. The proportion thinking smoking, inheritance, or infection a cause of cancer when they were asked about these factors specifically was highest for the people over 65—probably because this group is the most willing to accept suggestions of this sort uncritically.

Social class variations reveal surprisingly few differences. The proportion mentioning knocks (17%) and highest professional and intermediate occupations (17%) and highest for those in unskilled manual jobs, but no consistent variation can be observed when we consider smoking as a cause of cancer, and there is little variation in the proportion mentioning air pollution, fumes, or dirt.

Smoking Habits and their Relation to Beliefs on Smoking as a Cause of Cancer

The proportion spontaneously mentioning smoking as a cause of cancer did not vary significantly between smokers,

non-smokers, and people who had given up smoking; neither did the proportion who had heard of the relationship. However, when we asked people who had not mentioned smoking as a possible cause of cancer what they thought about the theory striking differences emerged.

Nearly half the people now smoking said they did not believe that smokers were more likely to get cancer than non-smokers. This was more than twice as high as the proportion of non-smokers who held this view. It might have been expected that the people who had given up smoking

TABLE III.—Relationship Between Smoking Habits and Beliefs About Smoking as a Cause of Cancer

	Smoke Now			Given up Smoking	Never Smoked
	20 a Day or More	Less than 20	All those Smoking Now*		
	%	%	%	%	%
Smoking mentioned spontaneously as a cause	24	23	23	18	22
Had heard of possible relationship	72	74	73	81	75
Had not heard of possible relationship	4	3	4	1	3
Thought smokers more likely to get cancer	17	25	22	38	40
Thought smokers not more likely to get cancer	51	45	47	32	21
Don't know	8	7	8	12	17
No. of individuals = 100%	109	164	288	76	187

* Including 10 pipe smokers and 5 people for whom the quantity was not known.

were those who believed most firmly in the relationship, but in fact this group fell in between the smokers and non-smokers in this respect. The reasons of 76 persons for giving up smoking were then examined. These were: expense, 39%; health reasons, 37%; others, 20%; no answers, 4%. Expense and health were the reasons most frequently put forward for giving up smoking, but when the beliefs about smoking as a cause of cancer are examined for the small group of 28 people who gave up smoking for health reasons we find no significant differences between them and the other members of our sample.

The absence of any relationship becomes clearer when the health reasons in question are examined in detail. Only 2 of the 28 individuals concerned had given up smoking because of a fear of cancer; this may be compared with 14 who gave up smoking as a result of major or minor respiratory conditions, 3 because of gastric illnesses, and another 2 with cardiac conditions. It is evident that even among those who claim to have given up smoking for health reasons fear of cancer of the lung has played a very small part.

Conclusions

It is clear that smoking is now quite widely believed to be a cause of cancer. In an inquiry conducted in the Manchester area four years before our own (Paterson and Aitken-Swan, 1954), only 2% of those questioned spoke spontaneously of smoking when asked about the causes of cancer. By 1957 the corresponding percentage among the Edinburgh population had risen to 22, and when asked specifically another 30% agreed that smoking was a possible cause. It would seem that recent suggestions, in Parliament and elsewhere, that the Government should give widespread publicity to the association between lung cancer and cigarette smoking may be misconceived, since only three people in a hundred were not aware that such a relationship had been asserted. The problem is not so much one of knowledge as of conviction and action, and our findings demonstrate once again the fallacy of the Socratic assumption that underlies much health education.

Heavy smokers, though they were as likely as anyone else to know that an association between smoking and lung cancer had been postulated, were far more ready than non-smokers to deny the validity of the evidence. In short, their

expressed beliefs were largely a rationalization of their habits, while those who had never taken up smoking were correspondingly more prepared to attribute harmful effects to the cigarette. But if there is a gap between knowledge and belief there is also a gap between belief and action, for it is noteworthy that two-fifths even of the heavy smokers were prepared to accept the proposition that smokers ran a greater risk of contracting lung cancer. Among the motives of those who had given up smoking, fear of cancer played an insignificant part. To base one's beliefs on one's habits, rather than the reverse, is a characteristic not restricted to laymen. Pyke (1955) has shown that medical practitioners are no less irrational in their assessment of the evidence in question: 71% of non-smoking doctors were satisfied with the evidence linking cigarette smoking with carcinoma of the bronchus, but only 46% of the doctors who smoked cigarettes thought the evidence adequate.

The logic of the individual in our sample who said that if doctors believed in the association they would give up smoking, seems somewhat unjustified.

Public action directed towards the reduction of cigarette smoking may take one of two major forms. The first of these is the introduction of deterrents, of which the most obvious would be a further heavy increase in the excise duty on cigarette tobacco; this would probably have some effect, since the number of people who give up smoking on grounds of expense is already greater than the number who give it up for health reasons of any kind; but its precise effect would depend not only on the extent of the increase but also on future trends in income levels and in the relative attractiveness of alternative objects of expenditure. The other possible approach is educational. It is obvious that a mere exposition of facts is unlikely to be effective in persuading confirmed smokers to give up the habit, though it may dissuade some young people forming the habit. It seems to us that if educational activity is to be effective it must be based upon direct study of the habit of cigarette smoking—of the processes by which it takes root, the satisfaction which it yields, and the difficulty of giving it up. This is a subject on which we are aware of a number of hypotheses, but of little objective evidence.

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ATTITUDES OF THE GENERAL PUBLIC TO MENTAL ILLNESS

BY

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Although it is very likely that the attitudes of members of the general public towards mental illnesses have an important bearing upon the recognition and treatment of these conditions, few systematic investigations of such attitudes have been carried out, and all of these in the United States of America or Canada (Ramsey and Seipp, 1948; Roper, 1950; Woodward, 1951; Star, 1952; Cumming, 1955; Redlich *et al.*, 1955). Recently an opportunity presented itself to make some similar observations in this country.

In January, 1957, the B.B.C. broadcast a series of five television programmes under the general title of the

"Hurt Mind" which dealt with various problems connected with the aetiology, nature, and treatment of mental illness. Each of the broadcasts in the series was seen by approximately 15% of the adult population in the United Kingdom, equivalent to about 5½ million people. An attempt was made to measure some of the change in attitudes of the viewing public which could be attributed to seeing the programmes. The results have been reviewed by Dr. W. A. Belson, of the B.B.C. Audience Research Department, who found that a great majority of viewers drew a distinction between mental illness and insanity; many were unwilling to accept the ex-patient in certain occupational and other roles, and there was a general feeling that mental illness was something to keep quiet about. Little change was brought about in viewers' opinions in these respects. However, the series "increased somewhat viewers' knowledge on the subject of mental illness, especially in respect of methods of treatment. There was a moderate but broadly based increase in viewers' confidence in the ability of medical men to cure mental illness. . . . There was a small but well-spread increase in the viewers' willingness to associate with the ex-patient. . . ." (Belson, 1957).

When the "Hurt Mind" series was in preparation a preliminary survey of the "target audience" for these programmes was made. Groups of viewers, drawn from the Greater London area, were invited to Broadcasting House and there asked to fill in a written questionnaire, to ascertain their ideas about mental illness and its treatment, and their attitudes towards the mentally ill. One hundred and eighty people were involved, but this number was reduced to 167 in order to match the viewing public of Greater London in terms of a social level and age. This material was kindly made available to us by the B.B.C., who also permitted us to carry out a content-analysis of 1,267 letters written to the B.B.C. by viewers in response to the "Hurt Mind" programmes.

I. Spontaneous Opinions About Mental Illness

At the onset of the preliminary inquiry the 167 volunteers were asked to write as fully as possible what they understood by the expression, "A person who is mentally ill." The following content-analysis is based upon the answers to this question.

Major Diagnostic Categories.—Seventy-two persons seemed to be describing a psychiatric condition only, and 24 a neurosis or personality disorder only, while 23 seemed to have both in mind when thinking of mental illness. Of those whose answers were classifiable in this way, 80% mentioned psychotic traits or syndromes in their answers, and 40% mentioned neuroses. Only four answers seemed to describe mental deficiency.

Topics most frequently mentioned.—Each answer was then broken down into a series of separate statements. The most popular single item was an expression of general good will such as "needs much help, understanding, and kindness." Forty-five individuals (27%) replied in this way. Other fairly popular responses (mentioned by more than 20 people) were: "Due to worry, mental strain," etc.; "Sometimes violent"; "Needs to be supervised in an institution"; "Behaves or reacts abnormally"; "Pessimistic, depressed," etc. There were 665 separate items, of which 572 could broadly be classified under the headings Descriptive, Aetiological, and Therapeutic.

Descriptive Items.—The 301 descriptive items could be further sorted into five "syndromes" which accounted for 260 of them. The largest "syndrome" accounting for

over half the descriptive items, was composed of items describing the conventional "madman" who had difficulty in thinking logically (46 items), was unpredictable in behaviour (58 items), was withdrawn (24 items), and was paranoid (21 items) or suffered from other delusions (10 items). The other "syndromes" were depression (e.g., "morose," "hopeless," etc., 33 items), anxiety (e.g., "worries unduly," 34 items), social maladjustment (e.g., "can't mix," 27 items), and socially deviant behaviour (e.g., "antisocial," "criminal," 7 items).

Aetiological items.—The 154 aetiological items could be divided into 12% "organic" (e.g., "brain diseased or damaged"), 9% "constitutional" (e.g., "inherited," "not strong enough"), and 79% "environmental." The latter could be subdivided into general (e.g., "due to worry, circumstances of life," etc.) and more specific, such as "due to financial difficulty," etc. Very few people spontaneously remarked that mental illness was due to treatment as a child or connected it with personality development.

Therapeutic Items.—These were 117 items dealing chiefly with the need of the mentally ill person for treatment. Sixty-three items were concerned with unspecified "psychological treatment (good will, kindness, etc.). Seventeen specified rest or psychotherapy. Institutionalization and supervision were suggested in 20 items, and one of the physical treatments in 7.

Minority views.—Certain responses were not as much in evidence as might perhaps have been expected. Moral considerations were introduced in only two answers, and only six mentioned "unnatural cravings." Only one person mentioned malingering. Nineteen wrote about fear or horror of the mentally ill; 11 of them described this in themselves, 8 of them in other people, adding that it was unjustified.

To summarize, in these spontaneous answers 167 people—thought to be representative of the viewing public of Greater London—indicated what the words "a person who is mentally ill" meant to them. They seemed to think primarily of the traditional "madman," who could not think logically and was unpredictable, deluded, and withdrawn. Depressive, neurotic, and personality disorders were much less frequently mentioned. Aetiology was conceived mainly in terms of general or specific life stresses beginning in the recent past, with little mention of physical or hereditary causation. Therapy, similarly, was thought to consist of unspecific measures such as rest and kindness; the nature of psychotherapy was almost certainly not understood, and physical treatments were hardly mentioned.

II. Letters Written in Response to the "Hurt Mind" Programmes

An examination of the 1,267 letters written to the B.B.C. by viewers of this series provided some indication of the topics about which patients and their relatives expressed concern. Less than half of these letters complied with the invitation to submit questions which might be answered in a final programme; many of them consisted partly, or entirely, in an unburdening of the writer's own experiences and emotions. Several writers expressed their thanks for the evidence given by these programmes that *someone* was interested in their problems, and appeared to regard the act of writing to the B.B.C. as being in itself helpful to them. As might be expected, quite a number of the letters (approximately 20%) were written by persons who were themselves suffering from some form of mental disorder, but in only six instances were the contents of the letters dictated exclusively by delusions arising from the illness itself.

Of the total, 730 were from women, 372 from men: in 165 cases the sex of the writer was not indicated. This 2/1 sex ratio was shown in every topic studied in the content-analysis except three. The inequality was much less marked in letters concerning organic complaints (stroke, tinnitus etc.) and in two instances (questions about legal

formalities and about rehabilitation after mental illness) the men outnumbered the women.

In all, 1,842 topics were identified in the analysis. These could be categorized under the following main headings.

Requests for Further Information (mentioned in 526 letters)

This category includes all those letters which complied with the broadcast invitation to submit questions which could be answered on the air. The majority asked for more facts (and in some cases expressed disagreement) about matters touched on in the early programmes; some asked for the titles of good books on psychiatry. *Heredity* was the subject of surprisingly few inquiries (17 in all). Other forms of aetiology were mentioned in 23 letters, of which 13 discussed environmental influences and only 7 implied a belief in organic causes. Three writers asked if there is any foundation for popular beliefs about the influence of the moon. Only two persons explicitly asked about the relationship between neurosis and insanity. Five letters, all written by women, requested more discussion of the bearing of religion on mental illness.

Requests for Advice About Treatment (554 letters)

Many letters contained requests for help in dealing with a current illness of the writer or of someone in his or her household. Some of these described problems of such urgency that the producer of the television series passed 314 of them on to the National Association for Mental Health for their immediate attention.

It was possible in 91% of these letters to make a fairly confident guess at the diagnosis of the conditions described. Cases of neurotic illness (including character disorders and psychopathy) were described most frequently (202 letters), psychoses somewhat less (175), and mental illnesses with an organic basis considerably less often (128). These overall ratios were, however, very different when one contrasted letters describing the writer's own case with those describing illness in other people. In the former letters neuroses predominated, whereas in the latter cases of psychosis and organic illness were each twice as common as neuroses. It appears from this analysis that, whereas neurotic patients are readily able to express the need they feel for treatment, it is the relatives of psychotic and organically ill patients who are more likely to seek help on their behalf. It can be assumed that neurotic patients are more likely to have insight into their conditions: but these letters give the additional piece of information that in relatively few instances were correspondents concerned about neurotic illness in other members of the family.

In addition to asking what can be done in general for their sick relatives, 55 correspondents wanted to know what they personally could do to help them. In 29 of these instances the patient had refused to accept treatment, or to see a doctor, thus intensifying the relative's feeling of responsibility. Two persons described suicide in near relatives and wondered in retrospect what they might have done to avert this.

Unorthodox Methods of Treatment (21 letters)

Some of the letters received were concerned to impart information rather than to ask for it. This was particularly true of the writers who advocated unusual lines of treatment, such as biotherapy, scientology, "abntranosis," and "Dr. Croften's virus injections." The only one of such treatments which received support from more than one correspondent was *spiritualism*: 14 letters argued vehemently in favour of the healing powers of mediums and clairvoyants, three of the writers going on to explain that mental illnesses could most fruitfully be treated by exorcism.

Treatment in the Community (72 letters)

Concern about the presence of a mental patient in the household was often expressed. One woman wrote: "Surely the passage from skilled hands to total incompre-

hension from the family is a strain on the patient." Others dwelt upon the distress experienced by other members of the patient's family: "It is worse for the relatives of sick people, they have to face reality and cannot retire into the 'other world'." A woman whose husband has epileptic fits described herself as living "in awful perpetual dread of a seizure"; another with a severely disturbed epileptic child wrote, "She is ruining my health." One mother complained of her schizophrenic daughter: "She behaves just like a naughty child"; and another, in despair at her son's seemingly intractable psychosis, comes to the conclusion: "I feel that it would be more humane to put him to sleep, out of his misery."

In the great majority of cases, however, the relatives' concern was focused upon the patient's welfare after he or she had left mental hospital: and of those who raised the topic of treatment, no fewer than 39 (54%) said there is not enough aftercare provision. They also criticized treatment at psychiatric out-patient clinics, with comments such as: "One has a long wait in the out-patient department, and then a very cursory interview," or the recurrent complaint: "The psychiatrist just gave me pills which doped me." Individual writers made positive suggestions for extending the work of ex-patients' clubs and of occupation centres. One woman suggested: "Wouldn't it be better for patients to stay at work, living in a night hospital or a hostel if necessary?" Several writers made the point that the benefits of recovery in hospital could be lost if the patient were not helped to find suitable employment: six of these described instances where the ex-patient encountered the additional obstacle of prejudice instead of help in seeking work.

Stigma of Mental Illness (56 letters)

Patients and their relatives wrote with feeling about popular prejudice against those who have been mentally ill. Thus one woman, whose husband had suffered a depressive illness and thereafter could not find work, wrote: "The stigma of mental trouble is most damaging, and I begin to wonder if a man who has been to prison for some crime is certainly no worse off." A husband whose wife was severely depressed believed that her condition was aggravated by the attitude of their neighbours, who "said she was not safe to be with as she was a mental case." An ex-patient complained: "People make you feel you are not safe to be around." The parent of a mentally defective child pointed out that in his opinion this prejudice is apparent in the terminology of the law relating to mental defect. He wrote: "Mental defective is itself used almost as a term of abuse. Also 'on licence' and 'absconding' are terms suggesting a criminal aspect."

Three letters cited cases where members of the family themselves showed an unhelpful attitude towards a convalescent mental patient. It was implied that they should have known better; this implication was also evident in some bitter criticisms of the attitude of the patients' general practitioners.

General Practitioners (96 letters)

The practitioners' attitude to psychiatric illness, and their seeming powerlessness to help, were emphasized by both relatives and patients (but especially the latter). Doctors were accused of having no time for this type of patient, either literally or figuratively: "Doctors are always in a rush, haven't time to bother with you. Write you a prescription and say—Sorry, but it's not physical, it's yourself." "The doctor who I am under gives me sleeping-tablets; says he can do nothing else." "My doctor, who is a busy man, just gives me nerve tonics." "Our doctor hasn't much practice or understanding of this kind of thing: my husband has had thousands of tranquillizers and takes sleeping-tablets every night."

A woman patient wrote: "I have been to my doctor, but he just keeps giving me pills—they are too busy to talk"; and another complained that her doctor "always puts me off, tells me I must help myself, and gives me pills" (chlorpromazine). A man wrote: "Works doctors

do not understand about psychiatric illness"; and another: "I could go to my G.P., but what would be the use, as he does not know anything about this kind of illness?"

There is therefore among those who sent in letters to the B.B.C. a widespread opinion that general practitioners prescribe too many sedatives, and are disinclined or unable to give psychiatric patients the amount or type of attention which the latter think they need. In some cases patients said they were afraid to consult their doctors—for example, "A very harassed doctor gave me a brusque interview. He was quite scornful, told me to get a man"; and another wrote that she was reluctant to mention her symptoms to her G.P. again "in case I get another rebuff." Yet another wrote plaintively: "My doctor tells me I have got to overcome this myself, and I just do not seem able to do it."

Many writers, while complaining of their doctor's inability to help them, expressed gratitude for his attentions in other illnesses and sympathized with his heavy burden of work; but expressed the belief that most doctors neither understood nor sympathized with mental illness. Three writers urged that more attention should be given to teaching psychological medicine to doctors in training. On the other hand, a general practitioner wrote that in his opinion a great many minor neuroses respond to a brisk admonition to "pull yourself together."

Complaints About Hospitals (154 letters)

The large number of these letters implied considerable public dissatisfaction with the present state of the mental health services. Here the content of the first three television broadcasts especially provoked viewers' comments. The designers of the programme were anxious to put across a positive and optimistic picture of the work of mental hospitals and clinics; but as a result many people wrote to say that their experience had been very different. Surprisingly few letters came from patients currently in mental hospital, perhaps because it is in only a few institutions that patients are permitted to watch television programmes later than 10 p.m. (as were all of this series). In this category letters from relatives or friends were much more numerous than those from present or former patients (78% as against 22%).

The principal grounds for complaint were the lack of amenities in patients' surroundings and in their dress. Six writers laid particular stress on locked doors, which, as one put it, make the hospital "grim and prison-like." Seven letters made especial complaint of patients being left in idleness. One writer stressed both of these points: "Lots of mothers think the same as me; they should not be locked up. They will never get better like that, to sit about all day long watching each other. . . . Will you please take the matter up, about locking the patients in because they are afraid they might run away."

There were several complaints about overcrowding and about the mixing together of patients of widely different ages and degrees of severity of illness. Five letters mentioned brutal or harshly inconsiderate treatment by nurses. Another recurrent theme was the failure of doctors to give relatives the information they sought about patients in hospital. A patient's daughter paid a backhand compliment when she wrote: "My experience with the medical superintendent leads me to suppose that the one interviewed by Christopher Mayhew last night is a rarity."

Among the nine letters about institutions for mental defectives, four contained complaints about difficulties and delays in getting patients admitted, and three complained even more bitterly about obstruction of their efforts to have their relatives discharged.

In Praise of Mental Hospitals (24 letters)

After so much adverse criticism, it was a relief to find that there were a few writers who spoke with appreciation of hospitals and their staffs. One woman described the harrowing experience of trying to cope with her acutely

paranoid husband for some days before his admission to hospital: "I never want to live through that again . . . thank God there are such places." Only one person, a mother, spontaneously praised a mental deficiency institution; she said that her mongol boy was doing very well in "a splendid home where they work wonders."

Offers of Help for the Mentally Ill (26 letters)

Two writers proposed that volunteers should be invited to "adopt" and take a personal interest in neglected patients. Three others offered forthwith to entertain such patients in their homes. Two writers sent donations for mental health work, and four others described ways in which they were already befriending hospital patients; the remainder expressed their readiness to help if someone would advise them how they could best do so.

Questions About Formal Procedure (36 letters)

These letters were very varied in content, the only recurrent theme being requests for guidance on how to bring about the discharge of certified relatives (mentioned explicitly in six letters, and implied in a number of others). The remainder concerned questions of property and civil rights of the mentally ill. Two men wrote questioning the competence of the ordinary medical practitioner to sign certificates of unsoundness of mind; on the other hand, a woman J. P. and another correspondent wrote in favour of the fairness of the present certification procedure.

Organic Conditions (30 letters)

A number of correspondents wrote about conditions of medical rather than psychiatric concern, although the after-effects of a stroke (mentioned in 10 letters) may often include some mental impairment. Conditions such as myasthenia gravis, myopathy, tinnitus, and chorea had evidently been described to patients as disorders of the nervous system, and were misinterpreted as instances of "nerves." In contrast, two other letters (included in the first category above) were from relatives of melancholic patients who asked if it were true that in such cases "the depression nerve" is particularly affected.

Maternal Deprivation (7 letters)

In view of the widespread interest and discussion among mental-health workers of Dr. Bowlby's contentions about the lasting ill-effects of maternal deprivation in early childhood, all references to this subject were separately noted. It is evident, however, that this controversy does not appear to have made much impression upon the television-viewing public. Among those who expressed concern about the possible harmful effects of separation were a mother and a father who sought guidance about whether they should send their children (age 5 and 12) to an epileptic colony and to a residential school for blind children, respectively.

Miscellaneous (217 letters)

These letters ranged over a wide variety of topics, including euthanasia, the efficacy of prayer, the need for more pay for mental nurses, the law on divorce, and the question of suicide. In this category were included the few frankly psychotic letters, and several from less-disturbed patients who described their sense of isolation and their difficulty in communicating their feelings. A depressed married woman wrote: "Every time I look at my local newspaper I am shown the easy way. Should the Press print all the suicides? It cannot help the unbalanced." Another said: "The doctors on the T.V. programme all made it sound so easy to get well," and a third, still more depressed, exposed: "Why don't doctors tell the truth; there is no cure, only a bullet through the brain." Included in this miscellany were five letters protesting against the rather series of programmes, 12 complaining about the rather horrific faces which introduced the first broadcast, and

three expressions of thanks to the organizers of the programmes for directing public interest and sympathy towards this problem.

Discussion

The term "mental illness" is used by psychiatrists to cover a wide range of conditions, from frank psychoses to neuroses and minor personality disorders. The American studies have shown that in general it is the more severe disturbances which are popularly classed under this heading: milder emotional abnormalities are regarded as closely akin to everyday behaviour. The first part of the present analysis confirms this tendency in the London sample: for them, too, "mental illness" has become the accepted euphemism for insanity, whereas the milder forms of neurosis have not yet been generally recognized as illness.

This indifference to neurotic illness is not shared by the sufferers themselves, as was shown by the letters to the B.B.C. Such patients, and their relatives, strongly deplored the seeming reluctance of other members of the public, and especially of doctors, to treat them with the consideration and the specialized attention which they felt they needed. Here the limitations of this particular self-selected sample must be borne in mind. Those who wrote to the B.B.C. were moved to do so, in many cases, by pressing current needs, or by a lingering resentment against real or imagined mistreatment; this may account for the volume of criticisms against the doctors and hospitals. Psychiatrists by no means escaped criticism either, in spite of (or perhaps because of) the fact that the programmes were given a decidedly optimistic bias.

There is inevitably an uncontrolled bias in these samples, more especially in the case of the letters to the B.B.C.; yet it may be pointed out that social investigations, whether of sexual behaviour or of occupational status, have proved rewarding even though the populations on which they were based did not conform to rigorous principles of selection. The data revealed by this type of sociological serendipity can suggest fruitful topics for systematic inquiry. For example, it is noteworthy that so many correspondents express misgivings about the present facilities for the recognition and treatment of mental disorders. Nor were all the criticisms couched in negative terms; there were many constructive suggestions about increasing doctors' instruction in psychological medicine, and improving aftercare and rehabilitation services. In view of the recent Royal Commission's stress for an increase in "community care" it is interesting to find this indication, tenuous though it may be, of a reciprocal public readiness for such measures. It is probably relevant that the most popular item in all responses to the question asked at Broadcasting House was an expression of good will towards the mentally afflicted.

Mental illness is a disquieting subject, and one which is most feared when least is known about it. This investigation has suggested that in some quarters there still exists a good deal of disquiet and lack of information; and this in turn suggests the desirability for continuing efforts of health education in this field.

We thank Mrs. Adams, Dr. W. A. Belson, and Mr. Miller-Jones, of the B.B.C., and Miss Appleby and Miss Addis, of the National Association for Mental Health, for their co-operation in this inquiry.

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Reviews

GRAY'S ANATOMY

Gray's Anatomy, Descriptive and Applied. Edited by T. B. Johnston, C.B.E., M.D., D. V. Davies, M.A.(Cantab.), M.B., B.S., and F. Davies, M.D., D.Sc.(Lond.), F.R.C.S. Thirty-second edition. (Pp. 1,604+xxiii; illustrated. 126s.) London: Longmans, Green and Co. 1958.

Textbooks, like human beings, seldom live for a hundred years. When they do, as in the case of *Gray's Anatomy*, it is because the original author hit on something which was urgently needed, and (quite as important) the successive editors kept well in view the original purpose and faithfully adhered to it. In the preface to the first edition (penned in August, 1858) Henry Gray clearly stated his purpose, which was "intended to furnish the student and practitioner with an accurate view of the anatomy of the human body, and more especially the application of the same to practical surgery." With that intent he made many dissections, and his friend Vandyke Carter sketched several hundred of them for insertion in the new book. Gray told his friend Timothy Holmes that he would have liked to include more strictly scientific matter, but he hoped to do so in a later edition. When the book was published it was welcomed by the *British Medical Journal* and the *Lancet*, but was severely, and unfairly, reviewed in the *Medical Times and Gazette*. The author was openly accused of plagiarism from Quain and Sharpey's book, and we think a careful reading of the long review gives a clue to the anonymous person who wrote it. It did the book no harm, and a second edition was called for within two years.

Unfortunately Henry Gray died in 1861, but his foundling was adopted by his friend Timothy Holmes, who inserted a long scientific introduction on general anatomy and histology which has remained a valuable feature of the work ever since. After Holmes had seen the book through seven editions it was taken over successively and successfully by Mr. Pickering Pick, Professors R. Howden, T. B. Johnston, and J. Whillis, and, in this latest edition, Professors D. V. Davies and F. Davies. Professor Johnston pays a warm and just tribute to the part played by the late Professor J. Whillis in helping to edit several editions, but the main credit for the present high standard attained must be given to Professor Johnston himself, who for nearly 30 years has efficiently supervised the revision of the work.

This centenary edition has been rejuvenated. Looking at its beautiful coloured pictures and excellent radiographs, noting the numerous references to recent researches and the surgical applications interspersed through the text, the reviewer feels a little envious of the modern student who has such a delightful and helpful companion as his guide. There is in this edition a very appropriate link with the original author, for Miss Fitton Jackson, a blood relative of Henry Gray, has contributed some excellent electron-micrographs. A happy thought also was the inclusion of photographs of five of the early editors, including Gray.

Henry Gray, Timothy Holmes, and Pickering Pick were all St. George's men, but the book is now a representative British work which has achieved international renown. Readers might like to know what this *Journal* thought of it a hundred years ago. In the *British Medical Journal* for November 13, 1858, the reviewer wrote: "We cannot avoid congratulating St. George's Hospital on the production of such a book by two of its own pupils—a book which must take its place as the Manual of Anatomy, Descriptive and Surgical." Not a bad prophecy.

ZACHARY COPE.

NATURE AND PURPOSE OF MEDICAL EDUCATION

For Future Doctors. By Alan Gregg, M.D. (Pp. 165+x. 26s.) Chicago: University of Chicago Press. London: Cambridge University Press. 1958.

In this book there are eleven essays by the late Alan Gregg, of the Rockefeller Foundation. They are delightfully written and are a pleasure to read. They offer a distillate

of the wisdom of a most able man who had made a wider study of medical education than any other in recent times. There is in them no mention of curricula, teaching-aids, schemes, or projects. Instead they state clearly the nature and purpose of medical education, and therefore they are of great value.

This is an era in which, not least in England, the medical profession faces the most serious danger possible—that of forgetting that it is a profession and by its own default ceasing to be one. Many join it now who have no experience or inherited awareness of professional life, and can acquire only those standards and values which they find in medical school and in practice. Intellectual honesty is hard to teach, and personal integrity can be shown only by example. Both can easily be made to bow before expediency, and when expediency is called realism then inspiration and creativeness are called idealism and are killed by kind ridicule. In these essays, written with the authority of one who knew most of the world's medical schools, Dr. Gregg rebuts this subtle propaganda and leaves no doubt that in reality we will lose all if we do not follow ideals. He quotes the words of Paul Valéry: "You must live as you think; if not, sooner or later you'll end by thinking as you have lived."

This book should be read by all future doctors. They will find in it a wealth of clear practical advice on two problems—what should be their aim and how they can achieve it. They cannot but benefit from the dreadful warning of "Preservéd Jones," who as a young man, in an age of bewildering increase in knowledge and fierce competition, was by his ambition to succeed led into dedicating himself to a narrow specialty. Now at 66, he is sadly complete, and "from his deliberate ignorance he cannot impart wisdom, or from his embitterment, serenity."

It is equally important, however, that all who teach should read, and read again, these essays by a man who saw so clearly the present predicament of the university—which must at the same time supply "stability of purpose and effort" and yet "be promptly and delicately responsive to changes in the environment and even changes in objectives." There are few who will not have to admit to suffering just a little from the "C.I.P." syndrome, the disease which can so easily affect those who belong to a "good" school of medicine: Complacency, Ingratitude, and Parochialism. There can be none who will not benefit from Dr. Gregg's words to the students of Texas: "He teaches best who shows his students how to learn: not what to think in 1953, but how to think and how to learn to think in that long stretch of days awaiting you till, let us say, the year 2000."

JOHN ELLIS.

THE LANGUAGE OF MEDICINE

The Story Behind the Word: Some Interesting Origins of Medical Terms. By Harry Wain, A.A., B.S.M., M.D., M.S.P.H. (Pp. 342+vi. 63s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1958.

As medicine becomes more and more technological any attempt to bring out its humanistic aspect deserves the warmest welcome. In this book the author has brought together a mass of interesting information not readily found elsewhere. He gives the origin and meaning of medical and allied scientific terms, the names of diseases, symptoms, signs, drugs, and instruments, with short biographies of their discoverers and inventors. He also includes popular terms such as "clap" (gonorrhoea) and "court plaster." Perhaps the greatest merit of the book is that it gives not only the changes in meaning which terms have undergone through the centuries but also the date of the adoption of the modern meaning and the name of the person responsible where this is known. So far as one can tell, the information is, in general, correct. On Lettsom, however, the author goes badly astray, describing him as "a Virgin Island physician who wrote an original account of alcoholism and gave an original description of alcoholic multiple neuritis."

Unfortunately the book is made unnecessarily bulky in several ways. It is written in full English instead of telegraphically, and no use is made of abbreviations such as *L.* for "Latin." Almost every item begins with some such sentence as "This term is derived from . . ." or "This term comes into our medical vocabulary from . . ." There are, moreover, a great many words, such as "education" and "eliminate," which are adequately dealt with in ordinary dictionaries. There is, for instance, a ponderous explanation of "visit." A worse fault is the inexplicable inclusion of words which have nothing to do with medicine—for example, "acrobat," "budget," "grass-widow," "Hobson's choice," "Portland cement," "daddy," and "ha-ha." These excrescences not only add to the size and cost, but also blur the author's admirable purpose of describing "the imagination and romance behind the language of medicine." The book could, without loss, be reduced to half its size. As it stands, it is far beyond the pocket of nurses and students. It should, however, be in every library, and teachers who wish to add human interest to their lectures would be well advised to use it.

FRANGCON ROBERTS.

EDUCATIONAL VALUE OF EXAMINATIONS

Goepp's Medical State Board Questions and Answers. By Harrison F. Flippin, M.D. Ninth edition. (Pp. 569+xi. 56s.) Philadelphia and London: W. B. Saunders Company. 1957.

This book, although new to me, was first published in 1908, and it is now in its ninth edition. Its 500 pages cover eleven medical subjects, including anatomy and physiology, and it contains answers to several thousand questions collected, one assumes, from the U.S. State Board examinations. The original author, the late Max Goepp, presumably approved the natural desire of students to pass examinations, and intended not only to save them the trouble of looking up the old examination papers but in doing so to provide them with much essential information. The book can then be used to discover how far written examinations can themselves contribute to the education of the student. Although these questions are for the most part unexceptionable examination specimens, such as the part unexceptionable examination specimens, such as the diagnosis of ruptured uterus or of posterior inferior cerebellar artery thrombosis, some questions, such as the treatment of the common cold (allotted 500 words) or of histamine headache, are more likely to educate the thoughtful examiner than to encourage rational thinking in the examinee. Since the questions chosen are mainly those requiring factual answers, demanding at the most a capacity for grouping remembered facts (answers of "the things on the bed, things in the bed, and things under the bed" variety), it may be that the candidate's experience and reasoning designed to test the candidate's experience and reasoning power.

The book has many merits. It is well printed and easy to read, and because it has been published so many times it is, in general, accurate and comprehensive in its information. Since many subjects are dealt with in one volume, it is possible for the student to refer easily to another section to resolve a doubt or to correlate facts—to look up in the anatomical section, for example, the situation of the restiform bodies and the vestibular nuclei when reading of posterior inferior cerebellar thrombosis, or to refer to the account of the phosphatases in the biochemical chapter when thinking about diseases of bone or liver. Although the book has a remarkable amount of information, it contains less than the cramming textbooks devoted to single subjects: much is omitted and much is presented in a form unsuitable for students. It is more authoritarian and dogmatic in tone than are modern textbooks; facts are stated without references, and hypotheses are advanced as facts without giving the evidence on which the theories are based. For example, it is stated that fat children are sexually retarded (itself unestablished) because the gonadal hormones are fat-soluble and are stored in the excess body fat—an ingenious but non-proven hypothesis; and the

long-held theory that gynaecomastia in liver disease is associated with an excess of circulating oestrogen is said to be supported by an increased output of oestrogen in the urine—a finding by no means universally accepted. The point here is not only that the student has been misled, but that an opportunity has been lost of allowing him to come to a conclusion as to the validity of a hypothesis by the presentation of the evidence.

The faults of the book are in some measure the faults of medical education and of the examination system. They can be illustrated by the frequent use of the word "significance" in these questions—for example, "What is the significance of the blood cholesterol?" (p. 235). The word "significance" is unqualified, and at its worst, therefore, it might denote an "examination significance" requiring a list of disorders in which the blood cholesterol is plus or minus (as supplied in the answer); at the same level it might imply the "retrospective diagnostic significance" of an unsuspected deviation of the blood cholesterol not suggested by the clinical findings; at a slightly higher level the "diagnostic significance" of an abnormal blood cholesterol waiting to be fitted into an already determined clinical pattern; and finally it should comprehend the only true meaning of "significance" as applied to the level of the blood cholesterol—the pathogenesis of a disturbance of cholesterol metabolism. And how much do we know of that?

It is not, then, surprising that a book of this sort should fail to teach medicine at a high level, for the authors have set their sights lower than this. Their objective is to assist the students to pass examinations. Such cramming textbooks are educationally damned for one reason alone—that knowledge hastily acquired is by most brains rapidly forgotten. This book can be unreservedly recommended only to the unfortunate emigrant Englishman who, having successfully emerged from the fiery trials staged in Lincoln's Inn Fields or Pall Mall East, is nevertheless compelled to face the State Board's qualifying examination.

D. V. HUBBLE.

The Student-Physician is a series of studies in the sociology of medical education, edited by R. K. Merton, G. Reader, and Patricia L. Kendall (pp. 360; Harvard University Press, 1957). It attempts to answer such questions as why students decide to study medicine and by whom they are influenced in making their decisions; when and why they decide to specialize; the attitude of students towards their future careers, and when and how they begin to think of themselves as doctors. The types of patients preferred by various kinds of students are also examined, and two papers are included giving experiences with the Cornell Comprehensive Care and Teaching Program, in which students serve as "family physician" to a particular patient and, if possible, to the patient's family as well. *The Student-Physician* is available in this country from the Oxford University Press, price 40s.

Pica, by Marcia Cooper (pp. 114; Blackwell Scientific Publications, 1957; 27s. 6d.), is a comprehensive survey of the historical literature on the subject by the assistant professor of public health administration at Johns Hopkins University. The author has included reports of pica in animals and has considered its anthropological and psychological implications. She has also studied its incidence in 784 pre-school children, of whom 21.9% were found to have a record of pica. It is suggested that poor nutrition may be the underlying factor.

Natural Selection and Heredity, by P. M. Sheppard (pp. 212; Hutchinson and Co. Ltd., 18s.), deals with some recent ideas on the mechanism of evolution. Two chapters explaining the elementary principles of heredity are included. The author has not attempted a complete survey of the whole field of population genetics, which would have been impossible in a book of this size, but has treated in detail certain selected subjects which illustrate important principles.

The Atom and the Energy Revolution, a Penguin Special by Norman Lansdell (pp. 200; 2s. 6d.), is an explanation of the social and political implications of developments in this field, written for the general reader, for the business man who wishes to adapt himself to the new environment, and for the specialist in other fields. A chapter is included on radiation risks and insurance against them.

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THE STUDENT LIFE IN GENERAL
PRACTICE

William Osler, in his valedictory address to students at McGill University in 1905, exhorted them to remember that the education in which they had engaged themselves was not a medical course, but a life course, for which the work of a few years under teachers was but a preparation. He recognized that some of his listeners were natural students, and for them there would be little difficulty in a continuing devotion to books and journals; while others were students of men, practical fellows who enjoyed the diversity of God's creatures. The danger for the first group was that they might become bookish, shy, diffident, impractical men whose knowledge was therefore not readily available to meet their patients' needs; and for the second that they would become practitioners busily immersed in routine labours which left them without either the time or the inclination for study. The great clinicians are those who, like Osler himself, we may now add, are both students of books and students of men.

The need for the continuing education of the general practitioner is certainly not less than it was fifty years ago. The opportunities for successful diagnosis and treatment which lie ready to be used by the resourceful and educated family doctor are immeasurably greater than they were in Osler's day. He gave, in this and other addresses, much the same advice to the perpetual student-doctor as can be found, fifty years later, in the Fourth Annual Report of the College of General Practitioners, 1956, and in the article by Dr. George Swift in this issue (p. 580). The paramount requirement in continuing education is for good doctoring itself—good history-taking and examination, and careful records. This requires method and self-discipline, and too many, both inside and outside hospital, have to admit that from time to time they fall short of their own standards. The education of the medical student in these matters steadily improves, and good habits deeply rooted in youth are not so easily lost. Further, a few journals must be regularly read, the local medical society enthusiastically supported, and the refresher course

annually attended. Osler favoured a long period of postgraduate study every five years—the quinquennial brain-dusting—but to-day this is hard to achieve, and for most doctors it would be less valuable than a week's refreshment and stimulus each year.

As the need for continuing education is increasing, so are the opportunities. The fees and expenses of practitioners attending postgraduate courses, up to twenty-two half-days a year, are now paid by the Ministry of Health. There is no doubt, too, that the domiciliary consultation scheme has done much, not only for the education of both general practitioner and consultant but also for their good relationships. Consultants must be gratified to see it publicly stated by general practitioners that they find these consultations of considerable educational value. The increasing access of family doctors to x-ray departments and to pathological laboratories has vastly improved their facilities for studying the advances in the diagnosis of disease. Again, the opportunity to teach medical students and to train assistants has notably stimulated self-education in some general practitioners.

Although good progress has been made in the first ten years of the National Health Service, much remains to be achieved. The objective is to make continuing education as easy as possible for the largest number of general practitioners. Elsewhere in this issue (p. 583) Drs. John and Valerie Graves describe the early results of an interesting and hopeful experiment by the Medical Recording Service of the College of General Practitioners to provide medical talks on tape or disk for the doctor who finds it difficult to get to refresher courses. Their intention is not that the isolated practitioner shall listen to these records in solitude, but that he will gather a few of his neighbours to form a small discussion group to debate the medical message. The College hopes eventually to be able to provide for its members an up-to-date course in any subject.

For other difficulties there must eventually be found varying solutions. The Ministry of Health can provide further help: for example, by paying locum fees for the doctor in a partnership who is attending a refresher course. Most partnerships are at full stretch during the holiday periods of the summer, and to ask them to cover additional absence for postgraduate courses is to demand too much. More leisure for study, higher capitation fees, and merit awards—these are subjects which will receive increasing discussion in the next few years. Heaven—in this case the Ministry of Health and the Treasury—must show itself ready to help those who are now so obviously helping themselves.

PHARMACOPOEIAS AND FORMULARIES

The prescribing doctor of to-day is not short of pharmacopoeias and formularies, to say nothing of the spate of literature from the pharmaceutical houses that he finds in his letter-box every morning. Two new editions of pharmacopoeias have recently appeared, Volume I of the *Extra Pharmacopoeia*¹ ("Martindale") and the *British Pharmacopoeia*.² Seventy-five years ago William Martindale in collaboration with Dr. Westcott produced the first edition of "*Martindale*," a small volume of 313 pages. Martindale was at one time a pharmacist at University College Hospital, London, and later the owner of a retail and manufacturing business in New Cavendish Street. The *Extra Pharmacopoeia* was an immediate success, and edition followed edition until it was finally produced under the direction of the Pharmaceutical Society with the help of a panel of experts. The latest edition, the 24th, which contains some 1,700 pages, is a very valuable reference book for both doctor and pharmacist. For the first time the titles of the monographs are in English and not pharmaceutical Latin, an innovation introduced by the British Pharmacopoeia Commission five years ago. Doses are expressed for the first time exclusively in the metric system, the Imperial equivalents being added only for those drugs that are often prescribed in this system. In *Martindale* one can find the physical and chemical properties, pharmacology, mode of action, dosage, uses, side-effects, antidotes, and literature references for every drug likely to be prescribed. Not only are old remedies described, but also the latest drugs, such as sulphamethoxypyridazine ("midicel," "lederkyn"). The wide coverage of the book can be judged from the index, which contains 20,000 references. It is remarkable how up to date *Martindale* is, and Dr. K. Capper, the editor, is to be congratulated for his share in its production. There are references to a large number of foreign pharmacopoeias and to almost every proprietary preparation available in this country. There are special sections on antibiotics, immunological products, and radio-active isotopes. In each successive edition of *Martindale* the proportion of space allotted to new therapeutic agents has increased, yet with remarkably few deletions of the older and traditional remedies. There are some who deprecate the inclusion of many of the latter, yet they are still prescribed: once a drug becomes established, it takes a long time for it to become obsolete. Undoubtedly *Martindale* is one of

¹ The *Extra Pharmacopoeia*, vol. I, 1958, the Pharmaceutical Press, London. Price £3 5s. net.
² The *British Pharmacopoeia*, 1958. Published for the General Medical Council by the Pharmaceutical Press, London. Price £3 3s. net.

the most useful reference books on drugs for both doctor and pharmacist.

The *British Pharmacopoeia*, which is published under the direction of the General Medical Council at intervals of five years, is more useful to the pharmacist than to the physician. The new edition, which came into force on September 1, is the ninth. The *B.P.* lays down standards of purity, methods of testing and identification, and the doses of the more important drugs. The doses given are not binding on prescribers, but are intended for general guidance and represent the average range of dosage suitable for adults. *B.P.* doses are a useful guide for the pharmacist in checking quantities prescribed. As in the new *Martindale*, doses are now given in the metric system and the titles of the monographs are no longer in pharmaceutical Latin, but in English. The *B.P.* is drawn up by the British Pharmacopoeia Commission, of which Professor Dunlop, of Edinburgh, is chairman. Approved names for new drugs are devised or selected by the Commission from time to time. The permission given in certain monographs for the addition of a suitable colouring agent to the coating of tablets is an innovation.

The *British Pharmaceutical Codex*, familiarly known as the *B.P.C.*, was originally produced in 1903 by the Council of the Pharmaceutical Society as a book of reference for those engaged in prescribing or dispensing medicines. The need for a book of standards for drugs and preparations not in the *B.P.* became increasingly apparent, and the provision of such standards has become an important function of the *B.P.C.* The inclusion of a drug in the *B.P.C.* is now regarded as an indication that it is of value, or is an established constituent of a useful preparation. The monographs give a description of the drug, its sources or preparation, physical properties, a critical summary of its pharmacological action and uses, dosage, conditions for storage, and the treatment of poisoning through overdosage. Like *Martindale*, the *B.P.C.* continues to be a reference book of the greatest value in the practice of medicine and pharmacy. Its object is to describe all new drugs which clinical evidence and experience have shown to be useful. A new edition is due to appear next year. The many new compounds produced by a very active pharmaceutical manufacturing industry will provide ample material from which to select drugs for the new edition. A valuable part of the *B.P.C.* is the formulary section, which gives details of the preparation of a number of prescriptions and tablets.

The *British National Formulary*, which is produced by the Joint Formulary Committee of the B.M.A. and

that of American medical schools. Finally, a student does not graduate M.D. until after a year of rotating internship, during which he also has to write a thesis.

Departments Visited

Because of the impending move into a permanent centre, the University has been reluctant to spend money on the erection of large temporary buildings. Equipment, however, is freely transportable; there is therefore the paradox of inconveniently small and overcrowded departments magnificently provided with the latest American equipment.

Both the Anatomy and Pathology Departments have great difficulty because of religious objections to the examination of the cadaver. Consequently, eight or more students may work on a single body for the whole year, and this number was once as high as 20. Nevertheless, the students I met appeared to have at least as thorough a knowledge of topography as any of my Oxford contemporaries. When the Department first started there were only brains to study; it is now the custom to start dissection with the C.N.S. as an example in anatomical method and always to refer back to it. There is unfortunately very little emphasis on surface or surgical anatomy. The Histological Laboratory is furnished entirely with round tables centrally lighted, seating eight students. This attractive system saves space and makes for easy demonstration.

Physiology and biochemistry are taught as separate "block" subjects, and lead easily into the pharmacology of the fourth year. The all-purpose changeable laboratory for these subjects is makeshift and clearly inadequate at present. The departments are extremely well equipped and actively engaged in research. While the lecture syllabus is very full, the practical course is still unfortunately based mainly on animal experiments, and there is no adequate course in *human* physiology. Staff difficulties are common; usually one man in six is out of the country on a research grant; and all personnel must do one month each year in the Army. These factors, coupled with occasional illness, contribute to periodic overloading of the teachers.

The Pathology Department is very modern: it has a room for pathological photomicrography and an excellent small departmental library. Students have to master about 400 slides, and appear to receive a very thorough training. Museum facilities, however, are still poor. The Department runs the biopsy (about 7,000 a year) and necropsy (about 300 a year) services of Hadassah; it also teaches medical and dental students, engages in research, and holds weekly clinico-pathological conferences and sessions with many special departments—for example, thoracic, paediatric, and neurological].

The present clinical school has found temporary accommodation in a large polyclinic building and a series of hospitals not designed for teaching, but tolerably near each other. The wards are small and crowded; a ward with 10 beds would in London have only six. Neurosurgery and cardiac surgery are performed in Jerusalem and Tel-Aviv. In one small shed in the grounds of the Beth Hadegeel Hospital were a ballistocardiograph, for which students are research subjects, and all the apparatus necessary for cardiac catheterization. This housing of difficult techniques in small sheds is a characteristic paradox of life in Israel to-day, but should be unusual within 10 years.

The selection of clinical material was quite excellent, comprising the whole range of London hospital medicine as well as infestations and infections seldom encountered there. All patients are very thoroughly investigated and students are expected to be absolutely *au fait* with their own four or five patients. Students are responsible for routine blood counts, urinalysis, and microscopy, and the students' notes are official and are consulted along with those of the intern. This system gives clinical clerks a more possessive attitude to their patients and allows students to feel that their views are important and that the hospital would be the worse off without their work.

Hadassah Social Medicine Centre at Beth Mazmil

The emphasis on a scientific and research attitude to medicine is so great that it sometimes surprised me that students seemed to know their patients so well. The new Social Medicine Centre should counteract the tendency to forget the individual patient within the welter of investigations. It is described in some detail because social medicine is paid so much lip-service in Britain while so little is done outside of special postgraduate units. This centre was set up by a South African and an English doctor who aimed to do first-class general practice which would be as good as the best in their own countries. Special emphasis had to be placed on the preventive approach and on research. The population to be cared for consists of about 5,000 people who are largely new immigrants and range from destitute Moroccans to Anglo-Saxon intellectuals. All these people have been recently rehoused in a new estate in the Beth Mazmil suburb of Jerusalem.

The Centre itself is financed by Hadassah and has just moved to ample and pleasant new buildings. The staff of the Centre includes six G.P.s, of whom three are usually away (Army or study leave or illness), eight to ten well-trained nurses, a psychiatrist, psychiatric social workers, and an anthropologist. An infant welfare clinic and a birth control clinic are run from the main building. This last was less popular when two of the doctors became pregnant! While the doctors must have the exclusion and treatment of organic disease as their first concern, they are always on the *qui vive* for disease of psychosomatic origin. Psychosomatic illness is extremely widespread in Israel, presumably because of the horrors of the background of many immigrants and the daily stress of life in a new and pioneering country. The Centre has resident nurses who are each responsible for about 300 families, and it is therefore able to tackle this type of disease quickly and easily.

At the moment, students go out for lecture-demonstrations. They are allocated families to follow, usually including at least one with a pregnant mother where they can later study neonatal growth. In one or two years' time, when the Centre is fully on its feet, students will each do about three weeks of full general practice under supervision from the Centre. They may also participate in the research projects that are run from the Centre.

New Centre: Future Plans.—With regard to Mount Scopus, Hadassah has cut its losses. It has already started to build an enormous new centre in Ein Karim, a western suburb of Jerusalem, to hold schools of medicine, dentistry, pharmacy, and nursing, a library, a polyclinic, and 550 teaching beds, to be expanded later to 900. This scheme should be finished by the end of 1958, and is already ahead of schedule. It will be the main postgraduate medical centre of Israel.

Topics in Medical Education

Student Selection

The current joke of the Medical School is that the Hebrew University must be the most antisemitic in the world. Only 60 students are selected from about 300 applicants, and the University is not anxious to train students other than Israeli citizens or foreign students who have definitely immigrated and are still under the age of 21. At first the Medical School accepted those who had done their preclinical work elsewhere, but now acceptance is for the first year only. Three years ago 30% of the students were women, now only 6%. Private practice in Israel is more difficult to obtain even than in England, and consequently women are as unlikely to lead a full professional life there as they are in England. There is, however, no strict quota system, and women who are academically very good will be accepted. Money is not a factor in student selection: the School disburses £1,50,000 (£10,000 sterling) in scholarships, mainly provided from outside, and each diploma costs the School about £3,000.

Assessment

Curricula

Hospital appointments are nearly always full-time, and even a very senior chief will have only about six hours a week for his private practice. This increased time in the teaching hospital and the other factors of familiarity with students make examinations largely a formality. The teacher usually knows more about his students than an examination can tell him. Formal records are kept and examinations are held, but most students know they will pass. One student felt that there was "no feeling of competition to put out another student" as at her American university, but she "had to work very hard to keep up." In the final examination there are no formal written papers, but the detailed differential diagnosis has to be written and discussed in the clinical examination. Objective-type papers are not used.

Clinical Curricula of Two Students Chosen at Random

5th Year—In-patients		6th Year—Out-patients	
Surgery	6 weeks	Internal medicine ..	4 weeks
Tuberculosis ..	3 ..	Gynaecology	3 ..
Preventive medicine ..	3 ..	Dermatology	3 ..
Internal medicine ..	12 ..	E.N.T.	3 ..
Obstetrics and gynaecology ..	8 ..	Physical medicine ..	2 ..
<i>A choix</i> (extra medicine in Jerusalem) ..	4 ..	<i>A choix</i> (Kaplan Hospital, Rehovot) ..	4 ..
Holiday	8 ..	Psychiatry (residence in mental hospital) ..	4 ..
Paediatrics	8 ..	More neurology and internal medicine ..	4 ..
	52 ..	Radiotherapy	2 ..
		Ophthalmology	3 ..
		Military medicine ..	2 ..
		More surgery and paediatrics	5 ..
		Social paediatrics (antenatal work)	1 week
		Holiday	2 weeks
		Final examination ..	1 week
			41 weeks

Comparison with the English Curriculum

Psychology is more emphasized and is taught earlier than in Britain. Parasitology is very important and is taught in detail. However, students will conduct only about eight deliveries themselves (the obstetrician delivers babies), and they have no undergraduate training in anaesthetics. Paediatrics is very much emphasized: Israel is a growing country with a lot of children, and the care of these is in any case a major national obsession. The system of two months' work *à choix*—in Jerusalem or elsewhere—is attractive: choices varied from extra neurology in Tel-Aviv to a month with the G.P. on a communal settlement or in Beer-sheba among the Bedouins. Time spent on preventive medicine includes trips to factories in Haifa and to restaurants and sewers locally; there are seminars on such diverse subjects as the social incidence of tuberculosis, prostitution, and coronary atheroma.

Integration

Integration, if not a nasty word, is certainly a thorny problem. All agree that more is needed, but nobody is sure of how it should be done. Attempts are frequently made: a paediatrician lectures on neonatal growth and takes students to his wards during the anatomy course, and there is an x-ray machine in the anatomy department. Neuro-anatomy and neurophysiology are taught together, and the teaching in histology is of a functional character. Physiology, biochemistry, and pharmacology will eventually be integrated, at least in practical work. There is also discussion of a projected bioclinical course to give more basic science in the last two years. Clinico-pathological and clinico-radiological conferences and weekly hospital staff meetings are popular. Dr. Prywes, however, does not believe in full clinical-preclinical integration; instead he is concerned to try to get surgeons into the anatomy department and more *doctors* in the preclinical departments in general. He thinks the best method of integration is to encourage a system where teachers have dual appointments in the medical school and in the hospital—and there is a slight tendency towards this.

sterling. The School is prepared to make loans to students. Parental background is not important, and there is obviously no problem about the sons of alumni.

The pre-entrance examination has eight papers—four in science and four in the humanities. A student may be examined in two scientific subjects or in one scientific subject and one other subject. After this examination a hundred students go forward for the interview. Here there are about six teachers, and the object is the same as in other schools. The sub-dean, Dr. Prywes, described his method of interview and explained why he always wanted to know about special interests and hobbies. This was not because they might be of importance in themselves, but in order to test the knowledge claimed and to enable him to judge "how far the student was honest with himself about his hobby and might therefore be expected to be honest about medicine." Round-table arguments among students with teachers watching were discarded because they were technically difficult to arrange and students were shy. There is no discussion, and each selector marks for "in," "in if places available," or "out." By comparing the students' academic results with the original opinions of each selector, it is hoped to obtain over the next few years a group of good student selectors—or, at any rate, good selectors of good examinees—without regard to position on the staff.

The attitude of the Hebrew University to its selections is unusual. If a student fails (failure rates are as low as 3%) it is regarded as the fault of the school that selected and taught that student. Laziness is very unpopular with the faculty, but nevertheless failure without obvious cause is regarded as a slur upon the whole educational procedure.

Atmosphere of Learning

In the conversation quoted at the beginning of this article, both the approachability of the professor and his interest in and enthusiasm for teaching itself are typical of Israel and would be much less generally encountered in Britain. The most exciting facet of Israel for the visitor from abroad—and for the Jew in particular—is the atmosphere of everyone working together to create a new country quickly. Something of the infectious "muck in together" enthusiasm of the country expresses itself in the Medical School. Staff want to teach and students want to learn, both because they are really interested in their subjects and also because they want to produce good doctors for their country. Consequently staff-student relationships are amazingly informal with very few exceptions, even though not quite on first-name terms.

In the new buildings, staff and students will sit together at meals. Any problem can be discussed easily with any teacher, even with the professors. This type of relationship means that the retinue of registrars and housemen and the unnecessary formality of many English chiefs' rounds can be dispensed with and that students can learn much faster in this atmosphere. Much more emphasis is placed on the bedside tutorial and on the weekly seminars where staff and students can sit comfortably and discuss any problem which may arise during the week about the condition and treatment of particular patients. Unfortunately, I did not speak enough Hebrew to benefit from attending one of these seminars, but students assure me that these are very lively, popular, and instructive two-way procedures.

The Israeli student is as old as his English contemporary, but there the similarity ends. Often he is married; he may have one or more destitute relations to assist in supporting; he will usually take a laboratory job—at any rate during his clinical years; and, above all these major differences, he is passionately interested in medicine. He arrives at the hospital at about 8 a.m. and he might not leave it until 12 hours later; he works extremely hard. It is, of course, a pity that he should have to take these jobs, but it is agreed that these paraclinical jobs supplement formal teaching. He is said to miss a lot of the fun of student life and to be the worse for the lack of it. If so, I did not notice it and I enjoyed his company.

The General Medical Council has virtually given a free hand to the medical schools to reorganize the curriculum, and while experimenting there can be little harm in trying methods used in other countries.

The time has come to realize that the clinical student is no longer a schoolchild but an adult at one of the most impressionable periods of life, and, while the majority of teachers appreciate this, there are still many people who believe that those on the very bottom rung of the ladder should be seen and heard only when spoken to. The transition from student to doctor should be almost imperceptible, not suddenly on obtaining some letters after one's name.

Nova et Vetera

GRAY'S ANATOMY THE FIRST HUNDRED YEARS

Biologically, survival for a hundred years is sufficiently rare to be regarded as a curiosity, but in the world of books there are creations so timeless as to be unaffected by a century more or less of human regard. *Gray's Anatomy*, which was first published on September 1, 1858, can by no stretch of the imagination be included among these immortals. In earlier times, when age lent authority to medical as well as theological doctrine, it was commonplace for students to be examined on texts almost as ancient as their own civilization. That the same work should have served so many generations of medical students in a century which has seen greater advances in medical knowledge than had the thousand which preceded it is so extraordinary a fact as to rank with the curiosities.

What is the reason for it? Has anatomy stood still while all else has been on the march? Or is it so little regarded that the same manual which instructed our great-grandfathers will serve for our sons? What is so special about this book, that, in an age and in a department of knowledge where the very latest information is eagerly sought, it should reach the solitary eminence among current textbooks of celebrating its centenary? The answer must be that, like other centenarians, it owes its survival to the intelligence and skill with which it has been treated, at critical times, by its medical attendants, in this case a succession of distinguished editors and gifted draughtsmen. They have amputated, excised, grafted, and injected to such effect that Gray himself would regard with amazement the prodigy which has grown from his own modest offspring, although a closer inspection would enable him to recognize its original features.

Henry Gray

The son of a Court Messenger, Henry Gray was born in 1827 and enrolled as a student at St. George's in 1845. Painstaking industry, rather than brilliance, won him an important prize from the Royal College of Surgeons in 1848, and at the age of 25 he was elected a Fellow of the Royal Society, a distinction less notable then than it is to-day. For a dissertation "On the structure and use of the spleen" he was in 1853 awarded the Astley Cooper prize of 300 guineas. He was, then, a young man of promise and some achievement—but not the greatest or even the most knowledgeable anatomist of his day—when he set out to provide the student, within the covers of a single volume, all that he needed to know of human anatomy in order to pass his examinations and to practise competently as physician or surgeon.

His duties as demonstrator and lecturer on anatomy at St. George's, and as curator of its museum, gave him the experience and material necessary for such a work. Within his own circle of friends and colleagues he was fortunate in

having a first-class draughtsman, Henry Vandyke Carter (1831-97),¹ who had also held the post of demonstrator of anatomy at St. George's, and an unusually skilled literary mentor, Timothy Holmes (1825-1907),² who was also a surgeon-anatomist. Gray's debt to his illustrator is plain for all to see, and the early success of the book has been attributed to the excellence of Carter's drawings. Of these there were 363 in a volume of 750 pages. The greater part of them were entirely original, but some were borrowed—with acknowledgment—from the works of Quain, Arnold, Breschet, Mascagni, and others, the black-and-white of the woodcuts being relieved by colour only in the sections on the blood vessels, where blue and red indicate veins and arteries. The order is similar to that of modern editions,



FIG. 1.—Henry Gray (1827-1861), from an original photograph taken by Henry Pollock. By courtesy of the Wellcome Historical Medical Museum.

but sections originally dealt with separately are now grouped together under the comprehensive headings of angiology, neurology, and splanchnology. Notable by their absence are the now familiar introductory sections on histology and embryology.

The publisher, John W. Parker, included many of the great Victorian authors in his list. He was printer to Cambridge University and is remembered for the introduction of the steam-press against considerable opposition, especially when it was employed in printing Bibles, a proceeding regarded as faintly sacrilegious. His imprint also appeared on the second edition in 1860, but in 1863 he retired and sold his business, with all his copyrights, to Longmans, whose name is found on the title-page of Gray's third edition in 1864.

Work must have begun on a second edition almost immediately, for it was published at the end of 1860 with a number of revisions and corrections by Gray and with 32 additional illustrations, 27 of them from new and original drawings by John Guise Westmacott (1811-84). This was the last edition for which Gray himself was responsible. In June, 1861, while attending a nephew suffering from small-pox, he contracted the disease and died within a week. He was 34.

Later Editors

It was fortunate for the future of Gray's book that his friend Timothy Holmes, who had just begun publication of his *System of Surgery*, agreed to take over the third edition, which was published by Longmans in January, 1864. Few changes were made at first, but for the fifth edition (1869) Holmes supplied an introductory section on general anatomy and development "so as to furnish the student with a very succinct, but it is hoped sufficient, introduction to Microscopic Anatomy." He also included a description of the ovum and structures characteristic of the foetal state, "a subject passed over in previous editions." As he thought it

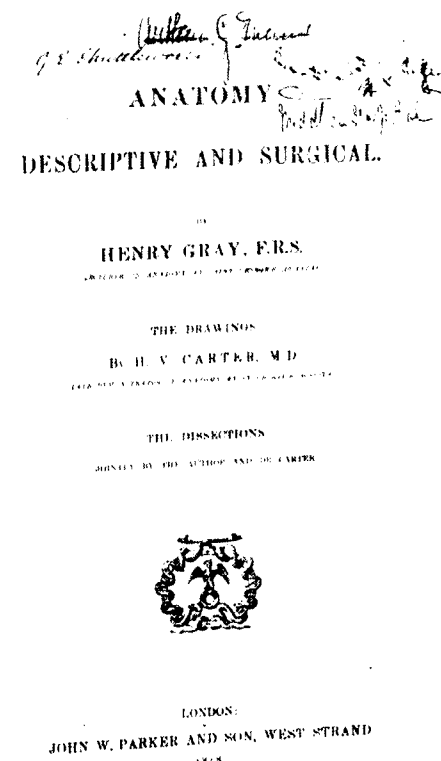


FIG. 2.—The title-page of the first edition, from the copy in the Wellcome Historical Medical Library.

"useless to manufacture new drawings" to accompany this additional text, suitable illustrations were borrowed from Kölliker, Tedd, Bowman, and others. In subsequent editions, until the ninth (1880), the last which he edited, Holmes continued to pay particular attention to the section on histology, and additional illustrations were added from the Klein's *Handbook for the Physiological Laboratory* and the same author's *Atlas of Histology*. The section on visceral anatomy was also thoroughly revised with the aid of Professor Darling, of New York, and the account of the anatomy of the kidney was rewritten by E. J. Spitta.

Even when Holmes felt that it was time for him to hand over his task to another the link with Gray was still unbroken, for the new editor, Thomas Pickering Pick (1841-1919), was not only a St. George's man but had actually learnt his anatomy from Gray himself. Under his care the stately progression of editions continued unabated, each larger and more comprehensive than the one preceding. The tenth edition (1883) had some new drawings made from fresh dissections carried out at St. George's; the thirteenth (1893) drew on the resources of the Hunterian Museum of the Royal College of Surgeons and new dissections were

made there by Professor Pearson, who also helped in the preparation of the drawings, some of which were printed in colour. Pick retired in 1900, but he collaborated with his successor, Robert Howden (1856-1940), in preparing the 15th and 16th editions (1901, 1905). To judge by the glowing portrait of Howden, written by the late Professor Grey Turner when Howden died, he was a very different character from Pick. Howden, who was professor of anatomy at Durham University, "made the subject of anatomy of living and surpassing interest" to his students. Pick "was rapid and correct, but not very inspiring, for he followed the lines of *Gray's Anatomy* so closely that he was popularly reputed among the students to know that elaborate treatise by heart." Pick had introduced the use of rather unsatisfactory half-tone blocks into the illustrations. In the 16th edition (1905) a return was made to woodcuts and line drawing, ostensibly "to lighten the weight of the book," which now had 1,248 pages and 811 illustrations. In the course of his 25 years as editor of the *Anatomy* Howden carried out innumerable dissections for the purpose of new illustrations and constantly strove to keep the book up to date. According to Sir Thomas Oliver, "when he was about to bring out a fresh edition he had the artist for weeks by his side in the college, so careful was he about the minutest details." It was at Grey Turner's suggestion that a reminder of its original author was given to the reader in the 23rd edition (1926), the last which Howden edited, in the form of a brief biographical memoir and portrait of Gray.

It would take up too much space to name all those who have had a part in producing the various twentieth-century editions. The book has followed a parallel course in America, where one of its most important editors was W. W. Keen. When Professor T. B. Johnston, of Guy's Hospital Medical School (later assisted by Dr. J. Whillis), took over the editorship from Howden in 1930 the book was again drastically revised and partly rewritten, and the 24th edition of that year had grown to 1,466 pages and 1,301 illustrations, of which 607 were coloured. The Centenary Edition—the 32nd—which is noted elsewhere in this issue, must therefore be looked upon as the mature product of many minds and many hands. A close analysis would enable us to determine exactly how much of Gray is left in it, but it would be a pointless task. He was once the author of a book, but he might more truly be regarded as the founder of an institution.

F. N. L. POYNTER.

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- ¹ For an account of his subsequent career and a portrait see Bishop, W. J., *Med. Biol.* III., 1954, 4, 73.
- ² *The Dictionary of National Biography* and *Plarr's Lives of the Fellows of the Royal College of Surgeons of England* have good biographical accounts of Holmes.
- ³ *Brit. med. J.*, 1940, 2, 885.
- ⁴ *Lancet*, 1919, 2, 499.
- ⁵ *Ibid.*, 1940, 2, 826.

"It has always seemed to me that the best of all ways to convey an idea is with chalk. Not only does the speaker get a doubling of the receptive channels—the visual added to the auditory—but the progressive adding of each element to the structure of the drawing drives home, piece by piece, a thing not quickly or completely grasped as a whole from a previously prepared, complete drawing. In teaching the medical student the primary requisite is to keep him awake; obviously you cannot teach anything to a sleeping man. Like the exhaust of the airplane the patter of words of a read paper is soporific. Chalk-talking arouses the drowsy. When a late-hour student seemed to be on the verge of succumbing, he could be brought back by speeding up the drawing or by changing to a correlated subject. For example, the sleepy student could not resist a chalk demonstration of tracheotomy, in which the patient, first shown as apparently dead of asphyxia, is changed by a few strokes to a smiling, grateful patient, and is quoted as saying, 'Thank you, Doctor Jackson.'" (From *The Life of Chevalier Jackson—An Autobiography*. Macmillan Company, New York, 1938.)

At present there is no quota for medical students in the University of Oxford: the preclinical entry is about 75 per year, of whom about 12 may be women. Some of the colleges have formed themselves into groups for the purpose of considering applicants to read medicine, and the following extracts from the *Oxford University Gazette*, June 13, explain the position: "University, Balliol, Trinity, St. John's and Jesus Colleges and St. Peter's Hall will act as a group

Even with the development of these new academic departments for teaching and research, and the provision of an increased number of teaching beds in the Radcliffe Infirmary, the university does not intend to increase the size of the clinical school, which will remain limited to an intake of 32 a year. The majority of the students are drawn from the preclinical departments of the university, but some are admitted from other universities. In the past all external students have read for the degree of their parent university. Most will continue to do so, but a university statute now makes it possible for selected students from other universities to apply to take the Oxford B.M. degree without having taken the preclinical course at Oxford or the Oxford B.A. Students from other universities in the United Kingdom and overseas who apply to read clinical medicine in Oxford and take the Oxford B.M. under the new regulations must have spent three years in the study of the preclinical sciences, have passed an examination equivalent to the first B.M. in anatomy and physiology, and have obtained an honours degree in the arts or sciences.

The aim of the university in limiting the number of clinical students is to ensure that each gets the maximum amount of personal instruction so that the scientific approach to the problems of medicine and the habit of independent thought, which is the hallmark of the honours course in physiology, can be fostered during the period of clinical study. The small size of the school makes it possible for each student to have a personal tutor and ensures that all have direct access to a large number of patients. Now that the pre-registration year has become part of the training of a medical student a further advantage that accrues from limiting the intake is that almost all who qualify from the United Oxford Hospitals can be sure of obtaining a pre-registration post in their own teaching hospital.

Cambridge

At the University of Cambridge the number of candidates wishing to study medicine continues to exceed the number of places available, and all college entries are subject to a university quota.

Two changes have been made in the regulations for the final M.B. examination. The first relates to the period of clinical instruction in midwifery and gynaecology. The regulations are amended so as to specify requirements of (a) six months' instead of three months' clinical training; (b) two months' instead of one month's residence in a maternity hospital; and (c) instruction in antenatal and post-natal care. Students who began their clinical training before October 1, 1956, however, will be allowed to proceed to the final M.B. examination on producing evidence satisfying the midwifery and gynaecology requirements previously in force.

The second change is designed to permit undergraduates who by the end of their second year's residence have obtained honours in the natural sciences tripos and have qualified in anatomy and physiology and who wish to undertake a course of non-medical study during the third year in Cambridge, to take the final M.B. examination at the same time as their contemporaries who devote three years to the tripos and qualifying examinations. The requirement that a candidate for either part of the final M.B. examination shall produce evidence of having completed five years of medical study has been amended to restrict the requirement to Part II only of that examination. The Cambridge medical student normally completes three of these five years as an undergraduate in residence, and on October 1 following graduation begins clinical studies at a recognized hospital. If, in the circumstances mentioned, the third year is devoted to non-medical study the student will begin hospital training with two years' medical study only to his credit, but will be allowed to count as part of his third year of medical study after graduation the period of three months during which he attends the long vacation course in elementary clinical methods. He will then be able to take Part I of the final M.B. (pathology and pharmacology) in the December of his third academical year at hospital and Part II (medicine, surgery, and midwifery and gynaecology) in the following June, if he begins hospital training in the July immediately following his qualification for the B.A. degree either in his clinical school or by taking the long vacation course in clinical methods in Cambridge.

TEACHING-HOSPITAL CENTRES IN ENGLAND AND WALES

Birmingham Medical School

The number of applicants wishing to enter the University of Birmingham Medical School greatly exceeds the number of places available, and requests for admission should be made by April of the preceding year for entry to both first- and second-year courses. Applicants in the United Kingdom are interviewed as soon as possible and told the result of the interview within a few days. There are 14 places available annually for first-year courses (students from the Colonies or Dominions are generally required to enter upon

first-year courses), and about 100 places per annum for men and women for second-year courses. Ten scholarships are available for selected students to spend an extra year to take the B.Sc. course in the honour school of either anatomical or physiological studies. Students from Oxford, Cambridge, and other universities are encouraged to study clinical subjects at Birmingham. Two interesting scholarships provide the opportunity of spending three months in residence in either East or West Africa, principally to gain experience in tropical medicine, although part of the time might be spent in some other clinical department. Advanced clinical students may spend some time with selected general practitioners, and a prize has recently been instituted as an award for an essay bearing on some topic of general practice.

The entire curriculum is under review, and an attempt is being made to integrate, so far as possible, the teaching provided by the several departments.

The library service within the medical school is an excellent one in that not only have students access to one of the largest collections of up-to-date medical literature in the provinces, but the resources of the whole university library are open to them. Sport at Birmingham is organized by students through the Guild of Undergraduates, and students may join, without further subscription, any of 30 clubs. Sailing and rowing excepted, all facilities lie within 400 yards of the medical school.

New Teaching Hospital for Sheffield

The recent laying, by Queen Elizabeth the Queen Mother, of the foundation stone of a new out-patient department for the United Sheffield Hospitals seems to indicate definite progress towards the ultimate provision of a complete new teaching hospital. New university building has not so far greatly affected the Sheffield Medical School, although a generous grant from the Rockefeller Trustees has furthered the activities of the department of microbiology. Assistance from the Sheffield Town Trustees has enabled the university to take a larger share in developing the department of psychiatry, while the building by the United Sheffield Hospitals of the new Whiteley Wood Clinic (an extension of the idea of a psychiatric wing within a general hospital) has also greatly assisted the department.

The discussions regarding the curriculum, referred to last year (*Journal*, September 7, 1957, p. 575), are expected to bear fruit next summer in the shape of considerable changes in the clinical part of the course. The arrangements for the various clerkships and dresserships will be modified, the orientation towards examinations and the timetable will be considerably altered, and two "elective periods" will be introduced. Partly in order to assist the students in the arrangement of their work during these periods, Dr. I. B. Sneddon has been nominated as director of clinical studies. A pilot experiment relating to the development of a tutorial scheme already shows much promise of success. Professor R. P. Jepson has resigned from the chair of surgery to go to Adelaide University; Professor W. Hobson from the chair of social and industrial medicine to take up a W.H.O. appointment in Copenhagen; and D. J. Pemberton from the same department on his appointment as professor of social medicine in Queen's University, Belfast. The future of the department of social and industrial medicine in Sheffield is now being considered by the university.

Liverpool's New Medical School

At Liverpool University the outstanding event of the year was the official opening of the new medical school by Queen Elizabeth the Queen Mother, an account of which was given in the *Journal* of May 17 (p. 1172). The new building houses the research laboratories of the departments of medicine, obstetrics and gynaecology, pathology, bacteriology, pharmacology and general therapeutics, and radiodiagnosis, six tutorial classrooms, three lecture theatres, two large class laboratories, museums, the dean's offices, a staff common

room, and a committee room. 91 new students were admitted to the M.B. course last October, and of these 42 entered the first year and 49 the second year. The number of applications for admission is slightly fewer than in previous years, but competition is still keen and a full complement of students will begin their studies this October. There have been no changes in the requirements for exemption from the first M.B., and passes at the advanced level in chemistry, physics, and biology (or botany and zoology) are still needed. The General Medical Council's new recommendations on the medical curriculum are receiving attention, but no changes have as yet been made.

A full-time readership in medicine has been established, and Dr. C. A. Clarke appointed to the post. Professor T. N. A. Jeffcoate is visiting Canada, U.S.A., and the West Indies as Sims-Black Commonwealth travelling professor in obstetrics and gynaecology. Professor R. M. Gordon, who has been a professor in the Liverpool School of Tropical Medicine since 1930, is retiring from the chair of entomology and parasitology after long and distinguished service, and Mr. A. McKie Reid from the post of lecturer-in-charge of the department of ophthalmology. Also, during the session Dr. Robert Coope, Mr. Hugh Reid, and Mr. John McGibbon have retired after long and devoted service as teachers in the clinical school.

Department of Psychiatry at Leeds

At the Leeds University new premises for the department of psychiatry were opened in January. They are in Hyde Terrace, adjacent to the department of biochemistry. Three large houses have been converted for the use of the department and provide administrative, library, research, and teaching accommodation, and also accommodation where patients can be seen. While it remains the long-term plan to provide this accommodation within the teaching hospital, in the meantime these new premises add greatly to the facilities available to the department. The building of the Martin Wing of the teaching hospital is well advanced and it is hoped that the full-time professorial units of medicine and surgery will be able to move into their new accommodation before the end of the coming session.

No major changes in the curriculum have been made during the last year, nor are any likely in the immediate future, though consideration is being given to entry requirements and the content of the premedical part of the course. There has been only a small reduction in the number of applications for entry, which continue to exceed the number of places available.

New Regulations at Manchester

The most important change is that new regulations have been introduced for the first M.B., Ch.B. examination. From October candidates who have passed in chemistry, physics, and biology (or zoology) at the advanced level of the G.C.E. will be entitled to exemption from the first M.B., Ch.B. examination and eligible for admission to second-year courses. Such candidates will be able to complete the full course for the degrees of M.B., Ch.B. in a minimum of five years.

A pilot scheme has been introduced to provide additional opportunities for students to obtain training and experience in general practice. With the help of the local Faculty of the College of General Practitioners, students have been attached to selected general practitioners, and the scheme has been very successful.

Residential Accommodation at Durham

At Durham University the extensions to the department of anatomy and to the animal house are nearing completion, and the additional accommodation which they will provide should be ready for occupation by the end of September. As part of the general college plan to provide more residential facilities for students it is hoped to start work next year on a new hall of residence for 225 male students, while in the near future conversion and additions to the present

buildings should provide accommodation for an additional 80 women students. King's College has also rented a large hostel from the Ministry of Pensions and National Insurance which, after renovations have been completed, should accommodate an additional 500 male students by next October. The hostel will be known as the Eustace Percy Hall, after the late Rector of King's College.

Once again the Medical Students' Council has been most active in representing the interests of medical students both in the college and on the British Medical Students' Association. Mr. Peter G. Wood has been elected president of the British Medical Students' Association. The Medical Athletic Union and the Medical Society completed a full programme of sporting events, visits, lectures, and social activities.

Bristol's Plans

The planning of the new medical school at Bristol University has been completed, and building is expected to start in the autumn. The number of applications for the undergraduate course in medicine has remained at the same high level as for the last several years. Major alterations are now taking place in the teaching hospital to improve the clinical facilities and accommodation for students. Some modifications in the medical curriculum have been introduced, mainly with the purpose of allowing a greater amount of voluntary attendance in lecture courses.

Welsh National School of Medicine

The school sustained last year a serious loss in the death of Lord Aberdare, its president for many years. The court of the University of Wales has elected Sir Clement Price Thomas to succeed him.

During the past year the details of the schedules of accommodation for the new teaching centre in Cardiff have been agreed with the Welsh Board of Health. It may be some time before building can start, but there is every hope that an architectural competition will soon be announced for a centre where educational and hospital accommodation is to be completely integrated. In the meantime the school is proceeding with the building of a dining hall and library, which will have the effect of improving amenities for students. Additional houses have also been acquired, so that hostel accommodation will be adequate for all those who desire it. The school authorities, like many others, are engaged in revising the curriculum, but, although it is not likely that this will be completed for some time, improvements are being made especially in the direction of correlating teaching in the different departments. The student health service of the University of Wales, which is administered by the medical school, is extending its activities, and it is hoped to provide more and better accommodation.

During the past year a careful review of the pre-registration appointments in the Welsh Region has been made, with a view to ensuring that times spent in them is a real extension of medical education, and for this the co-operation of the regional consultants is being enlisted. The school has received many visits from visiting societies, and the lectures in connexion with these have proved stimulating to both undergraduates and postgraduates. Invitations have also been received by several members of the staff to visit countries and universities abroad, which the school regards as a most valuable means of extending its influence and reputation.

SCOTTISH SCHOOLS

Edinburgh University

At the University of Edinburgh the past year has been one of continuing activity. The number of applicants for admission to the M.B., Ch.B. course this year remains high in relation to the number of places available. Those applying for admission for the course beginning in October, 1959, should submit their applications to the dean of the faculty by December 31. A limited number of undergraduate

bursaries and scholarships are available to students in the faculty of medicine for advanced courses of study—for example, an honours course of instruction for the B.Sc. degree.

Extensions at Glasgow

At Glasgow University plans are well advanced for the building which will house the new department of virology and also an extension to the genetics department. It is hoped that the new building will be available for occupation in two years' time. A start is expected to be made this year on a new unit for experimental surgery. The number of applications for admission to the medical school is very similar to that of last year. It is still in excess of the number of available places. The most important staff changes are the promotion of ordinances for the institution of chairs in orthopaedics and in infectious diseases. The junior teaching staff has been augmented by several additions in the lecturer grade.

Aberdeen University

At Aberdeen University the curriculum for the degrees of M.B., Ch.B. extends over six academic years. Courses in the premedical and preclinical subjects are given in departments located in Marischal College and in Old Aberdeen, which provide instruction for science as well as medical students. Laboratory and lecture courses in the three clinical years are conducted in the university buildings on the Foresterhill site, where the main hospitals are, and clinical instruction is given in all the hospitals in Aberdeen. The number of students for admission continues to tend to fall, but it is still above the number of places available. An increasing number of applications are coming from overseas students in various parts of the Commonwealth.

During the year a building to accommodate a special research department in clinical midwifery was completed and opened officially in April. It is staffed by the Medical Research Council, and its honorary director is the professor of midwifery. Plans have been prepared for a new medical physics building on the Foresterhill site, but work on it is unlikely to start until early next year.

A new medical ordinance promoted by the four Scottish universities has been approved. It permits certain candidates for admission to the medical faculty to sit the professional examination in physics, chemistry, and biology without attending university classes in these subjects. Each university can make regulations for this purpose, but so far the University of Aberdeen has not done so. They consider that the time has come to review as a whole the ordinances which govern medical education in the four Scottish universities. These were made as long ago as 1911 and are so restrictive in character that they interfere seriously with the prevailing mood of medical educationists in seeking experiment. It is proposed that a conference of the Scottish universities should be held early next term to consider the question of preparing new ordinances.

St. Andrews University

In the school of medicine of St. Andrews University instruction in the subjects of the clinical years of study is given in Dundee, while the premedical and preclinical subjects can be studied either at St. Andrews or at Dundee.

The annual intake of students to the faculty of medicine is limited to between 70 and 80 to ensure that the hospital facilities available are sufficient to allow of adequate clinical instruction being given to each undergraduate. The laboratory accommodation in both preclinical and clinical years has been recently extended and provides excellent facilities for students. There are at both centres excellent student residences which accommodate undergraduates from all or any of the faculties. Medical students in their early years are encouraged to reside in these, so that there is a width of contact among the undergraduates which is found to be of great educational value.

NORTHERN IRELAND

Queen's University, Belfast

The combined clinical course—a modified integrated curriculum—now enters upon its fifth year, and a committee has been sitting to review its results and to suggest modifications in the light of the new and more elastic recommendations of the General Medical Council. A new geriatric unit has been provided in one of the general teaching hospitals, and a new unit for the department of mental health in the same teaching hospital will be opened in the new year. The policy of attaching maternity students to general practitioners during part of their residential period has been most successful.

Professor Alan Stevenson has left to go to the Medical Research Council unit at Oxford and Professor J. Pemberton has been appointed to the vacant chair of social and preventive medicine. Dr. John Dundee, a Belfast graduate, has returned to head the new department of anaesthetics.

MEDICAL EDUCATION IN EIRE

Trinity College, Dublin

The entry of students has been restricted so that the numbers in the clinical years will probably not exceed 50 in future. The chairs of medicine and surgery are now full-time appointments. Clinical tutors in medicine and surgery have been appointed in the hospitals attended by school of physio students, under the direction of the clinical professors. Special arrangements for the teaching of paediatrics and for clerking in this specialty have been made jointly with the Rotunda and the National Children's Hospital. The professorial unit at the Rotunda Hospital has worked very satisfactorily during the past year.

The laboratories of anatomy, physiology, biochemistry, and pathology have undergone extensive alteration and reconstruction, with new equipment and increased facilities for research. Plans are being prepared for new accommodation for pharmacology. An extension of the chemistry building, now completed, provides greatly improved accommodation for premedical classes. Additional classes and demonstrations in pathology, bacteriology, and clinical biochemistry have been arranged in each of the hospitals; these are directed by the respective professors and carry on the systematic teaching of these three subjects up to the final academic year.

National University of Ireland

The constituent colleges of the National University of Ireland are those of Dublin, Cork, and Galway.

At *University College, Dublin*, the total entry to the first medical year is limited to 100 students, who are admitted on the results of the premedical examination. The maximum number of students admitted from outside Ireland is 20. Before a student may present for the M.B., B.Ch., B.A.O. degrees he must have passed the prescribed examinations having attended the necessary courses—that is, premedical year and five-year medical courses. These courses consist in lectures and practicals given at the college and attendance at clinics in recognized hospitals. In addition to the M.B., B.Ch., B.A.O. degrees there are a number of postgraduate degrees and diplomas, for some of which courses are held. Several new chairs have been established in the medical school for the coming session. There are now two full-time professors of surgery and of medicine. In addition, a chair of microbiology as applied to medicine and a chair of pharmacology have been established, and the appointed professors will have taken up their duties by October.

For some years *University College, Cork*, has restricted its entry to 36 medical students, only two of whom may be from overseas. Selection is made by the premedical examinations. The school has reverted to the six-term period of study in anatomy, physiology, and biochemistry in preparation for the second M.B. The introductory clinical course

has been abolished: instead, the department of physiology provides a course in clinical physiology in hospital during the last term; there is an introductory course in pharmacology; and the student receives instruction in elementary pathology, a question bearing on this subject being included in the professional examination in anatomy. The results of this approach to integration are being watched. Apart from obstetrical and specialist units, there are over 500 acute beds available for clinical study, which follows the lines customary elsewhere. The beds are distributed between three general teaching hospitals. Increasing attention is being given to research. Notable contributions have already been made by the departments of biochemistry, physiology, and anatomy. A gratifying addition to the resources of the department of anatomy has recently been made by the completion of two research laboratories, the cost of which was generously contributed by the Wellcome Trust.

At *University College, Galway*, the course for the degrees of M.B., B.Ch., B.A.O. covers six academic years. Courses in the premedical subjects are given in the college, and courses in the clinical subjects principally in the Regional Hospital, Galway. The latter is a new general hospital of about 500 beds, situated quite near the college. During the session just ended a new building for the hospital's departments of pathology and bacteriology has been completed and come into use, and the formal instruction of the medical students in pathology and bacteriology is now all carried out there. Clinical instruction is also given in the Western Chest Hospital, and in the Western Orthopaedic Hospital at Merlin Park, Galway. These are new hospitals with about 700 beds between them. Clinical instruction in psychiatry is given both in the Central Hospital, Galway, and in the Ballinasloe Mental Hospital. The summer term of the fourth medical year is spent in Dublin chiefly to enable students to reside in an obstetrical hospital for a period of two months. It is hoped that facilities for such residence will be provided in Galway in the near future. House appointments and registrarships are available for graduates in these hospitals.

Royal Colleges and the Apothecaries Hall

The *Royal College of Surgeons in Ireland* admits to the pre-registration classes approximately 100 students each year. The normal method of entrance is by competition in the preliminary examination, but a limited number of places are given to those with exceptional qualifications and to certain students selected through the Colonial Office.

The *Royal College of Physicians of Ireland* is an examining body for the M.R.C.P.I. In addition it forms with the *Royal College of Surgeons in Ireland* the Irish Conjoint Board which grants licences in medicine, surgery, and midwifery (L.R.C.P. and S.I., and L.M.).

The licentiatehip of the *Apothecaries Hall of Dublin* entitles to registration under the Medical Act, 1886. It enables the holder to practise pharmacy, as well as medicine, surgery, and midwifery, which means that he may, if he desires, open a medical hall. This, however, applies only to those who are qualifying to become doctors, not to pharmaceutical chemists. The Hall is an examining body only.

POSTGRADUATE EDUCATION

The universities and medical schools are responsible for most of the arrangements for postgraduate courses and other instruction facilities. Such courses will be found normally advertised in the medical press by the various organizations and authorities that provide them. Courses are for general practitioners (ranking for Ministry grant) are arranged in London by the British Postgraduate Medical Federation (see below); in universities other than London by the deans of the faculties of medicine or directors of

postgraduate studies, to whom application for further information should be made.

BRITISH POSTGRADUATE MEDICAL FEDERATION

The British Postgraduate Medical Federation (University of London) provides postgraduate education in the medical and dental specialties, supplementing the opportunities available at the undergraduate schools and teaching hospitals, and those provided by the three Royal Colleges. All postgraduates, including those from the Commonwealth and Colonial territories, and from foreign countries, may obtain the advice of the staff of the central office of the Federation (18, Guilford Street, London, W.C.1) on programmes of study. In addition to the Postgraduate Medical School of London at Hammersmith Hospital, with its university departments of general medicine, general surgery, and pathology, there are fourteen postgraduate institutes comprising the Federation. The provisions for study made by these are detailed below.

The Federation and its Institutes

Each of the institutes of the Federation is associated with a special postgraduate teaching hospital or with one of the Royal Colleges. The number of students who can be admitted to the clinical practice of these hospitals is limited. Resident clinical appointments are available to suitable students of the institutes and provide the most suitable form of postgraduate education. Selected graduates have opportunity for research. At all the institutes instruction is given throughout the academic year; it is suitable for graduates in the early stages of their specialist education and also for those who have completed their practical training. Two or more years of hospital work in general medicine and general surgery after graduation are normally advisable before beginning work in the special branches. The work at the institutes is of an advanced type and is comprehensive enough to enable graduates with suitable practical experience to prepare for higher degrees and diplomas. Emphasis is placed on clinical and laboratory teaching, supplemented by lectures and demonstrations. Each institute has a reference library and takes the current journals of its specialty.

Most of the institutes run short courses for consultants, and many of them have one-day courses for registrars. Regular programmes of these courses are available for each academic year. Short courses and other forms of continuing education for general medical and dental practitioners and local authority medical officers are arranged at hospitals throughout the four metropolitan regions, with the assistance of the advisers in postgraduate medical and dental education.

Postgraduate students from abroad are advised to make their arrangements well in advance. Those who desire the assistance of the central office of the Federation should get in touch with the director, Professor Sir Francis Fraser, at the address given above, as far in advance of their arrival in this country as possible. Those sponsored by their universities, Governments, or other official bodies receive first consideration in the allotment of vacancies. Established specialists from overseas who are here for a short time, and who wish to see something of the practice of the country, are always welcome; they are regarded as visiting colleagues, and the experts in their specialties are always ready to receive them and let them see the work and teaching being carried on. An information bureau of postgraduate activities in London and other university centres is maintained at the central office.

The Federation awards annually to graduates working in medical and dental schools or teaching hospitals of the University of London a number of travelling fellowships for the purpose of travelling abroad.

Each year the Federation arranges a series of advanced lectures entitled "The Scientific Basis of Medicine." These are delivered at 5.30 p.m. on Tuesdays and Thursdays at

the London School of Hygiene and Tropical Medicine, during the autumn and winter terms.

Postgraduate Medical School of London

The Postgraduate Medical School (Ducane Road, London, W.12) is associated with Hammersmith Hospital. The school is restricted to the medically qualified. It aims at the academic ideal of education rather than teaching, and is directed primarily to the training of teachers and specialists in general medicine, surgery, anaesthetics, pathology, and radiology. The work of the department of medicine is based on advanced clinical studies, supplemented by conferences, lectures, and discussions, with an emphasis on the scientific aspect of investigation and treatment. In the department of surgery the work is similarly arranged for the intimate clinical education of small groups in all aspects of surgery. The organized work of the clinical departments is concentrated into three university ten-week terms, starting in January, April, and October, leaving the vacations for more intensive research work. Research students are accepted for training and practice in methods of clinical investigation. The ordinary practice of the hospital is continuous throughout the year, but those not familiar with the school are advised not to start work in vacation-time. The clinical departments do not attempt to restrict the teaching to the needs of any particular examination curriculum, though it is of the proper standard for those working for higher degrees and diplomas. A year's comprehensive training in anaesthetics is provided. The work of the department of pathology includes a year's course for the university diploma in clinical pathology for which 16 students with pathology experience are selected. The hospital departments of radiology train doctors for the radiological diplomas. All these activities start in October. Many house officer and registrar posts are available in the appropriate departments.

The Specialist Institutes

The Institute of Basic Medical Sciences (Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2) comprises departments of anatomy, physiology, and pathology of the Royal College. It co-operates with other specialist institutes of the Federation in providing facilities for practical work and instruction in basic medical sciences, and provides opportunities for research for selected graduates. Full-time or part-time courses of fourteen weeks' duration, suitable for candidates for higher degrees and diplomas, begin in January and September.

The *Institute of Cancer Research* (Royal Marsden Hospital, Fulham Road, London, S.W.3) comprises the Chester Beatty Research Institute and parts of the departments of physics and radiotherapy at the Royal Marsden Hospital. The institute is concerned with all aspects of research into the causation and treatment of cancer, with the training of research workers in this field, and with advanced teaching in biophysics, radiotherapy, and problems of atomic energy. There are laboratories for chemical, biochemical, and histological investigations into cancer and allied diseases. Facilities are afforded to those wishing to pursue research into the clinical and pathological aspects of cancer or the physical and biological foundations of medical radiology, and who may be working for higher degrees such as the Ph.D. The department of radiotherapy gives a lecture and demonstration course of one week's duration in May and November annually, primarily for doctors from overseas, and accepts candidates to train for the diploma in medical radiotherapy. A course of lectures for students studying for the M.Sc. degree in biophysics commences in October.

The Institute of Cardiology (35, Wimpole Street, London, W.1) is associated with the National Heart Hospital. Six appointments in senior registrar and registrar grades are available in the hospital and the institute to provide specialized training for postgraduates who have already a sound grounding in general medicine. Full-time and part-time courses of instruction of about eleven weeks' duration are held twice annually, starting in April and October, and

two or three short intensive courses of lectures and demonstrations are held each year in February, June, and November; one of these is reserved for general practitioners.

The *Institute of Child Health* (The Hospital for Sick Children, Great Ormond Street, London, W.C.1) is associated with that hospital and with the Postgraduate Medical School at Hammersmith; the Queen Elizabeth Hospital for Children, Hackney, also participates in the clinical teaching. The Province of Natal Model Welfare Centre offers facilities for the study and care of the healthy child. The institute provides tuition throughout the year in three terms of **three** months each; in addition a series of lectures by specialists is given each term. Clinical clerkships are available for selected students.

The *Institute of Dental Surgery* (Eastman Dental Hospital, Gray's Inn Road, London, W.C.1) trains dental practitioners in the special branches of preventive and therapeutic dentistry. For candidates preparing for the F.D.S. of the Royal College of Surgeons, courses lasting eight months are held twice yearly, beginning in October and April.

The *Institute of Dermatology* (St. John's Hospital for Diseases of the Skin, 5, Lisle Street, London, W.C.2) gives clinical teaching daily throughout the year in the out-patient department, and instruction is given twice weekly at the in-patient department at Homerton. Tutorials in clinical dermatology and histopathology of the skin are given twice weekly during term time. There are also facilities for study and tuition in pathology, including mycology, and in radiotherapy and physiotherapy. Advanced students can apply for clinical and research assistantships, the former of which are competitive. In each of the university terms there is a series of lectures and a weekly clinical demonstration. Special short courses in histopathology and in medical mycology are also held. A discussion on cases of special interest, to which students attending the courses are invited, takes place once a week.

The *Institute of Diseases of the Chest* (Brompton Hospital, London, S.W.3) is associated with the Brompton and London Chest Hospitals. A comprehensive full-time course is conducted for a limited number of graduates who are specializing in chest disease, during the two terms beginning in October and January and a more selective one during the summer term. A larger number can be accepted for a part-time study, which is suitable for those reading for higher medical diplomas. Clinical instruction in thoracic surgery, including cardiac surgery, is given throughout the year, and there are courses in the October and January terms. Part-time instruction in radiology of the chest is given, and lectures and demonstrations open to the medical profession are held each week.

The *Institute of Laryngology and Otology* (330-332, Gray's Inn Road, London, W.C.1) is associated with the Royal National Throat, Nose and Ear Hospital. There is daily clinical teaching throughout the year. Whole-time courses held twice yearly include: basic sciences (three months), intensive lecture course (six weeks), practical revision course (two weeks), and advanced revision course (two weeks). Short courses on endoscopy, audiology, pathology, aural surgery, and malignant conditions are held occasionally.

The *Institute of Neurology* (National Hospital for Nervous Diseases, Queen Square, London, W.C.1) is associated with the National Hospital and the Maida Vale Hospital for Nervous Diseases. Teaching is mainly by attendance on hospital practice, supplemented by lectures and demonstrations. Two courses in clinical neurology are held annually, beginning in January and October. Clinical instruction in neurosurgery is given throughout the year. A course in the techniques of clinical neurophysiology is held annually in the summer months.

A course in the technique and clinical application of electroencephalography is held jointly with the Institute of Psychiatry twice a year. Courses of clinical demonstrations (two-weekly) are held several times a year. **Advanced** students are appointed as clinical clerks in the wards or attached to the special departments and research laboratories.

The *Institute of Obstetrics and Gynaecology* (Chelsea Hospital for Women, Dovehouse Street, London, S.W.3) is associated with Queen Charlotte's, the Chelsea Hospital.

and the department of obstetrics and gynaecology at Hammersmith Hospital. Teaching is based on ward work, supplemented by lectures and demonstrations during two terms of **thirteen weeks' duration** which begin in March and September. For students preparing for higher qualifications, two intensive courses of **a fortnight's duration** are held in June and December. A week's course for general practitioners is held twice a year.

The *Institute of Ophthalmology* (Judd Street, London, W.C.1) is associated with the Moorfields Eye Hospital. In addition to teaching by means of attendance on the hospital practice, a routine lecture and tutorial course, normally covering two terms of approximately sixteen weeks each, is held twice a year, commencing in March and October; the first part of the course is devoted to anatomy, embryology, histology, physiology, optics, and elementary clinical instruction; the second part comprises bacteriology, pathology, operative surgery, medical ophthalmology, and all aspects of ophthalmic disease. Introductory courses, lasting one week, in orthoptics and contact-lens practice are held during each term. Clinical teaching and lectures are given for advanced students, and there are facilities for research for suitably qualified candidates.

The *Institute of Orthopaedics* is associated with the Royal National Orthopaedic Hospital (234, Great Portland Street, London, W.1). Training in orthopaedics to selected graduates who have already been trained in general surgery and the basic sciences is afforded by means of clinical appointments, with opportunities for research. Short advanced courses for graduates with practical experience are held at various times during the year. Twice a year, in the spring and the autumn, a short revision course of a week's duration in advanced clinical orthopaedics is held. Both the central hospital in Great Portland Street and the country hospital are attended by postgraduate students.

The *Institute of Psychiatry* (Maudsley Hospital, Denmark Hill, London, S.E.5) is associated with the Bethlem Royal and Maudsley Hospitals. Training normally covers three years, after experience elsewhere in general medicine, and is based on responsible hospital duties under supervision. Regular series of lectures and demonstrations are given throughout each of the university terms. Clinical training continues throughout the year and includes seminars and case discussions. Students who, because of previous experience, do not wish to take the comprehensive course are able to attend a limited series of lectures and clinical instruction. For those who wish to specialize in child psychiatry a six-months course is held twice a year. A year's course in abnormal psychology for the university post-graduate diploma in psychology is available to holders of an honours degree in psychology. There are facilities for original investigation under supervision in the clinical and other departments.

The *Institute of Urology* (10, Henrietta Street, London, W.C.2) is associated with St. Peter's, St. Paul's, and St. Philip's Hospitals. Comprehensive instruction is given in the wards, out-patient departments, operating theatres, and laboratories throughout the year. Week-end courses of demonstrations and lectures are arranged for higher examination candidates. Occasional lectures on venereology are arranged with the Medical Society for the Study for Venereal Diseases, and arrangements can be made for graduates to attend venereal diseases clinics. In the winter months lecture-discussions on urological subjects of interest to the whole profession are held on Wednesday evenings at 5 o'clock. Limited numbers of clinical assistants are appointed to individual surgeons for personal tuition, and there are also research assistantships.

Fellowship of Postgraduate Medicine

The Fellowship of Postgraduate Medicine (60, Portland Place, London, W.1) provides general information on post-graduate work available both in London and in provincial centres, and itself arranges a certain number of courses of instruction at hospitals in or near London. These courses

are specially designed to be helpful to candidates for higher degrees and diplomas, though attendance at them is not restricted to such candidates. The courses include general medicine, general surgery, obstetrics and gynaecology, and children's diseases. Some are full-time, lasting for one or two weeks, but the majority are part-time and are intended particularly for postgraduates not free for full-time study.

The Fellowship also arranges week-end courses, occupying the whole of a Saturday and Sunday, in such subjects as general medicine, general surgery, orthopaedics, plastic surgery, rheumatic diseases, and infectious diseases. Although these are primarily intended for candidates for higher degrees, many of them are also suitable for, and attended by, general practitioners. The Fellowship is an independent body, and is not connected in any way with official arrangements for postgraduate instruction under the National Health Service.

COLLEGES IN LONDON

Royal College of Physicians

The Royal College of Physicians of London was founded in 1518 so that "none should be allowed to practise physic but those deeply studied therein," and the chief interest of the College is still the maintenance of a high standard of medical practice. The licence (L.R.C.P.) is granted after examination in association with the membership of the Royal College of Surgeons of England. Members (M.R.C.P.) are elected after passing a postgraduate examination. Fellows (F.R.C.P.) are elected annually from among the members, no examination being required. The College jointly with the Royal College of Surgeons conducts examinations for postgraduate diplomas in anaesthetics, child health, industrial health, laryngology and otology, medical radiodiagnosis, medical radiotherapy, ophthalmology, pathology, physical medicine, psychological medicine, public health, and tropical medicine and hygiene.

Each year about twenty lectures are held which are open to all members of the profession. This year, it has been decided to arrange conferences which, it is hoped, will be held from time to time on topics of scientific interest to consultant physicians. These conferences are designed especially for physicians in peripheral hospitals who wish to keep in touch with the latest developments. The first of these conferences on "Anaemia and the Alimentary Tract" was held in July (see *Journal*, August 2, p. 301); the second, on a subject to be announced, is to be held early next year.

The College has sponsored the foundation of the Association for the Study of Medical Education. The first conference of this body will be held at the College on September 25 and 26, when the subject for discussion will be "Experiment in Medical Education." The College also administers scholarships and grants for medical research. These are usually worth at least £1,000 per annum and are awarded for three years, and, although some of the scholarships are restricted, in all they cover a wide field of medical subjects. From time to time the College publishes reports on subjects of topical interest. This year a report has been published on electroencephalography.

Royal College of Surgeons

The origin of the Royal College of Surgeons of England is to be found in the history of two corporations which flourished in the City of London six hundred years ago and more, the Barbers' Guild and Fellowship or Guild of Surgeons. After a long period of rivalry the two corporations composed their differences and were granted an Act of Union by King Henry VIII in 1540. Disharmony between the Barbers and Surgeons recurred and increased until in 1745 an Act of Parliament established two separate companies. In 1880 the Company of Surgeons was reconstituted by Royal Charter into the Royal College of Surgeons of London (the name was changed into its present form in 1843) and left the City to take up its present position in

course in general surgery, 19 in orthopaedic surgery, 15 in public health, 11 in anaesthesia, 12 in psychological medicine, 25 in radiodiagnosis, 7 in radiotherapy, 4 in venereology, 67 in tropical medicine and hygiene, and 22 in the part-time M.R.C.P. course recently established. The course in general surgery is suitable for candidates who have already passed the primary examination for the F.R.C.S., but candidates for the course in orthopaedic surgery must already hold the F.R.C.S., to become eligible to take the examination for the M.Ch.Orth. degree. The courses leading to the D.M.R.D. and D.M.R.T. extend over two years; candidates are usually found registrar appointments during their second year. During the course in anaesthesia students are found appointments in recognized general hospitals for the purpose of gaining practical experience. Further information regarding university postgraduate courses may be obtained from the dean of the faculty of medicine.

At *Manchester University* courses for the diplomas in psychological medicine, public health, radiodiagnosis and radiotherapy have been held. The course for the diploma in bacteriology, however, will not be held in the coming session. A one-year course in medical statistics is also available. Refresher courses in industrial health have been held, and a series of lecture-demonstrations for general practitioners, which were held on alternate Sunday mornings, were very successful. These were given in conjunction with the College of General Practitioners, and a similar series will be given this autumn. The dean of postgraduate medical studies is Mr. R. L. Newell, who is available for consultation by appointment.

At the *University of Bristol* the degrees of M.D., Ch.M., and Ph.D. are open to graduates of other universities, but only to those graduates who have pursued original research in the university for not less than two years, and in effect this regulation means that these higher degrees are open only to those graduates of other universities who hold appointments on the staff of Bristol University or one of the local hospitals. The university diploma in psychological medicine is in abeyance. The university offers a diploma in public health, and a course for it will be held this session. A few postgraduate students are accepted for training for the D.M.R.D. and D.M.R.T. (Conjoint), and arrangements can sometimes be made for suitable candidates to hold a part-time post in the Bristol hospitals while doing the course. A course in child health lasting three months usually begins in October of each year, but this year is not being held. Refresher courses for general practitioners consist of Sunday morning lecture-demonstrations in Bristol and occasional intensive week-end courses at hospitals in various parts of the South-Western region. A postgraduate course in medical physics for science students has been instituted. A review of pre-registration appointments has been undertaken to ensure that only house officer posts which have the facilities necessary for sound postgraduate training are recognized for the purpose. A medical postgraduate dean has been appointed.

At the *University of Leeds* extended refresher courses for general practitioners, comprising one half-day session a week for six weeks and week-end refresher courses on special topics, are arranged from time to time, both in the teaching hospitals and in regional hospitals. The university grants a diploma in public health, also a diploma in psychological medicine, the part-time course for which covers eight academic terms. The secretary of the Postgraduate Committee is Dr. T. A. Divine, School of Medicine, Thoresby Place, Leeds, 2.

At *Sheffield University* the recently resuscitated D.P.H. course was successfully concluded last session, but for various reasons it is not proposed immediately to commence another. The development of the department of psychiatry, to which reference has already been made, has enabled the department to become increasingly a focus for regional postgraduate education in this specialty. Other postgraduate activities continue along the lines previously described, though the experiment is being tried, at the time of writing, of holding the usual intensive refresher course for general

practitioners in the hospitals of the Nottingham area instead of in Sheffield as in past years.

At the *Welsh National School of Medicine* one of the postgraduate diplomas which attracts many students from overseas—namely, the tuberculous diseases diploma—will in future include chest diseases generally, its title being changed to the diploma in tuberculosis and chest diseases (D.T.C.D.). This is the first step in developments which are contemplated in the department of tuberculosis.

SCOTTISH UNIVERSITIES

Postgraduate Facilities at Edinburgh

Edinburgh University holds postgraduate courses leading to the diplomas in medical radiodiagnosis (2 years), medical radiotherapy (2 years), psychiatry (6 months, full-time), public health (9 months), and tropical medicine and hygiene (6 months, see below). Graduate scholarships and fellowships are also offered, being open to graduates in the faculty of medicine of any university, to graduates in the faculties of arts or science of any university who hold an honours degree, and to licentiates in medicine. The holders of such awards are required to undertake research work in a department within the faculty of medicine. In addition, the Edinburgh Postgraduate Board for Medicine, which is an advisory council to the university, provides courses of instruction leading to the higher qualifications granted by the Royal Colleges of Edinburgh. These are advertised at intervals in the medical press, and full particulars can be obtained from the director of postgraduate studies, Surgeons Hall, Edinburgh, 8. In addition the board arranges library facilities and clinical work and helps the postgraduate students in a variety of ways. The courses of instruction are considered to be of value to those requiring a period of revision or those preparing for higher diplomas.

In the medical sciences a 12-weeks course begins at the end of June. This includes lectures and practical instruction in anatomy, physiology, pathology, biochemistry, and bacteriology. The instruction is of an advanced standard and students should already be well grounded in these subjects. In addition two 10-weeks courses are arranged to start in October and February. In surgery there are two 12-weeks courses each year, beginning in March and September. The numbers are limited and the instruction is primarily clinical in nature. In medicine there are two similar 12-weeks courses. The instruction is systematic, clinical, and by demonstrations. From July to September a course in clinical medicine is arranged in which clinical instruction in small groups is given in the teaching medical units in Edinburgh. For those already holding higher qualifications short intensive courses in special subjects are held from time to time. Advanced courses in endocrinology and gastro-enterology are being arranged to take place in March, 1959. The numbers on these courses are limited so that discussion can be free. Through the director of postgraduate studies, postgraduate students may be attached for clinical duties to the medical and surgical units in Edinburgh, preference being given to those who have attended the courses.

A two-weeks refresher course for general practitioners is held at Edinburgh in May, giving a wide variety of instruction in medicine, surgery, and obstetrics. There are also occasional one-day courses in selected subjects, and a series of clinical meetings arranged for the general practitioners of the South-East Region of Scotland. In addition, there are occasional courses specially arranged for anaesthetists.

The Royal College of Surgeons of Edinburgh (18, Nicolson Street) has a two-part examination for its fellowship.

Postgraduate Facilities at Glasgow

Glasgow University Postgraduate Medical Education Committee, representing the University and the Royal Faculty of Physicians and Surgeons of Glasgow, is offering

the following courses during the coming session. A nine-weeks' part-time course of instruction in anatomy, physiology, biochemistry, pathology, and bacteriology will be held, as in previous years, from October to December. The course is suitable for candidates preparing for the primary examinations for the surgical fellowships, and will provide a total of approximately 180 hours of instruction. The course is organized primarily for the junior staff of hospitals in the Western Region of Scotland, but it is also open to other applicants. A modified form of the course is available for trainees in anaesthetics reading for the primary examination of the F.F.A. Clinical attachments to teaching units of one to three months' duration can be arranged in general medicine, general surgery, and various specialties for those proceeding to higher qualifications.

An annual course for the diploma in public health is available, and a course for the diploma in industrial health will be arranged in any year in which there are sufficient applicants. Short courses in other specialties are arranged when the demand arises and are advertised in the medical journals. For the ensuing session a three-weeks course in mental deficiency and two week-end courses in chemotherapy have already been arranged. The department of psychological medicine will hold a part-time course, extending from January to June, 1959, for candidates reading for the D.P.M. Training in radiodiagnosis and radiotherapy, recognized for the D.M.R.(D.) and D.M.R.(T.) is available. At least two refresher courses for general practitioners are held each year. A very successful addition to the range of postgraduate courses has been the institution of short intensive courses on the use of radioactive isotopes. These courses are organized by the staff of the Regional Physics Department, which advises and assists hospitals on matters concerned with isotopes and electronic apparatus.

The Royal Faculty of Physicians and Surgeons of Glasgow grants, after examination, a fellowship *qua* physician and a fellowship *qua* surgeon. The examinations are clinical, written, and oral.

Universities of St. Andrews and Aberdeen

At *St. Andrews University* a combined clinical and medical sciences course will be held from October to March at Queen's College, Dundee. All who take this course will have a clinical attachment in one of the 16 specialist subjects of their choice and a supervisor. The object of the course is to bring postgraduate students up to date with the current trends in the medical sciences which are of importance to future medical developments. In addition there are weekly open postgraduate lectures by distinguished visitors and a course of lectures on scientific methods. There is also a postgraduate course in anatomy and physiology (including biochemistry) at St. Salvator's College, also lasting from October to March. Details of these courses may be obtained from the dean of the medical faculty.

At *Aberdeen University* there are courses for general practitioners. Once a year there is a full-time course of a fortnight's instruction, and part-time courses in the various specialties are held once a week during each term. Apart from the instruction given to registrars in preparing them for examinations for higher qualifications, there are no organized courses for such people, but anyone who is interested may be taken on to do postgraduate study in the various departments.

HYGIENE AND TROPICAL MEDICINE

The London School

The London School of Hygiene and Tropical Medicine (Keppel Street, Gower Street, W.C.1) is a postgraduate school of the University of London, devoting its attention to teaching and research in preventive medicine and occupational health, bacteriology, and the whole range of subjects concerned with tropical medicine and hygiene. The work of the school is organized in ten main departments: applied physiology, bacteriology and immunology, bio-

chemistry, clinical tropical medicine, entomology, human nutrition, medical statistics and epidemiology, parasitology, public health, and the Ross Institute of Tropical Hygiene.

The research work has many links with other institutions at home and abroad. On the teaching side the school prepares students for four academic postgraduate diplomas of London University: applied parasitology and entomology, bacteriology, public health, and tropical medicine and hygiene. These courses occupy a whole academic year. The school also provides a five-months course for the Conjoint Board's D.T.M.&H. Teaching for the University of London postgraduate D.P.H. is designed to develop the student's knowledge of principles of preventive medicine and to bring him in touch with practical issues of public health administration. Much of the work is in the form of practical instruction against the background of the British health services, and arrangements are made for the students to visit health areas in both urban and rural districts and to study central administration. The study of British health services is intended to illustrate the broad principles of public health in such a way as to render the course appropriate to students from both home and overseas. In addition to the subjects covered by the D.P.H. syllabus the students may take one of the following special subjects: child health, medical statistics and epidemiology, mental health, occupational health, tropical hygiene, and nutrition. The special subject of occupational health, together with the general teaching for the D.P.H., fulfil in part the requirements for entry to the examination for the D.I.H.

The course for the University of London postgraduate diploma in bacteriology provides advanced instruction for graduates in medicine, science, and pharmacy, and for others with suitable qualifications, who intend to follow a career in bacteriology. The course begins in October and lasts for nine months. The course for the Conjoint Board's D.T.M.&H. is of five months' duration and is held twice a year. The course for the University of London academic postgraduate D.T.M.&H. occupies an academic year. There is a preliminary course of approximately four and a half months for the Certificate in Tropical Medicine and Hygiene commencing at about the beginning of October each year. The final part of not less than four months consists of advanced study in one of the following two fields—clinical tropical medicine and tropical hygiene.

The course for the University of London postgraduate certificate and diploma in applied parasitology and entomology, planned mainly for those wishing to take up research or laboratory appointments abroad, is held annually commencing in October. Graduates in medicine, veterinary medicine, veterinary science, and science, and those with approved non-graduate qualifications in medicine and veterinary medicine, are eligible. The full course lasts for nine months.

A course in statistical methods applied to medicine and epidemiology is held annually on two days a week from approximately the beginning of March to the end of June. Students without a medical qualification can be accepted. A ten-weeks course in environmental control is held twice a year, commencing at approximately the beginning of March and October. Although intended primarily for health inspectors from abroad, the course is so planned as to be of value to medical officers and others interested in the health aspects of environmental control both at home and abroad.

Royal Institute of Public Health and Hygiene

The Royal Institute of Public Health and Hygiene (28, Portland Place, London, W.1) conducts recognized courses of instruction for the diploma in public health and for the diploma in industrial health. The next courses will start on September 12. All tuition may be taken as whole time or part-time study. Part-time study may be commenced at any time. Clinical tuition in general medicine at a postgraduate medical teaching hospital is available and may be undertaken optionally. The examinations are those of the Conjoint Board of the Royal College of Physicians of

London and the Royal College of Surgeons of England for both diplomas, and, in addition, of the Society of Apothecaries of London for the D.I.H.

Liverpool School of Tropical Medicine

Men and women students of any nationality who hold a medical qualification approved by the university are admitted at the Liverpool School of Tropical Medicine (Pembroke Place, Liverpool) to examination for the D.T.M.&H. (Liverpool). A complete course of instruction lasting about three months is given twice yearly. The examination is held in December and April, and consists of two papers on tropical medicine (including pathology and bacteriology), one on parasitology, one on entomology, two on tropical hygiene and related subjects; and practical and oral examinations in tropical medicine, parasitology and entomology, and tropical hygiene. The dates of the courses are September to December and January to April. The school also gives courses in parasitology and entomology for students taking the D.P.H.

Tropical Medicine at Edinburgh

There is no separate school of tropical medicine at Edinburgh University, although there is a department in that subject. Other departments also contribute to the courses of instruction leading to the diploma in tropical medicine and hygiene. The primary course is held in the autumn and the secondary course in the spring. The former comprises systematic instruction and practical work in the diseases of tropical climates, entomology, parasitology, bacteriology, and vector control. The secondary course provides further instruction in diseases of tropical climates and also in tropical hygiene, virology, applied physiology, venereal diseases, tuberculosis, and elementary statistics. Clinical instruction is given in the wards of the Eastern General Hospital and the other classes are held in the appropriate university departments. Examinations are held at the end of the primary and secondary courses. Candidates who have passed the examination at the end of the first term may interrupt their course and take the secondary course at a later date.

OTHER COURSES AND EXAMINATIONS

The *Tavistock Clinic* (2-4, Beaumont Street, London, W.1) is an out-patient clinic for psychotherapy of neurotic and personality disorders, both of adults and of children. Registrar and senior registrar appointments, in both the adult department and the department for children and parents, provide systematic training in these fields. Personal analysis is available to such trainees in the adult department. There are also the following extramural courses: (1) a two-year part-time introductory course in psychotherapy, including psychopathology and group experience, open to selected trainees from other National Health Service institutions; (2) seminars at introductory and more advanced levels for general practitioners and consultants in principles of psychological medicine and the doctor-patient relationship, including case supervision for those who want experience in treating neurotic and psychosomatic disorders in their own practices. There are also courses in Rorschach testing (open to psychiatrists), and for clinical psychologists, social workers, and child psychotherapists (non-medical). The clinic welcomes visitors, and has some facilities for offering associate status to interested overseas psychiatrists, psychologists, and social workers who are in Great Britain for further training. Full particulars may be obtained from the training secretary at the above address.

The *National Association for Mental Health* (39, Queen Anne Street, London, W.1) organizes, with the extramural department of the University of London, courses on educationally subnormal children and mental defectives for school medical officers. The course includes lectures on normal child development, the pathology and causation of intellectual retardation and maladjustment, the psychology of

educationally subnormal children, and educational and social implications of backwardness. A year's course is organized for men and women wishing to train for work in occupation centres and "school departments" of mental deficiency hospitals. Lectures and courses for social workers, health visitors, and teachers are also held.

The *Institute of Psycho-Analysis* (63, New Cavendish Street, London, W.1) furnishes a part-time course lasting about four years in psycho-analytic theory and technique. It includes personal analysis, attendance at lectures and seminars, and clinical work under supervision. General psychiatric experience must be obtained at other clinics or hospitals, since the teaching at the institute is confined to psycho-analysis.

The *Society of Analytical Psychology* (25, Park Crescent, London, W.1), founded in 1945, is the professional body representing Jungian psychology in this country, and is a training centre for analytical psychology with C. G. Jung as its President. For some years the society has operated a part-time course of training in analysis. This consists of two parts. Candidates accepted for Part I undergo a personal training analysis for at least two years. Later, if accepted for Part II, candidates attend a two-year course of seminars on clinical practice, the theoretical aspects of analysis, and an introduction to mythological material in relation to medical psychology. In addition each candidate begins to treat cases under the supervision of a training analyst. Election to associated professional membership takes place when the candidates have fulfilled certain minimum requirements with regard to the length of their personal analysis and supervision period, and when they are considered competent to treat cases without supervision. For its own members the society gives the opportunity of participation in lectures, seminars, and research groups concerned with problems of adult and child analysis.

A course of instruction in homoeopathy for medical practitioners and senior students, arranged by the *Faculty of Homoeopathy*, begins at the Royal London Homoeopathic Hospital (Great Ormond Street, W.C.1) on October 9. It includes lectures on homoeopathic prescribing and on homoeopathy in theory and practice, also clinical tutorials for practical instruction in homoeopathic practice. The lectures deal with subjects required for examination for the Diploma of Membership of the Faculty.

CAREERS IN RESEARCH AND THE SERVICES

Medical Research Council

The Medical Research Council (38, Old Queen Street, London, S.W.1), originally established in 1913 as the Medical Research Committee, is appointed to administer the funds provided annually by Parliament for the promotion of research in medical science. The Council is under the general direction of the Committee of Privy Council for Medical Research, of which the Lord President is the chairman and the Minister responsible to Parliament. The Council is not constitutionally a Government department; it selects and appoints its own staff, who are not civil servants. The scientific staff of the Council work in some 70 establishments located mainly in hospitals and universities in Great Britain, and Uganda. The total scientific staff of the Council numbers nearly 700, of whom about one-half are medically qualified. Its research establishments vary widely in size; the largest is the National Institute at Mill Hill, but the average research unit consists of from five to ten scientific workers with a number of technical and clerical assistants. Arrangements have been made by the Council, in consultation with the Health Departments and with the advice of the Clinical Research Board, for the development of research in the

The aim of the Council is to provide the opportunity for careers which are equivalent to those offered in the universities to men and women of equal ability and experience; the Council's salary scales for scientific appointments are based on this principle. New appointments to the scientific staff, except in the case of senior posts, are normally made for definite periods, usually of three or five years at a time. In addition to maintaining its own staff, the Council makes available short-term grants in support of specific research projects carried out by independent workers in universities, hospitals, and elsewhere. The Council also awards clinical research fellowships, scholarships for training in research methods, and certain travelling fellowships; these last are awarded either on an agency basis for other bodies or from private benefactions entrusted to the Council.

Pamphlets dealing with the constitution and functions of the Council, and describing opportunities for service on its staff, are obtainable from the Council's headquarters office.

Public Health Laboratory Service

On behalf of the Ministry of Health the Medical Research Council administers the Public Health Laboratory Service, which was originally set up as an emergency service in 1939 and has since become permanent; there are about 60 separate laboratories in England and Wales.

In addition to their more routine duties, members of the staff of the service, whose salary scales are normally equated with those of the National Health Service, undertake research problems in bacteriology and epidemiology. Furthermore, the service maintains a number of special laboratories which act as reference centres for particular infections, and these engage largely in research.

Naval Medical Service

"Naval medicine" comprises a variety of subjects including the physiology of diving, the physical aspects of service afloat and ashore, commando service, tropical diseases, and industrial hygiene; an important further specialty is that of aviation medicine, and a small number of naval medical officers undergo full pilot training before undertaking duties with the Fleet Air Arm or in research establishments. The naval medical officer is not concerned solely with the welfare of the sailor, but also with the families of Service men and of Admiralty personnel serving abroad. Officers on the permanent list are encouraged to specialize in all branches of medicine and are given full facilities to obtain higher qualifications. Courses of postgraduate study are carried out both in naval hospitals and at civilian teaching centres.

Service on the active list is up to the age of 55 for all officers, 57 for surgeon captains, and 60 for surgeon rear-admirals. Previous experience, both Service and professional, is counted in assessing seniority—previous commissioned service as a medical officer in one of the armed Forces counts in full, and non-medical commissioned service counts as to half. Civilian hospital experience and also some medical experience in private practice may be allowed to count up to a limit of seven years in all. Officers serving in the United Kingdom are granted 42 days' leave per annum on full pay and allowances, with three free travel warrants. If serving overseas local leave is given at the rate of 14 days a year, and foreign service leave at the rate of two days for each month is allowed on returning to the United Kingdom. Leave for officers serving in H.M. ships on general service is at the rate of three days for each month.

All entries at present are being made as short commissions in the first instance. Short service consists of either three or four years, during which period a medical officer becomes eligible to apply for a surgeon lieutenant R.N., and is eligible to apply for a transfer with full seniority to the permanent list. Officers who transfer to the permanent list after a minimum of one year's service will be paid a grant of £1,500 (taxable). The normal career of a medical officer enables him to be promoted to the full rank of surgeon lieutenant after one

year's service and to surgeon lieutenant-commander after a further seven years' service. In the normal course surgeon lieutenant-commanders are promoted to surgeon commanders by selection at about their fifteenth year of total service, and surgeon commanders to surgeon captains at about their twenty-third year of total service.

Further information may be obtained from the Medical Department, Admiralty, Queen Anne's Mansions, St. James's Park, London, S.W.1.

A Career in the R.A.M.C.

Two-thirds of medical officers in the Royal Army Medical Corps are employed on general-practitioner duties. After attending the junior officers' course at the Royal Army Medical College, Millbank, they start their career as regimental medical officers and they become conversant with the soldier and his environment, the objects of the Army, and the requirements from its medical service in peace and war. They will later serve overseas, where, as regimental medical officers or in charge of a medical reception station or small hospital, they will be able to study the causation, prevention, and treatment of tropical diseases, the effects of climate, and the like. On return to the United Kingdom they attend the senior officers' course, the first two and a half months being spent in study at Royal Army Medical College, Millbank, and the next three months undergoing a special postgraduate course at selected teaching hospitals. At this stage officers may opt to remain at general medical duties or take up field training or junior staff appointments. For the more senior appointments the requirements are a sound background of clinical and preventive medicine to meet their advanced responsibilities in the administration of the Army Medical Service in peace and war.

Specialists are, subject to professional proficiency, employed on specialist duties up to the rank of colonel. Thereafter they may serve in this rank up to the retiring age of 57 or may be selected for promotion to brigadier in either a specialist or non-specialist capacity. The process of selection for specialist training is carried out after the junior officers' course, those applicants who are most successful in the course examination being accepted. Those accepted are provided with excellent opportunities to obtain higher qualifications and specialist experience. At present ophthalmologists, otolaryngologists, and radiologists are especially required. There are liberal arrangements for specialists and non-specialists to undergo postgraduate training throughout their career.

All suitable medical officers, specialist or non-specialist, may be employed up to the age of 65 in appointments specially set aside for retired officers. Non-specialists are employed on general-practitioner or medical administrative duties and specialists on specialist duties.

Further information may be obtained from the Assistant Director General, War Office, A.M.D.2, London, S.W.1.

Medical Branch of the R.A.F.

The Royal Air Force offers an attractive career to both men and women medical practitioners who are British subjects or citizens of the Irish Republic. The normal upper age limit for applicants is 33, but older applicants may be considered. Appointment in the first instance is normally to short-service commissions for three, four, five, or six years, each of which may be extended to complete a maximum period of eight years. Exceptionally, suitable candidates may be appointed to permanent commissions direct from civil life. Short-service officers may apply for permanent commissions at any time during their service. Medical practice in the R.A.F. brings officers into contact with flying, and air evacuation of the sick and wounded as well as with the clinical specialties and the treatment of Service families. In addition, there are opportunities in aviation medicine, physiology, hygiene, and industrial health.

Officers serving on permanent commissions may be allowed study leave to take approved postgraduate courses, for which tuition fees on an approved scale may be granted. Officers having experience or aptitude in a specialty may be employed on specialist duties, if Service conditions permit, with the object of qualifying as junior specialists and subsequently earning recognition as R.A.F. specialists. A full career is possible in the clinical specialties with time promotion to group captain and additional specialist pay. Non-specialist medical officers below the rank of group captain may be awarded additional pay on gaining a registrable D.P.H., D.I.H., or D.T.M.&H., provided the prescribed period of study occupied an academic year. Non-specialist medical officers can expect time promotion to wing commander, with promotion to higher ranks by selection. Antedate of seniority up to a maximum of seven years may be admissible for civil experience and will count towards pay, seniority, and promotion.

Further information can be obtained from the Under Secretary of State for Air, Air Ministry, M.A.1, 1-6, Tavistock Square, London, W.C.1.

Prison Medical Service

The Prison Medical Service is a part of the general service class of the medical civil service, and is under the immediate control of the director of medical services at the Prison Commission. The work is mainly clinical and the medical officer is responsible for the physical and mental welfare of the inmates, a responsibility which extends to a general oversight of the hygiene of the establishment in which he is working. The service is expanding to meet the needs of a rising inmate population and the increased demands of present-day methods. It offers an attractive career to medical practitioners who are interested in the various problems connected with crime and the understanding and treatment of criminals. The medical and surgical cases seen are comparable with those met with in outside practice. The various establishments have their own hospital accommodation; a large prison, for example, may well have a hospital with up to 100 beds.

The doctor in a prison or borstal is a member of a team whose efforts are directed towards the rehabilitation of those committed to its charge. On the medical side the aim is not only to attend to ordinary day-to-day medical care but to discover, and if possible to remedy, disabilities and maladjustments which hinder the training of the offender and make it more difficult for him to regain a place among law-abiding citizens. Although not himself in the National Health Service the prison medical officer maintains a close liaison with the hospital and specialist facilities of that Service.

There are now over 70 establishments under the control of the Prison Commissioners and they vary very much in their size and purpose, depending on the class of inmate, and their medical requirements differ accordingly. At the larger establishments the medical work is in the hands of whole-time medical officers, whereas the small institutions are served by part-time doctors who are usually local general practitioners. The more important prisons may have as many as four or five full-time medical officers, together with psychologists and assistants for psychological testing. Principal and senior medical officers have advisory and other duties in connexion with small groups of establishments. At a few prisons there are also psychiatric social workers. The medical officer is called upon to make medical and psychiatric reports to the Commissioners from time to time. In remand prisons the preparation of reports to court and the giving of verbal evidence, particularly in regard to the mental condition of offenders, are important aspects of the work. Postgraduate experience in psychiatry is therefore an advantage. Surgical and psychotherapeutic units are established at selected centres, where the work is undertaken mainly by visiting specialists working on a sessional basis and in close association with the regular medical staff.

The national scales of remuneration are in accordance with the general civil service scales. The appointments are pensionable, without contributions being required, and on retirement normally a pension and lump sum gratuity are payable. There is also a contributory widows' and children's pension scheme. Pensionable service under the National Health Service and established civil service may be aggregated for pension. Unfurnished quarters, when available, are provided at a moderate rental. Permanent appointments are made by the Civil Service Commission, 6, Burlington Gardens, London, W.1, to whom inquiries for such appointments should be addressed. On occasion temporary full-time appointments are available, and for such appointments, as well as for part-time appointments, particulars can be obtained from the Prison Commission, Horseferry House, Dean Ryle Street, London, S.W.1.

Overseas Civil Service

In the medical departments of the Governments of the territories overseas for which the Secretary of State of the Colonies is responsible, openings occur in all parts of the world. Many future appointments are likely to be made on the bases of short-term contracts, usually renewable. Doctors in the N.H.S. may take temporary appointments overseas up to six years without loss of pension rights. In some territories permanent appointments are available; candidates selected for these appointments become members of the medical branch of Her Majesty's Overseas Civil Service. Candidates must normally be British subjects whose names appear on the Medical Register, and should not be over 45 years of age.

Full terms and conditions of service may be obtained from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith Street, London, S.W.1.

Missionary Service

For doctors with a call to dedicated service, the mission field offers great opportunity for the exercise of medical knowledge and skill where the need is greatest. Though the financial rewards are small, a Christian doctor will find this work immensely satisfying. Any who have this service in view are advised to spend eighteen months or two years in resident appointments after qualification. Special missionary training is required by some of the societies. Although long service is preferred, short-term offers are considered by most societies. Application may be made to any of the missionary societies, or to the Secretary of the Medical Advisory Board, Edinburgh House, 2, Eaton Gate, London, S.W.1, or to the Secretary, Medical Missionary Association, 31, Bedford Place, London, W.C.1.

OPENINGS IN INDUSTRIAL MEDICINE

Industrial medicine can be especially attractive to a doctor who is interested in preventive medicine and who wishes to do clinical work. It offers opportunities for treating the injured and sick, for the surveillance of vulnerable groups of workers such as the young and old, and those employed in dangerous trades, and also for studying the effects of the working environment on health. The doctor may also help to identify occupational hazards and control them. He often has the advantages of constructive criticism from colleagues, a close contact with other professions, and assistance from nurses and secretaries in the routine work. He has the material assets of holidays with pay, pension schemes, and definite hours of work, but he has to deal with emergencies and is expected to keep abreast with new knowledge by reading and by contact with professional societies. Industrial medical services are extensive without being comprehensive and, although they are not linked with the

National Health Service, many of the doctors working part-time in industrial medicine are general practitioners. In the United Kingdom there are approximately 400 whole-time and 3,000 part-time doctors in industry. In addition some 1,700 or more general practitioners are Appointed Factory Doctors who examine young persons and others employed in dangerous trades as required by law. Most of the industrial medical officers are employed in factories, but recently services have been developed in mines, transport undertakings, shops, and offices; many universities also have medical services for their students and staff. Medical services in industry have grown largely as a result of the voluntary enterprise of employers; some provide for no more than the treatment of casualties, while others fulfil the modern conception of occupational health—namely, to promote and maintain the highest degree of physical, mental, and social well-being for all types of workers.

Appointments in industrial medicine are frequently advertised. Salaries vary according to age, experience, and qualifications. Medical officers are usually either on a definite salary scale or receive increments in accordance with the growing value of their work and length of service. A few doctors who have the interest and abilities to do research and to teach in this field are employed by the Medical Research Council units and university departments of social and industrial medicine. Occasionally there are vacancies for medical inspectors of factories in the Ministry of Labour and National Service and for medical officers in the Ministry of Pensions and National Insurance. Many of these appointments are not easy to obtain, but a doctor who has a good experience of clinical medicine and some post-graduate training in preventive medicine has a good chance of becoming a whole-time industrial medical officer and of doing work which can be both fascinating and challenging.

The Association of Industrial Medical Officers was formed in 1935 to bring together doctors employed full-time in industrial medicine in order to promote scientific study and to provide mutual help. In 1941 doctors working part-time in industrial medicine were admitted as associate members. The total membership is now nearly 1,000 and there are 12 local groups in the United Kingdom which hold frequent meetings. In addition three meetings of the whole association are held every year, two in London and one in the provinces. The association has adhered to its original aim to confine itself to scientific and social activities. It publishes its own *Transactions*.

PROFESSIONAL ORGANIZATIONS

British Medical Association

The British Medical Association, which was founded in 1832, now comprises a membership of over 70,000, of whom about 16,000 are overseas. Its main objects are to promote the medical and allied sciences and to maintain the honour and interests of the medical profession. Although membership is entirely voluntary, 80% of practising doctors in this country are members and the Association can therefore claim to speak for the whole of the profession in its dealings with Government and other authorities.

The Association is often described as a federation of local medical societies known as Divisions. These are grouped in Branches. Every member is automatically included in the membership of the local unit in whose area he resides or practises. The Divisions hold regular meetings for clinical, social, or business purposes, and every member is entitled to take part in their activities.

Other privileges of membership of the Association include the receipt each week of the *British Medical Journal* and its *Supplement*, the latter being the official means of communication between Headquarters and the individual member. In addition to the *Journal* the Association publishes a number of specialist journals, *Abstracts of World Medicine*, and, from time to time, reports of special

subjects. In collaboration with the Pharmaceutical Society of Great Britain it compiles and publishes the *British National Formulary*. The Association also possesses one of the world's leading medical libraries. This contains 70,000 volumes, and 1,600 periodicals are received regularly. The library has a large lending and circulating service and members are entitled to use its service for obtaining references. There are reading-rooms for those who are able to call at B.M.A. House. The Association also maintains a large film library and an extensive range of films is available for local meetings. Lastly, the help of a highly skilled and experienced staff at Headquarters is available to members in connexion with the many problems which arise in practice.

The policy of the Association is determined by the Representative Body, which is composed of representatives from all the Divisions. The Council is the executive of the Representative Body and is responsible for the general management of the Association affairs. Its method of election ensures representation of all parts of the United Kingdom, of the medical branches of the Fighting Services, the Public Health Service, and the Overseas Branches. Most of the day-to-day work of the Association is carried out through a large number of standing and special committees. The Central Consultants and Specialists Committee (which also has a regional organization) acts with the Royal Colleges on all matters affecting hospital staffs. The General Medical Services Committee acts as executive of the Conference of Representatives of Local Medical Committees in all questions affecting general practice in the National Health Service. The Public Health Committee, which has a working agreement with the Society of Medical Officers of Health, deals with all matters relating to the Public Health Service. Other committees of the Association are concerned with private practice, ethical questions, and the encouragement of medical science and research, and there are also special committees which look after the interests of groups of members in varying specialties and also joint committees with other bodies for the consideration of matters of mutual interest.

The Association has important Branches in Australia and New Zealand and flourishing local units in many parts of the British Commonwealth. The Medical Associations of Canada, South Africa, India, and Ceylon are affiliated to the British Medical Association.

Society of Medical Officers of Health

The Society of Medical Officers of Health (Tavistock House South, Tavistock Square, London, W.C.1) is a body of medical officers engaged in public health work. It has branches and groups throughout Great Britain and Northern Ireland, New South Wales, Malaya, and, since 1957, East Africa, which meet regularly to discuss the medical and administrative aspects of preventive medicine. The council of the Society, representative of the branches and groups, is the governing body in respect of policy and finance. It examines all legislation concerned with the Ministries of Health, Housing and Local Government, Agriculture, Fisheries and Food, Education, the Home Office, and the Department of Health for Scotland, and with public health, and maintains relations with the public health departments of the universities and local government authorities. There is reciprocal representation on the Public Health Committee of the British Medical Association and the council of the Society, and the Public Health Committee acts in conformity with an agreement with the Society of Medical Officers of Health under which medico-political activities are undertaken by the Association.

The mental health group, inaugurated in March, 1957, continues to expand and to attract to it an increasing number of consultants in the mental health field. A recent development is the formation of a joint body comprised of equal numbers of members of the Royal Medico-Psychological Association and of the Society. This body will address itself in the first instance to considering common

problems in the care of the mentally disordered, with particular reference to the report of the Royal Commission on Mental Illness and Mental Deficiency. The teaching group, established at the same time, has concerned itself with the future of the medical services and its implications for the teaching of social medicine, with the content of social medicine teaching, both undergraduate and postgraduate, and with teaching methods. The Society is fully conscious of the need to keep members abreast of modern practice and developments in the field of public health. Accordingly, the various groups of the Society arrange refresher courses for their members, which are well attended. Courses are held by the county borough, county district, dental, maternity and child welfare, mental health, school health, and Services groups of the Society.

Medical Women's Federation

The Medical Women's Federation (Tavistock House North, London, W.C.1) works closely with the British Medical Association, and is represented by a woman member on the General Medical Services Committee. The Federation is the only professional organization consisting solely of medical women, and is thus in a position to represent the interests of women doctors and to deal with the problems affecting them as a minority in the profession. It also considers and investigates medical matters of special concern to women doctors. The Federation has active local associations all over the Kingdom, including a large London association, and an association of its overseas members. These associations meet regularly, and the *Journal* of the Federation is published quarterly for private circulation among its members.

British Medical Students' Association

This association was founded in 1942, and its membership now includes over 90% of the medical students in the country. It is purely a professional organization, providing a means of communication between medical students in the different universities and hospitals, and also between British students and those in other countries. It presents the medical students' point of view to the medical profession, to Government departments, and to other interested bodies. The organization of the association depends on an annual general meeting at which an executive committee is elected, and on four regional councils. Both clinical and preclinical conferences and "schools" are arranged from time to time, and these are appreciated not only for their academic interest but also for the opportunities which they provide for meeting fellow students from other medical schools. Local activities of the constituent organizations of the association include lectures, visits, discussions, and the showing of films from the B.M.A. and other film libraries. Amongst its publications are the *British Medical Students' Journal*, which appears once a term, and an annual list of vacation appointments for those members requiring work in hospitals during vacations.

The principal activity of the B.M.S.A. during the past three years has been the work of its medical education subcommittee. The subcommittee has prepared reports on entry to the medical course, the first year of medicine, the preclinical curriculum, and this year, as a result of a carefully conducted survey of the clinical curriculum, hopes to publish its views on the clinical section of the medical course. These reports are available to all who are interested in medical education, and the subcommittee is only too pleased to receive comment on the reports.

The association is represented on those committees of the B.M.A. that deal with matters affecting students and newly qualified doctors, and has recently taken an active interest in the formation of the new Junior Members Forum. The happy liaison with the College of General Practitioners has been continued, and the association's representatives sit on the undergraduate education committee of the College. Close interest is maintained in the British Student Tuberculosis Foundation and the United Kingdom Committee of

the World Health Organization. Active co-operation exists between the B.M.S.A. and other student organizations.

The B.M.S.A. is a founder member of the International Federation of Medical Student Associations, whose membership now embraces the associations of 21 nations. I.F.M.S.A. continues to develop successfully, and is recognized by the World Medical Association and Unesco. Under its auspices the annual students' international clinical conference has been held this year in Scandinavia. Opportunities also exist for individual clerkships in hospitals abroad, and the B.M.S.A., through the offices of a student international secretary, does much to assist British students to take advantage of these and other opportunities to travel and see something of medicine in other countries. Similarly, the B.M.S.A. makes arrangements for many foreign students to visit hospitals in this country. This year the number of students making use of these facilities has greatly increased. To encourage and assist deserving British students to attend courses and hospitals abroad the B.M.S.A. established four years ago a travel fund. This year the administrators of the fund awarded twenty-four scholarships of the total value of £200. It is hoped to improve on this figure in future years.

As its honorary president this year the B.M.S.A. has Sir Tudor Thomas, a past president of the B.M.A. The address of the association is B.M.A. House, Tavistock Square, London, W.C.1.

ADVISORY BUREAUX

Medical Practices Advisory Bureau

The National Health Service brought many changes in traditional methods of entering practice, and it was felt that there should be some advisory body which, though not directly linked to central or local government, could maintain effective liaison with executive councils, hospital management committees, the medical practices committee, etc., and at the same time command the confidence of the profession. To meet this need the Medical Practices Advisory Bureau was established in 1948 as a department of the British Medical Association under the direction of a medical member of its Secretariat.

The bureau has two functions; it acts as an agency and source of information concerning openings in various fields of practice, introducing partners, assistants, and locums. Secondly, it is prepared to advise on individual and personal problems associated with entry into and the day-to-day conduct of practice. For example, though it is not the function of the bureau to give legal advice, there are many questions concerning partnership agreements where the advice of an experienced doctor is needed as well as that of a lawyer. It is the accepted policy of the Association that there should be a legal agreement between principals and assistants in all cases, and the bureau can supply a model form for this purpose.

These services, which are available to all doctors, are, with very few exceptions, free of charge to members of the B.M.A. Others may be required to pay nominal charges for the agency services. Inquiries should be addressed to the medical director either at the Head Office of the Association in London or at the Branch Offices—33, Cross Street, Manchester 2; 7, Drumsheugh Gardens, Edinburgh 3; 9, Lynedoch Crescent, Glasgow C.3.

Commonwealth and International Medical Advisory Bureaux

The Council of the Association has set up at Headquarters, Tavistock Square, two bureaux, one of which welcomes doctors visiting this country from other parts of the British Commonwealth and provides them with a personal advisory service. The other serves a similar function for doctors from countries outside the Commonwealth.

The Commonwealth Medical Advisory Bureau invites doctors from overseas to write to its medical director (Dr. R. A. Pallister), preferably well in advance of their proposed visit, stating their expected date of arrival, whether accompanied by their family, how long they propose to stay, and in what ways assistance can be given. If an overseas doctor wishes to visit hospitals or seeks advice about postgraduate courses, he should add particulars of his professional experience. The medical director will also be pleased to see him at the bureau as soon as possible after his arrival or to talk over any points on which he may need advice or assistance. Contact is maintained with medical schools, postgraduate institutions, hospitals, and other bodies able to assist overseas visitors in the educational field. A register of suitable hotels and lodgings is maintained by the bureau, and general information is given on travel, customs duties, facilities for sport, exhibitions, and the like.

The other bureau is the International Medical Advisory Bureau, also located at B.M.A. House and also under the directorship of Dr. Pallister. Here again information is obtainable on postgraduate education, visits to hospitals and clinics are arranged, and assistance is given to visitors in finding accommodation and in other respects. The bureau also arranges holiday exchanges between the families of U.K. members and their Continental colleagues; last year nearly 200 such exchanges were arranged.

Medical Insurance Agency

The Medical Insurance Agency (B.M.A. House, Tavistock Square, London, W.C.1) is a recognized agent of all the leading insurance offices, and is thus able to obtain for members of the medical profession the best terms available in the insurance market. The Agency, which was established in 1907, distributes all its surplus to medical and dental charities. Special loan facilities are available for the purchase of houses, motor-cars, and equipment. Information can be obtained from the chief office of the Agency (Telephone No. : Euston 6031) or from its branches in Birmingham, Bristol, Cardiff, Dublin, Edinburgh, Glasgow, Leeds, Manchester, and Newcastle.

DEFENCE SOCIETIES

The *Medical Defence Union* (Tavistock House South, Tavistock Square, London, W.C.1) has a membership in excess of 45,000. The Union accepts medical and dental practitioners as members, whether practising in the United Kingdom or in certain countries overseas. A particular appeal for early membership is addressed to the provisionally registered practitioners when they commence their hospital duties. Special arrangements exist with regard to the protection of temporarily registered medical practitioners who visit the United Kingdom to obtain further experience or a higher qualification.

All members elected since October, 1953, pay their second and subsequent subscriptions on the anniversary date of their application for membership; members previously elected pay their subscriptions on January 1 in each year. The Union provides advice and full financial indemnity for any member concerned with, or involved in, medical litigation raising a question of professional principle or allegation of professional negligence. The subscription for newly qualified practitioners is £1 for the first three years, £2 for the fourth year, and £3 thereafter, with special rates for overseas practitioners. Since its foundation the Union has spent over £750,000 in the payment of damages and costs incurred in protecting its members.

The *Medical Protection Society* (Victory House, Leicester Square, London, W.C.2) has a membership of over 34,000. Membership is open to registered medical and dental prac-

tioners, including those provisionally registered. Members are afforded advice and assistance in all matters of professional difficulty, with unlimited indemnity against legal expenses incurred in defending and conducting cases on their behalf, also against costs and damages in those cases in which adverse verdicts result. Legal expenses and amounts paid by way of adverse costs and damages greatly increased during the past year. Indemnity is secured by financial resources of £220,000 and reinsurance with Lloyd's underwriters. There are special provisions for members practising overseas: practitioners throughout the Commonwealth are joining the Society in increasing numbers.

The *Medical and Dental Defence Union of Scotland* (105, St. Vincent Street, Glasgow, C.2) has a membership of approximately 8,500. The number of claims appears to be reasonably steady, but the amounts claimed show a tendency to increase. A number of claims have been defended successfully and the professional reputation of the doctors concerned completely vindicated in the Courts, sometimes at a cost to the Union running into thousands of pounds. It is very rarely that anything is recovered, as most of the claimants are suing with the help of Legal Aid.

NURSES AND MEDICAL AUXILIARIES

The General Nursing Council and the Royal College of Nursing

The differences in the respective responsibilities of the General Nursing Council and the Royal College of Nursing in the field of nursing education are not always understood.

The General Nursing Council is the statutory body responsible for the conduct of nursing education in hospitals approved as nurse-training schools for admission to the *Register of Nurses* or to the *Roll of Assistant Nurses*. The Council was, by the Nurses Registration Act, 1919, set up to form and maintain a *Register of Nurses*, subdivided into a general and special parts, and to lay down conditions of admission to it. Similarly in 1943 the Council was required by legislation to form and maintain the *Roll of Assistant Nurses*. Admission to the *Register* is by examination on completion of three years' hospital training, and among the functions exercised by the Council are the approval and inspection of training schools, the drawing up of syllabuses, and the appointing of Boards of Examiners. Admission to the *Roll* is on completion of two years' training in an approved training school under the supervision of State-registered nurses; the assessment conducted by the Council may be taken at any time after the completion of one year's training.

A further aspect of the Council's responsibility for basic nursing education is the adaptation of training to meet changing needs and conditions within the Health Service, as illustrated in recent years by approval given to experimental schemes for integrated training—for example, general and sick children, general and mental, general and public health nursing.

In Scotland a separate council has similar obligations to those of the General Nursing Council for England and Wales. In Northern Ireland the Joint Nurses and Midwives Council is the parallel body.

The Royal College of Nursing is an independent voluntary body founded by leaders of the nursing profession in 1916, before the attainment of State registration, which was one of its early objectives. Its activities, laid down in its Royal Charter, 1928, can be grouped under three headings: educational, professional, and welfare.

The educational programme of the College provides opportunities for State-registered nurses who have completed their basic training to undertake advanced study in preparation for administrative and teaching posts in hospital and public health work or for other senior positions. The

College believes it is essential for nurses who wish to take up higher appointments to be so prepared. Courses provided by the College include a two-year course in preparation for the Sister Tutor Diploma of the University of London and a course for the Health Visitor Certificate of the Royal Society of Health. The College also awards its own certificates on successful completion of courses given for nurse administrators and teachers, for ward and departmental sisters, and for occupational health nurses. Refresher courses and study conferences are also arranged.

The Scottish Board of the College and its Committee for Northern Ireland also arrange post-registration courses and the Birmingham Centre of Nursing Education provides refresher courses for students in that area.

The respective functions of the two bodies with major responsibility for nursing education was given in greater detail in the *British Medical Journal* of September 7, 1957 (p. 586).

Medical Auxiliaries

The *Board of Registration of Medical Auxiliaries* (B.M.A. House, Tavistock Square, London, W.C.1) exists to maintain and publish a register of properly qualified medical auxiliaries. The Board helps the medical auxiliary professions to attain or to consolidate and improve their professional status, and insists that each such profession shall, before registration, establish at least the basic principles for training and practice. In return it offers the registered persons protection in that they and they only are recommended to doctors as qualified to practise their particular specialty.

Separate or sectional registers of members of each branch of medical auxiliary work are printed, and are supplied free to medical officers of health, hospital management committees, hospitals, executive councils, public libraries, medical practitioners, and others, the circulation lists varying according to the particular group of auxiliaries.

The register is composed of the following sections: audiology technicians, chiropodists, dispensing opticians, operating theatre technicians, orthoptists, radiographers, and venereal disease technicians. Copies of any or all of the current sections will be sent free to medical practitioners on application to the registrar.

The *Chartered Society of Physiotherapy* (Tavistock House South, Tavistock Square, London, W.C.1) approves 34 schools, connected with hospitals in London and the Provinces. These schools prepare students for the Society's examinations, which are recognized by the Ministry of Health under the National Health Service (Medical Auxiliaries) Regulations, 1954. Successful candidates may practise as Chartered Physiotherapists.

The Trading Representations (Disabled Persons) Act received the Royal Assent on July 23. Its purpose is to control the attempts of certain traders to exploit the sympathy and good will which is generally felt for blind and other disabled people by making misleading and exaggerated claims about the extent to which their business provides employment for, or otherwise benefits, such people. It applies only to representations made in the course of postal or house-to-house canvassing, since it is these particular forms of trading which are thought to have given rise to abuse. The effect of the Act is that after January 1, 1959, it will be a punishable offence to make the kind of representations referred to in the Act unless the person carrying on the business has his name included in a register to be set up by the Minister of Labour and National Service. This provision will not apply where the business is carried on by a local authority, by a non-profit-making body, or by a disabled person selling his own products. Any person guilty of an offence under the Act will be liable on summary conviction to a fine not exceeding £100 or imprisonment for a term not exceeding three months, or both.

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Codelprone (Merck Sharp and Dohme Ltd.).—Each tablet of this substance contains prednisolone 2 mg., meprobamate 200 mg., and dried aluminium hydroxide 200 mg. The rationale of this mixture is that the calming effect and spasmolytic action of meprobamate and the buffering action of the antacid are added to the anti-inflammatory action of the steroid. It is therefore put out for use in all those conditions for which prednisolone is at present prescribed; its indications and contraindications are those of prednisolone. The dosage recommended is the lowest which keeps the symptoms adequately controlled; an initial dosage of 2 tablets three or four times a day is suggested.

N.H.S. basic price: 100 tabs., 72s.

Bemaco (B. M. Laboratories Ltd.).—The composition of these tablets is: chloroquine phosphate 42 mg., acetylsalicylic acid 162.5 mg., calcium carbonate 45 mg., ascorbic acid 25 mg., and citric acid 15 mg. The rationale here is that the action of chloroquine potentiates that of acetylsalicylic acid, and for this reason its use is advocated in rheumatoid arthritis and allied arthropathies in a dose of 6 to 12 tablets a day. But chloroquine can hardly as yet be said to have been accepted by most clinicians as of proved use in rheumatoid arthritis.

N.H.S. basic price: 100 tabs., 10s.

Chloromycetin Palmitate Suspension (Parke, Davis and Co.).—Chloramphenicol (chloromycetin) palmitate has not the bitter taste of chloramphenicol. The palatability of this suspension thus enables the antibiotic to be given without difficulty to children who cannot swallow capsules. This compound is broken down in the bowel, and the chloramphenicol so liberated is absorbed, exerting the same action as if it had been administered as such.

Chloramphenicol is superior to any other antibiotic for the treatment of typhoid and paratyphoid fever and of severe cases of salmonella gastro-enteritis; for some forms of meningitis, particularly those due to coliform bacilli or *H. influenzae*, both because of the sensitivity of these species and because chloramphenicol attains higher concentrations in the cerebrospinal fluid than other antibiotics; and for infections of the air passages due to *H. influenzae*. It is also valuable, although its superiority to other drugs has perhaps not been so clearly proved, in acute laryngitis, tracheo-bronchitis, whooping-cough, and the virus pneumonias. As a broad-spectrum antibiotic it has many other possible uses for which other drugs are as good or better.

Whether this distinction between indications for which there are or are not equivalent alternatives is important depends on the view taken about the risk of producing aplasia of the bone marrow. The frequency of this complication is much disputed. A recent author reports 7 cases seen in one city within a year, while others have used the drug freely without ever encountering it. No second factor contributing to it is known. The risk is probably greater when large doses are given or treatment is prolonged. It is probably unwise to continue a course for much more than a week, but this should rarely be necessary.

N.H.S. basic price: 60 ml., 10s. 8d.

Correction.—We regret that the N.H.S. basic prices for "nilergex" tablets were given incorrectly (August 23, p. 507); they should be: 100 4-mg. tabs., 18s. 4d.; 100 12-mg. tabs., 33s. 4d.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Human Mammotrophin

SIR.—At the Annual Meeting of the B.M.A. this year, during a plenary session of the Section of Surgery, Dr. A. C. Crooke opened a discussion on advanced carcinoma of the breast (*Journal*, July 26, p. 225). He emphasized the complexity of the hormonal factors controlling breast development, and, with every justification, warned his audience against uncritical interpretation of hormone assays in the human. He stated that I had claimed to have detected a mammatrophic hormone in human urine but that my results have been challenged and other workers have failed to confirm them. I should be grateful if I may be allowed to comment on this statement.

It has been assumed for several years, and with increasing conviction, that human female urine must contain, in small and probably minute quantities, a protein hormone of pituitary origin which in conjunction with ovarian steroids controls the proliferation by mitosis of mammary epithelium and is thereby responsible for the production of a duct system. In 1955, Dr. E. F. Scowen¹ suggested that it should be possible to detect such a hormone by injecting a urinary extract containing an adequate proportion of normal urinary extract into weanling male mice. These animals were suggested because the high growth potential of their rudimentary mammae enables them to be rapidly feminized by specific exogenous stimulation and their simplicity of structure provides an ideal zero baseline for the detection and estimation of an artificially induced growth response. The proposal was then subjected to experimental test and an unmistakable growth response was induced in the mammae of weanling male mice of a commercial strain by injecting a Klinefelter extract of the urine of a normal pre-menopausal woman.²

During the next year this initial and successful experiment was repeated on a large scale, again using commercial mice but omitting the Klinefelter extraction as being untrustworthy. The finding of a large number of urines from healthy women was shown to induce an unequivocal mammary growth response in weanling male mice.³ We were then compelled to discontinue the use of commercial mice because of serious, frequent, and unmanageable irregularities in their mammary reactivity. A reactive pedigree strain (Strong A2G) was then discovered. One breeding colony of this strain is maintained under strict genetic control in our own laboratories. Two other colonies are kept under similar conditions—one at the Laboratory Animals Centre of the Medical Research Council and the second at the Imperial Cancer Research Fund's laboratories at Mill Hill. We are fully convinced that the above precautions are essential if accurate and consistent results are to be obtained by the use of intact mice.

Some time ago, in reviewing our problems, we decided that an accurate bioassay of human mammatrophin calls for a far more rigorous quantitative method of extracting urine protein than the simple procedures we had at first employed. This problem is being investigated but is still unsolved. We were also disturbed by the lack of any rigid proof that the mammatrophic responses observed in our mice injected with human urine were induced by a pituitary hormone of human origin. It is becoming increasingly difficult to deny that one of the major functions of the oestrogenic ovarian steroids is to release mammatrophic hormones from the anterior pituitary by selective stimulation of its mammatrophic cells. It was therefore difficult to escape the probability that if an injected urine contains oestrogens, even in very small amounts, enough mammatrophin will be released from the mouse pituitary to induce mammary growth. In the face of these doubts and difficulties we decided to use totally hypophysectomized mice and to discontinue the use of intact animals. This removed many of our difficulties. It has provided good evidence that the mammatrophic agent in human urine is an anterior pituitary hormone of human origin and in other respects it has proved to be a sensitive test object for the investigation of pituitary function.

We are not surprised that other observers have failed to reproduce our initial results in intact mice. We now consider the investigation of human pituitary function in the intact animal to be fallacious and confusing. To the best of our knowledge the work we have done on hypophysectomized animals has not been repeated.

Dr. Crooke suggested that our results may be important and should be confirmed. We are encouraged to hear this, but we hope that those who may embark on this problem will use totally hypophysectomized weanling males of a reactive and carefully bred strain. The total removal of the anterior pituitary in a 10-gramme mouse is a far less lethal and formidable operation than is generally supposed. One trained operator can easily provide 80 totally hypophysectomized weanlings a week.—I am, etc.,

London, W.C.2.

GEOFFREY HADFIELD.

REFERENCES

- Scowen, E. F., and Hadfield, G., *Cancer*, 1955, 8, 890.
- Hadfield, G., and Young, J. S., *Brit. J. Cancer*, 1956, 10, 145.
- Young, J. S., *ibid.*, 1957, 11, 116.

Anorexia Nervosa

SIR.—As one of us (W. S.) was, in 1951, one of the first to report the use of modified leucotomy in the treatment of anorexia nervosa, we are interested to see that Dr. E. Williams (*Journal*, July 26, p. 190) still recommends the use of this treatment as the alternative to intubation when all else has failed. However, we hope that it may now be generally possible to avoid modified leucotomy, since we have been very impressed with the effects of combining large doses of chlorpromazine with a modified insulin regime, provided the patient is confined strictly to bed. We have given our patients up to 1,000 mg. of chlorpromazine in the 24 hours (the average dose being about 600 mg.) and insulin in doses of around 60–80 units; the dose of chlorpromazine is, however, reduced when they are allowed up again. No undesirable complications have occurred so far in 11 patients who conform closely to Gull's original description of anorexia nervosa. We stumbled upon this combination accidentally, after we had learned about the possible value of reserpine and chlorpromazine in anorexia nervosa. But we are not very impressed with the use of either of these drugs alone, and reserpine can make patients very depressed.

For many years now one has tried to use modified insulin alone, but it has seemed to us to have been singularly unsuccessful in most patients, despite the hunger-producing effects of the insulin regime. The effect of adding chlorpromazine to the insulin seems to break down the patient's previous ability to go on refusing food. Dr. D. Stafford Clark (*Journal*, August 16, p. 446) stresses the long time needed to restore weight in anorexia nervosa under an ordinary hospital regime, combined with psychotherapy. The average duration of each admission in his series of 13 was about 3½ months, and the average weight gain during this time was 22 lb. (10 kg.). We have found that an average of 4.2 lb. (1.9 kg.) a week was gained by our 11 patients with their combined treatment, their average stay in hospital being 32 days. One patient, for instance, gained 32 lb. (14.5 kg.) in 56 days, and another 25 lb. (11.3 kg.) in 27 days, the lowest in the series gaining only 11 lb. (4.9 kg.) in 19 days before taking her discharge against advice. We have rarely seen such rapid restorations of physique in anorexia nervosa as we have recently been obtaining with this combination of treatments skilfully applied, but no doubt we shall also meet with more failures later on.

We have found psychotherapy to be generally unnecessary during the initial phase of the recovery of lost weight. But the general handling of the patient has to be sensible and firm, and the patient must be supervised and left in no doubt that she will not be allowed out of bed until the desired gain in weight has occurred. Before the advent of combined insulin and chlorpromazine treatments this firmness

and supervision alone frequently failed. Psychotherapy and support does, however, seem necessary in addition to maintenance doses of chlorpromazine in the follow-up stage in order to prevent relapse when the patient has to return to conditions which may have helped to bring about or precipitate the illness. We have not found that the use of chlorpromazine alone can prevent relapse after discharge. Our longest follow-up is now three years, and so far there have been two bad relapses in those who had initially done very well; one of these has responded to a further course of combined treatment.

We hope to report our findings in greater detail later on if they continue to prove worth while, but meanwhile there may be other patients who might benefit like ours from this new combined method, about which we have so far found no reference in the literature. We also feel with Dr. Stafford Clark that intubation is most undesirable, and that this illness is full of psychological components in the total picture.—We are, etc.,

P. J. DALLY,
G. B. OPPENHEIM,
WILLIAM SARGANT.

London, S.E.1.

REFERENCE

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Suckling in Infants

SIR,—We were interested in the recent paper by Drs. J. R. T. Colley and B. Creamer (*Journal*, August 16, p. 422) describing the pressures measured in the mouth during the bottle-feeding of babies. Our own paper correlating pressure measurements during bottle- and breast-feeding with simultaneous cineradiography is awaiting publication. Under the conditions which Drs. Colley and Creamer describe in their paper, the pressures they record are exactly as we would expect. They have used their findings to criticize our description of a squeezing action of the tongue upon the bulb of the teat, despite the fact that we clearly stated that, unless the lumen of the neck of the teat was occluded or very much narrowed, the squeezing action of the tongue was ineffective.¹ We also stated that it was rare for the baby to be able to occlude the neck and to express the contents of the usual type of commercially made teat sold in this country; the type of teat which Drs. Colley and Creamer used is advertised as being constructed so as to prevent collapse of the teat.

If a soft rubber teat is used, which permits the neck to be occluded and which the tongue may indent, there is a significant rise in pressure within the lumen of the teat. Kid-goats and calves, when feeding from their mother's teats, also obliterate the lumen of the teat sinus from above downwards, causing a rise of pressure within the lumen of the sinus comparable to that obtained inside a soft rubber teat.^{2,3} We have also shown that the appearances of the teat sinus when milked by a standard intermittent negative-pressure milking-machine are not comparable.⁴ In our first paper¹ we were very careful not to forecast the relative magnitude of the positive- and negative-pressure elements until we had made pressure measurements, but we did point out that, when using a soft teat, the amount of milk obtained during the phase when the lumen of the teat was obliterated by the tongue was roughly equivalent to the amount which flowed into the back of the mouth beyond the end of the teat prior to the initiation of this phase: we suggested how suction might be created.

The statement by Drs. Colley and Creamer that suction is produced by a backward movement of the tongue within the mouth is not quite correct. The idea that suction was created by the lowering of the tongue from the roof of the mouth from before backwards was put forward by Auerbach⁵ in 1888. As we have shown,^{1,6} it is this movement which assists in refilling the teat and which may cause milk to flow into the back of the mouth: but this action alone can never empty the teat. Emptying of the teat is associated with elevation of the tongue to the palate from

before backwards, and simultaneously there is lowering and forward movement of the back of the tongue, thus continuing to create suction; it is the latter movement which makes the cavity in which the milk accumulates prior to swallowing.

For successful bottle-feeding with commercial teats of the type sold at the present time, the size of the hole in the teat is the most important factor. If the hole is big enough, fluid flows through it into the mouth cavity and the associated pressure gradient between the lumen of the teat and the cavity of the mouth is relatively low. But, if the hole is small, very little milk may be obtained, even though a very steep pressure gradient is created.—We are, etc.,

G. M. ARDRAN,
F. H. KEMP.

Oxford.

REFERENCES

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³ ———, *ibid.*, 1958, in press.
⁴ Clough, P. A., Dodd, F. H., and Kemp, F. H., *J. Dairy Res.*, 1958, 25, 154.
⁵ Auerbach, L., *Arch. Anat. Physiol., Physiol. Abt.*, 1888, p. 59.
⁶ Ardran, G. M., and Kemp, F. H., *Dent. Practit. Rec.*, 1955, 5, 252.

SIR,—I was interested to read of the experiments carried out by Drs. J. R. T. Colley and B. Creamer (*Journal*, August 16, p. 422) to record intraluminal pressures of the oesophagus and pharynx, the mouth and teat, in bottle-feeding. The findings need careful study and will add to our knowledge of a subject which has so often been taken for granted.

When working with the late Professor James Whillis, in the department of anatomy, Guy's, on the evolutionary history of the orofacial muscles in relation to breathing, feeding, and dental arch form, cine films of bottle-feeding were made which confirm the observations of Ardran and Kemp.¹ Moreover, it seemed clear to us from the revealing monograph on sucking by Auerbach,² and from our records, that sucking should not be confused with suckling. They are not synonymous terms. In sucking, the lips need to be sealed effectively round the opening of the vessel containing the fluid. Auerbach described a sucking space in the mouth which is formed by lowering the jaw and depressing the anterior half of the tongue away from the hard palate whilst keeping the posterior half heaped up in apposition with a tensed soft palate. A resultant intraoral negative pressure allows this space to be filled with fluid which can then be swallowed.

In suckling, the lips envelop and support the teat but an airtight seal is not necessary. The suckling process is brought about by a rhythmical furrowing and bulging action of the tongue in peristaltic fashion to pump and squirt the milk into the pharynx. A slow-motion cine film was made of an infant with bilateral hare lip and cleft through the upper alveolus but not through the palate. No intraoral negative pressure was possible. Suckling movements once started would continue for a few seconds when the teat was removed from the mouth. We were thus able to record the suckling cycle, obtaining a view of the oral cavity as far back as the soft palate. First, the jaw was lowered and a central grooving of the tongue allowed milk to flow into the teat. Then a sharp upward impinging of the blunt anterior margin of the tongue was followed by an elevation of the lower gum pad to nip the neck of the teat against the everted premaxilla (or upper gum pad had it been intact). This prevented the return flow of milk into the bottle while the teat was rolled out against the hard palate by a progressive bulging of the tongue from before backwards to express the milk. The central bulging of the tongue posteriorly against a tensed soft palate seemed to squirt the milk past the faucial margins in an almost continuous stream into the lateral food passages of the pharynx. How much milk was actually swallowed rather than squirted directly into the pharynx is not easy to say. There was no interference with the rhythm of breathing, and from studies in comparative anatomy I favour the latter method of transference as predominant. There was no backward movement of the tongue which could be likened to the action of a piston in an airtight syringe.

Innate patterns of muscle behaviour essential to life are stereotyped and common to all members of the species. I believe that the above pattern of muscle activity is primarily responsible for the suckling act and varies, not in form, but in degree from infant to infant, or in the same infant at different times; that intraoral negative pressures are to

be expected; that they are incidental yet helpful to the infant in suckling. I fully support the cineradiographic findings of Ardran and Kemp.—I am, etc.,

E. GWYNNE-EVANS.

London, W.1.

REFERENCES

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³ Gwynne-Evans, E., *Brit. dent. J.*, 1951, 91, 135.
⁴ ——— and Ballard, C. F., *Proc. roy. Soc. Med.*, 1958, 51, 279.

Cow's Milk Allergy

SIR,—I read with great interest the article by Drs. B. D. Bower, D. G. Stanley-Roose, and O. H. Wolff (*Journal*, July 26, p. 195) entitled "Two Cases of Cow's Milk Allergy." I practise in a rural dispensary district in Co. Kerry, Ireland, and in the past four years I have come across six cases of cow's milk allergy in infants.

The following is a brief description of two of those cases.

Case 1.—I first saw this bottle-fed infant when she was 14 weeks old. The mother stated that she had been restless, vomiting, and refusing feeds for about four days. The child's general condition was very good. A roughness of the skin on the forehead was noticeable, and an erythematous rash was apparent on the chest and trunk. The family history was that the father had suffered from nasal catarrh, and that the paternal mother had had bronchial asthma all her life.

Treatment was as follows. Milk for feeds was prepared by adding, drop by drop, slowly stirring to avoid curdling, a mixture of 40 minims (2.3 ml.) of dilute hydrochloric acid (B.P.) in 2 drams (7 ml.) of water to one pint (0.6 litre) of cow's milk which had previously been boiled for 10 minutes. To prevent scratching, an ointment was applied consisting of a solution of coal tar dr. 1 (3.5 ml.); zinc oxide dr. 2 (7.8 g.); powdered starch dr. 2 (7.8 g.); soft paraffin dr. 1 (3.5 ml.).

Case 2.—This child was also a bottle-fed infant 18 months old. She had a widespread weeping eczematous condition on the face, chest, trunk, and limbs. The rash first appeared at the age of 3 months. It began on the forehead, and gradually spread over the face, chest, and trunk until the whole body was covered. In spite of this the child's general condition was good. The child's uncle suffered from asthma. The same treatment was prescribed as in the previous case, and in ten days there was a marked improvement. The weeping condition of the skin had completely disappeared, the irritation was not present and the child was now sleeping very well. The acid-milk treatment was continued for five months, and after that the child took untreated cow's milk without any ill effects.

The remaining four cases received the same treatment, and all responded excellently.—I am, etc.,

Co. Kerry.

REDMOND M. O'BEIRNE.

Intracellular Iron-containing Enzymes

SIR,—Your excellent leading article on iron stores and iron deficiency (*Journal*, May 17, p. 1167), prompts me to draw the attention of your readers to the mounting evidence that basic disorders of intracellular iron-containing enzymes and perhaps resulting cellular anoxia may underlie various anaemias, on the one hand, and haemochromatosis as well as nutritional siderosis in Africans on the other. Your leading article makes only limited reference to related literature on this aspect of these problems. Since the altered iron absorption and utilization in all the above conditions may perhaps be only secondary to primary lesion(s) of the intracellular iron-containing enzymes, further reference to relevant data seems timely.

The nature of the prevailing intercellular metabolism probably exerts a profound influence on the uptake and utilization of iron by any cell. This is supported (perhaps so diagrammatically as to go unnoticed in the present context) even by the unique capacity of red cell precursors to take up iron, this capacity apparently diminishing as these cells mature.¹ It is not surprising, therefore, that in anaemias iron metabolism is deranged in varying degrees in many cells in the body other than those concerned with erythropoiesis. The findings of Beutler,² quoted in your leading article, are indeed satisfying proofs of this. However, the presence of widespread cellular metabolic derangements in the presence of widespread cellular metabolic derangements in anaemic subjects is evinced also by the now generally recognized

epithelial siderosis (see below) and megalocytosis even in non-haemopoietic cells in pernicious anaemia.^{3,4}

That bodily iron uptake and utilization may be profoundly altered by anoxia is supported by several recent studies. Thus, Smith *et al.*⁵ revealed that rats exposed to low oxygen tensions for as little as two hours absorbed far greater amounts of a single-standard test-dose of radio-iron than their controls at ambient oxygen tension. These workers suggested that their results indicated "that iron absorption from the gastrointestinal tract is a dynamic cellular process and not a matter of simple diffusion," a view favoured also by Granick⁶ and others. Additional evidence, substantiating the effects of anoxia on cellular enzyme composition, was provided by Tappan *et al.*,^{7,8} who demonstrated increased concentrations of certain oxidative and non-oxidative cellular enzymes as well as increases in skeletal muscle myoglobin in animals acclimatized to high altitudes. The repercussions of these enzyme increases on iron metabolism were not studied by these authors, but the work of Smith *et al.*, mentioned above, indicates the probable trends. Moreover, Colehour and associates^{9,10} demonstrated that even acute hypoxia induced an almost immediate rise in transferrin and a fall in serum iron, while Prentice and Mirand¹¹ found an increased circulating erythropoietin for up to five days following acute hypoxia, this increase being maintained for much longer periods in rats with previously injured livers. Such increases in erythropoietin which occur also in anaemias may perhaps play a part in promoting increased iron uptake from the alimentary tract. This possibility is strongly supported by the recent demonstration of two- to sevenfold increase in iron uptake by bone marrow cells exposed *in vitro* to "erythropoietin."¹² Thus, acute hypoxia can promote, probably through several mechanisms (direct and indirect) an increased iron uptake by the gastrointestinal mucosal cells and also, perhaps, by many other cells in the body as a result of the associated alterations of intracellular metabolism.

We have repeatedly expressed the opinion that iron overload alone is not the cause of experimental siderosis. Our recent investigations¹³ disclosed that, in certain diets, iron uptake may not be a function of the iron intake alone. Thus, rats fed an iron-enriched maize-meal diet absorbed and accumulated almost three times as much body iron and twice as much hepatic iron as rats on an iron-enriched stock diet, even though the total daily intake of iron by the maize-eaters was far less (almost half that of the better-fed rats). There is some indication that some metabolic disorder, resulting in cellular anoxia, occurs at least in the livers both of pellagrins¹⁴ and of rats fed a maize-meal diet.¹⁵ Moreover, preliminary results of new experiments by us indicate that one hour's exposure to simulated high altitudes thrice weekly seems to intensify considerably the hepatic siderosis in rats fed iron-enriched maize but not in those fed an iron-enriched stock diet—both diets with equal calcium and phosphorus contents. The latter findings suggest that the "malnutrition" and intermittent decompression operate synergistically in facilitating the absorption and storage of iron in the liver—perhaps through a mechanism similar to that described by Prentice and Mirand and by Jacobson and co-workers.^{16,17}

Sheldon¹⁸ suggested that the intra-epithelial iron in idiopathic haemochromatosis was derived from the affected cells themselves, as a result of some genetically determined distortion of cellular metabolism. There are already indications that the increased intracellular deposition of copper in Wilson's disease is attributable to some congenital derangement in protein metabolism with consequent formation of an abnormal protein with an undue affinity for copper. It seems possible that an analogous lesion may underlie haemochromatosis, the increased absorption and accumulation of iron being in fact secondary. A similar explanation may also perhaps apply to nutritional siderosis in Union Africans—in this case the intracellular metabolic disorder perhaps resulting from long-term chronic malnutrition. Thus, even in 1944 it was shown that in nutritional siderosis iron accumulates first on or around the hepatic cell mitochondria,¹⁹ and the name "cyto-siderin" was proposed for this pigment in order to indicate its derivation from cellular enzymes rather than from haemoglobin. This observation has apparently been confirmed by Richter's recent electron microscope study,²⁰ quoted in your leading article. It is notable, too, that, in experimental siderosis in rats, iron also accumulates first along the biliary poles of the hepatic epithelium in a manner directly comparable with that described in the early stages of human siderosis.²⁰

It seems possible that the microcytic anaemias, so common among malnourished peoples, may also be secondary to intracellular metabolic disorders, produced by the inadequate diet, rather than simply to deficiency in iron intake alone. This seems all the more likely in view of Foy and Kondi's recent finding,^{21,22} based on extensive studies, that there is no evidence for a deficient iron intake by peoples with microcytic anaemias studied by them.

AITOLIA ENGLISH.

Zoster Sine Herpete

SIR,—Dr. G. W. Lewis's comprehensive and important article on zoster sine herpete (*Journal*, August 16, p. 418) prompts me to record two out of a number of cases in support of his contention that this is a commoner condition than has been realized.

During an epidemic of varicella in the late spring of this year a married woman of 35 years was awakened in the early hours with severe nausea and vertigo. She staggered to a wash-basin, but did not vomit. The attack passed off within the hour and next day the symptoms did not reappear, though she felt lethargic. The following night the episode was repeated and it was with difficulty that her husband got her back to bed, so severe was the vertigo. The next day mild nausea and a very slight vertigo were present during the day and she developed a fairly severe right otalgia. The drum was normal; she had no deafness, nor tinnitus. A coarse nystagmus could be elicited. The otalgia slowly diminished, lasting five days altogether. The nausea and vertigo disappeared after ten days. On the fourth day after the start of the otalgia, two small vesicles of herpetic type appeared above the right pinna.

The second case had a moral attached. A medical student was "sitting in" with me at a consultation period. I had said how important it was to examine fully any cases where examination might be helpful, when a woman came in with a history of sudden severe pain of sciatic distribution after moving a piano. I sent her to the examination room with instructions to disrobe from the waist downwards. When we came to her she had omitted to remove her stockings. On my request she removed them with ill grace and an "Is-it-really-necessary?" expression. To our surprise and my delight we saw a group of herpetic vesicles on the outer side of the great toe extending on to the nearby dorsum of the foot. She had no further outcrop and the diagnosis might easily have been missed.

These two cases are not "sine herpete" but "cum herpete minimo," and show that zoster may produce so few vesicles that they may be overlooked.—I am, etc.,

Leeds, 8.

R. A. MURRAY SCOTT.

Jack Sprat

SIR,—Dr. S. Levin's suggestion about the possible metabolic background to the dietetic difficulties of Mr. Sprat (*Journal*, August 23, p. 503) is certainly original; unfortunately he says nothing about Mrs. Sprat's troubles. Be this as it may, it may interest people to know that according to my family tradition in Norfolk Mr. and Mrs. Jack Sprat were real people; they lived at Hethersett, a village just south of Norwich, in the early part of the eighteenth century. That knowledge of the Sprats became widely known is easy to understand when it is remembered that Hethersett was on the old road from Norwich to London via Braintree, a busy route originally popularized by the silk merchants.

It is curious to reflect that, while most nursery rhymes have a factual origin and perpetuate important events in our national life, no additions to the collection seem to have been made for a couple of hundred years or so.—I am, etc.,

London, W.1.

W. R. THROWER.

Informing the Hospital

SIR,—Very often patients come into hospital with boxes of tablets, which they say their G.P.s have been giving them for a long time, the name of which is unknown to them. This means that the house-physician or house-surgeon has to find out from the G.P. the name of the drug, and this is time-consuming and also results in delay in treating the patient. Sometimes patients describe the colour or taste of a drug which they say they have been taking, and if something different is given to them quite often they grumble, and it produces a difficult situation between the outside practitioner and the hospital resident doctor.

I think it would be a better arrangement if the private practitioner could inform the hospital doctor of the chronic illnesses of the patients they send in with some different acute condition—for example, appendicitis with chronic heart failure or epilepsy, or disseminated sclerosis—and the

treatment they are on. The house-physician or house-surgeon always has to make his own diagnosis about the present ailment, but it is humanly impossible for him to find out the name of the tablets patients have been on previously or to make a correct judgment about their past illness, which may be of great value in the treatment of the present condition—especially where anaesthesia and operative measures have to be considered.

Therefore I would like, through your *Journal*, to urge that in future G.P.s should inform hospital practitioners about the past history of their patients and the treatment they are on, and I am sure this would be a great help for the inexperienced junior members of the medical world like myself.—I am, etc.,

St. Albans, Herts.

BISWARUP BHATTACHARYA.

Coudé Catheter

SIR,—The scene is a surgical ward of the London Hospital in the early twenties. Russell Howard is taking a teaching round, and is on the warpath.

RUSSELL HOWARD: "What is the name of this catheter, you?"

STUDENT: "A coudé, Sir."

RUSSELL HOWARD: "Why is it called coudé?"

STUDENT: "After a French surgeon, Sir."

RUSSELL HOWARD (with the well-known leer): "Yes, and I suppose his brother Bi Coudé invented the other one." Collapse of student.

Mr. Hamilton Bailey (*Journal*, August 23, p. 513) must have missed this particular round.—I am, etc.,

London, S.E.10.

STEPHEN POWER.

SIR,—When I was a medical student in Johannesburg thirty years ago the following anecdote was currently popular. The scene was an oral examination in surgery.

EXAMINER: "And what, Mr. Blank, is this?"

CANDIDATE: "A coudé catheter, Sir."

EXAMINER: "And why, Mr. Blank, is it so called?"

CANDIDATE: "After the eminent French surgeon M. Coudé, Sir."

EXAMINER (producing a second instrument): "And this one, I presume, Mr. Blank, after the even more distinguished French surgeon, M. Bicoudé?"

What a lot of red faces there ought to be about! But what a brilliantly successful leg-haul!—I am, etc.,

Devonport.

C. H. JOYNT.

POINTS FROM LETTERS**Radiation and Childhood Malignancies**

Dr. JOHN D. ABBATT (Meopham Green, Kent) writes: Your leading article on this subject (*Journal*, July 12, p. 96) was lengthy and uninformative. In this article you rightly say that the full results of the Oxford investigation¹ have been awaited with special interest; this is self-evident in view of the anxiety aroused by the initial report. In your leader, apart from recapitulating some of the more important radiological features in the report, little else was said. No editorial assessment of the value of the investigations nor of the practical significance of the findings was attempted. This is particularly unhelpful. Your very understandable desire to avoid being wrong has, I believe, led you in this instance and on this topic to publish a masterpiece of "fence squatting."

REFERENCE

¹ Stewart, A., Webb, J., and Hewitt, D., *Brit. med. J.*, 1958, 1, 1495.

Treatment of Boils

Dr. ALLENE SCOTT (London) writes: Allow me to say that I agree entirely with Dr. G. N. Marsh (*Journal*, August 16, p. 451) that treatment with expensive antibiotics is not routinely indicated for boils. As our observations showed (*Journal*, July 12, p. 83), minor grades of boil are unaffected, and, as Dr. Marsh says, penicillin is likely to be effective for the majority of more severe ones. We chose this type of staphylococcal infection for a therapeutic study only because plenty of cases are available and the progress of the lesion can be closely watched, in the hope that the lessons learned might be applicable in other directions.

Obituary

C. C. UNGLEY, M.D., F.R.C.P.

Dr. C. C. Ungley, physician to the Royal Victoria Infirmary, Newcastle upon Tyne, and well known for his work on the treatment of pernicious anaemia and subacute combined degeneration of the cord, died at his home in Newcastle on August 21. He was 56.

Charles Cady Ungley was born on July 14, 1902. At the University of Durham, where he studied medicine, he soon made his mark as a man who would distinguish himself in his chosen profession. Winning the Turnbull and Tulloch, Gibb, Dickenson, and Philipson scholarships, he graduated M.B., B.S., with honours, in 1925, and proceeded M.D. two years later. After resident posts at the Royal Victoria Infirmary he took the M.R.C.P. and was appointed medical registrar at the Infirmary in 1928.

At that time he was particularly interested in neurology, and his first paper on subacute combined degeneration was published in *Brain* in 1929. Soon afterwards he was awarded a Rockefeller medical fellowship and he became research fellow in medicine at Harvard University and at the Massachusetts General Hospital, Boston. By this time he had turned his attention to the treatment of pernicious anaemia and published several papers on the subject in the *Quarterly Journal of Medicine*. Having returned to Newcastle he was appointed assistant physician at the Royal Victoria Infirmary in 1935 and full physician in 1947. Elected a Fellow of the Royal College of Physicians in 1937, he was previously a Leverhulme research scholar of the College, and in 1938 he gave the Goulstonian Lecture on "Some Deficiencies of Nutrition and their Relation to Disease."

Ungley was no cloistered research worker, but a clinician interested in all aspects of medicine. For several years he was honorary secretary of the Newcastle and Northern Counties Medical Society, and he was a member of the R.N.V.R. from the time he qualified. During the second world war he served as a surgeon commander and did some notable work to improve the chances of survival of the shipwrecked. After the war he and his colleagues continued to make many valuable contributions to clinical haematology, several of his papers being published in this *Journal*.

Dr. Ungley is survived by his wife, one son, and two daughters. Professor F. J. NATTRASS and Dr. R. B. THOMPSON write: The death of Charles Ungley removes a distinguished figure from British medicine. Though he was working to the last he had been dogged by ill-health intermittently for the past fifteen years. This first appeared when he was stationed in the South Africa during the war as a medical officer in the Royal Navy, an acute infection leading to the discovery of marked hypertension. From time to time since then his work has been interrupted by symptoms related directly or indirectly to this condition.

Ungley's very active life divides itself naturally into three periods—before, during, and after the second world war. His first and still perhaps most important work was on subacute combined degeneration of the spinal cord, and was carried out initially in conjunction with M. M. Suzman. It was thought at first that Minot and Murphy's discovery of

the liver treatment of pernicious anaemia was not applicable to the associated nervous disorder, but these workers showed that with greatly increased doses of whole liver the disease could frequently be cured or arrested. To show this Ungley and his colleague examined and followed up virtually all the cases of subacute combined degeneration in the north-east of England, carrying out the work with scrupulous clinical accuracy. The tremendous advances which have followed the discovery of the liver treatment have not solved the fundamental problem of the relationship of the blood and spinal-cord changes. But this discovery was the main stimulus of modern haematology, and to continuing research in this field Ungley devoted the rest of his life in conjunction with general clinical work and teaching. When Castle put forward his hypothesis Ungley became greatly interested in the nature of the "extrinsic factor" and carried out much experimental work on this subject. He was also intrigued by the haematopoietic responses, which could be obtained by yeast extracts, and carried out many clinical trials with such preparations. This early work deserves very great credit, for it was done in scanty accommodation and with few facilities.

A keen member of the R.N.V.R., Ungley was called up for service and in due course was stationed at the Royal Naval Hospital at Kingseat, near Aberdeen. His energy and initiative quickly directed his attention to urgent Service problems, and his work in two directions was of a character undoubtedly historic—namely, on survival at sea of shipwrecked men and on the particular problem of such men which he named "immersion foot." Though, owing to his health, publication of his work on the general problems of survival was long delayed, his official report, in conjunction with McCance, Crosfill, and Widdowson, is of first-class importance. One contemporary problem with which it deals decisively is the grave danger of the drinking of sea-water. The distressing "immersion foot" he studied in detail, investigating its circulatory and neurological manifestations, its management, and its aetiology, including its differences from frost-bite and other conditions.

The post-war period found him at work again among the complexities of research on pernicious anaemia. One of the most rewarding of his investigations was a series of clinical trials which were carried out with purified liver extracts prepared by Lester Smith and his colleagues of the Glaxo Laboratories. This time-consuming method was the only one then available for assaying the potency of haematopoietic material. These trials helped very substantially towards the purification of liver extracts and the eventual crystallization of vitamin B₁₂. He was also very much concerned during this period with experimental work on the nature of "intrinsic factor." His interests, however, were not limited to investigation of classical pernicious anaemia, for he wrote many papers on related megaloblastic anaemias such as pernicious anaemia of pregnancy and anaemias associated with disease of the small intestine.

Ungley's work showed well the indivisibility of medicine, for he was as good a neurologist as haematologist and also taught and practised effectively in other branches of medicine. He was very keen on undergraduate teaching and was never happier than when teaching the elements of the art in the wards. He was the first physician in his hospital to arrange—irregularly!—for his clinical clerks to obtain periods of experience in general practice, and he picked the doctors carefully. When the National Health Service came in he chose a whole-time contract in order to give all his time to hospital and research, but formerly he was in consulting practice.

Ungley's knowledge of nutritional disorders and of pernicious anaemia was extraordinarily extensive and was always at the disposal of anyone interested in such problems. He did not find writing easy, and his many lucid scientific papers were produced only after very critical assessment of his results and with much labour. Perhaps his only intellectual hobby was medicine, but he enjoyed golf and rather alarmingly in his latter years became an expert glider. He



enjoyed wonderful holidays with his wife, son, and two daughters. He was a very modest man. He had complete integrity, great kindness, and charitableness to all.

Dr. E. LESTER SMITH writes: The importance of Ungley's pioneer work with vitamin B₁₂ has tended to be overshadowed by later exciting developments. It is no exaggeration to say that without his help vitamin B₁₂ would not have been isolated by the British team. Although pink concentrates were obtained in 1946, it was believed for some time longer that the colour was due to an adventitious pigment accompanying the active principle. It needed a total of some 80 clinical tests (many of them repeats on the same sample) before the relationship between colour and activity became firmly established, and nearly all these tests were carried out by Dr. Ungley personally. This work was never published in detail; for as soon as the crystalline vitamin became available Ungley devoted all his abounding energy to constructing dose-response relationship for pernicious anaemia cases with different initial red-cell counts, with and without neurological complications. He also tried all possible methods of administration and was the first to demonstrate dramatic remissions with single massive oral doses (3,000 micrograms). Ungley was also one of the first to insist that in the treatment of pernicious anaemia dosage schedules need no longer be restricted to those established for liver extracts, and to recommend the larger doses that have since become routine. He deserves greatly to be remembered for all this original work and for the several excellent reviews of the subject that he compiled.

Dr. ANDREW SMITH writes: Some mention should be made of Dr. Ungley's interest in teaching students and particularly in introducing them to general practice. He started a student-general-practitioner attachment scheme in King's in 1952, long before such schemes became general. He approached four general practitioners (of which I was one) with urban, semi-urban, rural, and small-town practices respectively and persuaded each to take a student for one day each week and show him something of general practice. This scheme differed from most others which have been introduced since in that the student saw different types of practice and different doctors, and he saw general practice at the beginning of his hospital career. This made him realize that patients are people with homes and families, not merely vehicles of disease, and coloured his subsequent dealings with patients in hospital. The scheme, started as an experiment over six years ago, has continued ever since.

A. MARION HILLIARD, M.D.

Dr. Marion Hilliard, who was well known as a specialist in obstetrics and gynaecology in Toronto and was a vice-president of the Medical Women's International Association, died on July 15.

Anna Marion Hilliard was born in 1902 at Morrisburg, Ontario, the third of a family of five, and was educated at Victoria College, Toronto, and at the University of Toronto, graduating M.D. in 1927. As a student she distinguished herself not only scholastically but also as an athlete. After spending a year in hospitals in London, including the Hospital for Women, Soho, she returned to Toronto, where she established herself as an obstetrician and gynaecologist. She played an important part in the development of the Women's College Hospital in Toronto from a cottage hospital of 75 beds to a modern hospital and teaching unit of the university with 500 beds. A past president of the Canadian Federation of Medical Women and a vice-president of the Medical Women's International Association, Dr. Hilliard was nominated shortly before her death for the office of president of the latter association. She gave up her appointment at the Women's College Hospital only last year, but had planned to continue in private practice for some time to come; and she was looking forward to the opportunities which presidency of the M.W.I.A. would afford her to study conditions in other countries, particularly in India. Generous

and warm-hearted by nature, she had provided funds to establish a student scholarship at the Victoria College in memory of her father, and she gave the proceeds from the sale of her book, *A Woman Doctor Looks at Love and Life*, to the Women's College Hospital. By Dr. Hilliard's death Canada has lost one of her most popular women doctors.

ROBERT RUTHERFORD, O.B.E., T.D., F.R.C.S.

Mr. Robert Rutherford, who was in general practice at Longtown, Cumberland, died suddenly at his home there on August 19. He was 63 years of age.

Robert Rutherford was born in Glasgow on January 23, 1895. As a child he moved with his parents to Carlisle, and was educated at Grosvenor College there. He left an apprenticeship with a chemist to serve with the Black Watch in France in the first world war. Soon after his return to civilian life he became a medical student at King's College Hospital, and qualified M.R.C.S., L.R.C.P. in 1927. Three years later he was admitted F.R.C.S. After qualification he held the appointments of house-surgeon at the Belgrave Hospital for Children and casualty officer, house-surgeon, and surgical registrar at King's College Hospital. From 1930 to 1934 he was clinical director at Hillingdon County Hospital, after which he was in general practice at Longtown. The author of many articles on surgical subjects published in this and other journals, he examined in surgery for the General Nursing Council from 1932 to 1939. As a Territorial officer he was recalled to the R.A.M.C. in 1939 on the outbreak of the second world war, and served throughout. He was officer in charge of the surgical division of the 19th General Hospital in England and Egypt in 1939-40; in command of the 60th British General Hospital in Palestine and India from 1940 to 1942; and officer in charge of the surgical division of the Davy Hulme Military Hospital in 1943 and the 110th British General Hospital in Normandy and Belgium in 1944-5. His name was brought to notice in recognition of distinguished services in connexion with operations in the field from March to June, 1940. Three years later he was awarded the Efficiency Decoration of the Territorial Army. In 1946 he was appointed O.B.E. for gallant and distinguished services in North-west Europe, and in the previous year he was mentioned in dispatches. After the war he returned to his practice at Longtown, becoming also medical officer to the Westmorland and Cumberland Yeomanry. He retired from the Territorial Army in 1952 with the rank of colonel. He married Miss Nora Borrett in 1931, and she survives him together with the two sons and three daughters of the marriage.

JAMES ALEXANDER, M.D.

Dr. James Alexander, who was in general practice at Galston, Ayrshire, for over half a century, died at his home in near-by Darvel on August 12. He was in his 90th year.

James Alexander was born at Waterside, in the parish of Fenwick, Ayrshire, on April 16, 1869, and was educated at Kilmarnock Academy and Glasgow University, where he graduated M.B., C.M. in 1890. Four years later he proceeded to the M.D. After graduation he was in practice at Aberdare, South Wales, and later went to Vienna for postgraduate study before returning to practise in Galston. He remained there for the next fifty-five years, and retired after the introduction of the National Health Service in 1948. A justice of the peace of the county of Ayr, he served as chairman of the Kilmarnock and district licensing court. He had great experience in both town and country practice, and leaves behind him a splendid record of public work and service.

J.S. writes: Dr. James Alexander's death ends, in this part of Ayrshire, the era of medicine which is slowly closing all over the country, when the general practitioner had to

use his skill in many branches of medicine without appeal for specialist help. Dr. Alexander was well fitted for this work. Robust and tall, he gave confidence with his firm manner and quick decisions, so that he built up a practice of grateful and loyal patients. For transport he used in his time, in turn, riding-horse, horse and carriage, and motor-car. Only recently, with failing health, did he lose his quick, energetic stride.

ANGUS CAMPBELL, M.C., M.B., Ch.B.

Dr. Angus Campbell, who died suddenly on August 11 at the age of 82 while holidaying with his younger brothers at Port Ellen, Isle of Islay, had been for many years in practice at Evenwood, near Bishop Auckland.

Angus Campbell was born on May 27, 1876, and graduated M.B., Ch.B. at Glasgow University in 1902. He began his professional career at Crook, Co. Durham, where he served for some years as assistant to the late Dr. McKay. On leaving there to take an assistantship for a short time in Pontypridd he received an illuminated address from his grateful patients. Throughout the first world war he served as a regimental medical officer in France, was mentioned in dispatches, and awarded the Military Cross. Soon after completing his military service, Campbell bought the farm of Giol in Oa, Isle of Islay, where his father had for many years been a sheep farmer. At this time, too, he settled at Evenwood in practice on his own account. He remained there until he retired at the age of 72, when he went to farm Giol, which had been managed for him by a younger brother. His wife Edith died there in 1955.

H.C.D. writes: A Highlander of retiring disposition, and of a quiet, gentle nature, Campbell had never sought a wide circle of friends, but to those who were privileged to be numbered among his intimates he was a loyal, forthright, and beloved friend. His forty years in Evenwood were devoted to his patients, his only recreation being an occasional hour with the gun and short visits to his beloved Islay. He had a profound knowledge of sheep and of sheep farming. Only a year ago he sold his farm and made his home with his eldest daughter. While it is a disappointment to his friends that he did not live longer to enjoy a well-earned rest, we feel that his sudden painless passing in the island that he loved so well would have been his wish. Dr. Campbell is survived by one son, Dr. Angus Campbell, of Oldham, and by three married daughters, and to them we extend our sincere sympathy.

W. BARRINGTON PROWSE, F.R.C., M.R.C.S. L.R.C.P.

Dr. W. Barrington Prowse, honorary consulting radiologist to the Royal Sussex County Hospital, Brighton, died at the hospital on August 16 a few weeks after his 88th birthday.

William Barrington Prowse was born on June 18, 1870, the son of Dr. William Prowse, and was educated at Epsom College. Receiving his clinical training at Bristol Royal Infirmary, he qualified M.R.C.S., L.R.C.P. in 1900. After a period of further study in radiotherapy at the London Hospital, he joined his father in general practice at Brighton. A few years later he decided to concentrate his energies on radiology, and in 1906 he set up in practice as one of the early specialists in the subject. A valued supporter of local and national medical organizations, he served as one of the honorary secretaries of the Section of Electrotherapeutics at the Annual Meeting of the British Medical Association held at Brighton in 1913, and he was chairman of the Brighton Division of the Association in 1935-6 and president of the Sussex Branch in 1937-8. He was also a past president of the Brighton and Sussex Medico-Chirurgical Society. A widower since 1951, he is survived by two sons, one of whom, Dr. C. Barrington Prowse, is a consulting physician.

G.W.B. writes: From the beginning of his career Dr. W. Barrington Prowse came to be known as a diagnostician of unusual ability. His opinion was a model of clarity and precision. His reports were always written by his own hand, a practice he never discontinued. From them a doctor would catch the reflection of a man who, though deeply versed in his craft, was also concerned for his patients beyond the narrow limits that craft imposed. During a long and flourishing working life his patients knew him as a man of great warmth and sympathy, and showed their appreciation for his many acts of kindness and consideration. He was responsible for the formation of a department of radiology at the Royal Sussex County Hospital and at Worthing Hospital. His professional life spanned the history of British radiology. Early in the century he was associated with the Roentgen Society and with the British Association for the Advancement of Radiology and Physiotherapy. In 1934 he was a founder member of the British Association of Radiologists, to which body he was elected a Fellow in the following year. The name of the parent body was changed in 1939 to the Faculty of Radiologists, and he was automatically made a Fellow. His private work reflected the development of radiology in general, from the Roentgen-ray equipment he installed at his consulting-rooms in 1906 to the later appearance of radiotherapy as a specialty and the increasing refinements of radiodiagnosis. Outside his work his interests were wide, principally in fishing and golf, and his keenness for swimming made him a familiar figure all the year round at the early morning bathing parade. His passing removes from medical practice in Sussex one of our most respected colleagues, and from the lives of those who knew him a most charming friend.

J. L. SHELLSHEAR, D.S.O., M.D., M.S.

Professor JOHN KIRK writes: I would like to express my grateful appreciation of the tributes to Professor J. L. Shellshear by two of his friends published in the *Journal* of August 16 (p. 453) and August 23 (p. 517). They have vividly recalled to me many happy memories of him in Hong Kong more than thirty years ago. In those days occasional visits to the Colony were a delightful experience for those of us whose work lay in the Chinese hinterland, especially because of the warm welcome which we knew was always waiting for us in the homes of our friends. In the medical school of the University of Hong Kong at that time were four great-hearted gentlemen who stood out pre-eminently and inevitably because of their valued contributions to medical education in the Far East. Joseph Shellshear occupied the chair of anatomy, H. G. Earle the chair of physiology, John Anderson the chair of medicine, and Kenelm Digby the chair of surgery. They were indeed a noteworthy quartet and the university was fortunate to have men of such character and ability to pass on to the eager Chinese students not only the best of Western medicine, but also those high ideals of life and service which were typical of each of those eminent teachers. "Joe" Shellshear was the last survivor of that wonderful group, to whose friendship I owed so much. Like his three valiant colleagues, he now rests from his labours and his works do follow him.

CORRIE HUDSON, C.B., C.I.E., D.S.O., F.R.C.S.Ed.

Lieutenant-Colonel H. R. B. GIBSON, I.M.S. (retired), writes: It has been suggested to me that I might make known incidents in the varied life of Major-General Corrie Hudson, of whom an obituary notice appeared recently in the *B.M.J.* (August 9, p. 392). In Bombay on February 12, 1914, Corrie Hudson had but recently returned from the 2nd Balkan War and that night he told me of his experiences there. He was at home on leave when he heard that Sir Frederick Treves was raising a British Red Cross ambulance to go to the Balkans. "C.H." got an interview with Sir Frederick, and on explaining the reason of his visit Sir Frederick smiled

and opened a drawer of his desk, showing that it was full of applications. Corrie Hudson, not a bit perturbed, asked, "How many of these applicants have commanded a field ambulance on active service?" Sir Frederick replied, "None. Have you?" "Yes," said Corrie. "That makes a difference," Sir Frederick said. "What position are you prepared to hold?" Corrie replied, "Either I command it or nothing." He got command. On the eve of his departure from the Balkans he was given a farewell dinner. He was shaking hands with the officers, when one said, "Not good-bye: au revoir. We shall meet in Berlin." At this the other officers laughed, and Corrie, seeing that there was something behind the remark, asked for an explanation. After an incredulous, "Don't you know?" the explanation was given, "Austria will declare war against Serbia, Germany will go with Austria. Against Germany and Austria will be Italy, France, Britain, Belgium, Holland, and Denmark. It is not good-bye but au revoir. We shall meet in Berlin." C. H. was greatly impressed, and on his return to London went to various departments of the War Office and attempted to impress them with the story. Eventually he got an interview with Sir Edward Grey, but there too he did not seem to have any success.

H. A. SANDIFORD, M.C., M.B., D.P.H.

The obituary of Brigadier H. A. Sandiford was printed in the *Journal* of August 23 (p. 513).

Dr. J. G. HUNTER, General Secretary of the Federal Council of the British Medical Association in Australia, writes: We here in Australia were grieved to learn of the death of Brigadier H. A. Sandiford, "Sandy," to all who knew him well, with his quizzical smile, warm welcome, and charm of manner, was a friend indeed to all overseas members visiting London, and the Commonwealth Medical Advisory Bureau is a monument to his enthusiasm to industry. I have the happiest of recollections of my association with Sandy during several visits to London, and on behalf of the Association in Australia I would like to pay tribute to the great work he did as director of the Bureau, and to extend deepest sympathy to his widow, son, and two daughters.

J. L. G. writes: I am one of those who have been deeply interested in the Commonwealth Medical Advisory Bureau since, and even before, its inception, and I would like to add my quota of admiration for the great work which Sandiford performed, and of sorrow at his death. His energy and organizing ability and, above all, his kindness of heart combined to create an instrument more efficient than even the most sanguine of us could have hoped. Scores of letters from overseas testify to the aid which he so cheerfully gave to visitors who might otherwise have remained friendless. The Bureau will be a lasting memorial to the man whose work as its first director must have helped in no small degree to strengthen the links between Britain and the other members of the Commonwealth.

Universities and Colleges

SOCIETY OF APOTHECARIES OF LONDON

The following candidates, having completed the final examination, have been granted the diploma of L.M.S.S.A.:

D. H. Perkins, J. R. Carling, M. C. Liu, I. H. Bailes, R. J. Priddy, J. R. Johnson, R. N. Brain, S. K. C. R. Villayarayan, M. A. Saber, E. M. Blenkinsop, P. W. F. Chan, N. Mustapha, J. A. Saunders, D. F. Fergie-Woods, M. T. Haslam, H. Hunt, E. McIlwaine, P. Nour-Eldin, J. F. Rivers, M. Budd, L. B. Cannell, A. J. Casson, M. A. Gibson, A. M. Hazell, R. G. Hornung, J. G. Williams.

P. R. Sathyanadhan was awarded the Diploma in Mastery of Midwifery and F. de S. Donnan, G. F. Smith, and W. O. Thompson the Diploma in Industrial Health.

Medico-Legal

FATAL AGRANULOCYTOSIS AFTER "NOVALGIN"

[FROM A HAEMATOLOGIST]

In 1945 a healthy man aged 45 was seriously injured in a road accident. After 17 weeks in hospital he was discharged with residual pain for which was prescribed "novalgin," an amidopyrine derivative, 5 gr. (320 mg.), and phenobarbitone, $\frac{1}{2}$ gr. (32 mg.), every night. All attempts to wean him from this combination failed, so that in the last 12 years he must have consumed some 1.5 kg. of novalgin and 150 g. of phenobarbitone.

In August, 1957, he had a chill and developed an inflamed mouth, diagnosed as thrush, from which he recovered completely. On January 30, 1958, he was found to have a second attack with bleeding from the gums and a haemorrhagic rash on thighs and arms. This time he did not respond to treatment and was admitted to hospital on February 6 with severe ulceration of the mouth, palate, and pharynx, generalized purpura, and bilateral basal pneumonia. A blood count showed virtually no leucocytes. His mouth swabs yielded profuse growths of monilia, streptococci, and haemophili. He died 55 hours later; necropsy confirmed the clinical findings. At the inquest the coroner recorded an open verdict, considering that the drug novalgin was responsible for the man's death (*East Anglian Daily Times*, March 13).

Comment

There seems no reason for doubting that the novalgin caused this man's death. It is a derivative of amidopyrine and no less dangerous. The makers have withdrawn their brand of amidopyrine from the British market, and do not advertise novalgin; but they still distribute it because there are a few people who seem to obtain relief from pain with no other analgesic drug. It was the manufacturers themselves who asked that novalgin should be placed on the Schedule of Poisons, and this was done in 1952.

This is the classical story of agranulocytosis as caused by amidopyrine and its derivatives. There is no reliable information about the frequency of this complication with these drugs, but estimates of up to 1% have been published.¹ It is now believed that agranulocytosis results from a sensitization process in which an antibody is formed to the leucocyte-drug complex; in the presence of the drug the leucocytes are agglutinated and filtered off in the lungs. If the drug is stopped, the bone marrow soon repairs the deficit, but if it is continued the bone marrow liberates ever younger cells, and ultimately all recognizable granulocyte precursors are destroyed.² In such cases recovery is unusual.

There are many drugs which may cause agranulocytosis, but only four groups are of much importance: first and most dangerous, because more potent than the others, amidopyrine and novalgin, still used in a few cases as analgesics, especially in combination with barbiturates under proprietary names, e.g., "amidophen," "amyltal compound," "cibalgin," "corosedine," "optalidon," "somnosal," "veramon," "veropyron" (but "allonal" and "taumasthman" no longer contain amidopyrine); secondly, phenylbutazone, sometimes the only drug which renders existence tolerable for the arthritic; thirdly, antithyroid drugs, especially the thiouracils; and, lastly, the anti-convulsants troxidine and methoin. Of course, occasional cases occur with almost any synthetic drug, including anti-histamines and sulphonamides.

The best way to prevent agranulocytosis is to avoid prescribing drugs which cause it; the analgesics containing a barbiturate with aspirin or with phenazone or a derivative can often replace an amidopyrine mixture, especially if used from the beginning, because many patients become reluctant to change from a proved friend. However, there will still remain a few people who may need the more

dangerous amidopyrine, many who will need phenylbutazone, and some who must take an antithyroid or anticonvulsant drug if they are not to become complete invalids. Such patients should be warned of the risks associated with their treatment, and told that they must report to their doctor at once if they develop a sore throat or fever; this should be the signal for an immediate leucocyte count. Most authorities doubt whether routine blood counts are worth the trouble, although Holliday³ has produced evidence which suggests that they may reduce the mortality. In addition, it is wise to make sure that any of these drugs should be dispensed in a container bearing its own name, lest the patient develops agranulocytosis far from home.

Once agranulocytosis has developed, it is essential to stop the drug at once, and any other drugs which might be involved, including all antituberculous drugs. The object of treatment is to prevent infection for the six or seven days until the bone marrow recovers, and this is usually done by giving penicillin. However, this might seem to invite invasion by penicillin-resistant staphylococci, so that nowadays a triple sulphonamide may be preferred. The patient should, if possible, be barrier-nursed in a cubicle fitted with ultra-violet sterilizing lamps. It is claimed that corticotrophin speeds up bone-marrow recovery.⁴ Blood transfusion may help in severe anaemia. The prognosis, of course, depends entirely on the speed with which the condition is recognized and administration of the offending drug discontinued.

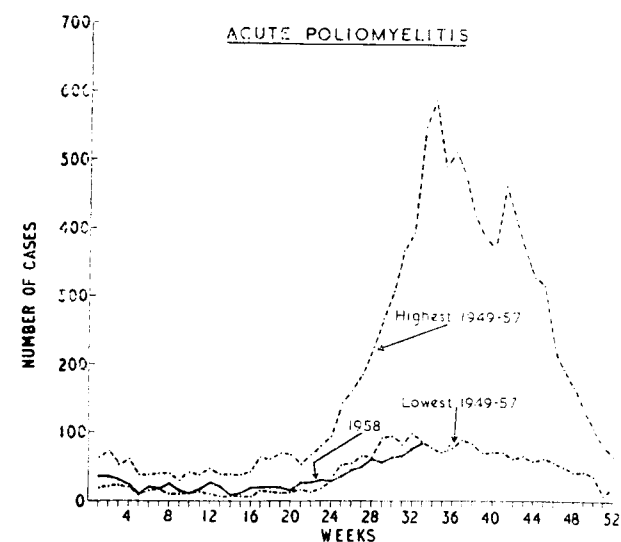
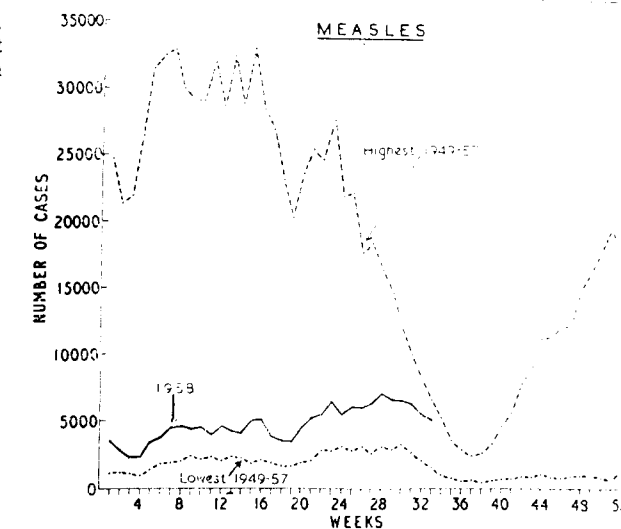
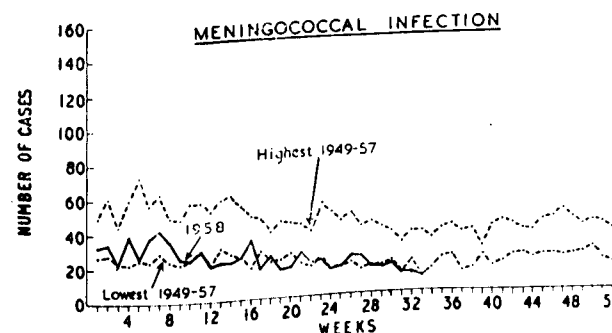
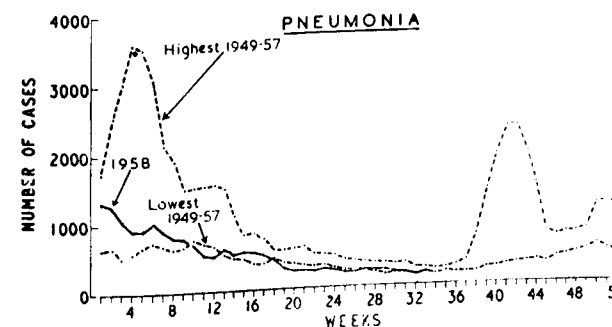
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Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus -----, the figures for 1958 thus ————. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending August 23

The largest fluctuations in the number of notifications of infectious diseases in England and Wales during the week ending August 23 were a decrease of 1,306 for measles, from 5,102 to 3,796, 61 for food-poisoning, from 287 to 226; 47 for scarlet fever, from 373 to 326; 32 for acute pneumonia, from 183 to 151; and an increase of 57 for whooping-cough, from 713 to 770; and 46 for dysentery, from 338 to 384. The largest falls in the incidence of measles were 150 in Lancashire from 615 to 465, 150 in Middlesex from 341 to 191, 78 in Cornwall from 130 to 52, and 62 in Hampshire from 146 to 84. Only small fluctuations were recorded in the local trends of scarlet fever and whooping-cough. Only two cases of diphtheria were notified—the same number as in the preceding week.

The notifications of acute poliomyelitis numbered 77, and there were 15 fewer paralytic and 6 more non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 20 (Leeds C.B. 5, Huddersfield C.B. 2, Hemsworth R.D. 2), Lancashire 8 (Burnley C.B. 2, Manchester C.B. 2), and Devonshire 5 (Plymouth C.B. 5). After falling for 6 consecutive weeks the number of notifications of dysentery rose slightly. The chief centres of infection were Yorkshire West Riding 78 (Thorne R.D. 17, Leeds C.B. 15), Lancashire 60 (Liverpool C.B. 24), London 55 (Islington 11, St. Pancras 10), and Gloucestershire 30 (Bristol C.B. 30).

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Age and Severity of Poliomyelitis

Q.—Is poliomyelitis infection likely to be "more harmless" in infants and young children than in older children and adults?

A.—The outcome of an infection by the virus depends upon the pre-existence of antibodies in the serum which will prevent viraemia and involvement of the C.N.S. and also on the susceptibility of the neurones to attack. The levels of antibodies in the serum increase rapidly in early childhood, except when exposure to the virus has been prevented by good sanitation. Nevertheless, even in civilized communities most children of school age possess antibodies, so that the likelihood of poliomyelitis infection involving the C.N.S. diminishes steadily with age. The mortality rate from paralytic disease increases, however, with age, probably because adult neurones are more readily damaged than are those of infants or children. Serious residual effects or death are therefore more often seen when the paralytic disease occurs in an older child or an adult. In this sense therefore polio is more harmless in the young infant than in the older child or adult.

Prednisolone for Infantile Eczema

Q.—Is there any risk in using oral prednisolone in the treatment of acute exacerbations of infantile flexural eczema in a girl aged 11?

A.—All steroid hormonal therapy carries risks, and their use is undesirable especially in children approaching puberty. This is particularly so in a chronic affection like flexural eczema, which can generally be brought under control by other means. The use of such hormonal therapy may be justified occasionally to control severe exacerbations. In the severe type of Besnier's prurigo with xeroderma, chronic eczema, asthma, and sometimes juvenile cataract formation, the incurable condition may make life so distressing and relief from moderate dosage of steroid hormones may be so marked that their use on a long-term basis may even be justified, but these are exceptional circumstances.

Encephalitis and Concurrent Vaccinations

Q.—How real is the danger of encephalitis when primary smallpox and yellow fever vaccinations are carried out at the same time? Is there still a danger in concurrent vaccination in an adult who had primary smallpox vaccination in childhood but has not been revaccinated since?

A.—In infants aged under 9 months a small number of cases of a mild encephalitic syndrome—fever, drowsiness, and muscular twitchings—have been reported about ten days after yellow fever vaccination. As primary smallpox vaccination also carries a danger of encephalitis, there is presumably a greater risk of neurological complications when both viruses are inoculated concurrently. It is deemed safer, therefore, in infants to leave an interval of at least 21 days between the two vaccinations whichever is done first; but yellow fever vaccination should in fact be postponed, wherever practicable, till the age of 9 or even 12 months.

In the case of older children and adults, the danger of encephalitis after yellow fever vaccine is negligible, but the danger of encephalitis after primary smallpox vaccination remains. When both vaccinations have to be done, the Ministry of Health recommends that yellow fever vaccination should precede smallpox vaccination by an interval of not less than four days. There are no known published

statistics giving the degree of risk if this wise precaution is not followed and both vaccinations are done at the same session.

The risk of encephalitis from concurrent vaccination is less still in the case of an adult who has had primary smallpox vaccination in childhood. Nevertheless, it is better to play for safety and to give yellow fever vaccine first and the smallpox vaccine four days later.

Carcinogens in Fertilizers

Q.—Is there a danger of fertilizers and insecticides making crops and fruit carcinogenic to the consumer?

A.—No material generally recognized to be carcinogenic is used in agriculture under conditions in which a residue might persist in the crop as it is consumed. When the question was raised in the specific case of a weedkiller—maleic hydrazide—an elaborate series of tests showed the supposition that it might be a carcinogen to be groundless.¹ When there are no special reasons for apprehension about a substance, such detailed investigations are not carried out, but routine toxicity tests are done, including the feeding of animals with the substance for a period of one to two years. This should give a reasonable chance for detecting any carcinogenic properties.

REFERENCE

¹ Barnes, J. M., et al., *Nature (Lond.)*, 1957, 180, 62.

Salt-losing Nephritis

Q.—Is sodium chloride indicated in salt-losing nephritis in the presence of considerable oedema, and should diuretics be used?

A.—If the patient has developed oedema there must be retention of salt and water by the kidneys, and if, therefore, salt-losing nephritis was once present it is no longer. The development of oedema in a patient with salt-losing nephritis is so unusual as to make one wonder whether the initial diagnosis was correct. None the less, it is theoretically possible for sodium retention to occur, even though the tubular transport of sodium is severely impaired, if the glomerular filtration rate becomes markedly depressed. Diuretics may be used to eliminate the oedema but should be used cautiously if there is any elevation of the blood urea.

Correction.—In Dr. A. C. E. BREACH's note describing an adjustable bed (*Journal*, August 23, p. 506), one of the advantages claimed for the bed was that "the orthopaedic patient can adjust his position, day or night, to give maximum comfort and can vary it at will." This should have referred to the *orthopaedic*, not the *orthopaedic*, patient.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 13 1958

LUNG CANCER DEATH RATES IN ENGLAND AND WALES COMPARED WITH THOSE IN THE U.S.A.

BY

E. CUYLER HAMMOND, Sc.D.

Director, Statistical Research Section, Medical Affairs Department, American Cancer Society, Inc.

The large differences between reported lung cancer death rates in England and Wales and in the United States have not yet been explained satisfactorily. A study of these differences may well lead to a better understanding of the aetiology of this disease. While the data available at the present time are inadequate for the purpose, they are worth discussing as a basis for further investigations.

The lung cancer death rate reported by the Registrar General for England and Wales in 1955 was 69.3 per 100,000 population for males and 10.6 per 100,000 for females. Standardizing the lung cancer death rates reported by the National Office of Vital Statistics for the United States in 1955 to the age distribution of the population of England and Wales in 1955, the rates were only 33.0 per 100,000 population for males and 6.7 per 100,000 population for females. In other words, the lung cancer death rate in England and Wales for males was 2.1 times as high as in the United States and for females 1.6 times as high. These ratios did not vary greatly in different age groups. For example, among males the ratio of the rate in England and Wales to the rate in the United States was 1.9 in age group 25-34; 2.0 in age group 35-44, 2.0 in age group 45-54; 2.2 in age group 55-64; 2.1 in age group 65-74; and 1.8 in age group 75-84.

Fig. 1 shows reported lung cancer death rates for males and females in age group 45-54 for England and Wales and for the United States from 1931-5 to 1956. The rates for the United States are for the white population only. Fig. 2 is similar but for age group 65-74. For males in both countries and both age groups the rates increased rapidly during this period of time. Within each age group the trend lines (plotted on semi-log paper) are roughly parallel for the two countries, but at a much higher level for England and Wales than for the United States. After 1948 the rate of increase was less in age group 45-54 than in age group 65-74.

The picture is somewhat different for females. From 1931-5 to 1948 the female rates in each of the two groups were only slightly higher in England and Wales than in the United States and generally increased in both countries during this period of time. The female rates continued to increase after 1948 in England and Wales but not in the United States.

It should be noted that a small number of deaths from cancer of the respiratory system other than the lungs—for example, pleura, trachea, and mediastinum—are included in some of the figures quoted above. These

inclusions are slightly different in figures from the two countries. However, the effect of this is trivial, since all but a very small percentage of the deaths are presumed to have been due to bronchogenic carcinoma.

Both the form of the death certificate and the rules for classifying deaths by cause were changed in the United States as from January 1, 1949. Changes in the rules for classification were also made in England and Wales in 1949, while the form of the death certificate had been changed at an earlier date.

The changes in reporting procedures in the United States may be responsible for the change in the trend lines for females which occurred after January 1, 1949. However, if this explanation is correct, it is hard to see why a change of similar magnitude did not occur in the trend lines for males.

Cigarette Smoking

There is evidence that, in both countries, lung cancer is highly associated with cigarette smoking (Doll and Hill, 1956; Hammond and Horn, 1958a, 1958b). Let us consider the hypothesis that differences in degree of exposure to cigarette smoke (or certain components of the smoke) account for the reported differences in lung cancer death rates between the two countries.

At least five different factors may be of importance in determining the degree to which the lungs of a cigarette smoker are exposed to important ingredients of the smoke. These are: (1) the average number of cigarettes smoked per day, (2) the number of years of smoking, (3) the degree to which the smoke is inhaled, (4) the proportion of each cigarette which is actually smoked, and (5) the amounts of various chemical ingredients in the main stream smoke of the cigarette. These are discussed in turn.

Average Daily Consumption

Cigarette smoking apparently became popular at an earlier date in the United Kingdom than in the United States. In 1935 the consumption per adult per annum of packeted cigarettes is reported to have been 1,589 in the United Kingdom and 1,410 in the United States (Todd, 1957). Cigarette consumption increased in both countries, but to a greater extent in the United States than in the United Kingdom. In 1956 the reported consumption per adult per annum of packeted cigarettes was 2,509 in the United Kingdom and 3,195 in the United States. The increase in total cigarette consumption was probably slightly less than these figures appear to indicate, since there was a decline in the use of hand-rolled cigarettes. It is also possible that more

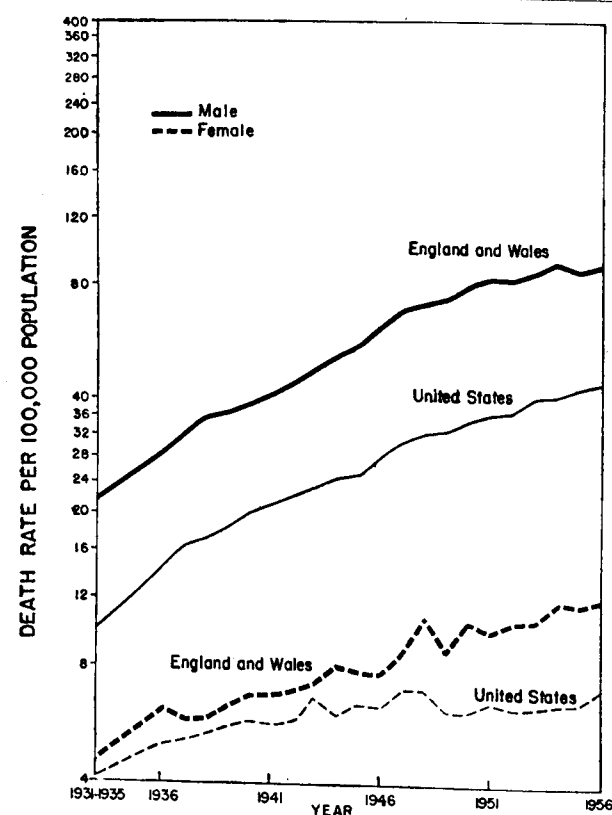


FIG. 1.—Lung cancer death rates, by sex, at age 45-54 for England and Wales and United States (white population) in 1931-5 to 1956. Source of data: Registrar-General of England and Wales and United States National Office of Vital Statistics.

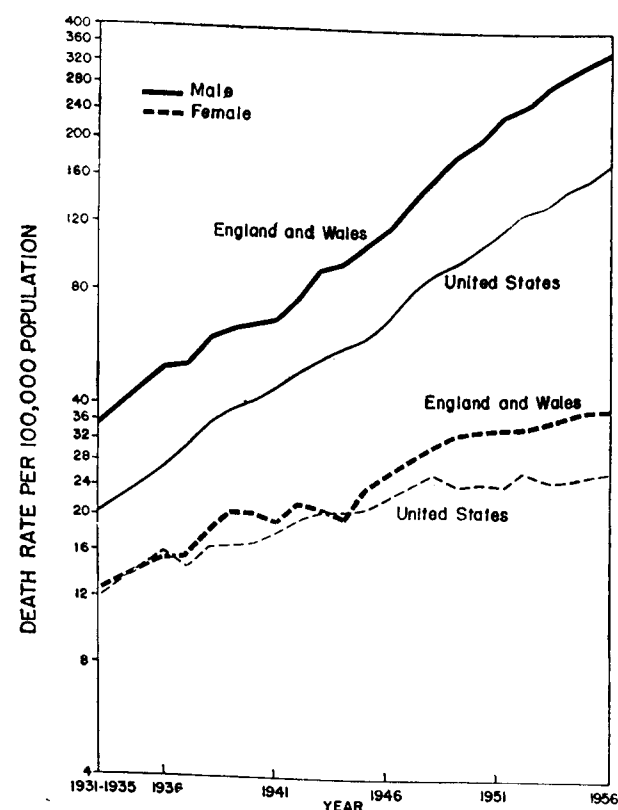


FIG. 2.—Lung cancer death rates, by sex, at age 65-74 for England and Wales and United States (white population) in 1931-5 to 1956. Source of data: Registrar-General of England and Wales and United States National Office of Vital Statistics.

hand-rolled cigarettes are now being smoked in the United Kingdom than in the United States. In the United Kingdom in 1956, 7.0% of all male cigarette smokers and 0.2% of all female cigarette smokers said that they smoked only the hand-rolled variety. However, 12.7% of male cigarette smokers in age group 60 and older still smoked only hand-rolled cigarettes. Information on this is not available for the United States.

For a proper comparison of cigarette consumption in the two countries one would need to know for each sex and for each five-year or ten-year age group the proportion of people who smoke cigarettes at each of several levels of number per day. This information is available for the United States for 1955 (Haenszel, Shimkin, and Miller, 1956) but is not available in such detail for the United Kingdom. However, some very useful data on the subject have been reported by the Tobacco Manufacturers' Standing Committee (Todd, 1957) for the United Kingdom in 1956. These are summarized in Tables I and II. Unfortunately, differences in age groupings and possible differences in definitions make comparisons between the two countries a bit difficult. About 4% of the people interviewed in the United States said that they smoked cigarettes "once in a while, not every day." These have been included as cigarette smokers in Tables I and II because the same procedure seems to have been used in the study in the United Kingdom.

TABLE I.—Percentage of People Smoking Cigarettes by Age and Sex in the United Kingdom and in the United States of America

United Kingdom, 1956				United States, 1955			
Age	% Smoking Cigarettes			Age	% Smoking Cigarettes		
Males				Males			
16-24	60.7	18-24	59.3				
25-34	70.9	25-34	69.2				
35-59	71.0	35-44	68.0				
60 and over	52.6	45-54	63.5				
		55-64	51.1				
		65 and over	29.5				
Total	66.0	Total	59.2				
Females				Females			
16-24	39.2	18-24	37.7				
25-34	51.8	25-34	43.0				
35-59	44.7	35-44	38.9				
60 and over	28.8	45-54	29.0				
		55-64	16.7				
		65 and over	8.1				
Total	41.6	Total	30.9				

TABLE II.—Percentage Distribution of Cigarette Smokers by Number Smoked Per Day for Males and Females in the United Kingdom in 1956 and the United States of America in 1955

Cigarettes Per Day	Males		Females	
	U.K.	U.S.A.	U.K.	U.S.A.
< 10	25	23	55	45
10-20	57	53	40	47
> 20	18	24	5	8
Total	100	100	100	100

In age group 16-24 in the United Kingdom and age group 18-24 in the United States it appears that the proportion of people who smoke cigarettes is about the same in the two countries. The same is true of males in age group 25-34. In all other groups, particularly in the old-age group, it appears that a larger percentage of people smoke cigarettes in the United Kingdom than in the United States. The difference is most marked among women in age group 60 and older.

These figures suggest that the difference in reported lung cancer death rates between England and Wales and the United States may be partly due to the fact that there are

proportionally more cigarette smokers in the former than in the latter country (in age groups where lung cancer most frequently occurs). However, if this be true, it would seem that the ratio of the lung cancer death rate in the United Kingdom to the lung cancer death rate in the United States should increase with age and be highest in women in the old-age group. This does not appear to be the case.

For all age groups combined it appears that a somewhat larger percentage of cigarette smokers are in the over-20-cigarettes-a-day class in the United States than in the United Kingdom (see Table II). This should tend to nullify some of the effect (on lung cancer death rates) of the larger proportionate number of cigarette smokers in the United Kingdom than in the United States. Unfortunately, these figures are not available by age groups (which might perhaps alter the picture).

Number of Years of Smoking

There is reason to suppose that, other things being equal, the longer a person has smoked cigarettes the greater is the likelihood that he will develop lung cancer. Since smoking became popular at an earlier date in the United Kingdom than in the United States, it may be that there is a larger proportion of long-time cigarette smokers in the former country than in the latter. However, the great majority of men in the United States in age group 50-69 who are currently smoking cigarettes took up the habit before reaching the age of 25 (over half took it up before the age of 20) (Hammond and Horn, 1958a). This being the case, it seems unlikely that a difference, if any, in the number of years that cigarette smokers have been addicted to the habit could account for the large difference in lung cancer death rates between England and Wales and the United States.

Inhaling

A study by Schwartz and Denoix (1957) seems to indicate that, holding age, sex, type of smoking, and amount of smoking constant, smokers who inhale run a greater risk of lung cancer than do smokers who do not inhale. Data reported by the Tobacco Manufacturers' Standing Committee (Todd, 1957) indicate that the proportion of cigarette smokers who inhale: (a) increases with amount of smoking, (b) decreases with age, and (c) is greater among men than among women. We have recently made a study of inhalation in relation to age, type of smoking, and amount of smoking among men in the United States (Hammond, 1958). The findings of our study are in agreement with those of the British study.

In the British study the men were asked the simple question, "Do you inhale?" In our study the subjects were asked how much they inhale, given the choice between "do not inhale," "inhale slightly," "inhale moderately," and "inhale deeply." We are under the impression that the answers "inhale moderately" and "inhale deeply" taken together are roughly comparable to the answer "yes" in response to the question, "Do you inhale?" The following comparisons are valid only if this assumption is correct. Disregarding age, amount of cigarette smoking, and whether pipes and cigars were smoked as well as cigarettes, the proportion of male cigarette smokers who inhale is about

84% in the United Kingdom and about 82% in the United States. Among men under 60 years of age who smoke about a pack of cigarettes a day (or 15 to 24 cigarettes), about 91% inhale in the United Kingdom and 88% inhale in the United States. The comparable figures for age group 60 and older are 67% for the United Kingdom and 65% for the United States. These percentages for the two countries are remarkably close.

Proportion of Cigarette Smoked

Much of the tar and nicotine volatilized just behind the burning tip of a freshly lit cigarette is condensed as it is drawn through the cigarette towards the mouth of the smoker. This condensed material is largely revolatilized as smoking continues. As a result, the smoke from the last part of a cigarette which can be smoked is far richer in these ingredients than is the smoke from the portion first consumed. Some observers are under the impression that American smokers often discard a cigarette after taking only a few puffs, while this seldom happens in the United Kingdom. If true, this might make an appreciable difference in the degree to which smokers in the two countries are exposed to tobacco smoke.

Since casual observations can be very misleading, I have undertaken to collect some data on this subject in the United States, hoping that data for comparison will soon be available in the United Kingdom. There is no information on what factors influence the extent to which each cigarette is smoked, but it seems likely that the location and current activities of the smoker as well as individual idiosyncrasies play a part. With this in mind, I had 4,283 discarded cigarette butts collected from a variety of different locations, including business offices, private homes, restaurants, sidewalks of city streets, railroad and bus stations, and a public park. The collection was carried out in four large cities (Los Angeles, Chicago, Pittsburgh, and New York) and several smaller cities and towns (Harrisburg and Bradford, Pennsylvania; Oak Park, Wheaton, and Brookfield, Illinois; and Albany, New York). The butts were divided into those with filter-tips and those without filter-tips. Each butt was straightened out and the length of the remaining paper was measured. When the paper was burned farther down on one side than on another, the average length of the remaining paper was recorded. The results are shown on Table III.

The average length of all the butts was 30.9 mm., being 31.0 mm. for those with filter-tips and 30.7 mm. for those without filter-tips. Only 0.2% of the butts with filter-tips and 1.8% of those without filter-tips measured less than 15 mm., while 8.2% and 9.4% respectively measured less than 20 mm. Most filter-tip cigarettes are 85 or 80 mm. in total length, of which 17 or 18 mm. is taken up by the filter; but some are shorter in total length and some have shorter filters (the average length being about 82 mm.). About two-thirds of the cigarettes without filters sold in the United States in 1957 measured 70 mm. and most of the remainder measured 85 mm., the average length being about 75 mm. Since both filter-tip and non-filter-tip butts average about 31 mm. in length, it appears that on the average about

TABLE III.—Lengths of Cigarette Butts Collected from Various Locations in the United States of America in 1958

Location or Type of Cigarette	No. of Butts	Mean Length in mm.	Length of Butts in mm.										
			< 15	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55 +	
			%	%	%	%	%	%	%	%	%	%	%
Total	4,283	30.9	0.8	7.9	19.7	19.9	20.9	12.8	8.9	4.4	2.7	2.0	
Non-filter-tip	1,697	30.7	1.8	7.6	17.1	22.1	21.8	12.6	8.7	4.4	2.2	1.9	
Filter-tip	2,586	31.0	0.2	8.0	21.3	18.4	20.4	13.0	9.1	4.3	2.9	2.2	
Homes	1,563	30.1	1.1	8.2	19.6	22.4	21.9	12.0	7.8	3.6	2.4	1.0	
Offices	1,117	30.3	1.1	7.6	21.5	19.5	20.9	13.6	7.6	3.8	2.4	1.9	
Restaurants	496	34.5	0.6	4.0	11.1	16.9	19.4	18.7	15.3	7.1	2.8	4.0	
Sidewalks	496	32.4	0.4	5.8	19.4	19.2	17.9	12.9	10.9	5.8	4.0	3.6	
Stations	271	32.8	0.4	7.7	9.2	19.9	27.3	11.8	10.3	5.5	4.4	3.3	
Park	340	26.7	0.3	15.9	35.3	14.7	18.2	5.9	5.0	2.1	1.8	0.9	

38% of each filter-tip cigarette and about 41% of each non-filter tip cigarette is discarded.

At my request, Dr. Remmert Korteweg has collected and measured cigarette butts discarded by several different groups of people in the Netherlands and has kindly given me permission to publish his findings. Altogether, 545 butts were measured. The mean length was only 19.7 mm.; 19.6% were less than 15 mm. in length and 55.6% were less than 20 mm. in length. Dr. Korteweg warns that these are preliminary figures. Nevertheless, the very large difference between his findings in the Netherlands and my finding in the United States is suggestive. If an equally large difference of this kind exists between the United Kingdom and the United States, it may well account for the difference in reported lung cancer death rates.

There are some obvious difficulties in the method used in this study of cigarette butts. For one thing, the cigarette butts collected may not have been reasonably representative of all the cigarette butts discarded in the United States in the early part of 1958. More important, it is questionable whether the length of a discarded cigarette butt is a reliable index of the amount of smoke which was drawn into the mouth of the smoker. For example, lighted cigarettes are sometimes left to burn out in an ash-tray or on the ground. Furthermore, much of a cigarette may burn up while being held in the hand or left in an ash-tray between puffs. Thus a short butt does not necessarily indicate that most of the potential smoke from the cigarette was drawn into the mouth of a smoker. On the other hand, a long butt is sure proof that the smoker failed to avail himself of a large proportion of the potential smoke. In spite of these difficulties, I hope that the method is sufficiently reliable to reveal a large difference in this respect between Great Britain and the United States if a large difference in fact exists.

Chemical Composition of the Smoke Stream

Cigarettes were very much a standard product in the United States up until a few years ago. Now there are a great variety of types on the market, including "regular size" and "king size"; those without filter-tips and those with filter-tips of various degrees of effectiveness; some with the nicotine partly removed from the tobacco; and some with types of tobacco producing relatively low nicotine and tar in the main stream smoke. In addition, some brands with filter-tips began to contain more heavy burley-type tobacco and less light flue-cured tobacco in their blends. This probably nullified the benefit, if any, to be derived from the filter-tip.

In the middle of 1957 the amount of nicotine in the main stream smoke of the more popular brands of cigarettes in the United States varied from about 1.8 to 3.1 mg. and the amount of tar varied from about 25.6 to 42.8 mg. (Miller and Monahan, 1957a). If the number of cigarettes of each brand sold (Wooten, 1957) and the composition of the smoke are taken into account, the main stream smoke of the average cigarette had about 2.6 mg. of nicotine and 28.8 mg. of tar. Later that year a filter-tip cigarette with only 1.1 mg. of nicotine and 19.7 mg. of tar in the main stream smoke was put on the market (Miller and Monahan, 1957b). It immediately became popular, probably owing in part to an article on the subject which appeared in an influential magazine. To-day there are several additional low nicotine and low tar brands on the market. There have been no reports on the content of carbon monoxide and other gases in the main stream smoke of these cigarettes as compared with others. It appears that these new cigarettes are selling well. It remains to be seen whether they will eventually replace the old type and, if so, whether smokers will be benefited in terms of health.

Other Environmental Factors

Now let us consider the hypothesis that some environmental factor other than smoking entirely accounts for the difference in lung cancer death rates between the two countries.

It is well established that lung cancer can be caused by many years of heavy exposure to dusts of certain types—for example, radioactive minerals, chromates, and nickel (Hammond and Machle, 1956). Hueper (1955) has expressed the opinion that workers in various industries are exposed to a great many different substances (in the form of dust, gas, or vapour) that are of aetiological significance in lung cancer. This is difficult to prove one way or the other, because it is usually hard to find sufficiently large groups of workers who have had long exposure to known concentrations of specific dusts. Many of the dusts under suspicion in relation to lung cancer—for example, asbestos and beryllium—produce other serious effects upon the lungs. For this reason, intensive efforts have been made in the United States and elsewhere to protect workers from undue exposure. Presumably this would reduce or eliminate any potential lung cancer hazard.

General air pollution has long been under suspicion. The substances most often mentioned in this respect are: (a) fumes from motor vehicles and oil furnaces, (b) combustion products of coal, and (c) dust from asphalt roads. All of these contain small quantities of known carcinogenic substances. In addition, certain industrial plants discharge fumes which produce air pollution in the surrounding area. Some of these fumes may contain carcinogenic substances. The fact that these air pollutants contain carcinogenic substances does not necessarily prove that they cause lung cancer.

What concerns us here is whether a difference between England and Wales and the United States in respect to either occupational exposures or general air pollution could account for the differences in lung cancer death rates. Stocks and Campbell (1955) have studied lung cancer rates among men aged 45 to 74 in relation to type and amount of smoking in Liverpool compared with several small English cities and a rural area in Wales. There is considerable air pollution in Liverpool, and the Liverpool area has a high lung cancer death rate. There is almost no air pollution in the rural areas studied. In each of these areas the lung cancer death rate was found to be of the order of magnitude of 300 per 100,000 population per year higher for heavy cigarette smokers than for non-smokers. Among non-smokers and smokers alike, the lung cancer death rate was roughly 100 per 100,000 per year higher in Liverpool than in the rural area of Wales. The lung cancer death rate in the small cities was about the same as in the rural areas. Hammond and Horn (1958b) have studied lung cancer death rates in relation to smoking habits among men aged 50-69 in large cities, small cities, and rural areas of the United States. The rate was about 250 per 100,000 per year higher among heavy cigarette smokers than among men who never smoked. Both for smokers and non-smokers the lung cancer death rate was roughly 20 per 100,000 per year higher in large cities than in rural areas.

Since the data quoted above are almost the only information available on the subject for the moment, let us assume: (a) that air pollution, occupational exposure, or some other factor associated with urbanization produces an increase in the lung cancer death rate, and (b) that the force of this effect among males in age group 50-69 is 80 per 100,000 population per year greater in English and Welsh cities than in cities in the United States. Further, let us assume that this differential applies to three-fourths of the male population of both countries (people living in rural areas and cities such as Chester and Wrexham not being affected). Under these assumptions, the lung cancer death rates of males in age group 50-69 should be about 60 per 100,000 higher in England and Wales than in the United States.

In 1956 the reported lung cancer death rate among males in age group 50-69 was 233 per 100,000 in England and Wales and 115 per 100,000 in the United States, a difference of 118 per 100,000. This reported difference is about twice as large as might be expected on the basis of the hypothesis outlined above. Thus, even assuming that Liverpool is typical of all urban areas in England and Wales, it appears

that the difference in male lung cancer death rates between England and Wales and the United States cannot be attributed entirely to differences in air pollution or occupational exposures. Actually, Liverpool is far from typical. According to a report of the Registrar General (1957), the male lung cancer death rate in Merseyside (which includes Liverpool) is higher than in any other region of England and Wales and is 42% higher than for England and Wales as a whole. Furthermore, it is no criticism of the excellent work of Stocks and Campbell to say that it is difficult to obtain an accurate estimate of the lung cancer death rate of non-smokers and that their findings have not yet been verified by other investigators or in other cities with heavy air pollution.

Climate is another factor which cannot be ignored. In some heavily populated areas such as London and Los Angeles peculiar atmospheric conditions produce episodes of "smog" from time to time. From what little evidence is available, it appears that a far larger proportion of the population live in areas where this is a problem in England and Wales than in the United States. In addition, the climate of the British Isles is apparently such as to produce a higher incidence of bronchitis than in the United States. While it seems unlikely that bronchitis alone can result in lung cancer, it is not unreasonable to postulate that bronchitis increases the susceptibility of an individual to the carcinogenic effect of some other factor such as cigarette smoke or air pollutants.

Accuracy of Diagnosis

Finally, let us consider the hypothesis that differences in diagnosis and recording of deaths by cause entirely account for the difference in lung cancer death rates between the two countries.

The problem of accuracy of diagnosis plagues us whenever we attempt to compare death rates from cancer of specific sites in different periods of time, different countries, or different sections of the same country. For example, there is reason to suspect that lung cancer, when present, is somewhat more likely to be diagnosed in urban areas than in rural areas of the United States (doctors and medical facilities being concentrated in cities). This being the case, we are not at all sure that the small difference between urban and rural areas in lung cancer death rates among men with the same smoking habits is real or whether it is merely the result of differences in diagnosis. Likewise, it is reasonable to suppose that, owing to improvements in medical science, lung cancer is more likely to be correctly diagnosed to-day than it was thirty or forty years ago. It seems likely that some of the apparent rise in lung cancer death rates was due to the improvement in diagnosis (Dorn, 1954).

If the difference in lung cancer death rates between England and Wales and the United States is merely the result

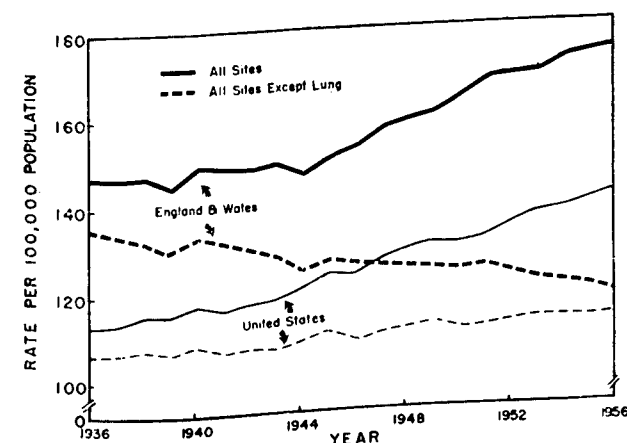


FIG. 3.—Male cancer death rates (standardized for age on 1940 U.S.A. population) for England and Wales and United States (U.S.A. figures for white males) in 1936-56.

of a difference in the level of diagnosis, then (a) British physicians are making this diagnosis in about twice as many men as actually have the disease, or (b) American physicians are missing about half the cases that actually occur in men, or (c) British physicians tend to err in one direction and American physicians tend to err in the other direction.

Some other respiratory disease may sometimes be recorded as the cause of death when the patient actually died of lung cancer. However, among white males aged 50-64 in 1955 in the United States, 9,789 deaths were attributed to lung cancer and only 9,112 deaths were attributed to all other respiratory disease combined (including pulmonary tuberculosis, influenza, pneumonia, etc.). Even if half of the deaths attributed to other respiratory diseases were actually due to lung cancer, it would not account for the entire difference in lung cancer deaths between England and Wales and the United States.

Fig. 3 shows the death rates from cancer of all sites and cancer of all sites except the lung for males in the two countries for the period 1936 to 1956. For comparability, the rates have been standardized for age on the age distribution of the population of the United States in 1940. The figures for the United States are for white males only.

The reported total cancer death rate (age-standardized) increased in the United States during this entire period of 20 years and increased in England and Wales from 1944 onward. In all of these years the rate was far higher in England and Wales than in the United States. The interesting fact shown on this chart is that when lung cancer is excluded the rate went steadily down in England and Wales from 1936 to 1956 while it rose slightly in the United States during the same period of time. This may be a true picture of what actually occurred. On the other hand, it may be a clue to a part of our puzzle.

We have reason to believe that cure rates for cancer of some sites improved somewhat in the United States during this period of time (Hammond, 1957). We have no reason to believe that there was a real increase in incidence rates of cancer of sites other than lung. When cancer kills, it is usually widespread in the body at the time of death, and in many cases it is by no means easy to ascertain the site of origin of the disease. These facts suggest the following hypothesis. When cancer is present at the time of death both in the lungs and in other parts of the body and the primary site cannot be determined with accuracy, there is a tendency in England and Wales to record lung as the primary site and a tendency in the United States to record some other organ as the primary site.

This hypothesis, if true, would account for a part of the difference in lung cancer death rates between the two countries; but it would not explain why the total cancer death rate among males is far higher in England and Wales than in the United States. One would further have to assume that cancer (regardless of primary site) is either over-reported as a cause of death in England and Wales or under-reported in the United States, or both.

Conclusions

There must be some explanation for the fact that reported lung cancer death rates for men are about twice as high in England and Wales as in the United States and the rates for females are about one and a half times as high in England and Wales as in the United States.

Data at present available do not support the hypothesis that a substantial part of this difference can be attributed to differences in amount of cigarette smoking among males and females in various age groups in the two countries. However, more detailed information on smoking habits and on the chemical composition of smoke from cigarettes in the two countries is needed before this can be definitely established.

While it is possible that some of the difference in lung cancer death rates may be due to factors associated with urbanization—for example, air pollution or occupational

mild hyaline change in some of the veins and a short segment of medial thickening in the anterior spinal artery, no other vascular abnormality was found. The spinal cord from T10 downwards showed a bilaterally symmetrical degeneration of uniform severity (see Fig.). The anterior horns were atrophied, with loss of motor neurones, and showed a round-celled infiltration. The lateral and anterior columns showed incomplete demyelination, the pyramidal tracts being spared. The posterior columns were unaffected. The sections from the segments below T10 showed that these changes were clearly confined to the anterior part of the cord in the distribution of the anterior spinal artery.



Transverse section of spinal cord at the level of S2, showing the symmetrical degeneration of the cord in the distribution of the anterior spinal artery. (Stained with methasol. $\times 6$.)

Discussion

In this patient the choice of anaesthetic was based on the following considerations. The state of his cardiovascular system, together with the bronchopneumonia and severe emphysematous changes in his lungs, made it appear wiser to use some form of local anaesthetic. Also, there was the added hazard of inhalation of vomit which might well have occurred under general anaesthesia. The choice of local anaesthetic in our minds lay between subcutaneous infiltration and local nerve block, spinal or epidural. It was thought that the inflammatory changes present over the hernial sac and inguinal ligament were sufficient to make it inadvisable to use either the subcutaneous method or the local nerve block. Spinal anaesthesia is less often used in this country, and was rejected because of its risk of nervous sequelae. Epidural anaesthesia was used because of the advantage of obtaining a pure sensory block, thus obviating any respiratory embarrassment due to motor paralysis. In addition, the unexplained bronchodilator effect of the epidural anaesthetic would be beneficial to this patient's emphysematous condition (Bromage, 1954). These advantages were considered to outweigh the risk of hypotension that might result. It was possible to prevent a further fall in blood pressure by using a moderate dose of ephedrine, without having to resort to the stronger vasopressor drugs, such as noradrenaline.

From the clinical picture and the pathological and histological findings our patient was quite clearly suffering from the syndrome of anterior spinal artery occlusion. Other causes for the paraplegia that might be related to the anaesthetic technique, such as disk protrusion, extradural haemorrhage, and haematomyelia, were considered. The disk protrusion could have been caused by flexion of the spine during the induction of anaesthesia. Extradural haemorrhage either spontaneously occurring through twisting or straining (Schultz *et al.*, 1953) or traumatic in origin by damage to the spinal veins, may have resulted. Haematomyelia may have been caused by damaging the cord. All these possible events were excluded on the

pathological findings. Further consideration must be given to the possibility that an accidental spinal anaesthesia was induced, causing the paraplegia. On clinical grounds this was excluded because the patient was able to move his legs some while after the epidural anaesthetic was given. But Sykes (1958) points out that this sign is not infallible, and a spinal anaesthesia may have resulted through seepage via a small dural puncture. A total spinal anaesthesia can be excluded on the grounds that there was no respiratory paralysis, no profound fall in blood pressure, or, as would be expected with a quantity of anaesthetic of this magnitude, no loss of consciousness and no pupil signs developed.

Two further causes of the neurological damage—chemical contamination of the spinal cord and infection—have to be excluded. The former can be ruled out because no chemical agent was used to sterilize the anaesthetic solution or the instruments. The possibility of the introduction of infection does not seem likely, because of the aseptic technique adopted. This consisted of autoclaving drums (30 minutes at 20 lb.), the use of sterile gowns and gloves, and the preparation of the skin over the lumbar region with Bonney's blue and 70% surgical spirit. Clinically, the onset of the paraplegia was rapid enough to make it unlikely that there was an infective cause. Furthermore, the absence of adhesive arachnoiditis at post-mortem examination ruled out both these possibilities.

It should also be mentioned that cases of paraplegia have been reported as occurring after general anaesthesia. These were due to either a thrombosis following hypotension (Ciliberti, 1948; Ditzler and McIver, 1956) or to air embolism during the induction of an artificial pneumothorax (Wikler *et al.*, 1937) or injury to the pulmonary vein during thoracotomy (Thomas and Dwyer, 1950).

Finally, the epidural anaesthetic as the prime cause of the paraplegia must be discussed. Because of the known hypotensive action of an epidural anaesthetic, precautions were taken at the onset to prevent a severe fall in blood pressure. However, a systolic pressure between 80 and 100 mm. Hg might well have been too low to maintain an adequate blood supply to the cord with his already failing circulation. This might possibly have led to stasis and subsequent thrombosis in the vessels. We are aware of a similar case where a temporary paraplegia resulted from the use of an epidural anaesthetic to provide controlled hypotension for a total parotidectomy (Massey Dawkins, 1958, personal communication).

The stasis might have been produced by compression of the spinal vessels by the volume of local anaesthetic solution introduced into the epidural space. This almost certainly can be excluded, for there is easy dispersion of the solution through this space and the paravertebral foramina. Furthermore, it would be more likely for the posterior spinal vessels to be affected rather than the anterior.

Many authorities have suggested that the local anaesthetic itself may cause permanent neurological damage (Payne and Bergentz, 1956). Frumin *et al.* (1953) have produced strong experimental evidence that the anaesthetic solution will diffuse from the epidural space into the spinal canal. Most of the local anaesthetic drugs have been incriminated in producing cord damage, but, so far as we can ascertain, no report following the use of lignocaine hydrochloride has been made. However, it would seem likely that this too might have a similar action on nervous tissue. From the clinical signs and the pathological findings of damage solely in the distribution of the anterior spinal artery, and lack of arachnoiditis, it is unlikely that this was a direct toxic action of the drugs on the cord.

A further possible cause is the vasoconstrictor action of adrenaline. The solution used during the anaesthetic procedure contained 1 in 300,000 adrenaline. Ruben *et al.* (1948) reported the spinal anaesthetic effects in the human following the use of vasoconstrictor substances alone. Priddle and Andros (1950), using adrenaline solution of 1 in 2,500 dilution, produced hypoaesthesia in the saddle area

following intrathecal injection. The explanation may be that this is an anoxic effect due to the vasoconstrictor action. However, those workers suggest that adrenaline itself has a direct effect on nerve conduction, and Forbes *et al.* (1933) and Fog (1939) showed that there was no arteriolar constriction following direct application of adrenaline to the pia mater. Nevertheless, the clinical and pathological findings of nervous damage confined to the anterior spinal artery distribution strongly suggest that some block, albeit transient, occurred in this arterial supply, and we believe that adrenaline could have caused such a transient block.

It is appropriate at this stage to discuss briefly the significant points concerning the arterial anatomy in the region. The cord derives its supply from three vessels, one anterior and two posterior. The anterior spinal artery arises as a branch from each vertebral artery. These unite at the level of the foramen magnum to form one vessel, which runs down the whole length of the cord in the midline. This vessel, through multiple small branches, supplies the lateral column and the anterior grey and white columns. The posterior pair of arteries arise from the posterior inferior cerebellar or from the vertebral arteries, and run down the whole length of the cord in relation to the posterior nerve roots supplying the posterior third of the cord. The anterior spinal artery is virtually an end-artery receiving significant collaterals only at the level of T1 and T11. The posterior spinal arteries in contrast have numerous collateral vessels freely anastomosing over the posterior part of the cord. It is obvious that interference with the blood supply derived from the anterior artery will give rise to ischaemic changes in the anterior two-thirds of the cord; whereas occlusion of the posterior vessels is less likely to produce permanent changes because of their free anastomosis.

The syndrome of anterior spinal artery thrombosis was first clinically diagnosed by Spiller (1909). Since his description many cases of this syndrome have been reported. The following aetiological factors have been blamed: interference with the blood supply through aortic compression, thrombosis, aneurysm and coarctation, syphilitic thrombosis, arteriosclerosis, and simple vascular spasm; as well as trauma, both direct and indirect, and compression due to tumour or disk (Steggmann, 1952; Peterman *et al.*, 1958). Still, there are numerous reports of cases where no causative factors were found.

The lesion produces a definite clinical picture of destruction in the area supplied by this anterior spinal artery. Most commonly the areas affected have been the lower cervical and the thoraco-lumbar regions. Our case was typical of this syndrome, and further elaboration is unnecessary.

Summary and Conclusions

A case of the anterior artery syndrome following epidural anaesthesia is presented.

We have discussed the possible causes of the anterior spinal artery syndrome in this case, and have come to the conclusion that no single factor was responsible. We believe that there are possibly two causes: firstly, the relative hypotension imposed on the patient's already failing peripheral circulation; and, secondly, the vaso-failing peripheral circulation. From the histological findings that thrombosis had not occurred in this artery, we have to assume, therefore, that the occlusion was of sufficient transient nature. Unfortunately, this was of sufficient duration to produce permanent changes in the anterior part of the cord due to ischaemia. His arterial supply was probably already decreased owing to his heart failure, and therefore interference with this supply was disastrous. Finally, it should be mentioned that cases of spontaneous occlusion of the anterior spinal artery have been reported and that, although unlikely, this might have been purely coincidental.

We thank Professor R. S. Pilcher for permission to publish this case and for his criticism and advice. Also we are indebted to Dr. Massey Dawkins for his helpful discussion. We thank Dr. W. Blackwood for his interest in the sections of the cord and Dr. D. H. Mills, of Ashford Hospital, for details of the patient's previous history.

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NEUROLOGICAL COMPLICATIONS OF EPIDURAL ANAESTHESIA

BY

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Epidural anaesthesia is generally regarded as being safe, easy to carry out, and free from complications. Many authors, in reviews of its use in thousands of cases, record very low mortality and morbidity. The technique of the injection involves the introduction of a lumbar-puncture needle between two spinous processes into the epidural space. In this situation a negative pressure exists, as demonstrated by the suction effect upon a drop of saline placed on the hilt of the needle. 2 ml. of 2% procaine solution is injected, and if during the next 10 minutes no reaction occurs a further 25–30 ml. is introduced.

Two cases are described in which neurological complications of a very serious nature appeared after epidural anaesthesia with the technique described above.

Case 1

A 26-year-old housewife had a caesarean section at another hospital four months previously, and because of a history of bronchial asthma epidural anaesthesia was decided upon. No untoward incidents were noted at the time of operation, but the same day she complained of headache and double vision, the latter passing off in a few hours. Headache and a feeling of intracranial pressure persisted for a few weeks, and at this time the patient noticed gradually increasing difficulty in walking. Weakness in the legs, first right and then left, became progressively more pronounced until a few weeks later she was quite unable to walk. Impairment of sphincter control followed some weeks later and became complete. She was readmitted to hospital, where lumbar puncture revealed partial manometric block. On myelographic examination the oil column was held up at D11.

The patient was transferred to this hospital and showed paralysis of the lower limbs, complete apart from feeble flexion of the right knee. The muscles were hypotonic, the right knee-jerk and abdominal reflexes were absent, and there was left bilateral ankle clonus; sensation, both

superficial and deep, was much impaired up to D 11. The bladder was paralysed, with retention of urine. In the hope that the cause of the paraplegia might conceivably be a local constrictive arachnoiditis at the level of the myelographic block, the patient was transferred to the neurosurgical department. Laminectomy at D 11-L 1, performed by Dr. Herzberger, revealed gross arachnoiditis, the cord being embedded in an opalescent jelly-like mass which extended as far as could be seen cranially and caudally. The condition of the patient was not influenced by the decompression, and she remained permanently crippled.

Case 2

A 66-year-old man was admitted for surgical treatment of vesical calculi. Five years previously he had undergone a spinal operation for a tumour at D 12, which proved to be a chordoma. His symptoms at the time were pains in the back and legs, and these were relieved by the operation. Up to the time of this second admission he had been entirely free of any complaints referable to the lower limbs and there were no objective neurological residua. Transurethral lithotomy under epidural anaesthesia passed off without incident.

A month later a second-stage operation was performed with transurethral resection of the prostate, again under epidural anaesthesia (L 2-3). The patient was seen in consultation on the following day because power in the legs had failed to return. He was found in good general condition, with paralysis of ilio-psoas and quadriceps muscles bilaterally; muscles below the knees were active. Deep reflexes were absent and sensation was reduced below the level of L 3. With this distribution of paralysis it was thought less likely that there had been inadvertent intrathecal injection than that for some reason the roots at the level of the injection had failed to recover from the anaesthesia. During the succeeding weeks there was only minor improvement until the patient died from cardio-pulmonary complications.

At post-mortem examination the remains of a nodular growth were seen at D 12 with an intrathecal extension the size of a pea. Considering the time relationship as outlined above, it was not thought that this tumour played a part in the production of the post-operative paralysis.

Discussion

The mechanism of production of the cord changes described above must remain to some extent speculative. Although sepsis cannot be ruled out, it is probably an unlikely explanation. In Case 1 there was nothing to suggest an acute post-operative meningitis; in Case 2 the complications were immediate, but limited to the anatomical segments innervated from the level of the injections. Taking into consideration the headaches and double-vision experienced by the first patient on the day of operation, it seems difficult to exclude the likelihood that the arachnoiditis and cord changes were a direct expression of a chemical meningo-myelopathy resulting from inadvertent injection of the anaesthetic into the subarachnoid space. Since complications of this nature are known (Payne and Bergentz, 1956) to follow deliberate intraspinal anaesthesia where total quantities of only 40 mg. of procaine are employed, it is not unreasonable to suppose that they may result from the introduction of some portion of the total of 500 mg. commonly employed in epidural anaesthesia. The clinical course of the case described by Payne and Bergentz resembles very closely that of our Case 1. Progressive paraplegia began seven days after the anaesthesia and became complete in two weeks. These authors quote experimental work on dogs which demonstrated the appearance of local arachnoiditis following spinal anaesthesia in clinical doses. Haxton (1956) mentions an experience of his own in which an intrathecal injection of phenol was unwittingly given when the intention was to place the needle paravertebrally, let alone epidurally.

Local hypersensitivity of nerve roots to the anaesthetic reagent or chemical changes or impurities may perhaps be invoked to account for the persistent paralysis in our second case.

General hypersensitivity to the anaesthetic agent would seem to be an unlikely explanation, as a reaction of a more widespread nature might be expected. In this connexion it is of no small interest that in the course of our investigation into the complications of epidural anaesthesia prompted by the above experiences it was discovered that the only two cases of cardiac arrest during anaesthesia which had occurred in this hospital happened while this method was being employed and before the operation itself had started.

Both patients were in good general health and were admitted for elective operations. In one, 15 ml. of anaesthetic was injected, when the heart suddenly stopped. In the second it was thought that a portion of the anaesthetic may have been introduced intrathecally. The needle was partially withdrawn and the anaesthesia proceeded with, as there were apparently no reactions; however, a few minutes later, as the skin was being incised, the pulse stopped. Cardiac massage succeeded in restoring the pulse in both cases, and one patient made a reasonable recovery in the course of some weeks; the other died in coma. In these two cases one may postulate the existence of hypersensitivity to procaine, though a reaction to the flooding of the cerebrospinal fluid with large quantities of anaesthetic cannot be ruled out.

Though the numerical incidence of complications following epidural anaesthesia as seen in this hospital is low (4 out of 200 lumbar and several hundred sacral injections) their seriousness and their tragic consequences suggest that this method should be employed only after very careful consideration. Although this method is claimed to be safe, we cannot be sure that all complications are indeed brought to light or even thought of when they are of delayed onset. It seems that Walshe's (1956) criticisms of intrathecal anaesthesia may be equally pertinent when applied to epidural anaesthesia.

Summary

Neurological complications are described in two patients following epidural anaesthesia: they are believed to have been due to a local chemical meningo-myelopathy or neuropathy.

Reference is made to two cases of cardiac arrest attributable to this technique.

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The Third International Congress of Photofluorography was held in Stockholm last month under the presidency of Professor CARL WEGELIUS. It was attended by 600 delegates from all over the world. The papers read at the Congress gave clear evidence that here is a field in a ferment of activity. Important advances such as alkali halide intensifying screens and new methods of film processing suggest that up to a tenfold reduction in received radiation may be expected from technical innovations. With modern coning and filtering of the x-ray beam the dose to the skin and gonads in taking a single chest film can be reduced to less than the weekly permitted safe dose for radiographers who spend their whole working lives exposed to x-radiation, while image intensification can increase the brightness of the screen picture a thousand times. This allows screening at very low radiation levels, a degree of brightness that makes dark adaptation unnecessary, and the making of permanent multiple or cine photographic records of physiological or pathological functions for analysis at leisure in "slow motion." A special edition of *Excerpta Medica* summarizes most of the papers presented at the Congress.

THROMBOSIS OF THE MAJOR PULMONARY ARTERIES

BY

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The clinical syndromes of pulmonary artery thrombosis are less well known than those of acute pulmonary embolism. Thrombosis may involve the secondary and tertiary branches, or the main right or left arteries and pulmonary trunk. Thrombosis of these larger vessels is uncommon. It is, nevertheless, being increasingly reported as a cause of striking clinical deterioration in a wide variety of predisposing illness (Ring and Bakke, 1955).

Pathogenesis

There are two main ways in which such thrombi can arise: (a) primary thrombi, and (b) secondary to pulmonary emboli. Carroll (1950), Hanelin and Eyer (1951), and Magidson and Jacobson (1955) have reported groups of cases, many showing a history of embolism or leg-vein thrombosis. The frequent finding of thrombi in the right heart or systemic veins led Brenner (1935) and Belt (1939) to conclude that most pulmonary artery thrombi are embolic in origin. Belt demonstrated by necropsy studies the sequence of changes which may follow embolism. He cites the elongated shape and characteristic mode of attachment of the thrombus, the lack of local vascular lesions, and the finding of thrombi of similar age in the peripheral veins as evidence for an embolic origin of many of these thrombi.

In six of seven cases described by Keating *et al.* (1953) there was evidence that the thrombi had arisen *in situ*, there was evidence that the thrombi had arisen *in situ*, either from the direct involvement of the vessels by primary lung disease, or as a result of disease of the vessels themselves. All their patients died in acute cor pulmonale. Advanced tuberculosis and anthracopulmonale. Advanced tuberculosis and anthracopulmonale were predisposing illnesses in the patients reported by Savocool and Charr (1941), who were able to trace the thrombosed vessels into the affected areas. The condition may develop in congenital and acquired heart disease, pulmonary hypertension and the altered dynamics of vascular shunts being predisposing factors. Thus, Kampmeier (1934) describes the condition with mitral stenosis, while interventricular septal defect (Bryson, 1949), cor triloculare (Cunningham, 1948), Fallot's tetralogy (Rich, 1948; Ring and Bakke, 1955), and persistent ductus arteriosus (Whitaker, Heath, and Brown, 1955), and in particular atrial septal defect (Bedford *et al.*, 1941; Trounce, 1953; Campbell, Neill, and Suzman, 1957) may be associated with widespread pulmonary artery thrombosis. When heart disease is present a vicious circle may develop in which thrombosis further increases the strain on the heart and predisposes to further extension of thrombosis.

Other factors can play a part in pathogenesis. Malignant disease may directly involve the pulmonary arteries, or cause widespread obstruction by multiple tumour emboli (Brill and Robertson, 1937). Multiple venous thromboses in association with malignant disease may involve the pulmonary vessels and progress despite adequate anticoagulant therapy.

Abnormal blood conditions such as primary or secondary polycythaemia (Hodes and Griffith, 1941; Carroll, 1950), sickle-cell disease (Yater and Hansmann, 1936), and cryoglobulinaemia (Cugudda, 1952) will at times predispose to pulmonary artery thromboses.

Although the pathogenesis of thrombosis is usually established by consideration of the post-mortem appearances together with the clinical findings, the distinction between post-embolic and autochthonous thrombosis may not be possible even at necropsy.

Present Investigation

Now that prolonged anticoagulant therapy is possible, it is important to recognize the syndromes of chronic thrombotic obstruction of the pulmonary vessels during life. The purpose of this paper is to present the findings in 19 cases in which thrombosis of the major pulmonary arteries was confirmed at necropsy. They illustrate the wide variety of predisposing illness, the varying factors in pathogenesis, and the types of clinical illness which result.

Sixteen of the cases were chosen from 1,673 consecutive post-mortem examinations carried out at St. George's Hospital, London, during the period January, 1952, to July, 1956. Three were observed subsequently. In all cases thrombosis affected the pulmonary trunk or the main left or right branches proximal to the hilum. Patients in whom major clinical embolism was the immediate cause of death were excluded. In the patients reported here, at least three weeks had elapsed since any major embolic episode; at necropsy the thrombi were organized and adherent in all but three of the cases.

Clinical Features

The ages in the present series range from 22 months to 78 years, 14 patients being over 50 years of age at the time of death. The clinical and pathological findings are summarized in the Table. Cases are divided into two main groups, Figs. 1, 2, and 3 illustrating the appearances and extent of the thrombotic obstruction of post-embolic and autochthonous thrombosis.

Group 1.—In six patients there was a history of frank pulmonary embolism during the preceding three months. In two further cases pulmonary embolism produced only minimal clinical changes, their possible significance in the resulting illness being recognized only in retrospect.

Group 2.—Of the nine examples of presumed *in situ* thrombosis, six had chronic heart disease and three emphysema. There was no definite history of thrombosis of the leg-veins, nor did necropsy reveal thrombi in the peripheral veins of similar age to the pulmonary artery thrombi. In the remaining two patients there were no progressive cardio-respiratory symptoms; at necropsy the pulmonary thrombi were pale, friable, and only lightly adherent. Their appearances suggested that they had formed terminally.



FIG. 1.—Case 1. Post-embolic thrombosis of the pulmonary arteries. A major embolic episode occurred three weeks before death. Smooth adherent thromboembolus occludes much of the lumen of both the right and left pulmonary arteries. Many of the secondary branches are affected.

The most frequently observed clinical features were increasing dyspnoea, cyanosis, and right heart failure. Dyspnoea was severe in 14 of the 19 cases, being often progressive and intractable, and at times proportionately more severe than the clinical and radiological findings suggested. Nevertheless, both dyspnoea and cyanosis were on occasion absent or minimal.

The cardio-respiratory symptoms of many of the underlying conditions make it difficult to appreciate any additional changes due to pulmonary artery thrombosis. A review of the clinical findings in this series did, however, reveal a number of features thought to be associated with the increasing thrombotic obstruction. These were the sudden onset of acute cor pulmonale with striking coldness of the extremities (Cases 9, 10, 11, and 14), paroxysmal epigastric pains (Case 11), the development of a prolonged generalized systolic murmur (Case 5), the onset of visible pulsations in the pulmonary area with greater accentuation of the second sound (Case 15), and possibly the development of paroxysmal cardiac arrhythmias (Case 12).

Electrocardiograms were taken in 11 patients and serial records were available in nine of these. There were no constant changes, the findings in general remaining those of the underlying conditions.

In 15 of the cases radiographic examination was made during the last three weeks of life, serial records being made in nine. In one of the two cases in which screening was carried out there was expansile pulsation of the proximal portions of the dilated right pulmonary vessels which diminished abruptly distally (Case 14). The most frequent finding (11 patients) was conspicuous enlargement of the pulmonary vessel shadows. In only three of the cases could progressive ischaemic changes of the peripheral lung fields characteristic of pulmonary artery obstruction be recognized. In some cases this was because the lung fields were obscured by the changes of effusion or infarction; in several, however, no changes of pulmonary artery obstruction were detected even though serial radiographs were compared. A further change noted (Case 13) was that of increasing accentuation of the pulmonary vessel outline due to diminished pulsation of the affected area.

The patients showed three types of clinical course. Cases 1, 2, 3, 4, 5, and 8 showed episodes of clinical pulmonary embolism, often repeated, with subacute cor pulmonale. In Cases 9, 10, 11, and 14 the post-mortem appearances suggested that the pulmonary artery thrombi had been present for some weeks, since they were well organized and firmly adherent. Nevertheless, few symptoms had resulted until the patients suddenly developed acute cor pulmonale. A gradually worsening chronic cor pulmonale was observed in one patient only (Case 6). Death occurred from other causes before cardio-respiratory symptoms were at all severe.

The present findings also support the observations that the right artery is more often affected than the left (Savacool and Charr, 1941). Even when thrombosis is bilateral, they point out that older lesions may often be identified in the right branches with recent extension to the left. They suggest that this may be related to the differing anatomy of the blood vessels at the lung roots.

Diagnosis has seldom been established during life. The condition may, however, be strongly suspected when there is a history of venous thrombosis of the legs followed by cardio-respiratory symptoms. That the time interval before cardio-respiratory symptoms may be measured in years is illustrated by a number of striking case reports (Means and Mallory, 1931; Covey, 1943; Madigson and Jacobson, 1955). In none of the present cases did the time between leg-vein thrombosis and embolic symptoms exceed three months. We have under treatment a further case in which subacute cor pulmonale has developed three and a half years after deep femoral vein thrombosis and in which radiological changes suggest pulmonary artery obstruction. It is well recognized that the clinical features of pulmonary embolism may be minimal; their significance was overlooked in Case 6 of the present series.

The condition may also be suspected when there is unexplained deterioration in any of the known predisposing cardiac or respiratory illnesses. The present findings support the view that *in situ* pulmonary artery thrombosis is particularly liable to occur when local vascular disease is severe, advanced vascular pathological changes being present in seven of the nine examples.

There may be changes in the physical signs. Changing heart signs were noted in three patients and epigastric pains in one patient. Severe attacks of epigastric pain were a striking feature in the patients studied by Middleton (1943) and in two reported by Magidson and Jacobson (1955). Syncopal attacks related to acute embolic episodes may be observed (Ball *et al.*, 1956).

The condition may first be suspected radiologically. The characteristic changes have been described by Westermarck (1948). These include right-sided heart enlargement, dilatation of the pulmonary artery proximal to the obstruction, with alteration of the vessel contour, and increased trans-



FIG. 2.—Case 13. *In situ* thrombosis of the pulmonary arteries. The arteries contain grey adherent laminated thrombus. Many of the peripheral vessels are occluded.



FIG. 3.—Case 11. Bilateral thrombosis of the pulmonary arteries. The relationship of the thrombus to atheroma of the vessels is seen in the right branch (below).

lucency of the lung fields distal to the obstruction. Keating *et al.* (1953) draw attention to the accentuation of the vessel outline due to diminished pulsations of the affected area. Three of the fifteen patients in the present series who had radiographs showed such changes, and screening was of assistance in a further case. Frequent and comparable radiographs in cases of cor pulmonale are of obvious value in the detection of the changes.

Electrocardiography did not suggest the diagnosis in the present cases, although the change to right-axis deviation from pre-existing left-axis deviation may be striking (Keating *et al.*, 1953).

The increasing use of angiography may confirm the diagnosis more often in the future. Obstruction to the major arteries has been demonstrated by this means (Carroll, 1950), and to the segmental vessels (Aitchison and McKay, 1956).

The present cases illustrate the variability of clinical effects attributable to massive pulmonary artery thrombosis. That these may be minimal is shown in Cases 6, 7, 8, and 18. This is in accord with evidence that in the experimental animal much of the pulmonary circulation may be obstructed without the development of progressive symptoms (Gibbon, Hopkinson, and Churchill, 1932), and with the necropsy findings in Cases 9, 10, 11, and 14, when virtually no progressive symptoms occurred until the patient suddenly developed acute cor pulmonale.

The most frequent clinical course was that of repeated embolic episodes or of an overwhelming acute cor pulmonale. Only one patient in the present series showed a slowly progressive chronic cor pulmonale. This type of illness may be the least frequent of the clinical syndromes of pulmonary artery thrombosis.

Discussion

Clinical and Pathological Features of 19 Cases of Pulmonary Artery Thrombosis

Case No.	Age	Sex	History	Duration of Recent Symptoms	Predisposing Conditions	Thrombosis Site	Heart Weight	Lung Vessels		Lung Infarction
								Major Artery Atheroma	Arterioles	
Group 1. Following Pulmonary Embolism										
1	48	M	Post-operative embolism. Femoral-vein ligation. Increasing dyspnoea and haemoptyses	3 weeks	Embolism	Bilateral	—	—	—	++
2	56	M	Cardiac infarction — progressive dyspnoea and haemoptyses. Death in congestive failure	9 "	Antero-septal infarction —mural thrombi	Left branch	720 g.	—	—	++
3	66	M	Venous thrombosis right leg. Pulmonary embolism. Spastic weakness right arm. Thrombosis left leg	5 "	Unsuspected hypernephroma. Multiple venous thromboses	Right "	540 g.	—	Intimal thickening	++
4	66	M	Venous thrombosis left leg. Pulmonary embolism. Left cephalic vein thrombosis. Recurring pleural effusion	3 months	Carcinoma left bronchus. Multiple venous thromboses	" "	370 g.	—	—	—
5	45	M	Emphysema and cor pulmonale 3 years. Leg-vein thrombosis and embolism	3 weeks	Recent embolism left branch—old thrombosis of right branch	Bilateral	450 g.	++	Severe arterio-sclerosis	+
6	69	F	"Feverish chill" followed by dyspnoea on exertion and persistent tachycardia	3 months	Embolism. Death from peritonitis due to perforation	"	360 g.	—	—	—
7	73	F	Hypertensive heart failure. Transient left apical chest pain. Re-admitted after insulin overdosage	3 "	Hypertensive heart disease. Diabetes. Prolonged coma	Left branch	420 g.	—	Intimal thickening	+
8	70	M	Fractured neck of femur—pinned. Increasing right hemiplegia post-operatively	3 weeks	Polycythaemia rubra vera. Hypertension	Bilateral	480 g.	—	"	+
Group 2. In Situ Thrombosis										
9	64	M	Chronic bronchitis and emphysema. Sudden acute cor pulmonale	24 hours	Emphysema	Right branch	330 g.	++	—	+
10	62	F	Parkinsonism 3 years. Kyphoscoliosis. Slight dyspnoea on exertion. Sudden acute cor pulmonale	8 weeks	"	Bilateral	380 g.	++	Severe arterio-sclerosis	+
11	62	M	Chronic bronchitis, worse 1 year. Recent epigastric pains. Acute cor pulmonale	48 hours	"	"	—	+	"	?
12	26	M	6 years' increasing dyspnoea. Recent right lower lobe "pneumonia." Congestive failure with fibrillation	3 months	Persistent ductus. Aortic coarctation	Right branch	650 g.	++	Moderate arterio-sclerosis	+
13	62	M	6 years' auricular flutter. Well controlled until 3 months before death	3 "	Atrial septal defect. Mural cardiac thrombi	Bilateral	750 g.	++	Severe arterio-sclerosis	++
14	52	M	Increasing dyspnoea with paroxysmal fibrillation. Sudden acute cor pulmonale	7 "	Lutembacher's syndrome	Right	630 g.	++	"	++
15	39	F	16 years' mitral stenosis. Episodes of congestive failure	2 weeks	Mitral stenosis	Bilateral and pulmonary conus	555 g.	+	Arteriosclerosis. Fibrinoid necrosis. Elastic fragmentation	++
16	68	F	6 months' increasing dyspnoea. Acute cor pulmonale	6 months	" "	Bilateral hilar. Thrombi red and not organized	600 g.	+	Severe arterio-sclerosis	+
17	68	F	2 years' congestive failure and fibrillation. Sudden acute cor pulmonale	3 days	" "	Left	600 g.	+	Moderate arterio-sclerosis	+
Group 3. Other Cases										
18	22 mths	M	3 days' fever and petechial rash	3 days	Pneumococcal septicaemia. Mastoiditis. Thrombus pale and not organized	Left branch	—	—	—	+
19	78	M	Cerebral vascular accident 3 weeks before death	3 weeks	Cerebral infarction. Prolonged coma	Bilateral	300 g.	—	—	+

Summary and Conclusions

Thrombosis of the major pulmonary arteries is being increasingly recognized as a complicating event in a variety of illnesses.

The clinical and pathological findings are summarized in 19 further examples. In eight cases thrombosis was consequent on previous pulmonary embolism, in nine the findings suggested that autochthonous thrombosis had occurred. In two cases the pathogenesis was not established with certainty.

The pathogenesis and clinical effects are briefly discussed. Many of the patients have severe disease of the heart or lungs. The variability of the clinical effects attributable to pulmonary artery thrombosis is stressed. In this series they ranged from minimal changes to sudden intractable right heart failure.

Although the clinical changes are often masked by the underlying illness, the diagnosis may be suggested by a history of thrombophlebitis or embolism, by the occurrence of new and unexpected clinical signs and symptoms in the course of one of the predisposing illnesses, and on occasion by the radiological appearances.

Some patients show an illness characterized by recurrent embolization; in others the presence of thrombotic obstruction is virtually symptomless until the onset of acute cor pulmonale. Less frequently, the thrombosis gives rise to a chronic cor pulmonale.

Thrombosis of the major pulmonary arteries may therefore have to be considered in the diagnosis of any case of acute, subacute, or chronic cor pulmonale.

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"Extra Care Stops Falls" is the slogan adopted by the Royal Society for the Prevention of Accidents for this year's National Industrial Safety Week, which is to be held from September 29 to October 4. The theme forms the basis of a nationwide campaign directed to both managements and workers with the object of reducing the toll of industrial accidents, and particularly those associated with falls of persons. In 1956, 22,548 persons were absent from work as a result of injuries following falls, equal to 14.1% of all reported industrial accidents.

ANAEMIA OF UNCERTAIN ORIGIN
IN INFANCY

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Severe anaemia in infancy and childhood is often seen at University College Hospital, Ibadan, Nigeria. In most cases anaemia occurs in association with conditions such as kwashiorkor, cancrum oris, tuberculosis, and chronic sepsis. Sick-cell anaemia is also relatively common. However, many patients present, especially during the first two years of life, with severe anaemia unassociated with other recognizable diseases and not due to the sickle-cell gene. There has been much speculation about the aetiology and pathogenesis of anaemia in this latter group, and malignant tertian malaria and dietary deficiencies (chiefly protein and iron) have long been regarded as the most likely causal factors. Little has been done, however, to verify these speculations. We report here the results of investigation and treatment of 24 of these cases selected from 85 similar cases which occurred among 1,318 admissions to the children's ward during the period October, 1955, to June 30, 1956.

Case Selection.—In a busy ward with a very rapid turnover of cases, one cot was set aside and used exclusively for the investigation of children under 2 years of age with severe anaemia (haemoglobin, 5.9 g./100 ml. or lower). Sick-cell anaemia and anaemia complicating some other illness were excluded. The 24 cases presented were those who were admitted into this cot.

Methods

Besides routine clinical examination the following were done: Tuberculin-testing by the Heaf technique was routinely performed and the majority of children had an x-ray examination of the chest and wrists. Haemoglobins were estimated, using Keeler M.R.C. grey wedge photometers (100% = 14.8 g./100 ml.). Thin blood films were stained with Leishman's and thick films with Field's stain. Supravital preparations, stained with brilliant cresyl blue (dried alcoholic solution), were made for reticulocyte determination (Whitby and Britton, 1953). Bone marrow was obtained by iliac crest puncture (Rubinstein, 1950), and smears were stained by Leishman and also by May-Grünwald-Giemsa. Differential marrow counts were made using the terminology of Dacie and White (1949) and red-cell maturation curves constructed (Pontoni, 1936). Serum protein estimation was performed by the biuret method, using a photoelectric colorimeter. Results were checked monthly against Kjeldahl. Liver-function tests consisted of thymol turbidity, zinc sulphate turbidity, alkaline phosphatase, and serum bilirubin, all performed with standard techniques. In four patients the serum cholesterol and in two the total serum lipids were estimated. Plasma volume estimation based on the single-injection technique of Chinard (1951) using Evans blue was performed on four patients before and after treatment. Sickling of the red cells was tested for by using a freshly prepared 2% solution of sodium metabisulphite. Cases showing sickling had samples of haemoglobin submitted for paper electrophoresis.

Routine Management

On admission, after blood and bone-marrow samples had been collected, each patient was given 200 mg. of "nivaquine" (150 mg. of chloroquine base) twice daily for three days. The only exception was Case 23, in which 25 mg. of mepacrine was given twice daily for three days. While in hospital all patients were fed by their mothers on food supplied only by them. We withheld comment on their feeding regimes. This course was decided on in order to eliminate alteration in the diet as a factor when assessing the results of treatment. Haemoglobin estimations and blood reticulocyte counts were done as often as possible. Blood transfusions were administered when it was considered that delay would jeopardize the patient's ultimate recovery. No haematinic was administered to any patient while in hospital, and indeed only one patient received ferrous sulphate, while attending the follow-up clinic. Complications were handled as circumstances warranted. After discharge patients were referred to a special follow-up clinic.

Results

Table I sets out the principal symptoms and signs, haemoglobins on admission, sickling, white-cell counts, and complications encountered.

History.—The average age of the patients was 9½ months (range 4 to 21); only two were over 12 months. There were 16 males and 8 females. The average duration of symptoms was 8½ days (range 1 to 60). All but three patients presented with fever; cough was present in 17 and vomiting in 10.

Diet.—With one exception (Case No. 1) all the patients were breast-fed. (Breast-feeding is almost universal in Ibadan during the first two years of life.) The majority in addition received a carbohydrate supplement in the form of "pap" (maize), "amala" (yam flour), and bread. Six of the mothers included a small ration of powdered milk in the

dietary, and one of these also gave her child orange juice daily.

General Condition on Admission.—Despite severe anaemia 12 cases were in good condition and four fair. The contrast between haemoglobin level and apparent well-being was striking in many of these children. Fig. 1 shows Case 24 soon after admission when his haemoglobin was only 3.8 g./100 ml. It will be seen that he is bright-faced and apparently in robust health. On the other hand, Cases 1, 3, 5, 13, 15, 19, and 23 were very ill on admission and their general condition caused anxiety. There appeared to be no constant relation between haemoglobin level and the degree of illness manifested.

Nutrition.—The majority were seen to be underweight, some grossly, when compared with standard weight curves for British and American children. The comparison is not valid because of vast social, economic, environmental, and genetic differences in the groups compared. Walters (1956), working in Ilobi, a typical Yoruba village in Western Nigeria, found that the average weight of normal children under 5 years of age was about 20% below that of English



FIG. 1.—Case 24. The haemoglobin was 3.7 g./100 ml. when this photograph was taken.

TABLE I.—Principal Symptoms and Signs, Haemoglobin, Sickling, White-cell Counts, and Complications in 24 Cases of Severe Anaemia in Infants

Case No.	Age in Months	Sex	Symptoms					Weight		Physical Findings				Blood				Complications
			Fever	Cough	Vomiting	Diarrhoea	Duration in Days	lb. oz.	g.	Gen. Cond.	Heart	Liver	Spleen	Hb g./100 ml.	Sickling	M.P.	W.B.C.	
1	21	F	+	+	+	+	60	16 0	7,260	V. poor	S.M. E.	Palp.	2f	4.0	Nil	+	9,800	Respiratory infection - ascaris. Procaine penicillin
2	7	M	+	+	+	+	8	13 15	6,320	Good	S.M. T.R.	3f	2f	5.6	..	+	..	Nil
3	9	M	+	+	+	+	5	14 14	6,750	V. poor	S.M.	3f	+	5.1	..	+	..	Respiratory infection. Procaine penicillin
4	7	F	+	+	+	+	2	12 9	5,695	..	S.M.	3f	+	4.5	..	+++	..	Persistent parasitaemia 3 days after nivaquine. Given mepacrine
5	8	M	+	+	+	+	10	15 8	7,030	Fair	N.A.D.	—	+	5.7	..	+	17,000	Respiratory infection. Sulphadimidine
6	9	M	+	+	+	+	8	9 24	4,155	Good	N.A.D.	1f	+	4.9	..	P.M.	18,200	Nil
7	12	M	+	+	+	+	6	17 7	7,910	Fair	S.M. E. T.R.	2f	+	3.8	..	—	10,900	..
8	9	F	+	+	+	+	5	12 13	5,810	Good	N.A.D.	1f	—	5.7	..	—	13,600	Gastro-enteritis on 5th day. I.V. fluids + chlortetracycline
9	4	M	+	+	+	+	5	10 4	4,650	..	N.A.D.	3f	4f	5.7	..	—	11,300	Nil
10	7	M	+	+	+	+	20	13 4	6,010	..	N.A.D.	—	3f	5.5	Trait	+	..	Diarrhoea on 7th day. S.C. fluid + chlortetracycline
11	8	M	+	+	+	+	5	9 0	4,080	Poor	N.A.D.	—	+	4.5	Nil	—	7,600	Nil
12	11	M	+	+	+	+	7	13 6	6,070	Good	S.M. E. T.R.	2f	—	4.7	Not done	—	24,300	Died soon after admission
13	6	F	+	+	+	+	9	18 0	8,165	Moribund	N.A.D.	—	—	4.9	Nil	+	11,000	Nil
14	11	M	+	+	+	+	6	14 8	6,575	Fair	S.M.	3f	4f	3.8	Not done	+	..	Died soon after admission
15	11	M	+	+	+	+	1	10 4	4,650	V. poor	N.A.D.	1f	2f	4.9	Nil	+	10,400	Respiratory infection. Procaine penicillin
16	8	M	+	+	+	+	16	16 2	7,315	Good	N.A.D.	2f	2f	5.3	..	+++	8,400	Nil
17	18	F	+	+	+	+	3	16 2	7,315	Good	S.M. E.	—	2f	5.9	..	—	17,000	P.U.O. first 6 days then diarrhoea and dehydration. Sulphadimidine. S.C. fluid. S.C. saline
18	12	M	+	+	+	+	5	15 0	6,805	..	..	—	—	—	..	—	..	..
19	9	F	+	+	+	+	3	13 12	6,235	Dehydr.	N.A.D.	1f	2f	5.3	Trait	P.M. + G.	8,200	Nil
20	5	F	+	+	+	+	2	15 0	6,805	Good	S.M. T.R.	—	—	4.8	Nil	+	50,200	..
21	8	M	+	+	+	+	7	15 5	6,945	..	N.A.D.	—	2f	5.1	Trait	—	4,200	..
22	12	M	+	+	+	+	7	13 13	6,265	V. poor	S.M.	2f	+	4.8	..	+	..	..
23	6	F	+	+	+	+	3	22 0	9,980	Good	S.M.	+	1f	3.8	..	—	16,000	..
24	12	M	+	+	+	+	3	22 0	9,980	Good	S.M.	+	1f	3.8	..	—	..	..

P.M. = pigmented monocytes. S.M. = systolic murmur. E. = enlargement. T.R. = triple rhythm. M.P. = malarial parasites. + G. = gametocytes present. 2f = enlarged 2 fingerbreadths.

children of the same age. Assessing our patients by standards familiar to us from work in the children's department at University College Hospital, Ibadan, most were classified as "within normal limits." Three patients (Cases 1, 6, and 19) showed evidence of mild protein malnutrition.

Cardiovascular System.—Nothing abnormal in the heart could be detected in 12 of our cases. The remainder all had apical systolic murmurs, and, in addition, Cases 1, 7, 13, and 18 showed enlargement of the heart, and in Cases 2, 7, 13, and 20 there was apical gallop rhythm. Case 13 was in congestive cardiac failure on admission. All cardiac signs disappeared on correction of the anaemia.

Abdomen and Chest.—The liver was palpable in 16 cases, and varied in size between 1 and 3 fingerbreadths below the costal margin. The spleen was enlarged in 19 patients, varying from "just palpable" to 4 fingerbreadths below the costal margin. The consistency of the organ was firm and in some patients it appeared to be tender. In spite of the frequent history of cough, only four patients showed evidence of mild respiratory infection. There were no positive tuberculin reactors. Cases 9, 11, and 18 were complicated by non-specific gastro-enteritis that developed in hospital, and were treated with parenteral fluids.

Haematological Findings

As already stated, only those patients with haemoglobin levels of 5.9 g./100 ml. (40%) or lower were included in the investigation. The blood-film appearances are summarized in Table II. It will be seen that in most films the cells were normochromic or slightly hypochromic, and that anisocytosis, poikilocytosis, and polychromasia were frequent findings.

Malarial parasitaemia was found in 13 cases, in all of which the parasite was *Plasmodium falciparum*. The initial reticulocyte count varied from 1% to 28% of total red cells, and in most the count was 5% or more. There appeared to be no relation between reticulocytosis and parasitaemia. The bone marrow showed a normoblastic hyper-

TABLE II.—Red-cell Appearances in Peripheral Blood Film

Case No.	M.P.	Hypo-chromic	Normo-chromic	Anisocytosis	Poikilo-cytosis	Polychrom- asia	Nuc. R.B.C. Total Nuc. Cells	Retic. % Total R.B.C.
1	++	—	++	++	++	++	0	7
2	++	—	++	++	++	++	0	16
3	++	—	++	++	++	++	0	11
4	++	—	++	++	++	++	0	11
5	++	—	++	++	++	++	0	20
6	++	—	++	++	++	++	0	13
7	++	—	++	++	++	++	0	9
8	++	—	++	++	++	++	0	10
9	++	—	++	++	++	++	0	16
10	++	—	++	++	++	++	0	11
11	++	—	++	++	++	++	0	11
12	++	—	++	++	++	++	0	2.5
13	++	—	++	++	++	++	0	16
14	++	—	++	++	++	++	0	10
15	++	—	++	++	++	++	0	10
16	++	—	++	++	++	++	0	10
17	++	—	++	++	++	++	0	3
18	++	—	++	++	++	++	0	2
19	++	—	++	++	++	++	0	5
20	++	—	++	++	++	++	0	17
21	++	—	++	++	++	++	0	5
22	++	—	++	++	++	++	0	28
23	++	—	++	++	++	++	0	30
24	++	—	++	++	++	++	0	30

M.P. = malarial parasites. Nuc. = nucleated. +G = malarial gametocytes. P.M. + = pigmented monocytes.

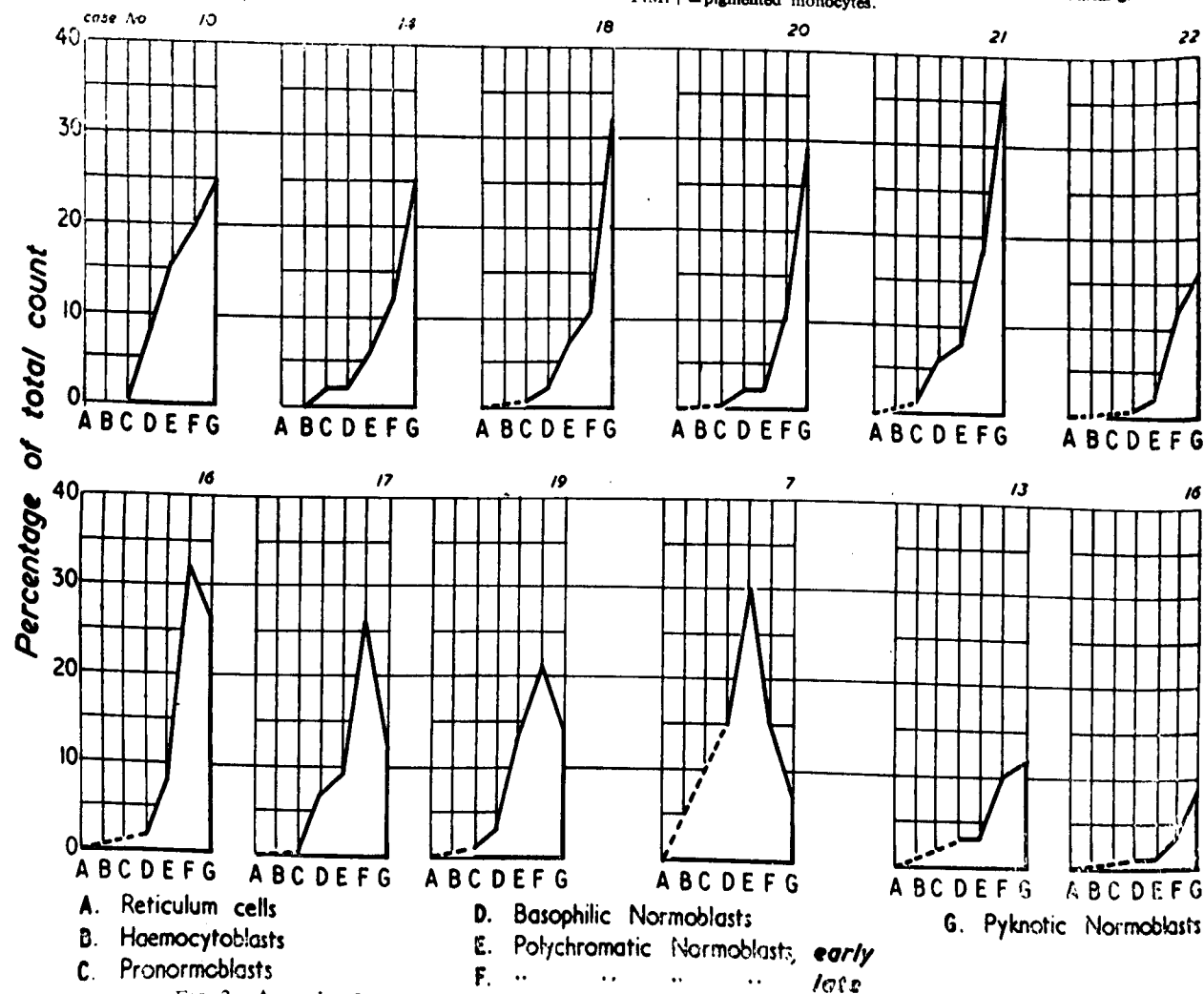


FIG. 2.—Anaemia of infancy presumed to be malarial. Bone-marrow red-cell maturation curves.

plasia in all but one of the patients from whom successful smears were made. Case 6 showed a mildly macronormoblastic marrow. There was evidence of very active erythropoiesis, with a greatly reduced leuco-erythrocytic ratio (average 0.2:1; range 0.1–0.41:1) in all except Cases 13, 16, and 22, in which the ratio was within normal limits given by Dacie and White (1949)—namely, 0.56–2.67:1.

Bone-marrow maturation curves varied in pattern. Some cases showed a normal pattern with raised peaks, while others showed curves similar to those described for iron-deficiency and congenital haemolytic anaemias. Fig. 2 shows curves that were constructed for 12 cases in the series. Included for comparison are maturation curves after Dacie and White (1949) (Fig. 3).

Sickling tests were positive in Cases 11, 19, 21, and 22. Case 11 also had reduced osmotic fragility of the red cells. All four cases were, however, confirmed to be sickle-cell trait and not sickle-cell anaemia on paper electrophoresis of the haemoglobin.

The total white-cell count varied considerably, but in 9 of the 16 cases in which counts were done on admission the figure was below 12,000. Two of the remaining cases had counts over 20,000. The differential counts showed a polymorph preponderance in eight cases. Monocytes, many showing pigment granules, were conspicuous in the majority.

Plasma Volume Estimations.—We are indebted to Dr. H. Schneiden, of the department of physiology, for this investigation. Results of estimations done before and after investigation. Results of estimations done before and after a rise in haemoglobin level in four cases are given in Table III. It will be seen that in Cases 5 and 8 there was a fall in plasma volumes corresponding with a rise in haemoglobin. Case 6 showed no real change. Case 9 had the first test on the day before he contracted gastro-

Case No.	Hb (g./100 ml.)	Plasma Vol.	Interval	Hb (g./100 ml.)	Plasma Vol.	Result
5	5.32	384 ml.	10 days	10.3	248 ml.	Fall 136 ml.
6	5.77	426 ..	10 ..	8.1	433 ..	No change
8	5.1	542 ..	9 ..	7.4	324 ..	Fall 218 ml.
9	5.77	242 ..	9 ..	9.64	298 ..	Rise 56 ml.

TABLE IV.—Serum Proteins, Liver-function Tests, and Serum Cholesterol in Infants with Severe Anaemia

Case No.	Serum Proteins				Liver-function Tests				
	Alb. g./100 ml.	Glob. g./100 ml.	Total g./100 ml.	A/G Ratio	T.T. Units	ZnSO ₄ Units	Bilirubin mg./100 ml.	Cholesterol mg./100 ml.	Alkaline Phosphatase K.A. Units
33	3.6	6.3	9.9	0.57	8		0.8	95	20.2
4	3.7	6.8	10.5	0.55			0.8	107	7.7
5	3.0	3.3	6.3	0.91	6		1.9		9.15
6	3.3	2.8	6.1	1.18	3.5		0.52		23.9
7	3.2	3.5	6.7	0.9	9.9		0.54		24.0
8	2.8	3.3	6.1	0.85	9.9		0.51		11.4
9	2.8	1.8	4.6	1.5	5.5		1.0		19.8
10					4.5				15.3
12	3.5	3.0	6.5	1.17	4.0		1.0		17.4
13					4.5		0.4	55	19.4
14	3.4	3.1	6.5	1.1	4.5		0.4		13.0
16	3.0	2.7	5.7	1.1	9.5		0.8	135	
17	3.35	3.25	6.7	1.0	12.0		0.7		10.5
19	3.2	3.9	7.1	0.8	20.6		0.85		5.9
21					8.4		0.2		34.5
22*					7.5		0.2		30.0
24*					6.2		0.2		

T.T. = thymol turbidity. ZnSO₄ = zinc sulphate turbidity. * Liver function tests done after correction of the anaemia. Comment: The high degree of systemic lipaemia in Cases 3 and 4 probably interfered with accurate globulin determination. In both these patients the serum presented an opaque, creamy appearance.

enteritis and became dehydrated. This may in part account for the rise in plasma volume in the second reading.

Serum Proteins.—The average serum albumin level in 12 cases was 3.24 g./100 ml. (range 2.8 to 3.7) and globulin 3.62 g./100 ml. (range 1.8 to 6.8), giving an A/G ratio of 0.89 to 1. Cases 3 and 4 showed abnormally high globulin levels which were thought to be false values occasioned by a high degree of systemic lipaemia which was present in these cases and interfered with accurate globulin determination. Excluding Cases 3 and 4, the average serum globulin becomes 3.07 g./100 ml. and the A/G ratio 1.05 (see Table IV). In order to provide a comparison, we examined the blood of some healthy non-anaemic children seen at an

TABLE V.—Results of Serum Protein Estimation, Liver-function Tests, and Serum Cholesterol Estimation in Healthy Infants at an Infant Welfare Clinic, University College Hospital, Ibadan

Case	Age in Months	Serum Proteins				Liver-Function Tests				
		Alb. g./100 ml.	Glob. g./100 ml.	Total g./100 ml.	A/G Ratio	T.T. Units	ZnSO ₄ Units	Bilirubin mg./100 ml.	Cholesterol mg./100 ml.	Alk. Phos. K.A. Units
WC/128	4	3.0	2.6	5.6	1.1	6.0	2.6	0.15		15.5
WC/191	10	3.2	2.0	5.2	1.6	4.9	4.0	0.5	80	15.5
WC/362	4	3.4	1.8	5.2	1.8	2.8	1.8			32.6
WC/28	15	3.0	3.1	6.1	0.96	8.5	2.8		124	75.9
WC/319	5	2.6	3.4	6.0	0.76	6.0	3.2	0.3		75.9
WC/324	3	1.5	4.2	5.7	0.35	2.2	2.4	0.15		98.6
WC/136	15					7.0	8.0	0.32	90	14.2
WC/380	1					0.6	4.5			35.9
WC/378	1					0.6	4.2	0.4		
WC/318	9	3.4	2.8	6.2	1.2				70	
WC/—	2	3.6	3.0	6.6	1.12				118	
WC/—	12	3.8	3.2	7.0	1.18				128	

Comment.—The children selected for the above investigations were all well nourished and showed no clinical evidence of anaemia. Physical examination revealed no abnormality. Blood films of Cases WC/28, 319, and 324 were negative for malarial parasites. The remaining cases did not have blood films taken at the time the tests were performed. (The clinical assessment of these children was made by a senior paediatric consultant.)

infant welfare clinic. Results are shown in Table V. The average serum albumin was 3.05 g./100 ml. (range 1.5 to 3.8) and average globulin 2.9 g./100 ml. (range 1.8 to 4.2), giving an A/G ratio of 1.05 to 1. Edozien (1957) records the average results of serum protein determinations on 200 healthy adult Nigerians as follows:

Total protein	6.8 ± 0.4 g./100 ml. (5.8 to 7.5)
Albumin	3.6 ± 0.3 g./100 ml. (2.6 to 4.0)
Globulin	3.2 ± 0.4 g./100 ml. (2.5 to 4.0)
A/G ratio	1.12 (0.8 to 1.5)

It will be seen that all the patients with anaemia and all but one of the welfare clinic cases (WC/324) had serum proteins within normal limits for Nigerians.

Liver-function Tests

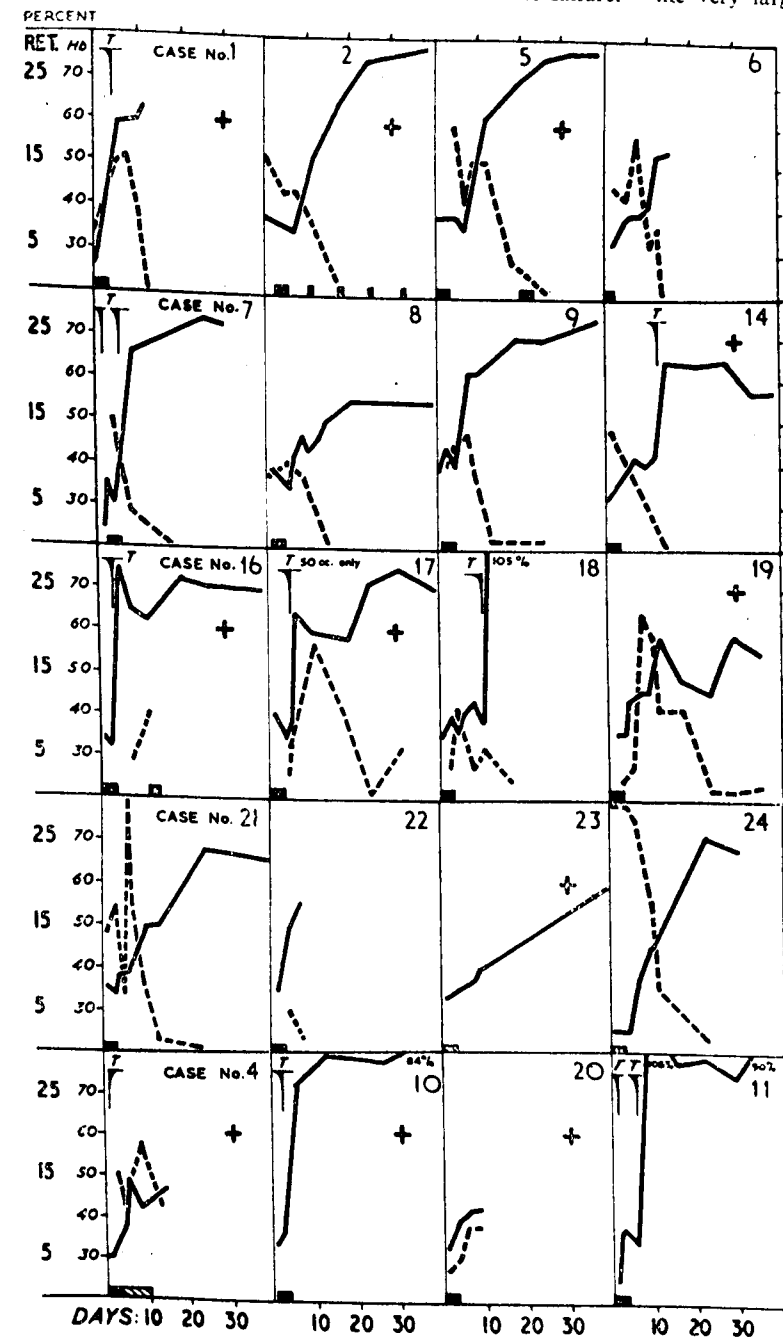
Thymol turbidity tests performed on 16 patients gave high readings (Table IV). The average value was 7.7 units (range 3.5 to 20.6). The zinc sulphate turbidity test performed on four patients gave an average reading of 14.5 units (range 7.5 to 22.5). Similar tests performed on the welfare clinic cases gave the following results (Table V): thymol turbidity, average, 4.3 units (range 0.6 to 8); zinc sulphate turbidity, average, 3.7 units (range 1.8 to 8). It will be seen that, while there was close agreement in the results of serum protein estimation in the two groups compared, the results of the flocculation tests differ. The zinc sulphate turbidity depends almost entirely on the gamma-globulin fraction of the serum, and is a relatively accurate index of the concentration of the gamma-globulin (Kunkel, 1947, and Discombe *et al.*, 1954, quoted by Edozien, 1957). It would therefore appear that there was a qualitative difference in the globulin fraction in the two groups, caused by an increase in the gamma-globulin in the anaemic children.

Estimation of the serum bilirubin in 15 anaemic patients gave an average value of 0.7 mg./100 ml. (range 0.2 to 1.9). Only three patients had values above the accepted upper limit of normal. Results on six welfare clinic cases gave

an average of 0.3 mg./100 ml. (range 0.15 to 0.5). Serum alkaline phosphatase levels tended to be high in both the anaemic and the non-anaemic children seen in the welfare clinic. Three children in the latter group gave readings of 70.28, 75.9, and 98.6 K.A. units respectively. The explanation might be that these children had rickets, a not uncommon finding in Ibadan, but the possibility of a laboratory error cannot be overlooked. (These three tests were done on the same day).

Response to Treatment

There were two deaths in the series; both occurred within the first few hours after admission. Case 13 was desperately ill on admission and thought to be in cardiac failure.



Transfusion
--- Reticulocytes
— Haemoglobin (100% = 14.8 g.)
+ Malarial Parasites found on admission
■ Nivaquine
□ Mepacrine

FIG. 4.—Anaemia of infancy presumed to be malarial. Haemoglobin and reticulocyte response to treatment.

She was given 50 ml. of packed cells and appeared to stand the transfusion well. Three hours later she was given an intramuscular injection of 200 mg. of nivaquine, and died shortly after. Case 15 was admitted with a haemoglobin level of 3.7 g./100 ml. and was in very poor general condition but showed no evidence of cardiac failure. He was transfused slowly and given 80 mg. of nivaquine by intramuscular injection but died shortly after. In neither case were we able to obtain a necropsy, nor was the exact cause of death determined, but in both we suspected that the injection of nivaquine might have been causally related. They were, however, both very anaemic and very ill and the risks of transfusion in such cases are considerable. Despite the very large oral doses of nivaquine used in this series and in many other patients, we have not observed any toxic effects when the drug is given by this route, but we have been alarmed on several occasions at sudden collapse occurring within minutes of an injection of nivaquine in anaemic infants not otherwise ill.

Fig. 4 shows the response of haemoglobin and reticulocytes to treatment over 40 days in 20 cases. (Cases 3 and 12 are shown separately on Fig. 5.) It will be seen that in all the untransfused patients the haemoglobin rose steeply after a lag period of up to seven days. In some patients there was a slight initial fall in haemoglobin. In Cases 2, 5, 6, 9, 21, and 24 the rise in the haemoglobin was sustained at the rate of 0.3 to 0.4 g./100 ml. (2-3%) for 14 to 21 days, reaching levels of 10.36 g. (70%) after about 21 days. Cases 20 and 22 appear to have responded in a similar manner, but the records are short. Case 8 responded similarly, but the level did not rise above 8.14 g. (55%). The haemoglobin level in Case 19 pursued a more erratic course, rising to 8.6 g. (58%) by the 29th day and remaining at this level for six weeks, after which it rose to 10.66 g. (72%) without further treatment. Case 23 showed a slower but steady rate of increase of haemoglobin from 4.9 g. (33%) on the first day to 11.8 g. (80%) by the 75th day.

In most of the transfused patients the post-transfusion level of haemoglobin was maintained or it continued to rise. Cases 7, 10, and 17 show this well. Case 14 showed a fall from 9.6 g. (65%) after transfusion to 8.6 g. (58%) on the 40th day, but by the 56th day the haemoglobin had risen to 11.24 g. (76%).

Fig. 5 shows the result of a 200-day follow-up in Cases 3 and 12. Case 3 had frequent relapses (or reinfections) of malignant tertian malaria in spite of prolonged use of nivaquine and pyrimethamine (daraprim) orally. On two occasions after nivaquine had been given intramuscularly, blood films became negative, reticulocytes rose and then fell, and the haemoglobin rose. Possibly his mother had failed to give him his oral doses, but she seemed reliable, and attended regularly, and insisted that she had carried out our instructions. Notwithstanding the persistent parasitaemia and fluctuations in haemoglobin level, his weight showed a slow but steady rise except between the 60th and 70th days, when there was a fall associated with an attack of diarrhoea.

In Case 12 the haemoglobin level fell steadily after transfusion, when it was over

15 g., to 6.35 g. (43%) by the 102nd day. This fall was accompanied by return of malarial parasites in the peripheral blood film. Nivaquine was then given and the haemoglobin again rose to 12.72 g. (86%) by the 137th day. His weight showed a steady increase throughout. When parasites reappeared on the 150th day there was another fall in haemoglobin and weight. No treatment was given. The haemoglobin level became stationary at 10.95 g. (74%) and the weight at 18 lb. (8,165 g.), and both remained thus until the 218th day (not shown in Fig. 5). On the 250th day he had fever and was coughing, and the haemoglobin was found to be 8 g. (54%). Nivaquine was prescribed. On the 280th day, when he was last seen, his haemoglobin level was 10.36 g. (70%) and his weight 20 lb. 8 oz. (9,300 g.).

Reticulocyte response to nivaquine seemed to be of two types. The first, shown by Cases 1, 3, 4, 6, 9, 16, 17, 18, 19, 20, and 21, is typified by a peak about seven days after start of treatment, and conforms to Fairley's (1934) description of a reticulocyte crisis following administration of quinine in malaria. The second type, seen in Cases 2, 5, 7, 8, 14, and 23, consists of a high initial count falling steadily after the start of treatment.

Discussion

Ibadan is in a highly malarious area, and any investigation into the aetiology of anaemia, in any age group, occurring locally must perforce be influenced by this con-

sideration. At the outset of the present investigation we could only guess at the contribution of malaria to the anaemia of infants. We aimed first to eliminate malaria as a variable by giving all our patients a large enough dose of nivaquine to be certain of controlling any latent or overt infection, and decided to use the drug irrespective of the presence or absence of parasitaemia. Besides malaria, the population of Ibadan, because of a deficiency of protein in their diet, suffer from protein malnutrition (Lawson and Lister, 1956).

Woodruff (1955), reporting on work carried out in Ibadan, states: "There is, therefore, evidence that anaemia in some African older children, adult males, and non-pregnant females may be associated with chronic protein malnutrition and liver damage, and this anaemia has the same characteristics as that found in young children and pregnant females." With this in mind, we paid particular attention to the dietary histories of our patients, and in order to avoid confusion we decided to keep them on their accustomed diets until the results of investigation showed the need for a change. The results set out above show that we were able to correct the anaemia in all our patients, without altering the diet, by giving them nivaquine, supplemented where necessary by blood transfusion. Of particular interest is the fact that improvement occurred irrespective of the initial presence or absence of malarial parasitaemia. Trowell (1949, 1956), working in Uganda, found

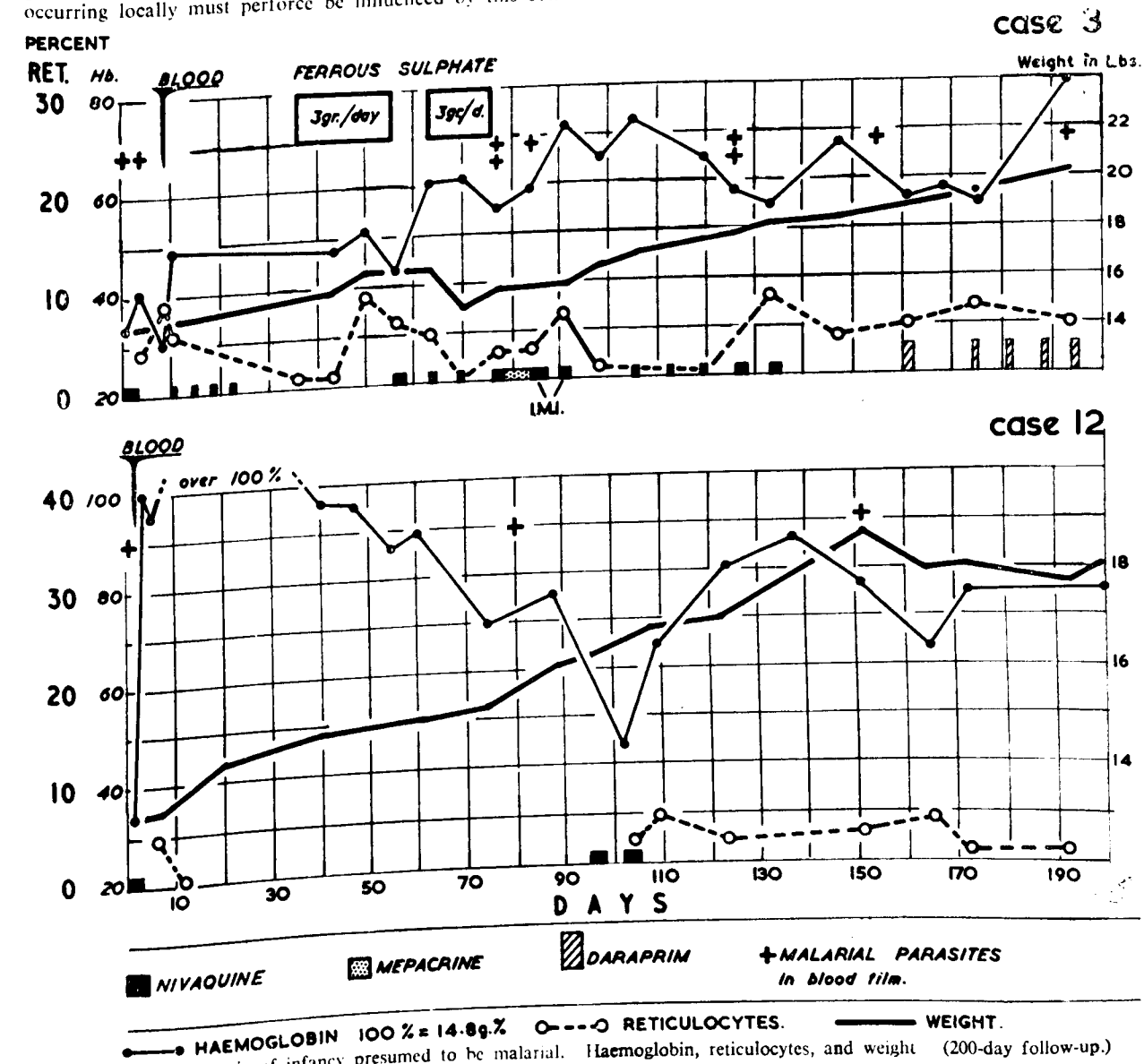


FIG. 5.—Anaemia of infancy presumed to be malarial. Haemoglobin, reticulocytes, and weight (200-day follow-up.)

that in infancy severe anaemia is usually caused by malaria. He records that following quinine administration combined with a high-protein diet these infants show a reticulocyte response and rapid rise in haemoglobin level.

Iron deficiency is an important cause of anaemia in infancy. Milk-fed infants rely to a great extent on stores laid down in the liver in foetal life, and these in turn depend to some degree on the mother's diet during pregnancy. Premature infants are born with limited iron stores and are prone to hypochromic anaemia. Infections serve to increase iron requirements; infants reared in unhygienic surroundings are thus particularly subject to hypochromic anaemia (Holt and McIntosh, 1953). In Ibadan, maternal diets are generally poor, environmental conditions are unhygienic, and the incidence of prematurity is high (Lawson and Lister, 1956; Woodruff, 1951). It is surprising, therefore, that iron deficiency appeared to play no significant part in the pathogenesis of anaemia in our patients, who, without exception, recovered without being given iron. Clinical evidence and response to antimalarial treatment has led us to conclude that we were dealing with anaemia resulting from infection with *Pl. falciparum*. The efficacy of chloroquine in the treatment of malaria is well established (Trowell, 1956). However, the possibility exists that the drug might have acted in some other manner. Dähne (1943) found that quinine and mepacrine produced a reticulocyte response within three to eight days in normal non-anaemic and non-malarious subjects. He attributed this to a direct action on the bone marrow. In the absence of evidence to the contrary we must recognize the possibility that chloroquine might have acted in a similar manner in our patients.

Bruce-Chwatt (1952), working in Southern Nigeria, found the mean parasite rate in a sample of 138 infants to be: 0 to 3 months, 2.2%; 3 to 6 months, 60.0%; 6 to 9 months, 60-70%; over 9 months, $\pm$ 80%. It will be seen that prior to the third month of life the rate is negligible, but from then onward there is a sharp increase, so that by the age of 12 months 80% of infants have been infected. Reference to Table I will show that this "age of infection" corresponds in our patients with the age group in which anaemia is most common, but, whereas the parasite rate remains high after the first year, the incidence of anaemia declines. This decline in the incidence of anaemia is probably more apparent than real. After the first year the incidence of protein malnutrition rises and patients with anaemia and obvious malnutrition were excluded from the investigation. The explanation may, however, be bound up with immunological responses. During the first three months of life infants appear to be able to resist malarial infection. Thereafter susceptibility increases and anaemia might develop as part of the reaction of an individual with no acquired premunity to malaria. Survival of repeated attacks probably results in increased premunity, with consequent reduction in severity of clinical manifestations.

The anaemia of malaria is generally ascribed to haemolysis, though capillary haemorrhage may play a part (Strong, 1945). The essential features of a haemolytic anaemia are persistent anaemia, persistent reticulocytosis, hyperbilirubinaemia, and excess urobilinogen in the urine and in the faeces (Davidson, 1954). Our patients showed no evidence of haemorrhage. Jaundice was entirely lacking, and only three patients showed serum bilirubin levels slightly in excess of normal values.

In haemolytic anaemia the plasma bilirubin level usually lies between 1 and 3 mg./100 ml., but occasionally it is within normal range, normal levels being maintained by the ability of a healthy liver to excrete far more bilirubin than it is normally called upon to do (Dacie, 1954). Hepatomegaly and high values for the thymol turbidity and zinc sulphate turbidity tests in most of our cases suggest derangement of liver function. It seems unlikely, therefore, that normal serum bilirubin levels were maintained by healthy livers doing more than is usually required. In those patients in whom urine analyses were performed there

was no excess urobilinogen. From our findings it seems improbable that haemolysis was the only factor in the pathogenesis of the anaemia. All our patients showed active erythropoiesis, and it is difficult to reconcile this with the anaemia, seeing that there was no convincing evidence of blood loss by haemorrhage or haemolysis. Woodruff (1951) found a similar discrepancy between the bone-marrow appearances and the peripheral blood in his cases of anaemia of pregnancy in Ibadan; and Altman and Murray (1948, quoted by Woodruff, 1951) made a similar observation in nutritional anaemia of infants.

One is reminded of thrombocytopenic purpura, in which, in spite of a hyperplastic marrow with an increase in megakaryocytes, there is a reduction in the number of platelets in the peripheral blood. Splenectomy often produces dramatic relief in these patients. Wiseman and Doan (1939) described primary splenic neutropenia in which there is agranulocytosis due to excessive phagocytosis of neutrophils in the spleen. The bone marrow in these cases shows a myeloid hyperplasia. Doan (1944, quoted by Nelson, 1945) suggests that "the spleen has an inherent capacity for unusual sequestration and destruction of the formed elements of the blood, and that this function may be stimulated to excessive activity by any condition which causes the spleen to enlarge. In such instances anaemia, leucopenia, and thrombopenia may result because the bone marrow in spite of hypertrophy is unable to compensate." It might be that disturbance of this function is operative in producing the peculiar blood picture which we have described. Results of plasma-volume estimation in our cases suggest that alteration in plasma volume may also be a factor in the pathogenesis of the anaemia.

Summary

Severe anaemia in infancy is often seen at University College Hospital, Ibadan. The results of investigation of 24 cases of severe anaemia in infancy are presented. The typical clinical picture was: a breast-fed baby about 9 months old presenting with fever, cough, and, in 50%, vomiting of one week's duration. Examination showed hepatosplenomegaly, and, in 50%, cardiac signs. The blood showed a normochromic or slightly hypochromic anaemia with anisocytosis, poikilocytosis, and polychromasia. The reticulocyte count was raised and the bone marrow showed a normoblastic hyperplasia. *Pl. falciparum* was found in 13 cases. Serum proteins fell within the normal range for adult Nigerians, and liver-function flocculation tests gave high values in most. The serum bilirubin was raised in only three cases. After correction of anaemia two cases showed a fall in plasma volume.

Treatment consisted only in giving nivaquine (chloroquine) in large doses irrespective of malarial parasitaemia, supplemented by blood transfusion when necessary. No haematinics were given, and patients were maintained on their accustomed diet. There were two deaths. The rest responded to treatment, untransfused patients showing a rapid rise in haemoglobin to normal. A reticulocyte response was noted.

Malaria is thought to be the cause of the anaemia. Malnutrition and iron deficiency play no significant part in the aetiology. The possibility that nivaquine might exert a specific haematinic influence is considered. The absence of evidence of gross haemolysis or haemorrhage in an anaemic patient showing active erythropoiesis is commented on, and it is suggested that abnormal splenic function ("hypersplenism") and alterations in plasma volume may be factors in the pathogenesis of the anaemia.

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PROLONGED ANURIA COMPLICATED BY EPILEPTIFORM FITS

BY

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The dietary and fluid restrictions imposed on patients with anuria has been fully described (Bull *et al.*, 1949; Merrill, 1955). The occurrence of severe convulsions in the course of treatment is not a generally recognized complication.

The patient whose case is described below had very severe epileptiform fits on her 17th day of anuria, and recovered. The management and aetiology of the fits, as well as the nature of the residual renal lesion and its effect on child-bearing, are discussed.

Case History

A primigravida aged 26 was first seen on March 25, 1955, at the 25th week of pregnancy. Her blood pressure was 130/80 mm. Hg; there was no proteinuria or past history of renal disease. During the 29th week of gestation she was admitted to hospital complaining of abdominal pain, vomiting, absence of foetal movement, and anuria for some hours. She was pale and anxious, and her blood pressure was 140/90. There had been no vaginal bleeding. A small quantity of urine was obtained from the bladder by catheter, and there was no proteinuria.

On examination the uterus was hard and tender, and foetal parts could not be palpated nor the foetal heart heard.

Two pints (1,100 ml.) of blood was given, and three hours later uterine contractions were felt, so the foetus was delivered. Eight hours later a stillborn foetus was expelled, with 5 pints (2,840 ml.) of blood clot and the placenta. A further 2 pints (1,100 ml.) of blood was trans-

fused. No fall in blood pressure had occurred since she was admitted to hospital.

After delivery no further obstetrical complication arose, but complete anuria persisted for the first 11 days, and oliguria for another six (see Table and Chart). The anuria

Fluid Intake and Output

Day	Input (ml.)			Output (ml.)		
	Mouth	Intra-gastric Drip	Intravenous Drip	Urine	Vomit	Total
1	780	—	1,000 (blood)	1,780	—	—
2	120	600	1,000 (blood)	1,720	—	—
3	—	1,000	—	1,000	28	578*
4	—	800	—	800	—	—
5	800	—	—	800	19	160
6	800	—	1,000 (blood)	1,800	—	—
7	800	—	—	800	30	—
8	840	—	—	840	100	903
9	—	800	—	800	—	510
10	—	500	—	500	—	350
11	—	400	500 (blood)	900	—	240
12	—	500	—	500	510	870
13	495	—	700	1,195	150	255
14	480	—	1,000	1,480	270	270
15	180	—	1,025	1,605†	330	330
16	—	—	1,000	1,600‡	360	390
17	—	—	1,940	1,940	690	690
18	—	—	1,600	1,600	1,080	1,080
19	—	—	2,300	2,300	1,875	2,010
20	—	—	3,000	3,000	2,130	2,280
21	—	—	3,000	3,000	2,475	2,505
22	—	—	3,500	3,500	3,540	3,795
23	30	—	4,500	4,530	3,600	3,630
24	210	—	4,500	4,710	4,860	5,010
25	600	—	4,000	6,600	5,100	5,130
26	450	—	6,000	6,450	6,960	6,960
27	1,040	—	5,000	6,040	5,490	5,580
28	2,500	—	4,000	6,500	6,120	6,120
29	2,625	—	4,000	6,625	6,480	6,480
30	4,130	—	2,500	6,630	5,295	5,295
31	4,230	—	900	5,130	4,065	4,065

* 550 ml. in faeces. † 400 ml. by enema. ‡ 600 ml. by enema.

was treated on conventional lines at first, with 400 g. of glucose, 100 g. of peanut oil, emulsified to 1 litre of water (Bull *et al.*, 1949). As the anuria persisted the quantity of fluid was reduced to 800 ml. a day, given by mouth as 50% glucose with adequate vitamins. Excessive vomiting occurred on the eighth day, and the fluid was then given by intragastric drip: further attacks of vomiting necessitated changing to 40% glucose, given by caval drip (de Keyser *et al.*, 1949; Bull, 1952; Russell *et al.*, 1954). The electrolyte balance of the patient was followed at frequent intervals, and on the 12th day the serum potassium had risen to 7.6 mEq/l. This was reduced to 4.2 mEq/l. by giving 100 g. of "zeo-carb. 225/Na," suspended in 1 litre of water, administered in five divided doses over two days. The anaemia was twice treated by transfusion of concentrated red blood cells, 2 pints (1,100 ml.) on the sixth day and 1 pint (550 ml.) on the eleventh day.

Epileptiform Fits.—On the 17th day, just as renal function was returning, a series of epileptiform fits occurred, and at the first fit a blood pressure of 220/90 was recorded (a blood pressure of 170/100 had been recorded earlier in the day, a slight rise over the 160/80 of the day before) (see Chart). These fits were not controlled by the prompt administration of 4½ gr. (0.3 g.) of phenobarbitone sodium intramuscularly, nor by 3 g. of NaCl intravenously. The fits started to come at ever-increasing frequency and violence, 10 occurring in about two and a half hours. Thio-pentone sodium, 0.5 g. intravenously, brought immediate respite, and a further 0.25 g. was given when muscular twitching became apparent 15 minutes later. Bromethol ("avertin"), 6 ml. in 8 oz. (230 ml.) of water, was given, and this was followed by a fall in the blood pressure to 140/90. A further 4 ml. of bromethol was given three hours later, when the blood pressure had risen to 195/110. The blood pressure then fell to 165/90, and did not rise again, nor did fits recur. Sodium amylobarbitone, 3 gr. (0.2 g.), was given intravenously for the next six nights, which kept her in a very drowsy state. She was discharged from hospital on the 43rd day after the onset of the concealed accidental haemorrhage.

Fluid and Electrolyte Balance During Recovery Period.—The urine output returned in ever-increasing quantities following the occurrence of the epileptiform fits. During the period of semi-coma the fluid balance had to be maintained with intravenous therapy, and this was reinforced by the addition of sodium, potassium, chloride and bicarbonate. On the 23rd day, when the patient had regained consciousness, she was still nauseated, and the fluid requirement had to be maintained intravenously. This nausea

haemorrhage, although there is no reason to suspect pre-existing renal damage on the findings at her first antenatal visit.

Management of the Anuria

No new principles were involved here. The original recipe of glucose, peanut oil, and water (Bull *et al.*, 1949) is no longer advocated (Bull *et al.*, 1955; Parsons and McCracken, 1957). In particular, the peanut oil has been found unnecessary because, in the first place, the average reserves of fat in a patient developing acute anuria are sufficient to tide the individual through the anuric phase (Merrill, 1955), and, secondly, because of the incidence of nausea and the occasional occurrence of fat pneumonia. The amount of glucose to be administered should be pushed to the maximum dose of toleration for the purpose of reducing endogenous protein breakdown. A glucose-water mixture, adequately supplemented by vitamins, can often be taken by mouth without having to resort to an intragastric drip, but in this patient nausea occurred early, and the intragastric drip had to be used after the eighth day. Then, because of incessant vomiting, 40% glucose was delivered into the inferior vena cava by a "polythene" catheter from the 13th day onwards. Intravenous therapy had to be maintained in this patient even after the anuric phase had given place to the recovery phase, as vomiting and nausea prevented adequate oral intake to keep pace with the urinary output.

The quantity of fluid required during the anuric phase could not be ascertained with certainty in this patient, as no weighing scales were available. The total fluid balance for the first 16 days' treatment is given in the Table: input exceeded output by 8.7 litres, an average of 550 ml. per 24 hours, which probably is the amount of fluid required to satisfy the insensible loss when the water of oxidation and the water released in the cells when protein is

mobilized are taken into consideration. These calculations would suggest that perhaps no overhydration had taken place in the course of treatment. It is, however, emphasized that the fluid-balance chart can be notoriously inaccurate in these situations, and the only satisfactory investigation that can be performed to guard against overhydration is to weigh the patient daily (Merrill, 1955).

The degree of metabolic breakdown that was occurring during the period of anuria was not high in this patient, for the average daily rise in the blood urea nitrogen during the period of anuria was only 11.4 mg./100 ml.

The dangerous rise in the serum potassium level that occurred on the 12th day was treated by giving ion-exchange resin zeo carb 225/Na. As this could not be administered orally it was given by slow rectal drip, the resin being suspended in water. It will be seen from the Chart that this dose of resin successfully reduced the serum potassium level from 7.6 to 4.2 mEq/l.

Epileptiform Fits

The aetiology of the fits can only be a matter for conjecture. It seems unreasonable to postulate the occurrence

of eclampsia as long as 17 days after delivery, unless the renal failure had delayed the excretion of a substance responsible for eclamptic fits. These were associated with a marked rise in the blood pressure, and, although the treatment used in this patient caused a marked drop in the blood pressure with the cessation of the fits, it is no explanation simply to attribute the fits to the raised blood pressure, for this only leaves unsolved the aetiology of the sudden hypertension.

It is well known that overhydration with water can cause convulsions of an epileptiform type, but the fluid-balance investigations did not indicate an excessive intake of water, and certainly no clinical evidence of overhydration occurred. These findings were supported by the fact that rapid intravenous injection of 3 g. of sodium chloride failed to control the fits. Indeed, prior to the onset of the fits sodium had already been administered in the form of the ion-exchange resin.

From the evidence available it can only be assumed that the fits were associated in some way with the anuria and progressive uraemia, for after restoration of renal function the fits ceased and did not recur.

The treatment of the convulsions was entirely empirical, and was based on the management of eclampsia. Thiopentone was used as an emergency, followed by a full dose of bromethol. This was effective in controlling the fits initially, and a further small dose of bromethol was given three hours later, when the blood pressure began to rise again. Fortunately no harm came from the use of these drugs despite poor renal function.

Nature of the Residual Renal Lesion

The presence of proteinuria even one year after the episode of anuria suggests that the renal lesion was of some magnitude, and this is supported by the lowered inulin and P.A.H. clearances. The presence of pus cells also requires further explanation. No organisms were found in the urine either during the period of anuria or subsequently. Cystoscopy revealed no abnormality, and a retrograde pyelogram was essentially normal in the follow-up period. Perhaps the pus cells are the result of gross renal damage undergoing repair.

Future Pregnancies

In the chronic phase of Ellis type I nephritis the chances of foetal survival are very poor, and deterioration of the maternal condition is very great when the blood urea level is raised above 40 mg./100 ml. at the beginning of pregnancy (Dodds and Browne, 1940; Hamilton, 1952). In chronic pyelonephritis of comparable severity, on the other hand, the prognosis for the infant would not be so poor, and the maternal risk would lie more in the danger of superadded acute renal infection. In any case, the possibility of a recurrent pre-eclampsia and even accidental haemorrhage has to be considered. It would seem, therefore, that there would be considerable risk to mother and foetus in a further pregnancy. If the husband and wife are still determined to try again we could only keep a close watch, and offer termination of pregnancy immediately signs of deterioration develop.

Summary

A case is described of anuria for 11 days and oliguria for a further six days following severe concealed accidental haemorrhage.

Epileptiform fits occurred on the 17th day of reduced renal output. They were associated with a sudden rise of blood pressure.

The detailed management of the anuria and of the fits is described.

The results of renal investigations one year later are given. They showed persistent proteinuria and pyuria, with considerable impairment of renal function.

The management of anuria, the possible aetiology of the fits, the nature of the residual renal lesion, and the prognosis for future child-bearing are discussed.

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CORTICOTROPHIN IN TREATMENT OF HYPERTHYROIDISM

BY

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Harris and Woods (1956) reported that electrical stimulation of the tuber cinereum of rabbits by remote control rarely produced the expected increase in thyroid activity unless preceded by adrenalectomy. After reviewing other evidence for the possible inhibitory action of the adrenal cortex on thyroid function, they concluded that further investigation of the effects of corticotrophin administration in early and previously untreated cases of Graves's disease would be of interest. This communication records such an investigation, a preliminary report of which was given by Richardson (1957).

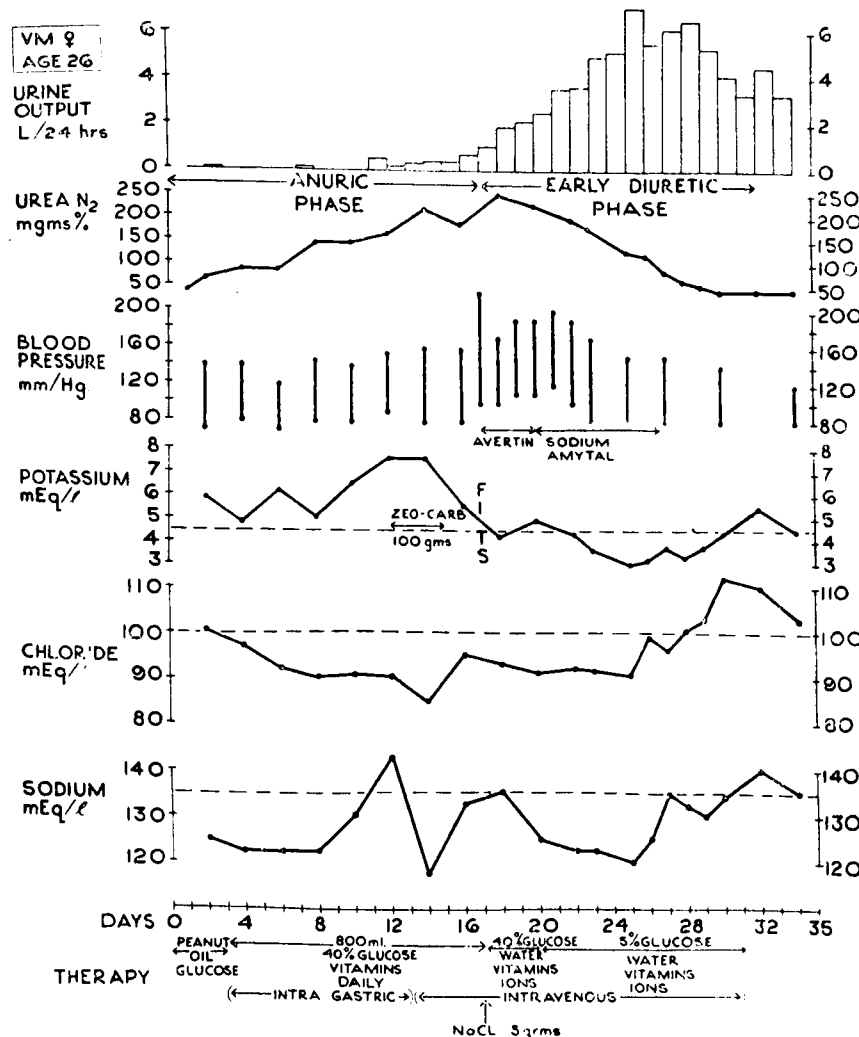
Methods

Eight patients with hyperthyroidism were admitted to hospital. The clinical diagnosis was confirmed by observation for at least 10 days, during which time radioiodine studies and protein-bound iodine estimations were made. Basal metabolic rate (B.M.R.) estimations were also carried out on three days towards the end of the observation period. Corticotrophin gel was then given by intramuscular injection for from two to five weeks, the initial dose of 20 units b.d. being halved in some cases after 7 to 11 days. At the end of the period of treatment the laboratory studies of thyroid function were repeated (Table I). The potency of the batch of corticotrophin which was used throughout had previously been demonstrated on a healthy subject. Confirmation of the efficiency of the adrenocortical stimulation was provided by the fluid retention which occurred and by the increases which were detected in the urinary excretions of 17-ketosteroids and 17-ketogenic steroids. Excessive retention of fluid was combated in the thyrotoxic subjects by injections of mersalyl, but such injections were not given when radioiodine or urinary steroid excretion studies were being made. However, in spite of precautions, pulmonary congestion developed at the end of the course of treatment in two patients.

A ninth patient with hyperthyroidism was treated with prednisone, 20 mg. b.d., for 14 days and studied in a similar way.

Results

A significant improvement in the hyperthyroid state was observed in only one patient, a man aged 40 with mild hyperthyroidism, a diffuse goitre, and symptoms of short duration (Case 2). Even though the improvement was only



decreased and more fluid could be given by mouth, but not until the 31st day of her illness was it possible to stop the intravenous supplement, the caval drip having operated for 19 days. Thereafter the patient returned to a full diet, taking all fluid and medication orally. On the 41st day—that is, two days before her discharge—the output of urine was 1,500 ml.

Subsequent Course.—One year after leaving hospital the patient was reinvestigated. Protein was still present in the urine in considerable quantity, as were a few pus cells and an occasional red blood cell. No casts were found. An intravenous pyelogram showed no abnormality other than a slight distortion of the calices of the left kidney. The plasma levels of sodium, potassium, chloride, calcium, phosphorus, and protein, and the carbon dioxide combining power were within normal limits, but the blood urea was 66 mg./100 ml. The haematocrit reading was 47%. The inulin clearance was 49 ml. a minute, and the P.A.H. clearance 224 ml. a minute. It was apparent, therefore, that considerable impairment of renal function existed. The nature of the residual lesion was obscure, particularly as no values were available prior to the onset of the accidental

TABLE I.—Clinical Details of Nine Hyperthyroid Patients, with Results of Laboratory Tests of Thyroid Function Before and at End of Treatment

Case No.	Age in Years	Sex	Goitre	Duration of Symptoms (Months)	B.M.R.* %		Serum P.B.I. μ g./100 ml.		Radioiodine Studies (% of Administered Dose)									
									Urine Excretion				Thyroid Uptake at 24 Hours		Plasma Radioiodide per Litre		Plasma P.B. Radioiodine per Litre	
					0-8 Hours		8-24 Hours											
					C	T	C	T	C	T	C	T	C	T	C	T	C	T
1	55	F	N	18	+37	+58	7.5	6.8	7.8	7.5	0.6	3.1	77.5	73.5	0.8	—	0.68	—
2	40	M	D	4	+27	+6	11.6	8.6	9.7	23.3	1.3	3.2	52	31.3	0.73	0.59	0.71	0.58
3	45	F	D	9	+44	+33	9.5	10.3	—	5.7	0.6	0.6	73.5	84	1.04	1.05	0.95	—
4	43	F	D	6	+51	+50	21.2	16.4	—	3.4	0.9	0.4	76	78	0.81	—	0.79	—
5	57	F	N	6	+40	+41	9.4	12.2	6	9.7	2.6	3.4	47.8	40.5	3.4	—	3.4	—
6	29	M	D	2	+69	+66	10.5	7.9	7.7	8.3	1.1	2.6	74.5	70.5	1.26	1.5	1.18	1.43
7	35	F	D	2	+57	+46	11.8	14.8	3.1	6.3	1.1	1.1	66.1	82.4	2.83	2.49	2.75	2.28
8	48	M	D	18	+37	+55	9.6	8.5	4.1	7.0	1.0	2.0	75	67.3	1.87	1.86	1.86	1.6
9	40	F	N	5	+30	+47	—	—	6.4	6.3	0.9	1.1	70.6	86.5	0.86	—	0.97	—
Normal Range							3.5-7.5		25-50		7-20		19053		<0.6		<0.3	

D=Diffuse goitre. N=Nodular goitre. * Lowest of three measurements. C=Duration of symptoms.

D=Diffuse goitre. N=Nodular goitre. *Lowest of three measurements. C=During control period. T=At termination of treatment.

slight it was apparent clinically and on each of the laboratory assessments of thyroid function.

Reduction in the size of the goitre was thought to have occurred in Case 3 during the first fortnight of treatment, but further reduction was not seen, although corticotrophin was given for another three weeks. The goitres of the other patients did not alter in size nor was any lessening of proptosis noted.

Although in Case 8 the patient, who had a typical thyrotoxic myopathy, showed no improvement in the hyperthyroid state, a definite increase in the power of the affected muscles occurred during treatment. The electromyographic abnormalities, however, persisted unchanged.

The results in the patient treated with prednisone (Case 9) were equally negative.

Discussion

Hill *et al.* (1950) treated six patients suffering from Graves's disease with corticotrophin in doses of 40 to 200 mg. a day for 5 to 23 days. Two showed an improvement amounting almost to complete remission, in two there was some reduction in hyperthyroidism on laboratory tests only, while two showed no improvement in any respect. Engel (1950) reported a single case of hyperthyroid heart disease in which a 10-day course of corticotrophin produced an immediate improvement in the general condition and was followed in three weeks by disappearance of all clinical evidence of thyroid overactivity. Excellent clinical responses to corticotrophin in single patients were also noted by Means and Stanbury (1950) and by Sideman (1951), although the latter's case relapsed two months after the end of treatment.

Szilagyi, McGraw, and Smyth (1952) investigated the effect of corticotrophin on five patients with hyperthyroidism who had proved unmanageable by the usual medical measures. A definite improvement in the laboratory tests accompanied by slight clinical improvement was noted in one case, deterioration occurred in another, and the three remaining patients showed no clear response. Similarly unsatisfactory results were described by Werner (1950), who treated two patients, and by Moseley and Merrill (1950) and Charvat *et al.* (1952), who reported single cases. More recently Wisniewski and Górowski (1957) gave corticotrophin as a preparation for thyroidectomy to five patients who were intolerant of antithyroid drugs. A reduction in hyperthyroidism was seen in four of the cases. Euthyroidism was never achieved, and relapse quickly followed cessation of therapy.

Thus in 10 of 23 patients with hyperthyroidism significant clinical benefit was obtained from the use of corticotrophin therapy, and this does not accord completely with our experience of only one moderately successful result after the treatment of eight patients. The fact that none of the authors of the single case reports have subsequently described larger series implies that the promise of their earlier successes has not been fulfilled. An unexpected feature revealed by the

analysis of the published results of corticotrophin treatment was the reduction in the size of the goitre in eight patients, often without any reduction in the hyperthyroidism. A doubtful effect was observed in only one patient in our series. The apparent improvement in muscle power in our patient with thyrotoxic myopathy is probably a non-specific effect; Maczynski and Sporny (1956) have described a temporary improvement in general strength in a hyperthyroid patient given 90 mg. of corticotrophin over 20 hours.

There have been several descriptions of the use of corticotrophin and adrenocortical steroids in malignant exophthalmos and in thyrotoxic crisis. In the former most writers agree that a reduction in the local oedema occurs without any improvement in proptosis or ophthalmoplegia. In the latter all observers believe that corticotrophin played an important part in ensuring and accelerating recovery, although all admit that, as other forms of therapy were given concurrently, clinical impressions form the only evidence for this beneficial effect.

The assessments of the function of the adrenal cortex in our patients (Table II) confirm the studies of the majority of preceding workers (Levin and Daughaday, 1955). Two of our cases (Nos. 3 and 4) had definitely subnormal levels of urinary excretion of 17-ketosteroids, while all other

TABLE II.—Adrenocortical Function in Nine Hyperthyroid Patients

Case No.	Sex	17-Ketosteroids* (mg./24 hours†)	17-Ketogenic Steroids† (mg./24 hours‡)
1	F	6.5	9.5
2	M	7.0	—
3	F	2.0	12.3
4	F	2.4	6.4
5	F	6.3	5.5
6	M	8.2	8.6
7	F	6.3	11.1
8	M	6.0	6.4
9	F	9.1	12.0

* Method of Norymberski *et al.* (1953). Normal (80%) range: males, 7-20; females, 5-15.

† Method of Gibson and Norymberski (1954). Normal (80%) range: males, 5-18; females, 5-15.

‡ Mean of at least two estimations.

patients had levels in the lower ranges of normality. Glucocorticoid activity as demonstrated by the urinary excretion of 17-ketogenic steroids was not significantly abnormal, and the rather low levels found in our cases are not uncommon in patients with normal adrenocortical activity after a short period of bed rest. As Harris and Woods (1956) pointed out, the surprising feature of these findings is that the urinary excretion of adrenal steroids is not increased in hyperthyroidism, a condition in which the patient would appear to be under physical and emotional stress.

It would seem, therefore, that significant improvement in hyperthyroidism is not to be expected after corticotrophin treatment, except possibly in mild and early cases. For these patients other more satisfactory and safer methods of treatment are available. In patients whose preoperative management is difficult or who develop thyrotoxic crises, the addition of corticotrophin to other therapeutic measures is probably worth while.

Summary

There is much evidence for the association of adrenal cortical underactivity with hyperthyroidism.

Nine hyperthyroid patients had subnormal or low levels of urinary excretion of 17-ketosteroids. The excretion of urinary 17-ketogenic steroids was not reduced.

Eight of the patients were treated with corticotrophin in full doses for two to five weeks. Only one patient showed any significant clinical benefit; this was accompanied by an improvement in all laboratory tests of thyroid overactivity. The ninth patient received treatment with prednisone without benefit.

The radioiodine studies and urinary steroid estimations were carried out in the laboratories of Professor F. T. G. Prunty, to whom we are grateful. We also thank Dr. R. V. Brooks and Dr. J. S. Staffurth for their assistance and Dr. W. J. Griffiths for laboratory facilities.

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WAX KERATOSIS IN CHILDREN'S EARS

BY

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It was some time before penicillin became easily available in forms which could be used by general medical practitioners, but once this happened it was used freely in the treatment of acute otitis media. In 1953 it was stated that nearly all such cases were being treated by general practitioners, only the failures being seen by otologists (Black, 1954). One of the causes of failure was due to a mistaken diagnosis in that the patient—a child—did not have otitis media, but infection and suppuration in a mass of wax deeply impacted in the external auditory canal. It had long been known that wax did occasionally become impacted against the tympanic membrane, where it became covered by sheets of desquamated epithelium, and we had come to call this "wax keratosis." This was thought to be the early stage of the so-called keratosis obturans, a condition well enough known to appear in the textbooks, although there was discussion about its cause and origin and even about its nature.

This wax keratosis seemed to be of interest in itself, in that we did not know how the wax got into the deeper

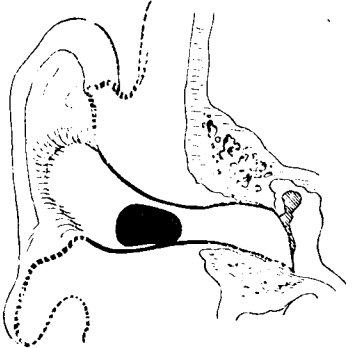
external auditory canal, nor quite what troubles it could cause when it got there. Another curious feature was a known association with chronic respiratory tract suppuration, that of sinusitis and bronchiectasis. Morrison (1956) stimulated further interest with a paper on keratosis obturans, in which he suggested an explanation for the presence of the wax against the tympanic-membrane and noted some of the facts of the condition.

Altogether, it seemed to justify some attempt at obtaining further facts, and accordingly an analysis of a collection of such cases has been made, and this forms the basis of the present paper.

Incidence and Location of Wax in Children's Ears

It was important at the outset to have some information concerning wax in children's ears, whether normal or otherwise.

The hair follicles and glandular elements in the skin of the external auditory canal are confined essentially to its outer half or so. Collins (1951) supported previous views that the waxy or more solid secretion of the sebaceous glands is softened by the secretion of the ceruminous glands so that it can find a way to the outside. Therefore it would be expected that wax would normally be found in the outer part of the external auditory canal or not at all (Fig. 1).



An investigation was carried out in 1,000 consecutive children seen for the first time in 1957 in three E.N.T. out-patient departments, perhaps not an entirely normal cross-section of the whole. Three different classes were recognized in these children, as follows: (1) no wax present anywhere in the external auditory canals; (2) wax present in the area which normally produces it; and (3) wax impacted in the deep part of the external auditory canals—that is, wax keratosis.

TABLE I

Class	First Series		Second Series	
	No. of Cases	%	No. of Cases	%
1	828	82.8	489	88.4
2	146	14.6	45	8.1
3	26	2.6	19	3.5
Total	1,000	100.0	553	100

A further series of over 500 children were seen in two more E.N.T. out-patient departments. The results in the two series are shown in Table I. It will be seen that 2.6% of the first series had wax firmly impacted against the tympanic membrane. When the wax was removed under general anaesthesia from these 26 children, 14 were found to have a well-formed wax keratosis, and in the remaining 12 the wax had formed a complete cast of the canal, but no epithelial envelope was present as yet. It is probable that these 26 cases represent degrees of the same process, which has been termed wax keratosis. In the second series 3.5% showed the presence of a wax keratosis.

It will be seen that these two series bear a striking similarity, and confirm the incidence of wax keratosis in about 3% of all children attending an E.N.T. out-patient department for a variety of reasons.

Definition and Description of Wax Keratosis

A wax keratosis has been described above as being a mass of wax impacted against the tympanic membrane in the deep part of the external auditory canal. It loses its natural

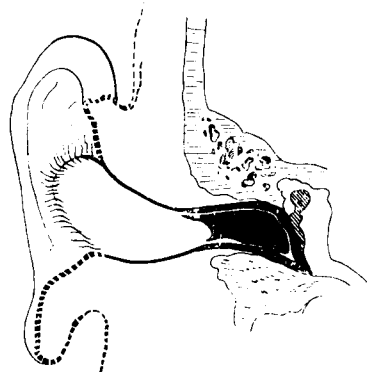


FIG. 2.—Wax keratosis in deep part of external auditory canal, with thickening and desquamation of epithelium.

brownish-yellow colour to become black and hard, and desquamated squamous epithelium forms a white envelope around it. The condition is usually present in both ears, and it can easily be missed unless a careful examination is made, as the outer half of the external auditory canal is normally free from wax, and the external surface of the wax keratosis tends to be concave (Fig. 2), so as to simulate the appearance of the tympanic membrane. Moreover, we have gained the impression that in cases of wax keratosis the outer half of the external auditory canal is narrow, making examination of the deeper part difficult.

Natural History of Wax Keratosis

Undiagnosed wax keratosis may lie dormant for a long period without giving rise to any symptoms apart from slight deafness, although even this may not be apparent. Audiometer examination suggests that only about 20 decibels of deafness occurs. During this period the surrounding envelope merely becomes thickened by further desquamation of the epithelium.

This process may progress to a stage where the wax keratosis becomes so firm as to erode by pressure alone, first the epithelium of the deep external auditory canal, and then the bony canal itself, giving rise to a true keratosis obturans. A period of many years may elapse before its ultimate discovery, possibly in an adult patient.

The wax keratosis may become infected. This condition can be cured by softening the mass, which is then extruded from the canal during suppuration, leaving a normal tympanic membrane.

Again, granulations may form so as to obstruct the external auditory canal and hide the infected wax keratosis from view. If allowed to go untreated a ring of granulation tissue may form at the junction of the external surface of the wax keratosis and the outer part of the auditory canal. A type of false membrane then develops.

Recurring or chronic suppuration may persist for a long time and cause mistakes both in diagnosis and in treatment. The real condition may become evident only after surgical removal of aural polypi, when it is realized that the trouble is all external to the tympanic membrane. Usually a large polypus, when it occurs, arises from the annulus, and removal leaves a normal tympanic membrane. All trace of wax and keratosis may have disappeared. A great help in the diagnosis is the presence in the other ear of a clean wax keratosis.

Analysis of Cases

The 90 cases available for study included those found during the survey already discussed, along with others previously on record as known cases of wax keratosis. An attempt has been made to analyse these cases, especially with a view to demonstrating conditions which may occur in association with them. These conditions justify an examination of the ears so as to allow early treatment of wax keratosis if it is found.

1. Presenting Symptoms

The reason for the attendance of the child at an E.N.T. out-patient clinic in those cases where a wax keratosis was demonstrated is shown in Table II.

TABLE II

Cardinal Complaint	No. of Cases	%
Deafness	20	22.2
Otorrhoea	17	19.0
Earache	4	4.5
Nasal catarrh	36	40.0
Recurrent tonsillitis	13	14.3
Total	90	100

It is significant that more than half these children were referred without any aural symptoms at all, usually with a history of recurrent sore throat or of a chronic nasal discharge. In these cases the wax keratosis was found on routine examination of the ears. In only two cases in which deafness was the reason for the child's attendance was there a request from the referring general practitioner for removal of impacted wax, for which treatment by softening and syringing had failed. In most of these deaf children post-nasal adenoidal obstruction or previous attacks of otitis media were thought to be the cause of the impaired hearing. When otorrhoea was present it was usually unilateral, and the history was one of failure to respond either to systemic antibiotics, given on the assumption that the cause was acute middle-ear suppuration, or to local treatment, given in an attempt to dry up a chronic suppurative otitis media.

In all groups the most frequent reason for attendance at an E.N.T. out-patient clinic was a request from the medical practitioner for the possible removal of tonsils and adenoids.

2. Condition When First Seen

Out of the 90 children known to have wax keratosis, both ears were affected in 81 cases, and in the other 9 there was a unilateral wax keratosis without any wax at all in the other ear. When the ears were cleaned out under general anaesthesia 68 of the 81 children were found to have a definite wax keratosis in both ears, whilst in the remaining 13 wax was present in the deep external auditory canal but had not yet become surrounded with desquamated epithelium. In the nine children where only one ear was affected, three gave a history of otorrhoea in the unaffected ear which may have given rise to spontaneous extrusion of a wax keratosis, and one was known to have had treatment to the ear elsewhere. Out of the 21 children presenting with otorrhoea or earache, 16 were found to have an acutely infected wax keratosis in one ear, with the formation of granulation tissue.

Several of the children, seen mainly because of aural symptoms alone, and before the relationship with respiratory infection was fully realized, did not have full investigations of their chest and sinuses. These investigations were carried out in 73 children, and the incidence of respiratory suppuration in these children is shown in Table III.

TABLE III

Cardinal Complaint	No. of Cases	Suspected Sinusitis	Obvious Sinusitis	Positive Antral Lavage	Known Chest Lesion	Total with Sinusitis or Chest Lesion
Deafness	15	5	7	11	6	13
Otorrhoea	11	5	4	7	10	11
Earache	4	—	4	4	2	4
Nasal catarrh	36	10	26	29	21	31
Recurrent tonsillitis	7	4	2	5	3	6
Total	73	24	43	56	42	65

Those children who had frank pus in the nose have been listed under "obvious sinusitis." When sinusitis might have been suspected from the history, but the nose was clean, the child was listed under "suspected sinusitis." Many

of these cases showed the presence of pus in the antra when lavage was undertaken. The chest lesions were of all grades, varying from a minor radiological change, usually at the base of the lung, to an advanced bronchiectasis.

It will be noted that 65 (89%) of these children were found to have either a sinus suppuration or a chronic respiratory infection or both.

3. Management

When the implication of the presence of a wax keratosis had been realized a routine procedure was followed in all cases.

Under general anaesthesia both ears were inspected, and the wax present in the deep part of the external auditory canal was removed. This was usually a most difficult procedure owing to general narrowing in the outer part of the canal and the very firm impaction of the wax in the depths beyond. Often this came out as a complete cast of the canal even to the imprint of the handle of the malleus, but occasionally difficulty was found in separating the epithelial envelope from the canal wall, and especially from the tympanic membrane. In these cases only the inner core of wax was removed, leaving the envelope to be extruded later by the normal physiological process of desquamation. Any granulation tissue present was removed by suction at the same time. Proof puncture and antral lavage of both maxillary antra were then performed, revealing in most cases an underlying suppuration requiring further treatment.

Many children had a productive cough which obviously needed treatment, but in those children in whom a chest condition was not so obvious a routine examination, including a chest x-ray examination, was carried out. In this manner about half of the children were found to have an unsuspected chest lesion.

4. Treated Prognosis of the Ears

It is not our intention to discuss the results of treatment of the sinusitis or of the coexistent chest lesion. This treatment is essential, and it has been evident that in children in whom respiratory suppuration remains a wax keratosis can re-form. Probably an important result of this investigation has been to emphasize the likely primary nature of the respiratory infection and the great difficulties experienced in its treatment. Many cases of unsuspected sinusitis and bronchitis have been discovered which would otherwise have continued untreated.

With regard to the ears, they will usually return to normal. When a non-infected wax keratosis has been removed, the tympanic membrane may appear opaque and thickened at first, especially when the outer envelope of the wax keratosis remains attached to it. Gradually this envelope is thrown off and the tympanic membrane becomes perfectly normal in all respects. Any deafness which was present has normally been due to the simple action of the wax keratosis as a foreign body, and the hearing returns to normal when it has been removed.

When the wax keratosis has become infected and granulation tissue has formed, local antiseptic drops may have to be used after the wax keratosis and the granulations have been removed. Once the pressure of the epithelial lining has been relieved there is no of the external auditory canal has been relieved there is no stimulus to the formation of granulation tissue, and in these children as well the ear soon returns to normal.

So long as the associated respiratory suppuration is treated and cured there will be no re-formation of the wax keratosis, and thus we hope that keratosis obturans will be prevented.

Summary

Wax keratosis, if looked for, will be found in about 3% of children attending an E.N.T. department for any reason.

It is almost universally bilateral.

In half the cases there will be no suspicion of any lesion in the ears until they are examined.

Respiratory suppuration (sinusitis, bronchitis, bronchiectasis) will be found, if looked for, in nearly all cases.

The wax keratoses must be removed to prevent the possibility of any future infection, with local suppuration or progression to keratosis obturans. General anaesthesia will be required for this removal and will allow the opportunity for antral lavage.

Chronic suppuration with polypus formation can occur and simulate chronic suppurative otitis media.

Early removal, associated with concurrent and subsequent treatment of any respiratory suppuration present, will result in an ear normal in appearance and in function, with no likelihood of recurrence.

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PHYSIOTHERAPY FOR BELL'S PALSY

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Bell's palsy can be defined as unilateral paralysis of the facial muscles resulting from an intrinsic lesion of the seventh cranial nerve (Cawthorne, 1951). There is general agreement that 70 to 80% of these patients recover completely within one to three months, while the remainder develop various sequelae (Taverner, 1955). There is no agreement about treatment, although many methods have been tried. At present electrical stimulation of the paralysed muscles is widely used, at least until voluntary movement reappears. This practice is supported by many of the standard textbooks (Collier, 1948; Evans, 1951; Nielsen, 1951; Elliott, Hughes, and Turner, 1952; Wilson, 1954; Brain, 1955; Wechsler, 1958), but Walshe (1952) states that galvanism is useless.

There is apparently no record in the literature of a controlled trial of the value of electrotherapy in facial palsy, and the present investigation was undertaken because daily electrotherapy is expensive and time-consuming. It was felt to be justifiable to withhold physiotherapy from the control patients because previous experience has shown that lack of physiotherapy does not necessarily prejudice recovery from peripheral nerve injuries (Henderson and Taverner, 1949).

Design of the Trial

All patients with Bell's palsy of less than 14 days' duration seen in the department of electromyography of the General Infirmary at Leeds from October, 1954, to December, 1956, were included in the trial. The diagnosis of Bell's palsy was made on the basis of the following

three criteria: (1) complete or partial paralysis of the muscles of expression of the whole of one side of the face of sudden onset; (2) absence of any symptom or sign of any other disease of the central nervous system; and (3) absence of any symptom or sign of any disease of the ear or posterior fossa. The patients were examined clinically and electromyographically throughout the course of their disorder. The degree of paralysis was estimated visually as a percentage of the function of the normal side. This method proved reasonably consistent from visit to visit, but was supplemented by photography under standard conditions in many patients.

The electrical examination consisted of concentric needle electrode exploration of the facial muscles without local analgesia. The electrical activity was amplified and recorded with conventional electromyographic equipment. In some patients supplementary studies of neuromuscular excitability were made with a Ritchie-Sneath stimulator.

Denervation of the facial muscles was established by the presence of fibrillation activity in the electromyogram, by abnormalities in the strength-duration curves, and by the subsequent development of abnormalities of the facial musculature during recovery (cf. Taverner, 1955).

All the patients were instructed to massage the face daily, but about half of them, by random allocation from a prepared list, were given daily galvanism by one of us (J. M.). Each patient received infra-red radiation to the affected side of the face at 2 ft. (60 cm.) distance for 10 minutes. The skin was prepared with soap and warm water, and interrupted galvanism was then applied from a Ritchie-Sneath stimulator, using saline electrodes. Each facial muscle in turn was stimulated to 30 minimal contractions with a pulse of 100 msec. duration. This was repeated three times, giving 90 contractions a muscle. In some patients with severe denervation of the facial musculature the muscles tired quickly and the number of contractions was then reduced to not fewer than 30 in three groups of 10. The muscles stimulated were frontalis, corrugator supercilii, orbicularis palpebrarum, levator labii superioris alaeque nasi, levator labii superioris, levator anguli oris, risorius, orbicularis oris, depressor anguli oris, depressor labii inferioris, levator menti. Treatment was given daily until active contractions returned and then thrice weekly until recovery was virtually complete or, in the event of denervation, until the condition seemed stationary. Treatment for patients with denervation lasted from two to six months.

Findings

Of the 86 patients admitted to the trial, three were eventually rejected—two because of failure to reattend, and one because of failure to complete treatment owing to illness. Of the 83 patients studied, 43 received physiotherapy, and 40 were used as controls. The age, sex, and duration of facial palsy did not differ significantly between the two groups (Table I).

TABLE I.—Mean Values for Age, Sex, and Duration of Facial Palsy When First Seen. Range in Parentheses

	Whole Group	Treated	Control
Age	37.5 years (3-79)	39.5 years (3-79)	35.6 years (7-73)
Sex	M.40; F.43	M.22; F.21	M.18; F.22
Duration	5.2 days (1-14)	5.2 days (1-14)	5.2 days (1-14)

It is known that when facial palsy is due to conduction block of the facial nerve no sign of denervation is found and recovery is complete in from one to three months. If denervation of the facial muscles develops, improvement is slower and complete recovery never occurs (Taverner, 1955). The patients in this trial were divided, for purposes of analysis, into those with and those without electromyographic evidence of denervation (Table II). Proportions with conduction block and denervation did not differ significantly between the two groups.

TABLE II.—Proportions with Denervation and Conduction Block in Treated and Control Groups

	Conduction Block	Denervation
Treated	23 (54%)	20 (46%)
Control	27 (68%)	13 (32%)

All the patients with conduction block recovered completely, and the time taken is shown in Table III. The clinical course of patients with conduction block was almost identical in treated and control groups, both in the time taken to initiate movements and in the time to complete recovery.

TABLE III.—Mean Time in Days From Onset of Facial Palsy to First Visible Movement and to Full Recovery in Treated and Control Groups. Range of Observations in Parentheses

	Initial Movement	Full Recovery
Treated	10 (3-21) days	43 (14-90) days
Control	11 (2-21) "	39 (14-134) "

The patients with denervation never recovered completely, and most of them were treated for much longer periods than those without denervation. The times from onset of palsy to first movement were 53 days (range 10-104) in the treated group and 66 days (range 14-90) in the control group. These patients were observed for at least a year or until no further recovery could be detected. The final degree of recovery of voluntary power was assessed visually as a percentage of that of the normal side. An overall estimate of facial movement was made by halving the sum of the percentage estimates of function for the frontalis and orbicularis oris muscles. The last assessments of percentage recovery in the two groups are presented in Table IV. Proportions showing varying degrees of recovery do not differ significantly between the two groups.

TABLE IV.—Estimated Voluntary Power After Maximal Recovery of Denervated Facial Musculature. Figures in Parentheses are Percentages of Respective Totals

	Total	<25%	25-75%	>75%
Treated	20	3 (15%)	11 (55%)	6 (30%)
Control	13	3 (23%)	6 (46%)	4 (31%)

The presence of contracture of the facial muscles was carefully recorded. This appears only after denervation, and its occurrence could not be related to the electrical treatment. Eleven (26%) of the treated group and eight (20%) of the control group developed contracture.

Discussion

The treated and control groups are similar enough to enable useful comparisons to be made. The three defaulters would have added two to the control group and one to the treated group and could scarcely have affected the issue. The results in the two groups are so similar that it is unlikely that electrical treatment can be of importance in the management of facial palsy. The cost to the community and to the patient of daily visits to hospital for electrotherapy does not seem justified on the present evidence. It has been suggested that physiotherapy is valuable for maintaining the morale of the patient. It has been found, in the management of several hundred patients with facial palsy, that if a firm prognosis and careful explanation and reassurance are given then full confidence is maintained.

Summary

A controlled trial of the value of galvanic stimulation in the management of Bell's palsy is reported. Eighty-six successive patients were randomly allocated to treatment and control groups. Eighty-three of them were studied until recovery was complete or for at least one year.

Treatment consisted of infra-red radiation followed by interrupted galvanism to 11 individual facial muscles on the affected side. Treatment was given daily at first and later thrice weekly.

No significant advantage could be demonstrated from the use of galvanic stimulation for Bell's palsy.

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LAXATIVE EFFECT OF SORBITOL

BY

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As sorbitol is now available commercially and is being used increasingly in food products, its metabolism and other physiological characteristics are of some importance. Apart from its value as a humectant and plastifier useful in confectionery as a diabetetic sugar it is and for increasing the shelf life of the products. Its metabolism has been studied extensively and further work is in progress. In the course of this work it has been observed that, like other sugars of its kind, it exerts a laxative effect, particularly noticeable in large dosage. An attempt to define the threshold dose was made by Ellis and Krantz (1941), who found that by trial on 12 subjects the minimum dose to produce soft or watery stools was about 50 g. a day for the crystalline product and 20-30 g. a day for the 70% syrup (the crystalline compound being much superior in quality to the syrup).

In view of the small number of subjects previously used in these tests the results can hardly be regarded as representative for the general population. We therefore decided to apply tests to a larger number of volunteers to determine the effects at a specified dosage.

Method

Dosage Consideration.—A prerequisite of the tests was that they should not unduly affect the majority of subjects, but should indicate exceptional susceptibility if such should exist. A trial approach was made on three apparently normal subjects, one at a dosage of 50 g., and the other two at 25 g. Only the higher dosage showed spectacular results, and the test level chosen was therefore 25 g. a day.

Of the 101 volunteers taking part, 15 failed to complete the test for reasons unconnected with the effect of sorbitol. Control was obtained by the provision of a glucose solution with an addition of saccharin to match the sweetness of the sorbitol. The volunteers were accepted *en bloc* and no planned distribution of age group, sex, etc., was arranged.

The test consisted in taking 12.5 g. of either sorbitol or glucose after meals twice daily for seven days, half of the panel taking sorbitol and the other half glucose, and then changing over to the other substance for a second week. So far as the subjects were concerned, the solutions were identical in appearance, colour, and taste.

The solutions were: (1) a 50% w/v solution of glucose in water and (2) a 50% w/v solution of sorbitol in water to which was added 0.04% w/v of saccharin (based on the sorbitol content).

Each subject was given a supply of test solution sufficient for one week and invited to complete a questionnaire day by day. The 101 volunteers are accounted for as follows: completed tests both weeks, 84; tests not completed owing to alleged effects of sorbitol, 2; tests not completed for reasons not connected with sorbitol, 8; tests not started for personal reasons, 7.

Results

Analysis of the factors, such as rotation of dosage, method of dosage (as supplied or in a beverage, etc.), age group, occupation, marital status, and some others, not all of which are analysed in the accompanying Table, did not

Table of Results

Occupation	Status	Solution Used	Age Groups				Totals	
			Under 30		Over 30		Sub.	Mot.
			Sub.	Mot.	Sub.	Mot.		
Active	Single	Glucose	3	21	1	11	4	32
	Married	Sorbitol	3	21	1	9	4	30
		Glucose	4	25	30	236	34	261
		Sorbitol	4	23	30	262	34	285
Sedentary	Single	Glucose	12	94	2	13	14	107
	Married	Sorbitol	12	90	2	17	14	107
		Glucose	7	48	25	223	32	271
		Sorbitol	7	53	25	273	32	326
Totals	{	Glucose	26	188	58	483	84	671
		Sorbitol	26	187	58	561	84	748

Sub. = Subjects. Mot. = Motions.

reveal any significant effects. In view of this the significant differences between sorbitol and glucose (standard deviation, 4.99 and 2.95 respectively; DF, 83) must be attributed to some other factor not disclosed in the group allocations.

By inspection three results were seen to be outstandingly divergent from the general run. A recalculation of standard deviation of the glucose and sorbitol series after eliminating these cases gave a standard deviation of 2.90 for glucose and 2.95 for sorbitol (DF, 80) indicating that the two series show no significant difference.

A fuller statistical analysis of the factors and interactions was found to be beyond our competence owing to the complications of disproportionate class numbers.

Inspection of the observations on "wind" showed a definite tendency to flatulence due to sorbitol.

Comment

Olmsted (1953) commented on the results of Ellis and Krantz (1941) and suggested that sorbitol may be a physiological laxative in the sense that it is a substrate for the colonic bacterial populations. It has been shown, however, that, in general, sorbitol is a poor nutrient for the more common bacteria, and it seems more likely that its humectant properties are the cause of the laxation observed at higher dosages.

We conclude that sorbitol administered in a split daily dosage of 25 g. does not cause laxation in the general population, but specific reactions may be expected from about 5% of the subjects. In practice it has been noticed that the presence of fats in foodstuffs allows much larger doses to be tolerated without laxative effects. In view of the increasing use of this product in the confectionery trade, it might be well to bear in mind the possibility of a sorbitol sensitivity as a cause of diarrhoea in an otherwise healthy subject.

Summary

The laxative effect of sorbitol was compared with the control glucose at a dosage level of 25 g. a day for 86 subjects; observations included the number of motions, and incidence of wind and of discomfort or pain. Discomfort and marked laxation were experienced by five subjects, two of these failing to complete the test. The remainder showed no significant difference from the glucose control with the exception of a slight tendency to wind after ingesting sorbitol. No known diabetics were allowed to participate in the tests.

Acknowledgment is made to Messrs. Howards of Mford Ltd. for assistance in facilitating these tests.

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Medical Memorandum

A.T.S. Cervical Polyradiculitis Treated by Cortisone

Neurological sequelae of serum therapy are well recognized. Miller and Stanton (1954) analysed the hundred adequately documented cases. Of these, 59 had brachial plexitis, 15 had other forms of radiculitis (radicular neuritis, mono-neuritis, shoulder-girdle neuritis), 10 had polyneuritis, 6 had Landry's paralysis and myelitis, and 10 had cerebral and meningeal manifestations. Moynihan (1955) found that one patient developed peripheral neuritis in 7,580 cases given prophylactic A.T.S. (antitetanus serum).

These syndromes are severe complications. "Progress may be slow, and, while improvement in patients with plexus and single-nerve involvement may start in a month, complete recovery may be prolonged up to two years. According to most writers, about 20% of patients never achieve a complete return of function" (MacGibbon, 1955).

As these syndromes are believed to have an allergic basis, an anaphylactic hypersensitivity, and as cortisone has been successful in non-neurological drug-hypersensitivity states (Carey *et al.*, 1950) and in encephalomyelitis following anti-rabies vaccine (Garrison, 1952), it is important to assess the value of steroid therapy in serum neuritis.

Cortisone had no effect on peripheral neuropathy which developed after A.T.S. in a patient (Walsh, 1952), but here the cortisone was not given until the third day of muscular weakness, and then only 50 mg. intramuscularly twice daily for 10 days. However, Shulman *et al.* (1953) produced a complete remission in a case of A.T.S. sciatic neuritis with a single intravenous infusion of corticotrophin; and Shafer (1957), using oral prednisone, 5 mg. six-hourly, relieved the pain in a case of A.T.S. shoulder-girdle neuritis in one day, with return of muscle power to normal in 10 days.

CASE REPORT

A sergeant, aged 36, cut his right hand on March 22, 1957. The wound was sutured but became infected, and on March 29 he was given injections of A.T.S., 1,500 units, in his right arm, and of fortified procaine penicillin, 1 ml. twice daily, in his buttocks, on that and the next two days. On April 4 he noticed that his right arm was itching, swollen, and red. At 10.30 that night an aching pain began in the left side of his neck, and spread gradually down the back, into the calf, and from the left shoulder down the arm to the elbow. These pains became worse when he moved the shoulder or sat up. Although he felt quite well otherwise, these aches were severe enough to make him come for admission to the Royal Herbert Hospital, Woolwich, at 3.30 a.m. on April 5. The only significant features of the history were that he was left-handed, that he had had penicillin injections before with no ill effects, and had been

given tetanus toxoid-antitoxin in 1937 and tetanus toxoid in 1938, 1939, 1942, and 1944.

On examination he was distressed and in obvious pain. His whole body with the exception of his head was covered with a fine erythematous eruption. He was afebrile, the scar on the right hand was soundly healed, and there was no swelling or tenderness at the sites of the injections. There were no other abnormal signs in the central nervous or any other system.

The haemoglobin, total and differential white-cell counts, and, later, x-ray films of the chest and cervical spine were normal. A diagnosis of serum sickness was made, and promethazine hydrochloride, 25 mg. six-hourly, was given.

By the following day (April 6) the rash had disappeared and the only pain was in the left upper limb, which he then noticed had become weak. There was no wasting or fasciculation, but tenderness of the muscles of the left upper arm was present and also profound weakness of the left pectoralis major, infraspinatus, deltoid, biceps, triceps, and brachioradialis, the flexors and extensors of the wrist and fingers, and the small muscles of the hand. The left supinator and biceps jerks were absent and that of the triceps was much reduced. There was impairment of superficial sensation over the radial side of the left lower forearm, the thumb, and index finger in the distribution of C6 dermatome. It seemed clear that the patient had serum neuritis, with a unilateral cervical radiculitis involving the left C5-8 and T1 roots, especially C6. He was given cortisone by mouth, beginning with 75 mg. six-hourly.

By the next morning (April 7) the aches were much less, and his power had improved remarkably both subjectively and objectively, while the sensory impairment was confined to a small area on the radial side of the left wrist and over the first metacarpal bone. The cortisone was decreased to 200 mg. that day, and the next morning he had some recurrence of pain in both shoulders. His power had continued to improve, and he was given 100 mg. of cortisone that day. On April 9 power and sensation were normal and his deep reflexes had all returned, though still reduced. The cortisone was continued at 100 mg. that day and then gradually tailed off over the next fortnight, so that he received a total of 1,175 mg. over 18 days.

On discharge from hospital on April 26 his only complaint was of slight ache over the left deltoid. One month later he was well and symptom-free; the only abnormal sign was a slightly decreased left biceps reflex.

COMMENT

In view of the unfavourable prognosis of serum neuritis it seems reasonable to attribute the rapid recovery in this patient and in those of Shulman *et al.* and Shafer to the use of cortisone, corticotrophin, and prednisone respectively. Such dramatic response lends support to the suggested "allergic" basis in this condition, and would suggest that early and sufficient steroid therapy is the most hopeful treatment available for serum neuritis. In the identical clinical picture of localized neuritis of the shoulder girdle or neuralgic amyotrophy (Spillane, 1943; Parsonage and Turner, 1948; Turner and Parsonage, 1957), when the miscellaneous precipitating factors include trauma and infection, it would seem worth while to attempt steroid therapy if it could be given as early as possible in the course of the disease.

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Reviews

GENERAL PSYCHOPATHOLOGY

An Introduction to Psychopathology. By D. Russell Davis. (Pp. 388+vi. 30s.) London: Oxford University Press. 1957.

We have long lacked in Great Britain any book on general psychopathology which can be recommended with confidence to the student. In this way we are badly handicapped in comparison with Germany, for instance, where in every textbook of psychiatry a substantial part of the whole volume is given to this part of teaching. What we have had instead is a number of works, many of them of great excellence, on psychopathology in the limited Freudian sense. Dr. Russell Davis has now supplied the deficiency with a book which covers the whole ground and is so lucid and intelligent that it is a pleasure to read. The author's basic tenet is that the most promising line of advance in psychiatry at the present time lies in the application of the findings of experimental psychology. His book is essentially the discussion of mental illness in the context of psychological theories. This is done with great ability, and the evidence has been collected and presented in a critical and stimulating way. Nevertheless the result is a work which is, as the author himself admits, somewhat one-sided in nature. The lack of appreciation felt for observations and theories along physical, medical, and genetical lines constantly involves him in difficulties. In presenting the hypothesis of a purely environmental and psychological causation for some condition he has to say that "there is little conclusive evidence with which to support it" or that it "would be possible to deny any weight to the arguments from which the theory has been built up." Though it is always made clear to the reader when the author's partialities are taking him beyond the evidence, one cannot but regret that a more judicial attitude was not found possible.

Despite these criticisms, this is an excellent and important book. It will not escape the thoughtful reader that in the present state of knowledge the psychological theories cannot bear the whole of the weight that is placed upon them. Yet the author has collected a mass of data, especially from the fields of experimental psychology and sociology, which are not easily available to psychiatrists, and he has pointed out lines of approach which may very well prove fruitful. Teachers and students are alike in his debt.

ELIOT SLATER.

CHEMOTHERAPY

The Strategy of Chemotherapy. Eighth Symposium of the Society for General Microbiology, held at the Royal Institution, London, April, 1958. Edited by S. T. Cowan and E. Rowatt. (Pp. 360+ix. 35s.) London: Cambridge University Press. 1958.

The title of this symposium evokes ideas of therapeutic policy. When is it better to attack promptly, and when to delay a declaration of war until an ally, the normal body defences, has mobilized and gone into action? Should the entire force be engaged in the hope of a single decisive action, or should there be a strong reserve or a deliberate policy of attrition? When is a combination of different arms to be preferred to deploying a single one? If there are two enemies, should they be engaged successively or together? At what point does the devastation caused by a campaign outweigh the fruits of victory? How far is it wise to go on provoking a fresh enemy to declare a war of superinfection? Perhaps these are matters of tactics, but the reader who looks for them here will be disappointed. Most of the 14 British and five American contributors are concerned either with the design of weapons used in this sort of war or with the kind of injury they inflict. There are those which destroy the bacterial cell wall or interfere with its construction, those which interfere with the metabolism of either carbohydrate or protein, and some which

divert a metabolic process so that an abnormal and toxic product results ("lethal synthesis"). There are others, it may be added, and not the least useful therapeutically, the mode of action of which cannot be so confidently defined. In the search for new weapons the random method has so far produced everything of any therapeutic importance which we possess; in future the rational method, on some such lines as the contribution here on the designing of antimetabolites, may yield more fruitful results. Several concluding contributions include one devoted very appropriately to the mechanisms of synergy, and others which are general accounts, with some discussion of the causes of failure, of the possibilities of chemotherapy in infections by bacteria, protozoa, and fungi. The authors of the last-named could have been less pessimistic about treating systemic mycoses if they had included some reference to amphotericin.

The Society for General Microbiology is again to be congratulated on publishing in a very handsome volume a series of contributions by experts in the rapidly expanding field shared by the bacteriologist and the biochemist. The progress which is being made in these fundamental studies is on a wide front and equally impressive in its depth. It is interesting that several contributors quote sayings of Ehrlich as directly applicable to the problems of the present day.

L. P. GARROD.

LESSONS IN MEDICAL EDUCATION

Adventures in Medical Education: A Personal Narrative of the Great Advance of American Medicine. By G. Canby Robinson, M.D., LL.D., Sc.D. (Pp. 338+xii; illustrated. 40s.) Cambridge, Massachusetts: Harvard University Press (for the Commonwealth Fund). London: Oxford University Press. 1957.

This is the autobiography of an octogenarian physician who looks back on his full and well-spent life and draws some lessons from his experience. Its main interest lies in the vivid insight it gives into the transition stage of American medical education at the beginning of the present century. Both in Great Britain and in the United States medical education during the past 200 years has gone through three stages—apprenticeship, private medical schools, and university medical schools. Dr. Canby Robinson took a considerable part in helping to make smoother the introduction of full-time academic professors and to lessen the disturbance in the change-over from private to university control in several big centres. Born in Baltimore, and trained at the Johns Hopkins Medical School, where he was inspired by Osler, Welch, Halsted, and Howard Kelly, he served as intern at the famous Philadelphia Hospital and had the good fortune to be appointed the first senior resident physician at the newly opened Hospital of the Rockefeller Institute. From there he went to take the position of associate professor of medicine in the Washington University Medical School at St. Louis, where he played an important part while full-time professors were being installed. Moving on to Nashville in 1920, he took a large share in planning, building, and staffing the new Vanderbilt University Medical School, and from there he went as director of the newly formed association between the New York Hospital and the Cornell Medical College. These experiences entitle Dr. Robinson's opinions to respect, and he is in no doubt as to the value of full-time professorships in medical education, though he appreciates the ever-present difficulty about permitting some private practice.

The generosity of private donors in America at that time was astonishing. From 1910 to 1935 over 500,000,000 dollars were thus contributed to medical education. Yet costs of running the medical schools continue to rise and cause financial worry. Dr. Robinson's later years were spent in research in social medicine, and he has some useful words to say on that branch of the profession. He pays a just tribute to the late Professor Ryle. The last chapter in the book is a useful essay (really a sermon) on medical progress during the last 50 years. He sums up briefly: "Medical education should cultivate the love of

God, the love of man, and the love of truth because these form the foundation on which medicine should be firmly based." Though serious-minded, the author has a sense of humour and relates this story. Chancellor Kirkland was the moving spirit at Vanderbilt University. He was a keen gardener, and one day when, dressed in very old garments, he was working in his garden, a lady who was passing admired the flowers and said to him, "Do you work for Chancellor Kirkland?" Concealing his identity, the Chancellor replied, "No, ma'am; I work for Mrs. Kirkland." One can see why he was made Chancellor.

ZACHARY COPE.

DIATHERMY

The Principles and Practice of Diathermy. By Bryan O. Scott, M.R.C.S., L.R.C.P., D.Phys.Med. (Pp. 193 + vii; illustrated. 25s.) London: William Heinemann (Medical Books) Ltd. 1957.

This is a useful book. The author briefly traces the history of the discovery of high-frequency currents and their application to medicine, and then covers succinctly the basic physics necessary for the complete understanding of the subject. Here he succeeds in getting a lot into a small space, and illustrates his points with simple analogies. Chapters on short-wave generators and high-frequency fields follow. The techniques of the introduction of energy into the body are described in full. The effects of high-frequency currents are discussed; these are the heating of the tissues, and the author wisely discounts any specific effects of short-wave diathermy apart from heat. Indications and contraindications to short-wave diathermy are discussed. A brief chapter describes the dangers of diathermy and their prevention. Surgery is not neglected, and the fundamentals of electro-desiccation, electrocoagulation, and electrosection are given. Finally the techniques of regional application are well and usefully described. Both a glossary and index are provided. The author is generous in his acknowledgments, but it is obvious that he has done much work himself in this field. Both physiotherapists and doctors who are taking up physical medicine will welcome this book.

WILLIAM TEGNER.

STAMMERING

Stuttering: A Psychodynamic Approach to its Understanding and Treatment. By Dominick A. Barbara, M.D., F.A.P.A. (Pp. 255. 25s.) London: Hutchinson Medical Publications. 1958.

This is the third book on this subject that has appeared recently, each one written by a therapist who had himself stammered earlier in life. Dr. Barbara's approach, however, differs from that of his two predecessors in that it was only after several years of training at the American Institute of Psychoanalysis that he was ready to combine his personal experience as a stutterer with Karen Horney's theory of psychoneurosis in the treatment of stuttering. It is not surprising, therefore, that the author's views as to the aetiology of stammering or stuttering are concerned mainly with psychological factors, and that he regards the disorder as primarily due to the anxiety of the stutterer in attempting to adjust himself to other individuals. Treatment, therefore, should not merely consist in vocal exercises and suggestions; it must be directed to the entire personality of the patient. With regard to the designations "stammering" and "stuttering," it is generally accepted in Great Britain that the two terms are synonymous, the former being used almost exclusively in this country and the Dominions, while "stuttering" is preferred in the U.S.A. Dr. Barbara, however, quotes J. S. Greene as stating: "According to the derivations, 'stuttering' stands for laboured, difficult, and hesitant speech with resulting defective conversation, while 'stammering' refers to defects of articulation and should not be confused with 'stuttering'; technically, stuttering is known as dysphemia, while stammering is known as dyslalia." This view, however, has never been held in Great Britain, where the term "dyslalia" is applied to a speech

disorder entirely different from stammering or stuttering, while "dysphemia" is sometimes used as an alternative for the latter condition.

The book is evidently intended not only for the professions of medicine and speech therapy but also as a help to families of child stutterers as well as adult sufferers. The incidence of the disorder and the various views concerning aetiology are discussed; also the symptomatology, illustrated by several case histories, is well presented. A chapter is provided on the "Demosthenes complex," as it is termed by the author, and which is defined as a process of self-glorification in stuttering based on an accentuation of anxiety and fears in the speaking situation; thus, in association with the stutterer's particular make-up, there is created an idealized image of his own particular needs. In the treatment of "primary" stuttering (5-10 years of age) the approach is mainly one of treating the parents and through them endeavouring to remove unfavourable influences, to give support, and yet help the child to lessen the degree of his inner turmoil and conflicts and so prevent the perpetuation of the disorder into the secondary stage. In "secondary" stuttering (11-19 years) treatment consists in a more direct approach, the aim being reorganization of the patient's personality, which admittedly is a tedious and difficult undertaking.

The exact causation of stammering or stuttering remains an unsolved problem. It is practically certain that no single factor but several in combination are concerned in the aetiology of the disorder. Psychogenic symptoms are only too frequent, but most of these may well be secondary to the primary stammer. Few cases, in my experience, are relieved of their stammer by psychotherapeutic, or even psycho-analytical, methods alone. Nevertheless, Dr. Barbara's work is well worthy of study by those interested in the problem of stammering (or stuttering), as he writes from a basis of considerable experience and a wide knowledge of the literature of the subject.

C. WORSTER-DROUGHT.

ELECTROCARDIOGRAPHY AND VECTOR-CARDIOGRAPHY

Fundamentals of Electrocardiography and Vectorcardiography. By Lawrence E. Lamb, M.D. (Pp. 142 + xiii; illustrated. 72s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

The subtitle of this book, "Three-dimensional Quantitative Spatial Vectorcardiography," certainly sounds rather formidable. But this is not really the case. If anyone wants to have a knowledge of electrocardiography that is not merely descriptive, this is the sort of book to read. The subject will then be approached from the angle of interpretation, which should result in full understanding. There is nothing really abstruse in vectorcardiography, and to translate the ordinary electrocardiogram into these curves is not really difficult—a further step leading to consideration in three dimensions instead of two is not insuperable. There are certain mathematical aspects, but it is not really essential to master these. This book sets forth the subject very clearly. There are many excellent diagrams. At the end there are chapters on the arrhythmias and also on drugs and cardiac metabolism. Throughout there is laudable economy of expression, but this does not obscure the thought; rather the reverse—it adds to the clearness. This book can be fully recommended for study; it is one of the best I have met with so far.

TERENCE EAST.

The fourth edition of Professor E. J. Conway's manual on *Microdiffusion Analysis and Volumetric Error* (Crosby Lockwood, 1957; 465 pages, 42s.) incorporates descriptions of several recent advances in technique, including the use of the blood ammonium method in the study of liver disease and the method of Weil-Malherbe and Green for total nitrogen determination in brain slices, and an account of some new developments in apparatus.

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SURGERY FOR DEAFNESS

For the perception of sound an intact end-organ and central connexions are necessary, and also an unobstructed conduction pathway. In addition, the sound waves must be received at the oval and round windows with a suitable phase difference. This is normally provided by the chain of ossicles in the middle ear transferring sound vibrations from the drum membrane to the foot-plate of the stapes and thence to the oval window, while at the same time these vibrations are conducted directly through the air space of the middle ear to the round window. Movements of the oval window are transferred to the incompressible fluid occupying the inner ear and are reflected in movements of the round window in the opposite phase. Motion thus imparted to the fluid of the inner ear stimulates the organ of Corti, the end-organ of perception. But these movements depend on there being a sufficient phase difference at the oval and round windows.

Transference of sound waves through the middle ear is affected by, firstly, lesions of the drum membrane and of the middle ear impairing the integrity of the ossicular chain or restricting its mobility by adhesions; secondly, scar tissue in the round window niche or at the foot-plate of the stapes; thirdly, fixation of the stapes foot-plate by bony ankylosis. Lesions in the first group are usually the result of suppuration, and the possible methods of treatment have been discussed.¹ Lesions in the second group may result from inflammation, or may be due to the organization of residual mesenchymal deposits, the so-called chronic adhesive process. The treatment will be considered with that of the third group.

The most common cause of fixation of the stapes foot-plate is otosclerosis, a condition in which new bone forms in the inner ear capsule, usually in the neighbourhood of the oval window, and perhaps because of an attempt at healing a persisting embryonic defect. This new bone gradually invades

the margins of the oval window and restricts the free movement of the stapes. In time the annular ligament attaching the foot-plate to the bony wall of the window becomes infiltrated with bone, which ultimately spreads into the foot-plate itself. These changes cause increasing deafness. The process is sometimes rapid, almost fulminating, but more often it takes years; it may be arrested at any stage and never produce complete bony ankylosis. This pathological process, although not the reason for it, has been well known for many years, and the theoretical possibilities of treatment have also been formulated and to some extent practised for years, but it is only within the past two decades that surgical treatment has become safe and the results reasonably predictable.

Six years ago Samuel Rosen, of New York, published his first series of cases treated by mobilization of the stapes foot-plate, and he has recently summarized for a British audience the progress during the intervening period.^{2,3} The method is essentially simple, and it seems almost absurd that success has taken so long in achievement. The use of magnification, scrupulous technique, and antibiotics all play their part, especially the first two. After local analgesia the drum membrane is reflected from its posterior attachment and the incudo-stapedial joint is exposed. It is often necessary to remove some bone from the postero-superior portion of the tympanic ring to obtain a good exposure of this joint and of the stapes foot-plate and round window which are the next essential anatomical landmarks. All this area is carefully inspected under high magnification. In cases of chronic adhesive deafness, the constricting adhesions are divided or dissected away. In otosclerosis, by Rosen's original method, an instrument is placed on the neck of the stapes and with light and controlled pressure the bone is rocked and the foot-plate is wholly or partially fractured out of its bony confinement. This procedure is unsuccessful in a number of cases because the ankylosis is too dense and the slender crura of the stapes give way before the ankylosing bone. When this appears likely the foot-plate is directly approached and attempts made to pry it loose. Even this may fail, and Rosen then resorts to making an opening in the foot-plate itself.⁴ The drum membrane is replaced at the end of the operation. By these simple but delicate manoeuvres hearing can be improved, and sometimes restored nearly to normal, in many cases of otosclerosis. Provided the organ of perception is functioning normally or reasonably well, good results can be expected in over 50% of cases, and this proportion increases as the operator's skill improves.⁵ There

¹ *Brit. med. J.*, 1957, 2, 90.

² Rosen, S., *Arch. Otolaryng.* (Chicago), 1952, 56, 610.

³ ———, *J. Laryng.*, 1958, 72, 263.

⁴ ———, *Arch. Otolaryng.* (Chicago), 1956, 64, 227.

⁵ ———, *Arch. Otolaryng.* (Chicago), 1957, 67, 615.

⁶ Goodhill, V., and Holcomb, A. L., *Laryngoscope* (St. Louis), 1957, 67, 615.

⁷ Lempert, J., *Arch. Otolaryng.* (Chicago), 1938, 28, 42.

are certain possible operative accidents, but they should be few and of little account. There are almost no contraindications, once the case has been selected, and the patient is only off work, or out of circulation, for a few days.

It is now exactly twenty years since Julius Lempert, of New York, published his first series of cases treated by fenestration.⁶ The idea of making a bypass opening somewhere in the capsule of the inner ear to act in concert with the round window is very old, and many attempts at it were made in past years. However, Lempert's technique was the first successful one. It too requires scrupulous care. A new opening (fenestra) is made in the external semicircular canal. This opening is covered with a flap of skin from the external meatus continuous with the drum membrane, and lies exposed to the outside world in a cavity similar to the cavity of a modified radical mastoidectomy. The drum membrane adheres to the inner wall of the middle ear above the round window, which is thus enclosed in an air-containing space continuous with the Eustachian tube. This arrangement ensures that sound waves arrive at the fenestra and the round window in a different phase, so that they can be propagated through the labyrinthine and cochlear fluids. These conditions are essential for a successful result. In the performance of the operation the incus and the head of the malleus are sacrificed, resulting in an inevitable loss of hearing, between twenty to twenty-five decibels by calculation and confirmed by observation. Thus the hearing can never be restored to normal by a fenestration, however successful, whereas stapedolysis can in theory result in normal hearing, and in practice some cases come very close to it. Nevertheless, the perfecting of the technique of fenestration during the twenty years of its enthusiastic performance all over the world has led to considerable certainty in the result to be expected in any given case, and to a high percentage of successful cases.

Fortunately, Rosen's and Lempert's procedures are complementary. If the direct attack on the stapes is unsuccessful, the indirect one, a fenestration, is neither invalidated nor prejudiced, and the operation can be performed as soon as the meatal wall is soundly healed. It is now usual to advise stapes mobilization as a first procedure, and fenestration if it fails. Surgery therefore has much to offer in deafness due to otosclerosis, and increasing experience is showing that some cases of chronic adhesive deafness can also be improved. These advances, together with similar advances in the surgical treatment of cases of suppuration, and the rapid improvement in construction of hearing-aids, are opening many new doors to the deaf patient.

HYPNO-ANAESTHESIA

Five thousand years ago man knew a great deal about influencing the psyche for the benefit of the sick or stricken soma. To our Western culture at least this knowledge has been largely lost. Perhaps the current waxing of interest in hypnosis marks the onset of a systematic effort to regain it.

Over the ages every type of operative procedure, major and minor, has been carried out under hypno-anaesthesia alone. In the last century Elliotson¹ and Esdaile² each wrote accounts of such work. Induction of hypnosis and the termination of the state are as smooth as falling into and awakening from natural sleep. While under hypnosis a patient may be made insensitive to pain from any defined area and also be made incapable of any given movement or of altering any desired posture.³ Indeed, he can be enabled to maintain any desired posture indefinitely and without conscious effort, strain, or fatigue. Post-hypnotic suggestion will permit a suggestion given to the hypnotized patient to become effective immediately and remain effective after the hypnotic state has been terminated, or to become effective at some chosen moment in the future. During operation the patient may be kept conscious and fully co-operative, or placed in a state akin to normal sleep in which he is oblivious to his surroundings. All these phenomena can be made to cease in a moment and normal consciousness to be regained by appropriate counter-suggestions from the therapist. During and after operation there will be no complications directly attributable to the anaesthetic.

From this it would seem that hypnosis is the ideal anaesthetic for most kinds of surgery, and the question which at once arises is why it is not more widely used. The answer is that, though the mechanical aspects of the techniques for inducing hypnosis are easy to learn, successful induction largely depends on the interaction of factors in the personality of the patient which are but little understood with factors within the hypnotist which are not understood at all; and few therapists could guarantee to produce surgical hypno-anaesthesia in one in a hundred unselected surgical cases. Further, even the most favourable case might require three or four hours' work on different occasions before it was felt justifiable to operate. There is no quick and certain test to indicate the promising subject.

¹ Elliotson, J., *Numerous Cases of Surgical Operations Without Pain in the Mesmeric State*, 1843, H. Bailliere, London.
² Esdaile, J., *Mesmerism in India and Its Practical Application in Surgery and Medicine*, 1851, Hartford.
³ Le Cron, L. M., *Experimental Hypnosis*, 1952, Macmillan, London.
⁴ Kroger, W. S., and Deloe, S. T., *J. Amer. med. Ass.*, 1957, 163, 442.
⁵ Amer. J. Obstet. Gynec., 1946, 51, 544.
⁶ Abramson, M., and Heron, W. T., *ibid.*, 1950, 59, 1069.
⁷ Kelsey, D., and Barron, J. N., *Brit. med. J.*, 1958, 1, 756.

Perhaps the chief indication for hypno-anaesthesia is in obstetrics.⁴⁻⁶ Expectant mothers are apt to be good hypnotic subjects, and weekly training throughout pregnancy at the antenatal clinic would enable many labours to be completed without additional anaesthetics. This would mean that the mother would be fully conscious as she gave birth to her baby, to their great mutual benefit. It would also ensure that birth was as easy as possible for the baby, and in particular it would minimize the risk of the baby losing consciousness during the process of birth. Some workers believe that this is of importance for the future psychological development of the child. D. Kelsey and J. N. Barron⁷ recently used hypnotically induced catatonia as the sole means of keeping a patient in a hand-to-foot posture for 28 days for purposes of plastic surgery. This application might possibly be extended to some orthopaedic work.

The same authors suggest that hypnosis would be advantageous for patients with severe burns who require a daily anaesthetic for their dressings and for whom every meal missed adds to the difficulty of maintaining the level of plasma proteins. Dentists³ have found hypno-anaesthesia of value in the treatment of both adults and children. Once analgesia has thus been successfully induced in the mouth, the patient can have it reinduced, or be trained to re-induce it himself, at will for the rest of his life. Some success has also been achieved in keeping the acute pain of earache, toothache, and some injuries at bay until adequate treatment could be instituted, and also in controlling the pain of inoperable malignant disease.

Though hypnosis is out of the question as a routine general anaesthetic, its advantages might be brought to many more surgical patients than at present if special hypnosis clinics were set up, experimentally at first, in the larger hospitals. Patients awaiting a non-urgent operation would be invited to attend the clinic on several occasions prior to admission. The clinic would work largely with groups, and the main aim would be to allay pre-operative anxiety and, by the use of post-hypnotic suggestion, forestall post-operative symptoms and complications. If a patient suffered no pain from his wound, for example, he would breathe and cough freely, thereby eliminating what is usually held to be the greatest single cause of post-operative chest disease. Sleep and appetite could be improved and appropriate individual suggestions could greatly assist the work of physiotherapists. In brief, convalescence and rehabilitation could be made smoother and speedier for many of the patients attending the clinic.

EARLY CARCINOMA OF STOMACH

The occurrence of early carcinomatous lesions in the stomach has aroused considerable interest during the last few years, and a case recently described by J. J. Bocian and A. E. Geschke¹ is regarded as a true example of carcinoma in situ. These authors are at pains to distinguish carcinoma in situ of non-polypoid form from superficial spreading carcinoma of the stomach. Both types of growth may replace the normal glandular tissue of the mucous membrane over a considerable area.

Carcinoma in situ occurs in the stomach in two forms, polypoid and non-polypoid. Polyps showing malignant appearances in some cells are occasionally found in the stomach, analogous with similar polyps occurring in the rectum, and in both sites they are apt to become malignant at a later date. From the edges of such a polyp, non-polypoid carcinoma in situ may spread along the gastric mucosa. In the non-polypoid form, which tends to occur in the pre-pyloric region, the abnormal cells of malignant appearance are confined within the basement membranes of the glands. These cells are atypical in form and arrangement; their nuclei are hyperchromatic and mitoses are frequent. A bizarre glandular pattern is produced which does not necessarily involve the deeper portions of the glands. The lesion may not be continuous, and necrosis and ulceration of its surface may be found.

T. B. Mallory² has reported seven cases of carcinoma in situ of the stomach, three of polypoid and four of non-polypoid form. In this small group there was no evidence of recurrence or of metastases in the intervals from one to seven years after resection of the stomach.

The superficial spreading carcinoma of the stomach, especially prone to occur in the pyloric antrum and often at the margin of a simple peptic ulcer, may spread for a considerable distance in the mucosa, invading the tissue spaces and lymphatics and not remaining confined within the basement membranes of the glands. In some cases a dedifferentiation of varying degree has taken place, with the result that a varied picture is produced, and in whole or in part the lesion may assume the appearance of a small spheroidal-cell carcinoma. Intervening areas of mucosa not invaded by the growth, and perhaps showing intestinal metaplasia, may be present. A superficial or deep ulceration of the malignant tissue may be found. A. P. Stout described fifteen cases of this condition. In nine the growth started at the margin of a simple peptic ulcer and in five the growth itself was ulcerated. There was invasion of the muscularis, minimal in extent, in five cases only, but in seven metastases were found in the superior or inferior gastric glands. Other authors have described cases in which small but definitely larger foci of invasion beyond the muscularis mucosae were found at intervals. All Stout's fifteen

¹ Bocian, J. J., and Geschke, A. E., *Arch. Path. (Chicago)*, 1958, 65, 6.
² Mallory, T. B., *ibid.*, 1940, 30, 348.
³ Stout, A. P., *Arch. Surg. (Chicago)*, 1942, 44, 651.
⁴ Graham, R. M., Ulfelder, H., and Green, T. H., *Surg. Gynec. Obstet.*, 1948, 86, 257.
⁵ Schade, R. O. K., *Brit. med. J.*, 1958, 1, 743.

cases survived operation. One died of cancer 13 months after resection of stomach; of the remainder, four had survived for 3 years when his paper appeared, three between 2 and 3 years, three between 1 and 2 years, and three for less than a year. The prognosis in this type also would appear to be somewhat better than that obtaining in the average case of gastric carcinoma.

The distinction between carcinoma in situ, as defined above, and superficial spreading carcinoma of the stomach, rests therefore on a histological basis. In the absence of invasion of the muscularis mucosae some authors would place both lesions in the same category, though this is not strictly accurate. It would appear probable, however, that the former lesion may pass imperceptibly into the latter; but, as in cases of carcinoma in situ occurring elsewhere—for example, in the cervix uteri—a variable period, perhaps many years, may elapse.

In the detection of these early changes certain precautions have to be taken in the macroscopic examination of the resected stomach. It should be examined in the unfixed condition as soon as possible after removal. In some specimens there may be a reddish-brown discoloration or a slight puckering of the mucous membrane; in others, especially in cases of carcinoma in situ, nothing may be seen, the abnormal condition being discovered accidentally in the histological examination and perhaps starting at the margin of a gastric ulcer. A more extensive investigation of the stomach wall in the neighbourhood of gastric ulcers might reveal more of these cases—though they appear to be rare.

The more favourable results of operation reported in such cases indicate that early diagnosis is obviously desirable, but it is often a difficult matter and may be impossible. The clinical symptoms may be confused owing to the frequent association with gastric ulcer. X-ray examination may sometimes reveal a change in outline of the wall of the stomach and some interference with peristalsis. The use of the gastroscope and gastric biopsy may sometimes be successful. Of recent years cytological examination of the gastric mucosa has been practised and a variety of methods employed. Considerable experience is called for, but some workers—R. M. Graham⁴ and her colleagues, and R. O. K. Schade⁵—have succeeded in making early diagnoses.

MORE DEATHS FROM FOG

It is known that some increase in mortality accompanied a succession of severe fogs at the end of the nineteenth century, and there were occasional reports of similar occurrences during the first half of this century.¹ But it is only since 1949 that much notice has been taken of the great increase in the number of deaths that severe fog, especially

in London, brings in its train.² Now once more evidence has been presented of the toll taken of life. W. H. Bradley, W. P. D. Logan, and A. E. Martin³ have discussed the effect of the fog of December 2 to 5, 1957, on the Greater London area and J. A. Scott⁴ of its effect on the County of London. While it is impossible (and unnecessary) to be certain of the exact number of deaths attributable to the fog, there appears to have been an excess of between 800 and 1,000 deaths in Greater London, 400 of which occurred in the county council area (included in these figures are the 87 deaths of the Lewisham rail disaster). A. T. Gore and C. W. Shaddick⁵ suggest that there is a threshold level of four times the customary winter average of atmospheric pollution above which there will be an immediate increase in mortality. It is too early yet to say whether this hypothesis is generally true or whether a threshold value exists at all, but it is becoming increasingly clear that the rise in mortality occurs very early in the foggy period, and Bradley and his co-authors note that in the most recent episode it occurred before the atmospheric pollution had reached its maximum. Another point of interest is that deaths occurred among a younger group of persons than was the case with the fog of January, 1956,⁶ and Scott suggests that investigation would be worth while into the possibility of this having been related to the higher sulphur-dioxide content of the 1957 fog. Fogs undoubtedly cause sharp peaks in the mortality curve, but it is worth remembering that in the long run "normal" air pollution causes the greater loss of life. The Clean Air Act, 1956, will have the effect of reducing smoke and will probably thereby reduce mortality, but much remains to be done, not only in the study of the effect of air pollution on man and animals, but on the prevention of the pollution itself.

DEATH FROM OBSCURE CAUSES IN INFANCY

Though about 200 deaths of infants have been annually ascribed to accidental mechanical suffocation in England and Wales in recent years, many doctors have come to doubt whether the diagnosis is often valid. W. A. Brend⁷ was one of the first to study this question and to cast doubt on "overlying" by the mother as the frequent cause of death by suffocation it was then supposed to be. He commented, as others have done since, on the lack of adequate necropsy data. W. H. Davison⁸ made good this deficiency by carrying out post-mortem examinations in 1938-44 on 318 infants in Birmingham whose deaths were suspected to have been caused, at least in part, by asphyxia. Of these only 38 were found to have been so caused, and only 24 of them were ascribed to mechanical suffocation; the rest were ascribed to infections, mainly bronchopneumonia. Other investigators have confirmed the high incidence of infection as a cause of the deaths at first thought to be asphyxial, and many would agree with the comment made recently in our medico-legal columns⁹ that "a

diagnosis of accidental suffocation should not now be made unless there is an obvious mechanical cause for it."

In order to investigate these problems further a steering committee with Professor A. L. Banks, of Cambridge, as chairman was set up under the aegis of the Ministry of Health in 1953. Since then the members of this team have been carrying out necropsy studies on babies who died a sudden death between the ages of 2 weeks and 2 years in certain of the London boroughs and in the city of Cambridge and parts of the county. An interim report now presented¹⁰ shows the results in 64 London cases and 17 Cambridge cases. Of the 52 London cases examined histologically, 38 (73%) were found to have died of tracheobronchitis, 11 (21%) of bronchitis or bronchopneumonia, and the remaining 3 (6%) of septicaemia and gastro-enteritis. Of the 17 Cambridge cases 3 died of pneumonia (in the broad sense) and 1 of meningococcal septicaemia. In 13 cases the cause of death remained uncertain, but six of these showed inflammatory changes in the respiratory tract. Analysis of these deaths by the months in which they occurred showed them to be three times as prevalent in winter as in summer, while the proportion of males to females was 1.9 to 1. Both these statistical features are to be expected in deaths of babies from respiratory infection.

The investigation has now reached a point where the evidence so far gathered points to the need for more thorough virological study. Consequently the steering committee has formed a subcommittee under the chairmanship of Sir Samuel Bedson to pursue the viruses, and a full-time virus research worker is soon to be appointed. It is an important study and bids fair to unravel once and for all the exact causes of death in a type of case that is apt to be obscure to the doctor and particularly distressing to the parents.

TEENAGE SWIMMERS

At the recent Empire Games in Cardiff girls of from 14 to 19 years of age broke the world's records for the women's medley 4 × 110 yards relay swimming race and the women's 110 yards backstroke race. Why are such young girls capable of breaking swimming records presumably before at least some of them have developed their full physical strength? It has long been recognized that the peak age for best performances varies in different sports.¹ In the swimming events this seems consistently to be in the teens, especially so far as the women competitors are concerned. Are there any physiological factors to account for this or is it simply a training effect? The English girls in the successful relay team at Cardiff all trained for between 2 and 3½ hours a day and, with one exception, worked at school for the normal hours. The young Australian swimmers, whose success was also notable, trained for about the

same daily period. All divided the training into early morning and evening sessions. Most used the popular "controlled interval" method. This means that if the distance to be swum was one mile or 1,500 metres they divided the distance into 15 × 100 yards and swam each 100 yards at, say nine-tenths of their maximum speed, with a rest of about 10 seconds in between each 100 yards. The Australian swimmer Konrads would, for instance, swim 30 × 50 metres sprints at 32 seconds (his fastest time being about 27 seconds) with a 3-second rest between each sprint. This training technique is remarkable in its close resemblance to the "consecutive" quarter-miles run by Dr. Roger Bannister in his preparation for running the first under-four-minute mile.² But, apart from training, these girls also have inherent constitutional advantages in that they are of suitable somatotype for swimming. The combination of fat (endomorphism) for buoyancy and muscle (mesomorphism) for power and aggressiveness helps many young swimmers to achieve success. I. J. MacQueen³ has recently discussed the importance of somatotype in selection and training for sport. As puberty develops, the teenagers lose their puppy fat, develop more mature figures—and sink, or, at least, do not swim so fast. It has also been suggested that the younger of these girls have none of the worries of life (particularly boy friends) which may disturb the equanimity so essential to the expert swimmer.

"THE MEDICAL OFFICER"

For fifty years *The Medical Officer* has brought up-to-the-minute information to those who work in the public health service. This independent weekly periodical was founded by the late Sir George Elliston in 1908, and its golden jubilee number, dated September 5, 1958, has a commemorative article by Sir Allen Daley, who writes with respect and affection about the founder of the journal. Besides discussing the past Sir Allen also has some trenchant things to say about the future of the public health service. "The present position is," he writes, "that if local authorities are not prepared to pay the market price for good doctors they won't get them; preventive work will have to be tagged on to curative work, and the British public health service which has pioneered the world will die." Mr. Lewis Elliston, the present editor of *The Medical Officer* and eldest son of the founder, has taken the opportunity to recount the story of British public health as told in the pages of his journal from 1908 to 1958. The earlier part of this period was, as Sir Allen Daley says, the golden age of public health, but preventive medicine has still far to go, and public health workers may be confident that a journal which has served them so well in the past will successfully meet the changing needs of the future.

We record with regret the death on September 5 of Lieutenant-General Sir Bennett Hance, Director-General of the Indian Medical Service from 1943 to 1946.

¹ Ministry of Health, Reports on Public Health and Medical Subjects No. 95, 1954, H.M.S.O., London.
² Logan, W. P. D., *Lancet*, 1949, 1, 78.
³ Bradley, W. H., Logan, W. P. D., and Martin, A. E., *Mon. Bull. Min. Hlth*, 1958, 17, 156.
⁴ Scott, J. A., *Med. Offr.*, 1958, 99, 367.
⁵ Gore, A. T., and Shaddick, C. W., *Brit. J. prev. soc. Med.*, 1958, 12, 104.
⁶ Logan, W. P. D., *Brit. med. J.*, 1956, 1, 722.

⁷ Brend, W. A., *An Inquiry Into the Statistics of Deaths from Violence and Natural Causes in the United Kingdom*, 1915, London.
⁸ Davison, W. H., *Brit. med. J.*, 1945, 2, 251.
⁹ *Ibid.*, 1958, 2, 111.
¹⁰ Banks, A. L., *Mon. Bull. Min. Hlth Lab. Serv.*, 1958, 17, 182.

¹ See annotation in *Brit. med. J.*, 1957, 2, 874.

² Bannister, R., *The First Four Minutes*, 1955, London.
³ In a lecture to the British Association of Sport and Medicine, University College Hospital, London, 1957.

WORLD FEDERATION FOR MENTAL HEALTH

ANNUAL MEETING IN VIENNA, AUGUST 24-29

[FROM A SPECIAL CORRESPONDENT]

For the second time in its ten years' life the World Federation for Mental Health held its annual meeting in this lovely city, at the invitation of its Austrian member society and under the patronage of the President of the Federal Republic. Dr. BROCK CHISHOLM, the retiring president of W.F.M.H., shared chairmanship with Professor HANS HOFF, who was later installed as president for the ensuing year, with Dr. PAUL SIVADON (France) as vice-president.

"Uprooting and Resettlement"

The growing stature of W.F.M.H. in the world was indicated by there being a special conference, within the meeting, of officials of governments, who shared in private sessions the main congress theme, "Uprooting and Resettlement," but who also collaborated with the informal non-governmental membership. The topic was peculiarly appropriate to the Austrian and Viennese scene. Ministers of the Republic and civic dignitaries who spoke at the opening session imparted realism and urgency to the proceedings. Austrians can be very proud of the part they have played over the centuries as the recipients and second home for great waves of migrants. The size of the problem was emphasized by the figure of 1.5 million of uprooted persons received and "processed" by Austria alone since 1945, including 180,000 Hungarians since 1956.

The annual meetings of W.F.M.H. are essentially devoted to the exchange of experience and method between practical workers—doctors, nurses, social workers, and social scientists. The meeting proceeds by discussion groups fed by a small number of "Keynote" addresses. Of these, Dr. BROCK CHISHOLM's sounded a sombre note of challenge. Humanity's chance of survival depended entirely on our capacity to stay the hands of those who are still playing with the destructive, suicidal fire of nuclear armaments—the ultimate insanity and mental health problem, especially in the light of recent scientific reports on the long-term effects of radiation on genetic mutation. This responsibility for our generation was unprecedented, since we were the first human generation to have both the secrets of nuclear power and the knowledge and insight of modern behavioural science into factors making for the warping of human personality. Our children and succeeding generations would judge us by the way in which we could at least initiate the difficult, untried task of changing attitudes from partial, antiquated systems of values, loyalties, and prejudices to an overriding responsibility for humanity itself. Dr. Chisholm instanced this by his own experience of parents who had preferred to let their own child die rather than let it be admitted to a hospital open to them but run by a hated rival religious body. Great nations squandered untold wealth on "raising dust on the moon" while 600 million out of 900 million children were inadequately fed, clothed, or housed. The way children were either coerced into the parental mould or allowed freely to outgrow their parents' narrower values seemed to Dr. Chisholm one of the keys to lessening unconscious hate and rebellion against life and all that this implied by way of defensive or antisocial behaviour.

Refugee and Host

Dr. MARIA PFISTER, of the mental health section of W.H.O. and an authority on refugee and D.P. problems, gave a most valuable paper on the interaction of refugee and host. The central theme was again the overwhelming importance of the clash between cultural values. The deep need to preserve identity (whether by individual or group) could lead to defensive regression. The group might become statically injured and uncooperative, while the at first well-meaning host community, perplexed by this unrecognized primitive

defence mechanism, might lose its good will. Similarly, the individual D.P. might soon project his fear and hate of the original persecutors on to his new, innocent hosts. The need, then, was for insight into the strength and depth of "tribal" culture patterns of both parties. In practice it called for skilled teams of catalytic liaison figures representing both host and migrant groups. Dr. Pfister's lecture gave a reassuring demonstration of the advances of socio-psychological knowledge in this field, though its application to the therapeutic task involved in large-scale resettlement, even of the voluntary migrant, remains difficult.

This point was elaborated in greater detail by Mr. ELFAN REES, of the World Council of Churches. We began to see the working of uniform mechanisms behind the variety of psychological and social behaviour symptoms in various refugee populations. The epidemic of refugees was likely to be with us for many years. As some were resettled, other waves broke. Thus, last year a million fresh refugees were added, mainly from Hungary, Yugoslavia, and Algiers. Mr. Rees confirmed that the difficulty of resettlement depended on the degree of cultural difference. He emphasized the explosive dynamic nature of refugee groups—a sort of third force of the "dispossessed," prone to rumour, propaganda, and irredentist revenge dreams, ever rejecting the possible and demanding the impossible. In some very poor countries the status of refugee was eagerly sought after: U.N. help made this the one certain free-meal ticket.

Psychology of the Migrant

The problem of the migrant's identity and self-esteem was closely linked to the general psychology of development and regression by Mr. ERIK H. ERIKSON, the American psycho-analyst. He showed by clinical examples the overlap between the unconscious motivations of the voluntary migrant, the more "real" persecution fears of the forced refugee and the prodigal son—the adolescent rebel and "angry young man." In this talk entitled "Identity in our Time," Mr. Erikson argued that the sense of being powerless drove all these categories of the dispossessed (whether by real or by fantasy agency) into mastery of their loneliness by fierce self-assertion or denial of dependence. Normally and in health a person's identity is echoed by the community's conferment of role and status. This orderly process the "outsider" missed. Thus he compensated by inner anger and even a paranoid feeling of omnipotence.

From this part of the programme there emerged a surprisingly clear statement of the malaise of our era: the millions of human beings without settled roots or status who could become the new world citizens with a less particularist self-perception, but who in practice behave singly or collectively like deprived children. Here indeed is a challenge to the disciplines concerned with mental health. Dr. H. STROTZKA (Vienna) modestly related his experience at the head of a multi-professional mental health team which took up this challenge during the acute Hungarian refugee crisis on the Austrian border.* This was a practical and deliberately oriented piece of action research, perhaps the first in history to apply preventive psychiatry to a mass phenomenon during peace-time. In the teeth of the usual opposition to psychiatry by the "common-sense" folk, the team succeeded in isolating and helping the more overt casualties, in being given access to obvious mental health crises, in establishing some selection and training in elementary human relations for camp staff and key figures, and in making useful observations.

The last day of the conference was devoted to reports and evaluation of the work of the numerous discussion groups, and to an address by Professor HANS HOFF on "Home and Identity." A concluding banquet marked the tenth anniversary of the World Federation. Dr. J. R. REES, the Federation's indefatigable director, reported on progress over the

*Details can be read in H. Hoff and H. Strotzka's *Die psychosoziale Betreuung ungarischer Neuflüchtlinge in Österreich, 1956-1958*. Hollinek, Vienna, 1958.

decennium. From 22 affiliated societies the membership had risen to 113 member associations representing a large part of the civilized world. The Federation had been consulted increasingly as the accredited body on a wide variety of topics by numerous U.N. agencies and other non-governmental international bodies. A Mental Health Year (analogous to the International Geophysical Year) was planned for 1960 calling for great efforts by member bodies and governments in all countries. Dr. Rees received an ovation by the assembled representatives of many national groups.

During the conference, Dr. H. V. DICKS (London) delivered the first Mary Hemingway Rees memorial lecture. This memorial was established by a trust to be devoted to biennial lectures on mental health and spiritual values. Dr. Dicks chose to speak on the striking resemblances between certain ancient Indian and Chinese thought and practice and some modern psycho-analytic concepts.

Vienna's traditional charm and hospitality added greatly to the benefits of an otherwise very serious meeting, of which only the highlights are briefly reported. There were some good mental health films and also visits to refugee camps and institutions.

Motoring News

SEAT COVERS

For the motorist who likes to improve the appearance of his car and yet make its interior last longer there can be few better buys than a set of seat covers. We all know how luxurious even a cheap car can look if it has some attractive seat covers, and for an outlay of about £7 this can be very simply achieved. Seat covers perform several functions in that they protect the original upholstery, be it real leather or cheap leathercloth, from the ravages of dogs, young children, or untidy owners. They protect the suits of professional men from the shininess caused by rubbing against leather or plastic. They also stop dirt and stains from going into the upholstery, which is not so easily cleaned as detachable covers. Slippery seats also can often be cured by the fitting of good fabric covers, thus adding to the comfort of passengers on a long journey. Loose covers therefore have a definite value in keeping up the second-hand value of the car by protecting the upholstery.

There are so many different materials on the market today that it is not easy to choose the most suitable. Woven materials are generally best, though felt is perhaps the least expensive and will wash well without losing its shape. Rayon is suitable for very hard wear and where there is much dirt; it is an excellent material for those who must transport dogs in the car, for it can be wiped clean with a damp cloth. It is cold to the touch, however, and is not ideal for winter use. Natural fabrics such as the varieties of Bedford cord and pure wool give hard wear and warmth, and the same applies to the various imitation furs such as leopard and zebra. A less expensive material is cotton duck, which, though it is not thick, is warm in winter and cool in summer. In recent months transparent plastic has come into fashion, particularly on coupés and open cars, so as to show the original pattern of the upholstery and yet render it showerproof. While being reasonably hard-wearing, these plastics do not "breathe" like a normal cloth, and they are therefore uncomfortable in hot weather.

Touring Spares

If you are among the happy minority of motorists who have not yet embarked on a summer holiday, you may still be sorting out your baggage and prowling round your garage for useful items to add to the tool kit of your car in case of emergencies. The average tool roll provided with a new

car, if it is a popular model in the low or medium price range, is usually inadequate for any but the simplest of repairs. One item in particular which is often omitted from such an outfit is a spanner for adjusting the small nuts holding the contact-breaker points. A 2BA electrical spanner is therefore desirable as being the most useful, but a set including 2, 3, 4, and 5BA can be obtained cheaply and will cover all requirements. A small screwdriver with an insulated plastic handle and a large roll of insulating tape, wrapped to prevent oil from destroying its adhesive properties, should also be carried. Likewise a length of heavy-duty electric cable with some crocodile clips can be useful for temporary repairs where the wiring has failed in some inaccessible spot.

Spare fuses or fuse-wire, contact-breaker points, and spare parts for the water pump, if fitted, can often prevent hours of delay at some wayside garage should the correct pattern of parts be unobtainable. A tyre pressure gauge and a grease gun should, of course, be in the tool kit already, as well as a plug spanner. One item which is often omitted from a seemingly comprehensive tool kit is a powerful chrome-vanadium ring spanner for cylinder head nuts. If you have to change a gasket the usual cheap black spanner will not shift a nut done up to 45 lb./ft. or more. Mechanical spares such as fan belts, a spare plug, condenser, and a cylinder-head gasket should always be carried, and, if you want to be really independent, a half shaft and a coil should see you through any emergency. When carrying gaskets, however, remember to see that they are carefully stored in a position where they will not be damaged.

Yellow Lights

Within the past few years more and more British motorists have come to appreciate the advantages of yellow lights. Those who have driven in France, where yellow headlamps are compulsory, may have noted the advantage of lack of dazzle which yellow bulbs offer. There is very little difficulty in obtaining coloured bulbs to suit any normal British-made car, especially those of recent manufacture.

They cost slightly more than the white ones, but their light is much softer on the eyes both for the driver of the car to which they are fitted and for the drivers of oncoming cars. They are also better for use in fog and for town driving on dipped beams, as there is less dazzle from shop windows and other reflecting surfaces. The French Government found that it was easier to specify yellow bulbs for all vehicles than to go to the trouble of testing the headlamps of individual vehicles, and the system seems to be satisfactory.

The only road users who might find cause to complain are the owners of fast sports cars, for whom yellow lamps mean a shorter beam and therefore a smaller margin of safety at high speeds. This could be overcome by using lenses for a long narrow beam and by fitting supplementary lamps for kerb illumination. The normal road user, however, would find the more restful yellow beams sufficiently penetrating for all types of night driving, while the dipped beam could be used on busy arterial roads without there being any question of offending oncoming traffic, as is often the case with present double-dipping white lights. In many other European countries motorists are following the French example, for dazzle is a well-known cause of road accidents, and anything which counteracts this is surely worthy of trial.

IAIN GELLATLY.

Neurochirurgia is published by Georg Thieme, Leipzig, as a supplement to *Fortschritte der Neurologie und Psychiatrie*. It contains articles in English, French, or German, in each case with a summary in the other two languages. For the present, two numbers of *Neurochirurgia* will appear each year at an annual subscription of DM. 18 (DM. 16.20 to subscribers to the *Fortschritte*).

The public do not credit smoking with any therapeutic effects except those of soothing the nerves of the addict

and curbing an excessive appetite for food. If they assume that tobacco smoke contains some stimulating principle they are well justified, and propaganda designed to obscure this fact could hardly be called education, nor is it necessary or justifiable in any way. It would seem, on the contrary, a dangerous and ultimately futile attempt on the part of the medical profession to deceive both itself and the public.—I am, etc.,

London, S.W.10.

R. B. D. STOCKER.

Ergometrine with Hyaluronidase

SIR,—The studies on the puerperal uterus which Mr. W. J. Garrett and I reported (*Journal*, July 19, p. 138) were designed to measure objectively and compare the speeds of action of ergometrine when given by (i) intravenous injection, (ii) intramuscular injection, and (iii) intramuscular injection with added hyaluronidase. It was on a comparison of these speeds that we based our opinions as to the merit of routinely using intramuscular ergometrine with hyaluronidase at crowning of the head.

Mr. E. G. Jonas (*Journal*, August 16, p. 450) raises quite another issue, which I respectfully suggest is hardly relevant, when he implies that similar studies carried out in the second and third stages of labour might give very different results. In fact, there is little evidence to support this contention, and tocographic experiment shows that there is no significant difference between the speed of action of oxytocics in labour and in the early days of the puerperium. But, even allowing that the response to ergometrine is "at its zenith during labour," I would point out that it is the comparative speed of action of the three injections which is important. The addition of hyaluronidase to the injection undoubtedly accelerates the action of ergometrine, but the latent period is only reduced by 30%, while intravenous injection is still five times as rapid in action. It was in the light of these results that we questioned whether the adoption of the method as a routine for use by midwives was justified.—I am, etc.,

Oxford.

MOSTYN P. EMBREY.

Congenital Deaf-mutism

SIR,—The article by Dr. J. McKenzie on the aetiology and treatment of congenital deaf-mutism (*Journal*, July 26, p. 201) is so full of inaccuracies and statements contrary to physiology and clinical experience that one would need twice as much space as the article itself to refute them. Five children, including four who according to responses to air conduction audiometry were almost totally deaf, were examined by an audiometrician. Because there was also a response to sensations as produced by the oscillator for bone conduction audiometry at very much smaller intensities (as compared with the air conduction responses) Dr. McKenzie concluded that he made a completely new discovery—namely, that these children suffered not from a congenital perceptive but from a conductive deafness. He had no other evidence, but it was enough for him to formulate a theory. But these theoretical considerations are based on false assumptions. It is notorious how careful one must be with bone conduction tests in children, and how even in the older ones, when very deaf, the responses can be very unreliable.

Let us now analyse these audiograms. It is interesting to see that in four of them only a residual hearing for low frequencies is registered by air conduction, and that there is quite a significant variation in these, when the four audiograms are compared. But the response to the bone conduction oscillator is almost identical in all the cases. (If you take, for example, the responses in the right ear only, registered at twelve points, only at two points is there a slight difference. Otherwise the curves are absolutely identical.) This, of course, although not only this, immediately casts great doubts upon the validity of these tests. I wonder how Dr. McKenzie would explain it.

I suggest that the responses to the bone conduction oscillator do not represent sensations of hearing but are responses to the vibratory elements always contained in low frequency sounds of

high intensity. I would go even further and say that there is a possibility that the responses to sounds delivered via the earphones, when there is only a residual response to these low frequencies at high intensities, are only reactions to the vibratory element in the sound, and that these children often are in fact totally deaf. I am saying this from clinical observation and confirmation by histological evidence. I had the opportunity to test and observe a little girl, who was very deaf, from the age of 2½ to 3½. She responded to a very loud drum from 6 to 7 ft. (1.8 m. to 2 m.), to a loud xylophone of 500 c/s from 2 to 3 ft. (61 cm. to 0.9 m.), and to some other loud sounds of low frequency. This girl died later and the inner ear was examined histologically. There was no organ of Corti in any part of the cochlear canal; there was no vestibular membrane; also the nerve fibres entering the cochlear canal were very sparse. The aetiology was a well-known type of hereditary deafness. Undoubtedly a totally deaf individual can respond to the vibratory elements of low frequency sounds even in free field, and of course even better when the sound is applied by an oscillator on the skull. When these people are tested for bone-conduction hearing it is frequently difficult (even in some adults) to explain the difference between sensations of hearing and vibration, especially when they have never experienced true sensations of hearing normally. Also frequently there is the difficulty in communication which prevents a full explanation of the differences.

Of course the crux of the matter in the case of Dr. McKenzie's article is in his statement that careful attention was given to the possibility of the child confusing hearing with vibration. Could he explain how this was done in detail? And also the method of audiometry? For some years it has been possible to carry out reliable threshold audiometry in small children, in many cases from the age of 2½, and almost as a routine from 3½. What was the type of oscillator used? What was the signal the children were given during the test which indicated a reliable response? In an article entirely based on the results of a method of examination a clear and careful description of the method employed is essential.—I am, etc.,

Harrow.

L. FISCH.

Suffocation in Infancy

SIR,—I welcome Dr. J. Shackleton Bailey's letter (*Journal*, July 12, p. 104), and I agree with him that reconsideration of mechanical suffocation as the cause of many of the sudden deaths in infancy is urgently required. Unlike the pathologists mentioned in Dr. W. H. Davison's letter (*Journal*, July 26, p. 248), I have found by post-mortem, histological, and bacteriological examination an adequate natural cause of death in only about 25% of these infants. It is, I realize, a matter of opinion, but I am not persuaded that the finding of occasional mononuclear cells (some of which I think are desquamated bronchial epithelial cells) in the lung alveoli of a robust-looking infant of previous good health is adequate evidence of death from pneumonia. In the remainder of my cases, observed over the last six years, the infants were found in circumstances in which death could have been caused by suffocation. Indeed, in many cases suffocation seemed the obvious explanation of the observed circumstances. In my opinion the pathological findings were consistent with death from asphyxia.

I was therefore concerned to read that your paediatric correspondent (*Journal*, July 12, p. 111) seemed to suggest, if I understood him correctly, that asphyxia from overlying or soft pillows is an old wives' tale. I submit there is insufficient evidence to support such an opinion. I am also concerned in case such a view comes to the notice of, and is accepted by, parents; if this should happen I fear more bed and cot deaths will occur, not fewer. My experience leads me to think that the right place for a baby to sleep is in a separate cot with a firm mattress, and without a pillow until the age of 1 year, and that he should never be left unattended with a bottle in his mouth. I personally believe that if these simple conditions, observed in the children's wards of the Darlington Memorial Hospital, were put into practice in the home, many of these tragedies would be prevented.—I am, etc.,

Darlington.

J. TREGILLUS.

Perforated Ulcer in Pregnancy

SIR,—The publication of the memorandum by Mr. Martin Horwich in the *Journal* of July 19 (p. 145) prompts me to report the following case:

On December 8, 1957, a para 3, aged 28 years, who had been delivered of a live male infant on the previous day at home, was admitted as an emergency to the ward complaining of severe abdominal pain. The pregnancy was apparently quite normal until 48 hours before delivery, when she developed a mid-abdominal pain which she had never experienced before. This was accompanied by nausea, and diarrhoea on one occasion. Labour progressed normally apart from being accompanied by this pain, which was maximal in the hypogastrium, and delivery was uneventful. She vomited several times during labour, but no blood was noticed. The following day the pain became more severe and was accompanied by referred pain to the right shoulder tip.

On examination she appeared to be shocked and in severe pain. Her temperature was 98.2° F. (36.8° C.), B.P. 120/90, and pulse 98. Her abdomen was extremely tender, markedly so in the right hypochondrium, but there was no guarding or rigidity. The uterus was well contracted, being 5 in. (12.7 cm.) above the symphysis pubis. Shifting dullness was elicited and no bowel sounds were present. A provisional diagnosis of free fluid in the peritoneal cavity was made; a possible origin was thought to be a ruptured uterus. The pulse rate rose to 120 beats per minute during the following two hours, and a laparotomy was performed by Mr. C. T. F. Ealand, revealing a considerable quantity of bile-stained fluid in the peritoneal cavity and a large anterior perforation of the first part of the duodenum. Recovery was uneventful and she was discharged home a fortnight later.

As pointed out by Mr. Horwich, most cases of perforated ulcer which occur during pregnancy have a definite history, but this patient had no previous symptoms of abdominal pain or dyspepsia. Finally, I should like to draw attention to the fact that there was no guarding or rigidity of her abdomen. The absence of this classical sign of peritoneal irritation in the puerperium must be stressed, since failure to recognize this may result in serious delay in establishing a diagnosis.—I am, etc.,

Windsor.

I. G. ROSS.

Posture and Blood Pressure in Pregnancy

SIR,—A patient we thought to be suffering from early toxæmia of pregnancy had had frequent blood-pressure readings taken in the lying-down position, until the occasion when for no particular reason the blood pressure was taken in her living-room while she sat at a table. This time the readings were unexpectedly low, and normal. They were repeated a few minutes later when she was lying on her bed, and again the abnormally high readings were obtained. This state of affairs continued, so that if we relied on the readings taken while she was lying down we had to regard her as a case of toxæmia, but if we heeded only the readings taken while she was in the sitting position we could say she was normal.

Since this chance observation we have taken many double readings in expectant mothers who were first sitting, then lying down (or vice versa), and have in several cases, but not lying all, found similar differences between the sitting and lying readings. In a few patients the two sets of readings were the same, and in one case the lying pressures were lower than the sitting. Having been unable to find any reference to this phenomenon in several important textbooks, we would be interested to know if other observers have encountered it and be grateful for views as to its significance: can the higher readings be ignored regardless of the position with which they are associated?—We are, etc.,

P. R. BOUCHER.

MARGARET J. TURPIN.

Winfrith, Dorset.

Why are Medical Journals so Dull?

SIR,—Were it not for the fact that one remembers Dr. Richard Asher as the author some years ago of that stimulating article "Myxoedematous Madness," one would be inclined to take him at his word and agree with him that some, at any rate, of his present article (*Journal*, August 23, p. 502) was more than "probably irritating." One suspects Dr. Asher of writing very largely with his tongue in his

cheek. To say that style is everything and all the rest—syntax, grammar, spelling, etc.—do not matter is a heresy of the worst kind.

Is style so easy to acquire? Buffon, in what is now almost a cliché, said: "Le style, c'est l'homme." Anybody, apparently, except those who write learned articles in the medical journals can write good plain English, but how many people have individuality—style in other words? Dr. Asher evidently thinks that style consists in saying what is outrageous, highly controversial, or what you will. Style is only acquired, if ever, by any given individual, through wide reading, and even that won't always do it.—I am, etc.,

Brighton, 5.

G. L. DAVIES.

REFERENCE
Asher, R., *Brit. med. J.*, 1949, 2, 555.

SIR,—What a fine and worthy example of the art of the editor you gave us in publishing Dr. S. Levin's enlightening article on "Stool-gazing," following on Dr. Richard Asher's true lament on "Why are Medical Journals so Dull?" You did make the *Journal*, August 23, a brighter one. Even Dr. Asher must admit it was a subtle appreciation of his article.

Now that you publish a list of new drugs, maybe you can help the avid reader with a list of new "words," with explanatory notes?—I am, etc.,

London, W.1.

M. J. FENTON.

Coudé Catheter

SIR,—The letter from Mr. Hamilton Bailey and his colleagues (*Journal*, August 23, p. 513) has caused the research staff of *The Leech* considerable disappointment and distress, and the labelling of a "biography written in a serious and restrained vein," to use their own words, as "a hoax," "a fabrication," and "a mire" is unexpected from such distinguished men of medicine. However, the recognition given by the rest of the medical world has been most encouraging: a professor at one London medical school writes: "... an important contribution ... congratulations on a fine piece of work." This will hearten us to continue to publish our researches.—I am, etc.,

Cardiff.

D. M. J. WILLIAMS,
Editor, *The Leech*.

SIR,—I, too, share Dr. Peter Birkett's sorrow (*Journal*, August 30, p. 567) that great names have been dragged into the mire. However, one does not further the cause of historical accuracy by exposing one fabrication whilst condoning another. Fortunately every student knows that the real benefactor has proved to be, not Coudé, but his half-brother Bicoudé, who, as Mr. Clifford Morson (*Journal*, August 23, p. 513) well remembers, declined the presidency of the Société Internationale d'Urologie as a protest against the opening of Mercier's Bar.—I am, etc.,

London, W.1.

HOWARD G. HANLEY.

SIR,—A few years before the amusing episode narrated by Mr. Stephen Power (*Journal*, September 6, p. 640) I witnessed the following incident in the surgical out-patient department of the London Hospital.

RUSSELL HOWARD: "How would you relieve this patient's retention of urine?"

STUDENT: "I would pass a catheter."

RUSSELL HOWARD: "What type of catheter?"

STUDENT: "A Coué catheter, Sir."

RUSSELL HOWARD: "Oh! And I presume as you passed this catheter you would say to the patient: 'Every day and in every way I am passing my water better and better.'"

—I am, etc.,

Sholden, nr. Deal.

HAMILTON BAILEY.

* * This correspondence is now closed.—ED., *B.M.J.*

POINTS FROM LETTERS

Smallpox Vaccination

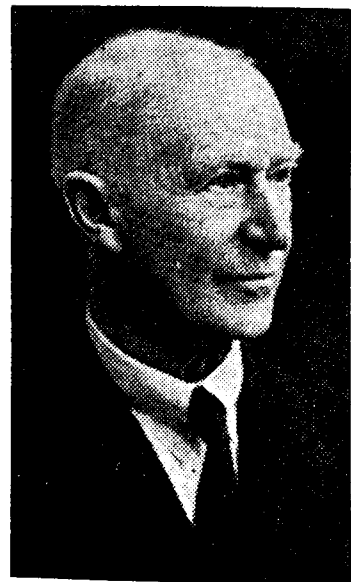
Dr. N. D. WAYNE (London, E.1) writes: In over 17 years of vaccinating people I have noticed, consistently, the appearance of a local skin reaction within ten minutes of completion of the act, when the lymph has dried. The area of scarification, or now of multiple pressure, becomes slightly raised and puckered. In all these cases the vaccination is invariably positive.

Obituary

RUPERT WATERHOUSE, M.D., F.R.C.P.

Dr. Rupert Waterhouse, who practised in Bath and was for many years a leading consultant there with a special interest in clinical pathology, died at the Royal United Hospital, Bath, on September 1 in his 86th year.

The youngest son of Dr. John Hodgson Waterhouse, Rupert Waterhouse was born at Sheffield on January 15, 1873. He was a descendant of Sir Gilbert Waterhouse, a nephew of Dr. T. Waterhouse, surgeon to Sheffield Royal Infirmary, and grandson of John Hodgson, a surgeon at Birmingham. From the Collegiate School and Wesley College, Sheffield, he went on to St. Bartholomew's Hospital, qualifying in 1897. After holding a resident appointment at the Royal Hospital, Sheffield, he graduated M.B. in 1900 and proceeded M.D. in 1903. He took the M.R.C.P. in 1908 and was elected F.R.C.P. in 1929.



Dr. Waterhouse first came to Bath in 1901, when he was appointed resident medical officer to the Royal United Hospital. Two years later he held a similar post in the Royal Mineral Water Hospital. Appointed first curator of the museum and pathologist at the Royal United Hospital, he later became an honorary physician to that hospital and to the Royal Mineral

Water Hospital. He was the author of many papers, mainly on rheumatological subjects, and his description of the clinical entity of acute suparenal insufficiency due to bilateral renal haemorrhage was published in 1911; it is now known throughout the world as the Waterhouse-Friderichsen syndrome.

A Territorial, Dr. Waterhouse served throughout the first world war in the R.A.M.C. in Gallipoli, Egypt, Palestine, and France. Serving first with the North Somerset Yeomanry, he commanded the 2nd South-West Mounted Brigade field ambulance for two years, and in 1920 was gazetted to command the 4th Southern General Hospital.

When he returned to Bath he practised mainly as a consultant in clinical pathology, and at the Annual Meeting of the B.M.A. in 1925 he was vice-president of the Section of Pathology and Bacteriology. Besides his hospital appointments in Bath he was on the staff of several hospitals in the neighbourhood, including the Victoria Hospital, Frome, the Trowbridge and District Hospital, and the cottage hospital at Chippenham. A founder member and past-president of the Bath Clinical Society, he was chairman of the Bath Division of the B.M.A. in 1923-4, and president of the Bath and Bristol Branch in 1928-9.

Dr. Waterhouse leaves a widow and a son and daughter.

G. D. K. writes: During his latter years Dr. Waterhouse was much handicapped by deafness and by lameness resulting from osteoarthritis and Paget's disease of the hip. In spite of this he was never heard to complain and retained his sense of humour and dry ready wit until the end. He will be remembered as one of the great old-time physicians of

Bath, and one who was more interested in the facts of medicine and their application to human beings than to their financially gainful possibilities. He stood for all that was honourable in the medical profession and had no use for any mumbo-jumbo. He was a reliable friend, never at a loss for a humorous answer to any question, and, although for a long time he had not been able to take an active part in medical matters, he will be very greatly missed by his colleagues and many friends.

K. S. LASHLEY, M.S., Sc.D., Ph.D.

We record with regret the death of Professor K. S. Lashley, formerly research professor in neuropsychology at Harvard University. He was 68.

Karl Spencer Lashley was educated at the Universities of West Virginia and Pittsburgh, where he graduated Sc.D. in 1911. After a few years as a teaching fellow at the University of Pittsburgh, he moved to Johns Hopkins and then to the University of Minnesota, where he became professor of psychology. Appointed to the equivalent position in Chicago in 1929, he became research professor at Harvard in 1937. He also held the directorship of the Yerkes Laboratories of Primate Biology at Orange Park, Florida, where much of his most notable work was done. On giving up his post at Harvard in 1955 he was appointed emeritus professor.

Lashley made many important contributions to psychology and neurophysiology, but he was best known for his work on animal behaviour. He was an honorary member of the British Society for the Study of Animal Behaviour, and in 1951 his outstanding work was recognized by his election to foreign membership of the Royal Society.

We are indebted to Professor O. L. ZANGWILL for the following appreciation: Professor K. S. Lashley won an international reputation for his studies on brain mechanisms and intelligence. Trained in psychology, Lashley worked with Dr. J. B. Watson at Johns Hopkins University and became a leading spirit in the Behaviourist movement. But he was quick to see the limitations of doctrinaire Behaviourism and had little use for speculative theory. His ideal was a science of behaviour firmly grounded in comparative neurology. That this ideal no longer seems incredible is the true measure of his achievement. Lashley's strength derived from his masterly synthesis of physiological and psychological methods of inquiry. From the neurophysiologist he took over the method of ablation; from the animal psychologist the use of systematic training techniques such as the maze and the discrimination box. As a result of this "combined operation" it became possible for the first time to assess the effects of brain lesions on behaviour in terms of measurement. Crude though measurements of behaviour may be, they at least make possible systematic comparison of pre- and post-operative performance in animals. In this way Lashley inaugurated a new epoch in the comparative study of the brain.

As is well known, Lashley's experiments led him to the view that cortical function is considerably less specialized and less narrowly related to specific structures than had formerly been supposed. Although habits involving a single sense modality—for instance, visual discrimination—were found to be impaired or lost only after ablations limited to the corresponding cortical projection area, more complicated tasks were found to be affected by lesions anywhere in the cortex. Thus, in the case of maze performance in the rat, impairment was found to follow lesions in any cortical area and the extent of the impairment proved to be broadly proportional to the extent of the lesion. Lashley therefore postulated a very considerable degree of equipotentiality within the cortex and a principle of mass action governing its efficiency. Although later work has cast doubt on both these assumptions, Lashley's thorough experimental work will long remain as a major contribution to neurology.

Although Lashley made no direct contribution to clinical problems, his work has had great influence. His study of the motor cortex published in *Brain* in 1921 and his later work with Clark on cortical cytoarchitectonics have become classical. Lashley was also widely informed in the literature of aphasia, agnosia, and apraxia, and took a lively interest in the work of such men as Goldstein and Head. If in an indirect manner, his work has had great influence on our modern conceptions of cerebral function in man. Lashley visited this country on several occasions and is particularly remembered for his contribution to the Symposium on Physiological Mechanisms in Animal Behaviour held at Cambridge in 1949. Here he impressed everyone by his remarkable grasp of the subject and his extraordinary quickness of mind.

MARGARET H. R. ROBINSON, M.B., Ch.B.

D.T.M.&H.

Dr. Margaret H. R. Robinson (formerly Young), who had worked in Hornsey for nearly fifteen years as medical officer for maternity, child welfare, and school health, died at Hampstead General Hospital on July 25 after a short illness. She was 59 years of age.

Margaret Helen Rattray Young was born on August 21, 1898, and was a medical student at St. Andrews University, where she graduated M.B., Ch.B. in 1922. She took the D.T.M.&H. with the intention of going to the tropics, but instead she became bacteriologist at the Central Public Health Laboratory, Utrecht, Holland, a position which she held for two years. Much of her time there was given to the investigation of tropical diseases, but she also worked on Weil's disease and post-vaccinal encephalitis. While in Utrecht she met her future husband, Dr. Conmar Robinson, and for the next fifteen years devoted her life to her family. She then returned to work as assistant medical officer of health to the Hertfordshire Council and two years later to the Hornsey Borough Council. She served Hornsey well for fourteen years, bringing to the personal health services of the borough a wide knowledge of the preventive aspects of child health and a deep understanding of the psychological problems of young people.

A friend writes: Those who were privileged to know "Greta" Robinson have indeed lost an exceptional friend. "Vital" is the word that describes her best. Lively, kind, energetic yet thoughtful, she was congenial through her wide interests to many utterly different people. From her student days her beautiful soprano voice made her welcome in musical circles; she read widely, and travelled not only along well-known routes but also in by-ways, and for these journeys she and her husband would first learn the language of the country they were to visit. Besides Dutch, she spoke French and Spanish fluently, and some German and Italian. She loved to entertain, and was a charming hostess at whose happy home young and old would meet the very people they wanted most to see. Now to these memories we have to add that of the gay courage with which she faced her terminal illness. The sympathy of her many friends goes out to her husband and her son and daughter (both members of her profession) in their sorrow.

J. S. du TOIT, M.D., F.R.C.S.Ed.

Mr. J. S. du Toit, consulting ophthalmic surgeon to the Groote Schuur Hospital, Capetown, died at his home in that city on August 3. A past president of the Medical Association of South Africa, he was also for very many years its honorary treasurer. He was 72 years of age.

Jacobus Stephanus du Toit was born at Worcester, Cape Province, on March 5, 1886, and was educated at Worcester Boys' High School, at French Hoek, and at Victoria College, Stellenbosch. He studied medicine at Edinburgh University, and graduated M.B., Ch.B. in 1912, proceeding to the M.D. and two years later. In 1915 he was elected F.R.C.S.Ed. After some four years of postgraduate study in ophthalmology and neurology in London, he returned to South Africa and

set up in private practice as an ophthalmic surgeon in Capetown in 1916. After setting up an ophthalmic clinic at the Capetown Free Dispensary he was elected to the staff of the Somerset Hospital, which was later transferred to Groote Schuur Hospital. From 1937 to 1949 he and Dr. A. W. S. Sichel served as joint chiefs of the department of ophthalmology at the hospital and joint senior lecturers at the university. For twenty-one years he was ophthalmic surgeon to the School for the Blind at Worcester.

Dr. du Toit was for many years honorary treasurer of the Cape Western Branch of the British Medical Association, and was president of the Branch and chairman of the Capetown Division in 1929-30. Since 1929 he had been honorary treasurer of the Medical Association of South Africa, which in 1952 awarded him its gold medal for distinguished services to the medical profession and the Association. Four years later he was elected President of the Association. Dr. du Toit was a member of the council of the University of Capetown for thirty-two years and a director for twenty-five years of the Nasionale Pers Beperk. For many years he was interested in farming and owned a farm at Durbanville. In 1916 he married Miss Emmeline J. Steyn, youngest daughter of President M. T. Steyn, of the Orange Free State, and she survives him together with the three daughters of the marriage. His only son died in 1935.

G. V. T. McMICHAEL, O.B.E., M.B., Ch.B. D.P.H.

Dr. G. V. T. McMichael, formerly medical officer of health for Paisley, died at the Western Infirmary, Glasgow, on August 22. He was 71 years of age.

George Vert Thomson McMichael was born on February 6, 1887, at Edinburgh, where his father was for many years a leading member of the city council. After receiving his schooling at George Watson's College, he studied medicine at Edinburgh University and graduated M.B., Ch.B. in 1911. In the following year he obtained the D.P.H. of the Scottish Royal Corporations. Soon after graduation he entered the public health service, and was assistant medical officer of health under the Renfrew county council until 1921. During the first world war he served for four years in the R.A.M.C., first as a regimental medical officer and then for some time in an administrative post in a general hospital in France, where his great gift for organization brought him promotion to the rank of major. In 1919 he returned to his civilian duties, and in 1921 he was appointed medical officer of health to the burgh of Paisley, a position he continued to occupy for the next 32 years. A member of the British Medical Association for 45 years, he was chairman of the Renfrewshire and Buteshire Division from 1931 to 1934. He leaves a widow, one son, and two daughters.

C. S. B. writes: During the time George McMichael was medical officer of health for Paisley he devoted all his energy and talent to improving the health services of the town, an aim in which he was brilliantly successful. An achievement that gave him great satisfaction was the establishment of the first municipally controlled maternity hospital in Scotland. He was the moving spirit also in the building of Paisley's very modern infectious diseases hospital. When first opened, almost 30 years ago, it was admitted to be—thanks to George McMichael's planning—one of the finest hospitals of its kind in Britain. Many others have been modelled on it, with its widely spaced pavilions, its well-equipped kitchens, and its admirable ancillary departments. George McMichael was a man of many activities. Among the positions he filled during his public career were those of president of the Royal Sanitary Association of Scotland, chairman of the Scottish division of the Society of Medical Officers of Health, and chairman of the Paisley and District Hospital Management Board. His good work was recognized in 1950 by his appointment as O.B.E. He suffered a long illness with the most admirable patience and cheerful courage.

HUGH MILLIGAN, M.B., B.Ch., D.P.H.

Dr. Hugh Milligan, who was in general practice at Whittle-le-Woods, near Chorley, Lancashire, died suddenly on August 23 while on holiday in the Isle of Man. He was 49 years of age.

Hugh Milligan was born at Holywood, Belfast, on January 18, 1909, and was educated at the Queen's University of Belfast, where he graduated M.B., B.Ch. in 1932. Two years later he obtained the D.P.H. He was in practice at Oldham before moving to Whittle-le-Woods in 1936. A founder-member of the Chorley and District Society for Mentally Handicapped Children, his work and interest in the society will long be remembered. In 1955 he was appointed police surgeon for the Chorley division of the Lancashire constabulary. He leaves a widow and three children.

W. McE. writes: It was as a village G.P. that Hugh Milligan earned for himself an outstanding reputation. A busy man with a large practice, he somehow managed to get to know every one of his patients, and few and far between were the ones whose background he did not remember or whose Christian name he did not use. He gave himself unsparingly to his work, and people in all walks of life valued greatly his skill, patience, advice, and friendship. Perhaps the secret of his success was his keen interest in people as individuals, and he inspired their confidence and trust because they knew he really cared. The fact that the whole village was grief-stricken at the news of his death and that something like a thousand people crowded the parish church at his funeral is an indication of the love and esteem in which he was held. This brief account would be incomplete without some mention of Hugh Milligan's personal courage. Although never very strong, he never allowed his disabilities to weigh heavily upon him, and only in extreme necessity did he allow any interference with his work. Two years ago he was forced to spend some time in hospital, yet even there he was fretting to be out and about, anxious for the welfare of his patients rather than his own. The prospect of death held little fear for him (for he had spiritual depth), but he could not bear to think of his patients looking to him in vain. His courage was impressive and his sense of humour a blessing both to himself and others. His name will long be honoured in the place where he worked: may he rest in peace.

J. C. CAMPBELL, M.B., Ch.B., F.R.C.S.Ed.

Mr. John Campbell, an ear, nose, and throat surgeon in Carlisle, who died at Cumberland Infirmary on August 26 after a short illness at the age of 36, will be greatly missed by his many friends, patients, and colleagues in Carlisle and the south-west of Scotland.

John Carr Campbell was born at Inverness on December 6, 1921, the son of a well-known doctor, and throughout his life he retained a great affection for Inverness and the Highlands. At Loretto School and Edinburgh University he was well known as a piper and for his prowess at rugby, which he played with enthusiasm and skill. After graduating M.B., Ch.B. in 1944 he held the appointment of house-surgeon at Leith Hospital, and then had a short spell in practice with his father before joining the R.A.M.C. His service in the Army was essentially spent in India during the troublesome times of 1947. He then returned to Edinburgh and pursued his main interest—ear, nose, and throat surgery—under the late Dr. G. Ewart Martin. During the tenure of his appointment at the Royal Infirmary he became a Fellow of the Royal College of Surgeons of Edinburgh in 1950. Shortly afterwards he went to Carlisle as a registrar, and after a short period in London was appointed a consultant to the East and West Cumberland groups of hospitals and to the Dumfriesshire hospitals.

A. B. MacL. writes: John Campbell's work was of the highest standard and he was a skilled operator. He had a very happy way of making friends with his patients, sparing no efforts to ensure their well-being in the widest sense, and yet he had a modest view of his own capabilities.

He was perhaps at his best with children, who, shrewd judges of character as they are, loved him and would do anything for him. A speaker of considerable wit and wisdom, he was often in demand on social occasions, and played a valuable part as the secretary of the Carlisle Medical Society. His interests were sailing, in a boat which he built himself, and in the occasional week-end in his caravan, in which he took great pride and in which he was able to share his leisure with his family. We have lost a well-loved, faithful, and generous friend, and our sympathies go to his two small sons and his wife, who is also a doctor.

DANIEL P. O'BRIEN, M.D.

Dr. Daniel P. O'Brien, who had been administrator of the medical science and research division of the Rockefeller Institute for Medical Research, died at Acapulco, Mexico, on August 16.

Daniel P. O'Brien, a native of Torrington, Connecticut, was born in 1894. He graduated in medicine from Johns Hopkins University in 1920. For some years before the second world war he worked as the European representative of the Rockefeller Foundation, and for the greater part of the war he was in London, where he did much to foster Anglo-American friendship.

A. D. writes: News of the death of Pat O'Brien will strike a sad note in the hearts of his many British friends. After the fall of France he moved the European office of the Rockefeller Foundation from Paris to London. He took a flat in St. James's, lived among us, and shared stoically and with humour our discomforts. In 1938 he had joined the Athenaeum Club: he was often there after he came to live in London, and he retained his membership until his death. Always cheerful and optimistic, he visited incessantly the various academic institutions receiving, or desirous of receiving, grants from his Foundation. His advice was freely sought and generously given. He had the ready and genial friendliness so often found in those of Irish extraction. There was always, until his vision began to fail, a merry twinkle in his strikingly blue eyes. He was a physiologist by training, and his later interests covered every branch of medicine and science. He knew all the leading scientific workers in Europe and told fascinating anecdotes of their idiosyncrasies. He was active in bringing together American and Canadian doctors then serving in this country and their Service and civilian colleagues here. My last meeting with him was in the ophthalmic ward of the Johns Hopkins Hospital, Baltimore, where he was under treatment for detached retina. He faced resignedly the prospect of complete loss of his sight. He did, however, recover some vision, and in a letter he wrote to me some months ago he expressed the intention of revisiting London to see his "many good friends." Alas, that was not to be, and the world is poorer for his loss. He never married, and when he was "at home," which was seldom, he lived with his sister in Connecticut.

Medico-Legal

MUNCHAUSEN SYNDROME

[FROM OUR LEGAL CORRESPONDENT]

On July 1 John Sherratt, aged 32, pleaded guilty at Melton Mowbray to obtaining food and drugs valued at £2 from Melton Mowbray War Memorial Hospital, and asked for no fewer than nine similar offences in hospitals in the preceding six months to be taken into consideration. He had been admitted complaining of abdominal pains, and the hospital food and drugs he had had over all 10 efforts amounted to £57 11s. 10d. He was sentenced to six months' imprisonment (*Manchester Guardian*, July 2). Another example of the Munchausen syndrome is reported in our correspondence columns this week (p. 690), but in that case the patient agreed to enter a mental hospital for treatment.

Vital Statistics

Venereal Diseases

In England and Wales during the quarter ending March 31, 1958, 1,088 new cases of syphilis were reported as attending the clinics as compared with 1,292 the previous year. Of these, 171 were classified as primary, secondary, or latent in the first year of infection. 8 cases of congenital syphilis in children aged under 1 year were reported, and 107 cases in persons over that age. New cases of gonorrhoea (with corresponding 1957 figures in parentheses) numbered 6,056 (5,073), of chancroid 76 (77), and of non-gonococcal urethritis (males only) 3,642 (3,662).—*Monthly Bulletin of the Ministry of Health*, August, 1958.

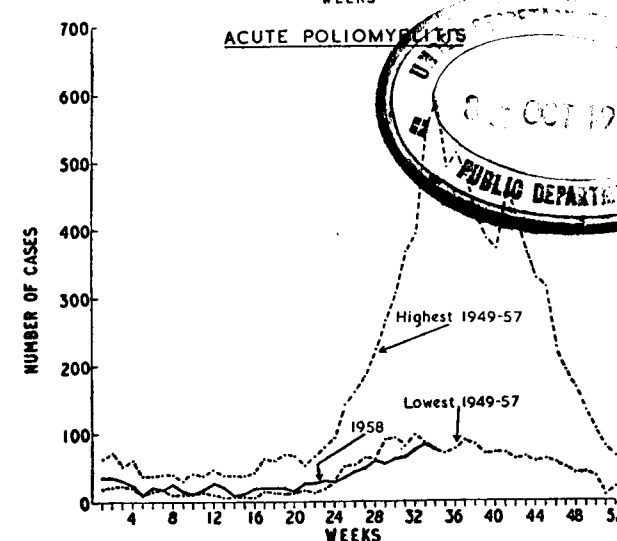
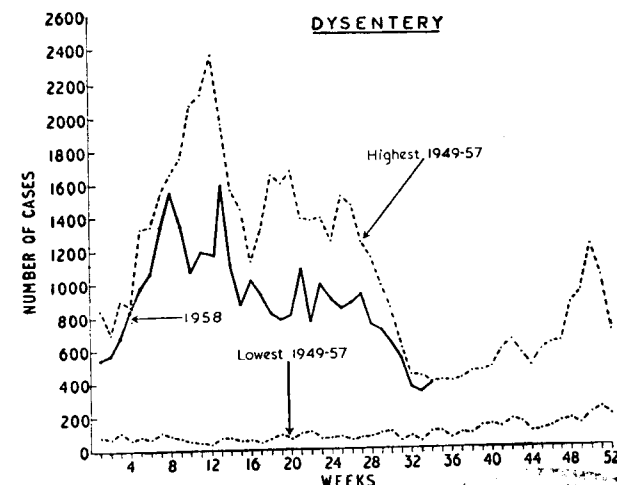
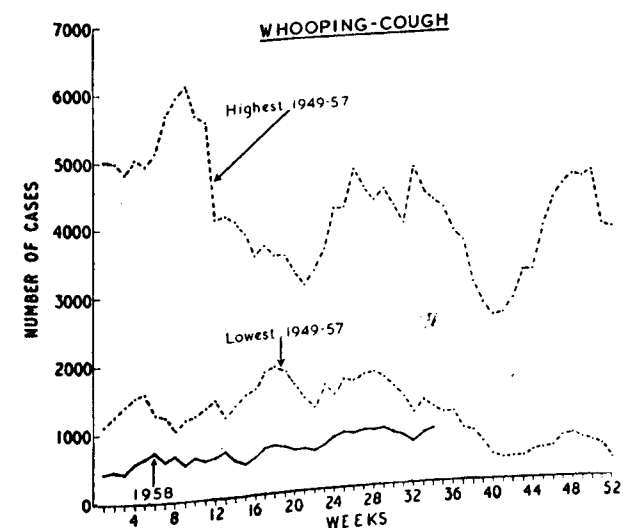
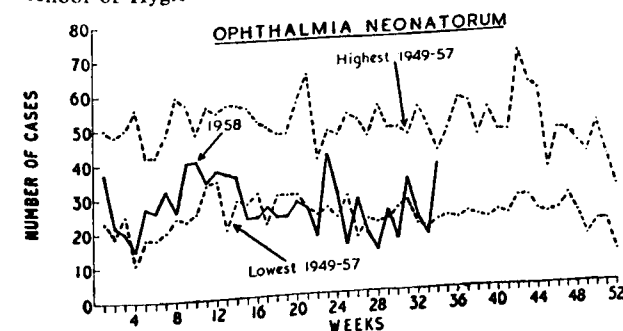
Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in July was 105, compared with 116 in the previous month and 114 in July, 1957.

The numbers of cases of industrial diseases in the United Kingdom reported during July, 1958, were as follows: lead poisoning 2, aniline poisoning 1, compressed-air illness 1, epitheliomatous ulceration 10, chrome ulceration 17; total August, 1958.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus -----, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending August 30

The largest increases in the numbers of notifications of infectious diseases in England and Wales during the week ending August 30 were 171 for food-poisoning, from 226 to 397, and 40 for whooping-cough, from 770 to 810; the largest decreases were 986 for measles, from 3,796 to 2,810, and 40 for scarlet fever, from 326 to 286.

The largest decreases in the incidence of measles were 146 in Kent, from 270 to 124, 67 in Gloucestershire, from 147 to 80, 56 in Wiltshire, from 85 to 29, 54 in Essex, from 194 to 140, 54 in Lancashire, from 465 to 411, and 53 in Surrey, from 103 to 50. Only small variations were reported in the local returns of scarlet fever. The largest fluctuations in the trends of whooping-cough were a rise of 35 in Warwickshire, from 35 to 70, and a fall of 39 in Sussex, from 70 to 31. No case of diphtheria was notified; in the preceding week there were 2 notifications.

The notifications of acute poliomyelitis numbered 78, and these were 4 more for paralytic and 3 fewer for non-paralytic cases than in the preceding week. The largest returns were Lancashire 15 (Manchester C.B. 6, Burnley C.B. 2, Preston C.B. 2, Nelson M.B. 2), Yorkshire West Riding 9 (Leeds C.B. 3, Sheffield C.B. 2), Devonshire 5 (Plymouth C.B. 3), Staffordshire 5 (Stoke-on-Trent C.B. 2).

The notifications of dysentery numbered 376 and were 8 fewer than in the preceding week. The chief centres were Yorkshire West Riding 69 (Leeds C.B. 28, Thorne R.D. 15), Lancashire 67 (Liverpool C.B. 15), London 41 (Islington 11), and Warwickshire 31 (Birmingham C.B. 19).

One-half of the notifications of food-poisoning were from Hampshire (Basingstoke R.D. 153, Winchester M.B. 37).

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending August 23 (No. 34) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria	2	1	1	0		6	0	1	0	1
Dysentery	384	55	150	21	4	287	26	164	9	7
Encephalitis, acute	5	0		1		3	0		1	
Enteric fever:										
Typhoid	4	0	0	0	1	4	1	1	0	0
Paratyphoid	4	1	1(B)	0	2(B)	12	2	0	0	0
Food-poisoning	226	27	21	3		336	26	15	54	
Infective enteritis or diarrhoea under 2 years				17	32				10	30
Measles*	3,796	221	11	24	19	4,267	90	32	25	23
Meningococcal infection	14	1	5	0	3	25	2	15	0	
Ophthalmia neonatorum	36	1	5	0		29	5	5	0	
Pneumonia†	151	15	110	6	0	176	5	103	0	
Poliomyelitis, acute:										
Paralytic	42	1		2	5	188	14		3	24
Non-paralytic	35	2				175	15			3
Puerperal fever§	198	30	16	1		229	45	19	4	
Scarlet fever	326	31	47	10	16	255	18	40	17	16
Tuberculosis:										
Respiratory	452	63	74	9		577	70	74	14	
Non-respiratory	81	13	15	1		73	4	10	7	
Whooping-cough	770	36	95	72	24	1,107	46	60	4	28

DEATHS	1958					1957				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	1
Dysentery	0	0		0		0		0		
Encephalitis, acute		0			0	0				0
Enteric fever	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years	8	0	0	0	2	0	0	0	1	
Influenza	1	0	0	0	0		0		0	
Measles		0	0	0	0	0	0	0	0	
Meningococcal infection		0	1			0	1			
Pneumonia	288	20	16	8	1	11	12	8	4	
Poliomyelitis, acute	3	0		0	0	1		2	0	
Scarlet fever		0	0	0	0	0	0	0	0	
Tuberculosis:										
Respiratory	54	1	9	0	0	4	4	0	1	
Non-respiratory		0	0	0	0	1	0	2	0	
Whooping-cough	1	0	0	0	0	0	0	0	2	
Deaths 0-1 year	248	25	32	8	12	24	19	5	11	
Deaths (excluding stillbirths)	7,867	632	485	86	143	617	480	100	143	
LIVE BIRTHS	13,602	1081	920	203	355	1088	909	212	414	
STILLBIRTHS	300	19	22			25	18			

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

Medical News

Medical Research Council.—The Committee of Privy Council for Medical Research, after consultation with the Medical Research Council and with the president of the Royal Society, have appointed as members of the M.R.C. Professor R. H. S. THOMPSON, professor of chemical pathology at Guy's Hospital Medical School; Professor E. J. WAYNE, regius professor of practice of medicine at Glasgow; and Professor B. W. WINDEYER, professor of radiology at the Middlesex Hospital.

Imperial Cancer Research Fund.—Dr. J. CRAIGIE, F.R.S., has resigned his post as director of the Fund's Mill Hill laboratories, so that he can devote himself entirely to research. Dr. R. J. C. HARRIS is joining the Fund's scientific staff on October 1 to take up a new appointment as head of the division of experimental biology and virology. He will also be responsible, under the director, Professor G. F. MARRIAN, F.R.S., for the general administration of the Mill Hill laboratories. Dr. A. R. CURRIE, at present assistant pathologist at the Royal Infirmary, Glasgow, has been appointed head of the division of pathology, and will take up his duties on October 1, 1959.

Polio Vaccination.—On July 21 Mr. DEREK WALKER-SMITH announced the Government's intention of extending their poliomyelitis vaccination programme by raising the upper age limit from 15 to 25, including a wider range of hospital staff, and making a start on third injections (*Journal*, July 26, pp. 218 and 254). Administrative details of these extensions have now been sent to local health authorities, hospital authorities, and executive councils. The Ministry recommends first, however, a drive to complete the vaccination of existing priority groups—children between the ages of 6 months and 15 years, expectant mothers, general practitioners, and certain hospital staff and their families. Raising the age limit to 25 is estimated to make a further 6,250,000 persons in Britain eligible for vaccination; the extension to further hospital staff (including medical students) and families will account for another 500,000 persons; and those due for third injections will comprise about 200,000 vaccinated in 1956 and 3,500,000 vaccinated in 1957. These extensions are based on advice given by the joint committee on poliomyelitis vaccine under Lord COHEN OF BIRKENHEAD's chairmanship, set up by the Central and Scottish Health Services Councils. By the end of last month a total of 16,164,995 doses of vaccine had been distributed in Britain, of which 5,680,871 were British and 10,484,117 Salk vaccine.

Committee on Artificial Insemination.—The membership of the Home Secretary's committee of inquiry into the practice and legal consequences of human artificial insemination (*Journal*, August 9, p. 397) has now been announced. There are three members of the medical profession, Dr. PRISCILLA FITZGIBBON, an anaesthetist and also magistrate to a juvenile court; Dr. D. T. McDONALD, a general practitioner and former president of the North of England Branch of the B.M.A.; and Professor R. E. TUNBRIDGE, professor of medicine at Leeds University. The other members are Mrs. PEGGY JAY, Mr. R. RISK, a former president of the Law Society of Scotland, Mr. J. ROSS, formerly head of the children's department at the Home Office, Mr. JUSTICE STEVENSON, a judge of the Probate, Divorce, and Admiralty Division, and Mrs. ELIZABETH WHITLEY. The committee's chairman, as announced earlier, is Lord FEVERSHAM. The secretary is Mr. R. F. D. SHUFFREY, of the Home Office (Whitehall, London, S.W.1), to whom any correspondence should be addressed.

Society for the Study of Fertility.—The officers and committee for 1958-9 are as follows: chairman, Dr. T. MANN, F.R.S.; secretary, Dr. A. S. PARKES, F.R.S.; editorial secretary, Professor R. S. HARRISON; treasurer, Mr. H. H. FOURACRE BARNES; ordinary members of the committee, Dr.

G. I. M. SWYER, Dr. P. M. F. BISHOP, Dr. E. J. C. POLGE, Miss P. SCOTT, and Mr. H. G. HANLEY. The Society's annual conference will be held next year in Dublin from May 28 to 30.

Hon. Fellows of Royal Faculty.—At a ceremony at the Royal Faculty of Physicians and Surgeons of Glasgow on August 29 the president, Professor STANLEY ALSTEAD, conferred honorary fellowships on Sir ALEXANDER FLECK, F.R.S., president of the British Association and chairman of Imperial Chemical Industries; Sir MAURICE BLOCH, founder of the Maurice Bloch Trust and donor of the Maurice Bloch lecture theatre; Professor CARL H. BROWNING, F.R.S., emeritus professor of bacteriology at Glasgow University; and the Hon. Mrs. STIRLING OF KEIR for her lifetime's work on behalf of the medical and medical auxiliary services. In the 359 years of its existence the Royal Faculty has conferred its honorary fellowship on only 56 previous occasions, and only once before on a lady.

F.R.F.P.S.—The following were admitted fellows of the Royal Faculty of Physicians and Surgeons of Glasgow on September 1: *Qua* physicians, Dr. S. MUKHERJEE, Professor T. FERGUSON RODGER, Dr. G. RUTLEDGE, and Professor T. SYMINGTON; *qua* surgeon, Mr. R. RANCHODBHAI PATEL.

Medical Chairs in Nigeria.—Mr. W. W. DAVEY, consultant surgeon to the Whittington Hospital, London, has been appointed to the chair of surgery at University College, Ibadan, in succession to Miss BEATRICE JOLY. Mr. Davey is a graduate of Queen's University, Belfast. Dr. G. M. EDINGTON, consultant pathologist to Whiston and Rainhill Hospitals, Liverpool Region, and formerly specialist pathologist in charge of the Medical Research Institute and Laboratory Services, Gold Coast, has been appointed to the chair of pathology at Ibadan in succession to Dr. B. G. T. ELMES. Dr. Edington graduated from Glasgow University.

Nigerian Minister in London.—The Nigerian Federal Minister of Health, Mr. AYO ROSILI, arrived in London last week for discussions here and on the Continent with mental health experts.

Health of Directors.—The Institute of Directors has set up a medical research unit to inquire into the health problems of directors. Mr. H. B. WRIGHT, F.R.C.S., formerly surgical officer to the Shell Petroleum Company, is in charge of the unit. The institute defines the unit's purpose as of the unit. The institute defines the unit's purpose as follows: (1) To demonstrate statistically the facts about the special occupational health hazards to which executives are liable; (2) to define and isolate the causes and effects of such hazards; and (3) to find ways of overcoming them.

Fellowship for Cancer Research.—Applications are invited for a fellowship tenable at the Memorial Center, New York, a training centre specializing in cancer and allied diseases and affiliated to Cornell University Medical College. The fellowship (salary \$6,000) is for one year, normally beginning July 1, and is renewable for one or two years. Candidates must be graduates of medical schools approved by the American Medical Association and have completed at least two years' postgraduate training in internal medicine in addition to a year's internship. The fellowship provides the opportunity for study and clinical investigation at the Memorial Center. Further information is obtainable from Dr. LLOYD F. CRAVER, Memorial Center for Cancer and Allied Diseases, 444, East 68th Street, New York, 21.

Medical Section of S.F.A.—The Scientific Film Association has established a medical section. Further information about the new section may be obtained from the secretary, S.F.A., 3, Belgrave Square, London, S.W.1.

"Family Doctor."—The theme of the September issue of *Family Doctor* is "back to school." Subjects such as growing boys and girls, immunization, and intelligence are reviewed.

COMING EVENTS

Royal College of Surgeons.—The College's second provincial meeting of fellows and members is being held at Cardiff on September 26 and 27. The programme includes a dinner, a scientific session at the Cardiff Royal Infirmary, the annual meeting of the College, and a lecture by Sir RUSSELL BRAIN on "The Cervical Spine." Further information may be obtained from the secretary, Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2.

Green-Armytage Anglo-American Sterility Lecture.—Mr. V. B. GREEN-ARMYTAGE will lecture on September 26 at 5 p.m. at the Royal Society of Medicine. His subject will be "Recent Advances in the Surgery of Infertility."

National Society for Clean Air.—Annual conference and exhibition, October 1-3 in Llandudno. Details from the society, Palace Chambers, Bridge Street, London, S.W.1.

Sheffield Medical School.—Old Students' Association dinner, October 11, 6.30 p.m. for 7 p.m. at Firth Hall. Details from the secretary of the association, c/o Department of Pathology, University of Sheffield, Sheffield, 10.

NEW ISSUES

SPECIALIST JOURNALS AND ABSTRACTS

The journals listed below are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Journal of Neurology, Neurosurgery and Psychiatry.—Issued quarterly (£3 annually). The new issue (Vol. 21, No. 3), includes: CEREBELLAR HYPOPLASIA ASSOCIATED WITH SYSTEMIC DEGENERATION IN EARLY LIFE. R. M. Norman and H. Ulrich. CLINICAL AND ELECTROENCEPHALOGRAPHIC OBSERVATIONS IN ALZHEIMER'S DISEASE. F. Letemendia and G. Pampiglione. INVESTIGATIONS OF E.E.G. FINDINGS IN PRESENILE DEMENTIA. D. W. Liddell. THE CENTRIFUGAL PATHWAY FOR MICTURITION WITHIN THE SPINAL CORD. P. W. Nathan and Marion C. Smith. LANGUAGE DISORDER IN A CASE OF KORSAKOFF'S SYNDROME. P. R. F. Clarke. Maria Wyke and O. L. Zangwill. THE SURGICAL SEPARATION OF SIAMESE TWINS CONJOINED BY THE HEADS (CEPHALOPAGUS FRONTALIS) FOLLOWED BY NORMAL DEVELOPMENT. Maitland Baldwin and Anatole Dekaban. YAWNING. Jacques Barbizet. OPHTHALMIC HERPES ZOSTER WITH CONTRALATERAL HEMIPLEGIA. C. Anastasopoulos, K. Routsonis, and C. S. Ierodiakonou. A PRELIMINARY REPORT ON THE LACK OF TOXICITY OF A PREPARATION OF TOTAL RAUWOLFIA ALKALOIDS. Homai M. Colabawalla. THE SYNDROME OF ACUTE CENTRAL CERVICAL SPINAL CORD INJURY. Richard C. Schneider, John M. Thompson, and Jose Bebin.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Friday, September 19

BRITISH TUBERCULOSIS ASSOCIATION.—At 26, Portland Place, W., 5 p.m., Dr. D. A. Mitchison: Methods of Assessment and the Significance of Drug Resistant Mycobacterium Tuberculosis; Dr. D. B. Llewellyn-Morgan: Some Factors in the Production of Drug Resistant Mycobacterium Tuberculosis; Dr. H. E. Thomas: Clinical Findings in Birmingham Patients with Drug Resistant Organisms; Dr. Sheila M. Stewart: Correlation Between the Clinical Outcome of Treatment and the Results of Bacteriological Resistance Tests. Discussion to be opened by Dr. J. G. Scadding.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. J. L. Livingstone: clinical demonstration.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Davidson.—On July 2, 1958, at 18, Frank Dixon Way, Dulwich, London, S.E., to Veronica (formerly Fortune) and John H. Davidson, M.B., B.S., a brother for Diana and Penelope—Michael Peter John.

Hughes.—On August 31, 1958, at Aberystwyth, to Dr. Elinor (formerly Cleland) and Dr. John H. Hughes, a daughter—Kathryn Anne.

DEATHS

Frazer.—On September 8, 1958, at the Royal Southern Hospital, Liverpool, William Mowll Frazer, O.B.E., M.D., M.Sc., D.P.H., aged 70.

Hance.—On September 5, 1958, at Machynlleth, Montgomeryshire, Sir James Bennett Hance, K.C.M.G., K.C.I.E., O.B.E., M.D., F.R.C.S.Ed., Lieutenant-General, I.M.S., retired, aged 71.

Oakley.—On August 16, 1958, Philip Douglas Oakley, C.B.E., M.R.C.S., L.R.C.P., D.T.M., late D.M.S., Sierra Leone, of Coasters Cottage, Roundabout, Pulborough, Sussex.

Wells.—On August 13, 1958, at 10, Lambridge, Bath, Somerset, Lionel Thomas Wells, M.R.C.S., L.R.C.P., aged 88.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Immediate Treatment of Cardiac Infarction

Q.—What immediate emergency treatment should be given at the onset of a case of cardiac infarction with syncope?

A.—Syncope at the onset of cardiac infarction is relatively uncommon. It is usually of the vaso-vagal type and hence short-lived and self-limiting. The patient should be laid flat and morphine given to relieve pain. Rarely it may be due to heart block (Stokes-Adams attack), when one would be forced to use isoprenaline, 5 mg. rectally, in spite of its stimulant action on the myocardium with consequent tendency to cause ventricular fibrillation. If shock, as distinct from syncope, is present, with a systolic blood pressure of 80 mm. Hg or below, then an attempt should be made to elevate the pressure with mephentermine sulphate, 15 mg. intramuscularly, repeated as necessary, in addition to complete rest, oxygen, and pain relief. Recently digoxin has been suggested as a vasopressor, and, while undoubtedly useful, it may cause sudden death from ventricular fibrillation and hence cannot be unreservedly recommended.

Pregnancy after Nephrectomy

Q.—Does the risk of renal damage justify advising against pregnancy in a woman of 25 who has recently had a nephrectomy for complete fibrosis of the left kidney?

A.—Before advising this patient about future pregnancy the function of the remaining kidney must be fully assessed. There have been many cases recorded of successful pregnancy following nephrectomy when the remaining kidney was healthy. This undergoes compensatory hypertrophy, and two years should be allowed to elapse between the operation and the beginning of a pregnancy. If the nephrectomy was for renal tuberculosis the prognosis is not so good. The management of pregnancy after nephrectomy does not differ from normal except there must be extra vigilance in the early detection and prevention of pre-eclamptic toxæmia. Pyelonephritis must be treated promptly, and, if this is resistant to treatment, the pregnancy should be terminated.

Midwifery Bag

Q.—What should the midwifery bag of a general practitioner contain?

A.—**Instruments.**—Most general practitioners try to equip their bags with all the instruments they will need in midwifery: sterilizer; scissors; needles; obstetric forceps; artery forceps; needle holder; vaginal speculum; dressing forceps; sterile catgut and silk worm or nylon; syringes—1 ml. and 10 ml. with suitable needles; rubber catheter—fine; packet of cord thread—sterilized. I also carry long artery forceps, ovum and volsellum forceps, and a Drew Smythe catheter. I include in a small canvas instrument-bag two intravenous cannulas and a scalpel. **Apparel.**—Rubber gloves—two pairs or more—and a tin of glove powder; face masks; one apron. **Drugs.**—Morphine, pethidine, "omnupon," and scopolamine in ampoules; oxytocin and ergometrine in ampoules; hyaluronidase ampoules; sedative tablets—e.g., tab. butobarbiton., gr. 1½ (0.1 g.); tab. codein. co. **Anaesthetics.**—Some doctors carry both local and general anaesthetics (if they use chloroform) in the midwifery bag. Others, who use more complicated forms of anaesthesia, require more bags. I suggest one

bottle of chloroform and drop bottle; procaine 2% in a 10-ml. rubber-capped bottle (for use in suturing perineums); sodium thiopentone and sterile water in ampoules (which I would use only for control of eclamptic fits); Schimmelbusch mask; lint; gag and tongue forceps; strap or harness for lithotomy position. Gas (N₂O) and air or trichlorethylene have to be carried separately. If a Minnitt machine is used it is possible to replace one N₂O cylinder with an oxygen cylinder for giving oxygen to mother or child. **Antiseptics.**—Scrubbing brush; cake of soap; "dettol," small bottle or equivalent; small kidney bowl.

A douche can is hardly ever used now, but the rubber tubing may be useful for making veins stand out. It is essential to have another bag containing transfusion-giving sets, bottles of serum or dextran, and sterile water. This bag may also hold 1 lb. (0.45 kg.) of cotton-wool. Finally, a word of warning—never carry a narcotic drug like morphine in a bottle which looks or feels like a bottle of local anaesthetic. No doubt general practitioners always read the label, but too often the eye sees what it expects to see rather than what is on the label.

Seaweed Preparations

Q.—Is there any poisonous principle in *Fucus* or other seaweed? Were the slimming properties attributed to these plants real or imaginary?

A.—There are no poisonous principles in medical preparations made from seaweed. They have no positive slimming properties, but they have practically no calorie value and act to some extent as bulk purgatives in the same way as methyl cellulose or agar-agar. Foods made with methyl cellulose, such as biscuits, have a certain satiety value, while agar-agar, which is actually made from seaweed, when sprinkled on food has hygroscopic qualities and consequently has a laxative effect owing to the bulk which it induces in the diet. In consequence, they may be said to exercise a secondary effect in causing slimming.

Correction.—Dr. A. J. Dalzell-Ward informs us that he made an inadvertent omission from his letter on prevention of lung cancer (*Journal*, August 30, p. 563). The first sentence of the last paragraph should have read "... the mortality from lung cancer amongst smokers was three times that amongst men who had given up the habit more than 10 years previously, and 76% greater than that amongst men who had given up the habit less than 10 years previously."

Collected Articles from the "British Medical Journal"

The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

Emergencies in General Practice (26s. 9d.).

Refresher Course for General Practitioners, Volumes 2 and 3 (26s. 9d.).

Clinical Pathology in General Practice (22s. 3d.).

Any Questions?, Volumes 2 and 3 (8s. 3d. each).

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Alfology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

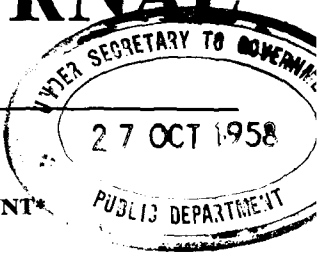
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BRITISH MEDICAL JOURNAL

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THE EISENMENGER SYNDROME

OR PULMONARY HYPERTENSION WITH REVERSED CENTRAL SHUNT*

BY

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[WITH SPECIAL PLATE]

Nomenclature

Eponymous titles are no longer in fashion, because they frequently lend themselves to controversy over historical precedence, invite criticism on the grounds of descriptive inaccuracy, and can usually be replaced with advantage by a scientific name which simultaneously identifies, defines, and classifies the disease in question. The term "Eisenmenger's syndrome," as used in these lectures, therefore requires some explanation, especially since the Editor of the *British Heart Journal* stated recently that it has "outlived [its] usefulness and should no longer be used in clinical medicine" (Brotmacher and Campbell, 1958).

An eponymous title may be justified, however, when it has been introduced by someone singularly entitled to do so (Abbott and Dawson, 1924), when it has become familiar by customary use on an international scale over a period of 34 years, when the aetiology and precise mechanism of the syndrome are still controversial, and when there is no convenient alternative title likely to stand the test of time. Nothing is gained by changing customary nomenclature prematurely. To dispense with the term altogether, and to regard the Eisenmenger complex simply as a variety of ventricular septal defect, is to deny the very essence of the syndrome, for, as will become clear later, its distinguishing feature lies not in the anatomy of the defect, but in the behaviour of the pulmonary circulation.

It may help at this early stage to state precisely what Eisenmenger described.

Dr. Victor Eisenmenger published his paper on "congenital defects of the ventricular septum" in 1897. He described in detail a typical example of the condition that has since become known as Eisenmenger's complex. His patient was a powerfully built man of 32 who gave a history of cyanosis and moderate breathlessness since infancy. The cyanosis increased considerably on effort. He managed well enough, however, and was able to lead an active life until January, 1894, when dyspnoea increased and oedema set in. Seven months later (August) he was admitted to hospital in a state of heart failure.

Examination revealed marked cyanosis, clubbing of the fingers and toes, thickening of the distal joints, and

*The Croonian Lectures delivered before the Royal College of Physicians of London on May 13, 1958.

polycythaemia. The venous pressure was raised, the liver distended, and oedema extensive. The right side of the heart was obviously enlarged, and there was a loud systolic murmur, accompanied by a thrill, maximal in the third and fourth left intercostal spaces near the sternal edge. The murmur was not conducted at all well to either the aortic or the pulmonary areas, and would have been regarded as tricuspid had it not been for the lack of a giant v wave in the jugular pulse. The pulmonary second sound was not impressive, but a basal diastolic murmur, presumably from pulmonary incompetence, developed later. He improved with rest and digitalis, but collapsed and died more or less suddenly on November 13 following a large haemoptysis.

The clinical diagnosis of ventricular septal defect was based on the systolic murmur and thrill in the third and fourth left interspaces. The haemoptysis was attributed to pulmonary infarction.

Both were confirmed at necropsy. The defect was round and situated in the membranous septum; it measured 2 to 2.5 cm. in diameter, and was placed in such a way that the lumen of the aortic orifice fell half over the left ventricular outflow tract and half over the right. Both aortic and pulmonary valves appeared to be competent. The left ventricle measured 8 to 10 mm. in thickness, the right 10 mm. The latter was much dilated and obviously the bigger chamber. The tricuspid ring was very widely stretched. There was considerable atherosclerosis of the pulmonary artery and its branches, but none in the aorta. In the left upper and right lower lobes of the lungs there was extensive haemorrhagic infarction secondary to multiple thrombosis.

Eisenmenger interpreted the situation as follows: in ventricular septal defect (he wrote) the difference in pressure between the left and right ventricles ensured a left-to-right shunt; the pulmonary circulation was therefore overfilled, the systemic circulation underfilled; increased stiffness of the lungs hindered ventilation and congestion hampered gaseous exchange; cyanosis depended more, however, on the poor systemic circulation—that is, it was peripheral rather than central. He discussed the "riding aorta" at considerable length and concluded that this was caused neither by a congenital fault of rotation nor by the direction of blood flow through the defect, but that it was a more or less

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inevitable consequence of the position of the defect itself in relation to the normal anatomy of the parts concerned, and was more apparent than real. Eisenmenger was unaware that the shunt was reversed in the case he described so carefully, despite his statement that a rise in pulmonary vascular resistance—from multiple thrombosis, for example—would equilibrate the pressures in the two circulations and so prevent both shunt and murmur.

His misinterpretation was based chiefly on two observations: first, since the cyanosis had been present from birth, he could not attribute it to reversed shunt from thrombo-obstructive pulmonary hypertension, for the thromboses were terminal; second, the absence of a giant v wave in the jugular pulse forced him to ascribe the systolic murmur and thrill to a left-to-right shunt through the defect rather than to tricuspid incompetence. He had no means of knowing that a high pulmonary vascular resistance might exist from birth independent of thrombo-obstructive lesions, and he was obviously unaware of the character of the venous pulse in cases of tricuspid incompetence with normal rhythm. In his honour, however, may be enumerated the following: (1) The case history that he described was complete, faultless, and wholly typical. (2) He stated that in otherwise uncomplicated ventricular septal defect pulmonary hypertension resulting from obstruction in the pulmonary circulation would abolish both left-to-right shunt and the classical murmur. (3) He took great pains to prove that an overriding aorta played no part in the physiological disturbance of the circulation.

Conflicting Hypotheses

Abbott and Dawson (1924) attributed the cyanosis of Eisenmenger's case to a right-to-left shunt through the defect on account of the overriding aorta, and Abbott described in detail a similar case herself (Baumgartner and Abbott, 1929). In her well-known table, which has recently been reproduced (Abbott, 1952), she analyses seven such cases. She ascribed the systolic murmur to the inter-ventricular shunt.

Taussig (1947) stated that "the essential feature of the Eisenmenger complex is that the aorta is dextroposed and overrides the right ventricle." That she was dissatisfied with this explanation, however, is clear from several other statements that she made: namely, "The dynamics of the circulation may be such that the powerful ejection of blood from the left ventricle into the aorta draws by suction a larger volume of blood from the right ventricle into the aorta than would be shunted through the opening if the force of ejection were the same in the two ventricles" (cf. the common ejectile force from both ventricles invoked by Edwards, 1957); and, "The cause of the cyanosis in these patients is by no means clear. In such individuals there may well be some alteration in the pulmonary epithelium or in the pulmonary vascular bed which prevents complete oxygenation of the blood in its passage through the lungs" (Taussig and Blalock, 1947). At that time she believed that "cyanosis was usually absent in infancy and early childhood," and may have been unable to correlate this with the override hypothesis.

Brown (1950) considered that the essential features of the Eisenmenger complex consisted of "a high defect of the interventricular septum, dextroposition of the aorta, and a normal or dilated pulmonary artery." He stated that the cyanosis was due partly to a right-to-left shunt depending on the degree of override, and partly to "failure of adequate oxygenation in the lungs."

Thus 50 years of cardiology failed to advance Eisenmenger's description, and opinion remained opposed to his belief that the overriding aorta was irrelevant. It was not

until 1947 that anyone followed up his suggestion that obstruction in the pulmonary vascular bed would be expected to raise the pulmonary blood pressure and to abolish both the left-to-right shunt and the murmur of uncomplicated ventricular septal defect. This was when Bing *et al.* (1947) demonstrated pulmonary hypertension at systemic level with bidirectional shunt in five cases of Eisenmenger's complex.

Since then innumerable studies have confirmed that pulmonary hypertension at systemic level is invariable in Eisenmenger's complex, typical earlier papers being those of Burchell *et al.* (1950), Wood (1950, 1952), Selzer and Laqueur (1951), and Soulié *et al.* (1953). The part played by pulmonary hypertension may be summed up in Selzer's words "that the most characteristic feature of Eisenmenger's complex is the presence of severe pulmonary hypertension."

As a result of such studies the concept quickly grew up that Eisenmenger's complex is pulmonary hypertension with reversed or bidirectional shunt through a large ventricular septal defect. Anatomical overriding or dextroposition of the root of the aorta may or may not be found at necropsy in clinically indistinguishable cases.

This has not ended the controversy, however, but has merely shifted the grounds of differing opinion. The debate now centres in the nature of the high pulmonary vascular resistance. Does this result from persistence of the foetal type of pulmonary circulation (Civin and Edwards, 1950), independent coincidental congenital disease of the pulmonary circulation (Evans, 1951; Kohout *et al.*, 1955), degenerative or thrombo-obstructive pulmonary vascular disease secondary to high flow or hyperkinetic pulmonary hypertension (Whitaker, 1958; Brotmacher and Campbell, 1958), transmission of a high left ventricular pressure to the pulmonary circulation owing to lack of obstruction at the site of a large defect (Edwards, 1957; Brotmacher and Campbell, 1958), a high right ventricular pressure initially determined by the override so that the right ventricle has to help support the systemic blood pressure (Soulié *et al.*, 1953), or initially from reactive pulmonary vasoconstriction, degenerative and late thrombo-obstructive pulmonary vascular disease being secondary (Wood, 1952, 1956, 1958)? With so many conflicting hypotheses concerning the origin and maintenance of this pulmonary hypertension at the present time, it would be begging the question to introduce new aetiological nomenclature.

Definition

But Eisenmenger's complex may be redefined with great advantage. Almost all writers have defined it as a cyanotic form of congenital heart disease with a large ventricular septal defect and overriding of the aorta, and in recent years pulmonary hypertension has been added. In the light of present knowledge, however, and fitting better with Eisenmenger's description, ideas, and insistence on the artificiality of the override, a better definition would be *pulmonary hypertension at systemic level, due to a high pulmonary vascular resistance (over 800 dynes sec./cm.²), with reversed or bidirectional shunt through a large ventricular septal defect (1.5 to 3 cm. across)*. Rarely the systemic and pulmonary vascular resistances may be so delicately balanced as to permit of no material shunt in either direction. To have no definitive name by which to call such cases would be intolerable; nor would ventricular septal defect with pulmonary hypertension suffice, for many such cases are not in the same category at all, the pulmonary hypertension being mainly hyperkinetic (due to a high pulmonary blood flow). The definition of Eisenmenger's complex given above is far too cumbersome to use routinely, and so there is little choice but to continue to employ the eponymous term itself, at least for the time being.

Now this modern definition of Eisenmenger's complex leads on to another very important consideration. The syndrome described is essentially pulmonary hypertension with reversed or bidirectional shunt, and it *matters very little*

where the shunt happens to be. At the bedside it is usually easy enough to diagnose the essential physiological situation, but often extremely difficult, if not impossible, to identify the site of the defect; indeed, to do so with certainty may still prove very difficult after full physiological investigation, including cardiac catheterization, angiocardiology, dye dilution curves, and other special tests. The frequency with which necropsies disclose an anatomical diagnosis different from what was expected is as embarrassing as it is educational. The fact is that a remarkably similar physiological situation occurs when any large communication between the two circulations is complicated by a pulmonary vascular resistance around systemic level. There are no fewer than 12 different anatomical abnormalities which may present in this way (Table I), and, in view of the frequent uncertainty

TABLE I.—Causes and Frequency of Eisenmenger's Syndrome

	Total No. of Cases	No. with Eisenmenger Reaction	Frequency of Eisenmenger Reaction (%)
i. Patent ductus arteriosus	180	29	16
ii. Aorto-pulmonary septal defect	10	6	60
iii. Persistent truncus arteriosus	4	4	100
iv. Transposition of the great vessels (with V.S.D.)	12	7	58
v. Corrected transposition (with V.S.D.)	3	3	100
vi. Single ventricle	6	6	100
vii. Ventricular septal defect	136	21	16
viii. Common atrio-ventricular canal or persistent ostium primum	21	9	43
ix. Single atrium	324	19	6
x. Atrial septal defect	3	0	0
xi. Hemianomalous pulmonary venous drainage	3	0	0
xii. Total anomalous pulmonary venous drainage	6	1	17
Site uncertain	22	22	
	727	127	17.5

regarding the exact anatomical diagnosis, a term which embraces them all is highly desirable. Since Eisenmenger's case, when seen clinically at that time, was no more likely to have had a ventricular septal defect than any of the other 11 conditions tabulated, with the possible exception of a simple atrial septal defect, I suggested extending the meaning of the expression "Eisenmenger's syndrome" to embrace these 12 conditions when behaving physiologically like "Eisenmenger's complex" proper (Wood, 1956).

In these lectures I propose to elaborate this theme, to discuss in detail the differential diagnosis between the various members of the group both at the bedside and by various means of special investigations, to probe the mechanism responsible for the high pulmonary vascular resistance, and finally, in synthesis, to offer a hypothesis which may explain both the common physiological behaviour and the exceptions to it.

Material

The analysis is based on a consecutive series of 127 cases of Eisenmenger's syndrome (as just defined) studied personally over a period of 11 years. Nearly all were catheterized, angiocardiology was carried out when considered necessary, and during the last year dye dilution curves have also been recorded. Eighteen of these 127 patients died, and a necropsy was obtained in 15 of them. The clinical diagnosis of the anatomical defect was correct in four, wrong in two, in nine, half correct but incomplete in four, wrong in two, and unproved because there was no necropsy in the other three. This represents a completely accurate clinical diagnosis in only 60%, or a rate of error far in excess of that experienced with any other form of congenital heart disease, and emphasizes the need for a single term to embrace the whole group clinically. Of the total of 127 cases, 22 have been rejected on the grounds of too much uncertainty with regard to the site of the defect.

In addition, and owing to the kindness of many friends in Britain, I have been able to collect details of a further 38 cases which were well worked out during life and which

subsequently came to necropsy. In these the shunt was aorto-pulmonary in 16, interventricular in 11, and inter-atrial in 11. To avoid duplication—for no doubt many of these cases have been or will be reported elsewhere—I am not including them in the analysis, but merely using them as a means of checking the accuracy of other data, and to facilitate the interpretation of my own findings. Without such necropsy control too many errors of interpretation are likely to be perpetuated. When data from these 38 post-mortem cases is used in this paper the fact is stated.

My own material is presented in Table I and represents 17.5% of a total of 727 cases of congenital heart disease with a communication of some sort between the systemic and pulmonary circulations. The frequency of the Eisenmenger reaction in each type of defect is given in the third column. It simplifies matters considerably if cases are regarded as having a shunt at aorto-pulmonary, ventricular, or atrial level, without stating specifically the nature of the defect. For example, both patent ductus and aorto-pulmonary septal defects have an aorto-pulmonary shunt, although there are specific differences between the two; again, persistent truncus, transposition or corrected transposition with ventricular septal defect, ventricular septal defect itself, single ventricle, and persistent ostium primum all shunt to an important degree at ventricular level, and in this respect may be taken together; similarly, atrial septal defect, single atrium, hemianomalous pulmonary venous drainage, and total anomalous pulmonary venous drainage directly or indirectly into the right atrium form a third group, all having the shunt at atrial level.

Frequency of the Eisenmenger Reaction

Eisenmenger's syndrome, as defined in this paper, accounted for 8% of the first 1,000 cases of congenital heart disease in my series.

Since necropsies prove conclusively that the Eisenmenger reaction is excited only by large communications between the two circulations, the frequency of such reactions in relation to the site of the communication should be assessed only as a percentage of large defects. In the 53 cases of Eisenmenger's syndrome that came to necropsy, the minimal size of aorto-pulmonary, ventricular, and atrial communications was 0.7 cm., 1.5 cm., and 3 cm. respectively. In the absence of the Eisenmenger reaction, defects of this order result in pulmonary blood flows ranging between 15 and 30 litres per minute, or pulmonary/systemic flow ratios of 3.5 to 6, at least in respect of aorto-pulmonary and ventricular communications; atrial septal defects are probably all large enough to excite the Eisenmenger reaction, but only those giving rise to similar pulmonary blood flows have been included in the calculations. The clinical features of these relatively large defects were in harmony with the physiological findings. It is appreciated that these are very artificial criteria for assuming that the defects were as large as those found in the Eisenmenger syndrome, but the object is simply to exclude from the estimates all those cases of mild or moderate severity which are known never to excite the Eisenmenger reaction.

The frequency of the Eisenmenger reaction in relation to large communications between the two circulations is given in Table II. It will be seen that Eisenmenger's syndrome occurs in over half of the cases with aorto-pulmonary or ventricular communications, but in only 9% of those with large atrial septal defects, and it is emphasized that this six-

TABLE II.—Frequency of the Eisenmenger Reaction in Relation to the Site and Size of the Defect

Site of Communication	Total No. of Cases	No. with Large Defects	No. with Eisenmenger Reaction	No. with Eisenmenger Reaction Expressed as percentage of Large Defects
Aorto-pulmonary	190	66	35	53
Interventricular	179	97	50	52
Interatrial	333	214	20	9

fold difference must be a conservative estimate, for it is probable that communications at aorto-pulmonary or ventricular level always excite the Eisenmenger reaction if they are of sufficient size, and that nearly all atrial septal defects are critical in the sense defined.

No explanation of the physiological mechanism underlying the Eisenmenger reaction is tenable unless it explains this remarkable difference.

Age

The average age of uncomplicated cases of patent ductus, ventricular septal defect, and atrial septal defect when first seen was 18, 13, and 26 respectively; when complicated by the Eisenmenger reaction otherwise similar cases had an average age of 19, 22, and 35 respectively.

The great majority of cases of uncomplicated patent ductus and ventricular septal defect (67% and 80% respectively) are referred to specialist clinics in childhood or adolescence. Early recognition of these cases probably depends on their characteristic and impressive murmurs. The bruit de Roger is especially difficult to overlook in view of its central position, and that may be why ventricular septal defect is recognized sooner than patent ductus, for a continuous murmur high up under the left clavicle may not be heard on casual auscultation. That the Eisenmenger group is referred somewhat later may be explained by the absence of these murmurs. Less than 50% of patients with uncomplicated atrial septal defect are referred in childhood or adolescence, no doubt for the same reason; but the much later reference of atrial cases with the Eisenmenger reaction can have no such explanation, and must mean that pulmonary hypertension in atrial septal defects is a late-acquired characteristic. That it is not an inevitable consequence of a high pulmonary blood flow acting on the pulmonary vasculature over a long period of time, however, is shown by the fact that 12% of uncomplicated cases of atrial septal defect and 15% of those with the Eisenmenger reaction were in persons between 50 and 75 years of age. It is clear that 70 years of pulmonary plethora may fail to raise the pulmonary vascular resistance.

Sex

Fig. 1 shows that the sex distribution in patent ductus (M/F=1/2) and ventricular septal defect (M/F=1) is the same in uncomplicated cases and in those with the Eisen-

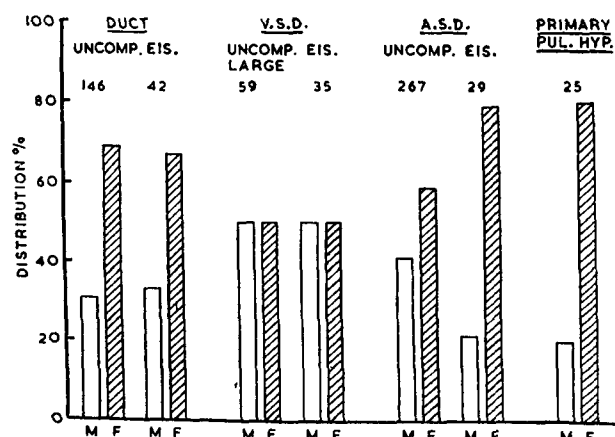


FIG. 1.—Sex distribution.

menger reaction. This disposes of the idea that Eisenmenger's complex might be ventricular septal defect associated with coincidental primary pulmonary hypertension, for the M/F sex ratio in the latter is 1/4.

In atrial septal defect, however, females are more common in the Eisenmenger group, in which they are as frequent as in primary pulmonary hypertension. This confirms that atrial septal defect complicated by a high pulmonary vascular resistance differs fundamentally from

Eisenmenger's complex, and from patent ductus with reversed shunt. Its late onset has already been offered as evidence that it is acquired, and now its high female bias suggests that it may have some factor in common with primary pulmonary hypertension.

Associated Anomalies

In a consecutive series of 1,250 cases of congenital heart disease certain relationships between anomalies outside the cardiovascular system and particular kinds of cardiovascular malformation have become firmly established. These may be enumerated as follows.

1. When congenital heart disease occurred in more than one member of a family, which it did in 5% of cases, it was nearly always of the same kind. This rule held good for patent ductus, ventricular septal defect, and atrial septal defect, as well as for coarctation, aortic stenosis, Fallot's tetralogy, simple pulmonary stenosis, and familial cardiomegaly.

2. Arachnodactyly was far more often associated with atrial septal defect than with any other anomaly, as endorsed by Reynolds (1950), and occurred in 15% of uncomplicated cases and in 12% of those with pulmonary stenosis and reversed interatrial shunt.

3. Deformities of the limbs were associated with ventricular septal defect in seven out of eight instances. Each of the three with polydactyly had Fallot's tetralogy.

4. Maternal rubella favoured patent ductus, as stated by Wesselhoef (1949). When no history of maternal rubella was obtained, cataract and deafness might have similar significance.

5. Mongols are said to be especially prone to have persistent ostium primum or common atrioventricular canal (Brown, 1950). The latter was proved at necropsy in one of our more difficult cases with the Eisenmenger reaction.

6. Hypertelorism alone, or as part of Turner's syndrome, was recognized in 20% of cases with pulmonary stenosis and reversed interatrial shunt, but in only 1% of cases of Fallot's tetralogy.

In the differential diagnosis of Eisenmenger's syndrome due regard should be paid to these observations.

Clinical Features

Onset.—It was usually possible to establish from the history when the Eisenmenger syndrome was first fully developed. Cases with inadequate data were excluded from the analysis. Table III shows that the Eisenmenger syn-

TABLE III.—Onset of Eisenmenger Syndrome

	Duct. %	V.S.D. %	A.S.D. %
Infancy	79	83	8
Childhood and adolescence	4	15	—
Adult life	17	2	92

drome started in infancy in about 80% of cases of patent ductus and ventricular septal defect, but in only 8% of cases of atrial septal defect; even more remarkable was the fact that it started in adult life in only 2% of cases of ventricular septal defect but in 92% of cases of atrial septal defect. No further proof is needed that a high pulmonary vascular resistance in atrial septal defect is acquired. Conversely, a high pulmonary vascular resistance in the great majority of cases of patent ductus and ventricular septal defect seems to be established at birth, or at the latest in infancy.

Effort Intolerance.—As described elsewhere, four grades of effort intolerance are recognized: slight, moderate, considerable, and gross—or, of course, there may be none. Fig. 2 shows clearly that in the Eisenmenger group patent ductus is by far the best tolerated, nearly half of such cases having only slight breathlessness on effort or none at all. There was little difference between ventricular septal defect and atrial septal defect in respect of effort intolerance; the average grading was 2.5 in both—three-quarters of a grade higher than in patent ductus. The lack of symptoms in patent ductus with reversed shunt is attributed to the relatively normal oxygen tension of blood going to the head

and neck; in most cases only the blood passing down the descending aorta below the junction of the duct is appreciably desaturated. As a corollary this explanation demands that breathlessness in the Eisenmenger syndrome is due to a low arterial oxygen saturation in blood passing through the chemoreceptors of the head and neck.

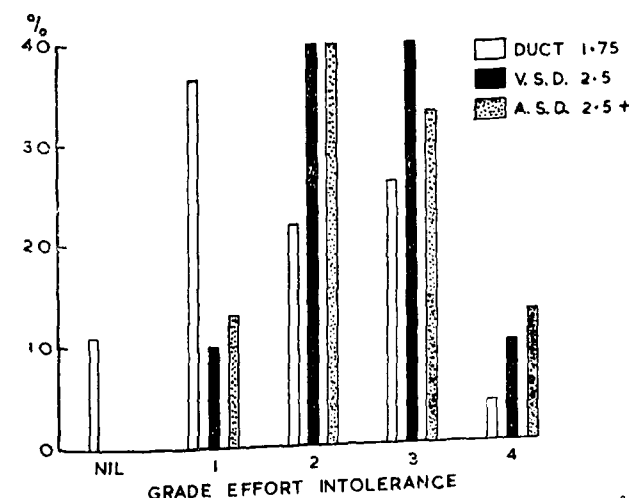


FIG. 2.—Degree of effort intolerance in the three main groups of Eisenmenger's syndrome.

Special Symptoms.—Apart from breathlessness, the chief symptoms of the Eisenmenger syndrome are angina pectoris, syncope, haemoptysis, and congestive heart failure, in that order of onset. The frequency of each in relation to the site of the shunt is given in Table IV.

TABLE IV.—Symptoms of Eisenmenger Syndrome

	Duct. %	V.S.D. %	A.S.D. %
Angina	20	14	15
Syncope	15	14	10
Haemoptysis	12	33	25
Congestive failure	12	8	10

Haemoptysis

The frequency of haemoptysis is emphasized. Its occurrence in 33% of cases of Eisenmenger's complex contrasts sharply with its 4% incidence in a parallel series of 27 cases of primary pulmonary hypertension; and its occurrence in 25% of cases of atrial septal defect with pulmonary hypertension and reversed shunt contrasts equally sharply with its 3% incidence in 300 cases of uncomplicated atrial septal

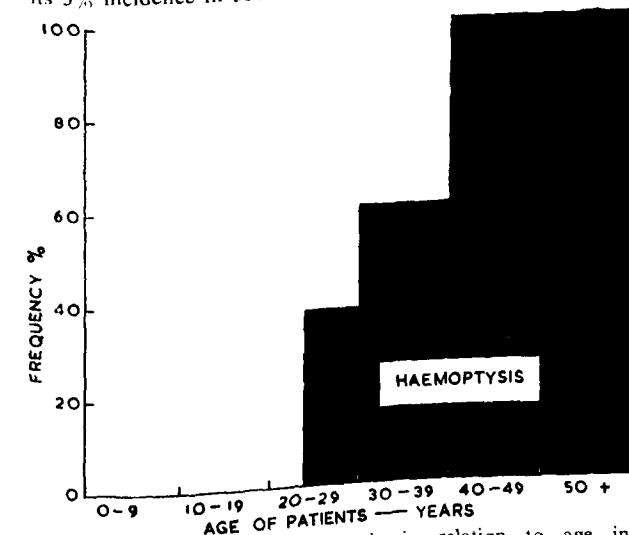


FIG. 3. Frequency of haemoptysis in relation to age in Eisenmenger's complex.

defect. It is clear from these figures that haemoptysis is not a complication of pulmonary hypertension *per se*, nor of pulmonary plethora.

In patients with Eisenmenger's complex haemoptysis was never seen before the age of 24, but thereafter it occurred with increasing frequency, to reach the 100% mark by the age of 40 (Fig. 3).

At necropsy the common cause of these haemorrhages is pulmonary infarction from pulmonary artery thrombosis (see Pathology), as in Eisenmenger's case. The factor which encourages such thrombosis in Eisenmenger's syndrome rather than in primary pulmonary hypertension may well be polycythaemia; and the factor which determines its onset relatively late in the course of the disease is probably atherosclerosis.

A large haemoptysis was the immediate cause of death in 29% of 42 fatal cases. As a rule, the patient collapsed and died within a few minutes of the onset of the haemorrhage. The sudden reduction of blood volume and fall in central venous pressure may excite a vasovagal reaction as described by Barcroft *et al.* (1944), and collapse of the peripheral resistance must result in an abrupt and profound fall in arterial oxygen tension as the blood swings away from the lungs.

Cyanosis

Cyanosis, clubbing of the fingers, and polycythaemia were all most florid when the shunt was at ventricular level and least with a patent ductus. Thus no case of Eisenmenger's complex was truly acyanotic even at rest, whereas 60% of cases with patent ductus and reversed shunt were acyanotic in the head and upper extremities. At the other end of the scale 42% of those with ventricular septal defect had considerable or gross cyanosis, compared with only 4% of those with patent ductus.

Clubbing of the fingers was, of course, closely associated with cyanosis: it was absent in 76% of the cases with patent ductus and considerable in only 5%; the respective figures for Eisenmenger's complex were 3% and 36%. With both cyanosis and clubbing cases with interatrial shunt occupied an intermediate position.

Polycythaemia was rather less unevenly distributed, indicating that hypoxia in the lower part of the body provided some stimulus to blood formation.

Differential cyanosis with or without differential clubbing was seen in 50% of cases with reversed shunt through a patent ductus. Not infrequently the left hand was an intermediate colour between the pink right hand and the blue feet.

Squatting was uncommon in all members of the Eisenmenger group, but was relatively more frequent with ventricular septal defect (15%) than with atrial septal defect (5%) or patent ductus (3%).

These five facets of arterial desaturation show that shunt reversal in the Eisenmenger complex is usually greater than in cases with atrial septal defect, and that shunt reversal in patent ductus is usually deflected down the descending aorta.

Pulse and Blood Pressure

The pulse was usually small or normal. It was small about twice as often with atrial septal defect (88%) as with ventricular septal defect (37%) or patent ductus (50%). When full or water-hammer in quality, atrial septal defect was never present except in one case with severe anaemia. Bidirectional aorto-pulmonary shunts otherwise provided the only examples of water-hammer pulses (12%).

The blood pressure was much the same in the three main groups comprising Eisenmenger's syndrome, averaging 117/74 with patent ductus, 116/78 with ventricular septal defect, and 110/72 with atrial septal defect.

Jugular Venous Pressure and Pulse.—Both venous pressure and pulse were commonly normal, but a small dominant a wave measuring about 3 mm. Hg was seen in 20 to 25% of cases of each type. A giant a wave measuring

*Transposition or corrected transposition with ventricular septal defect and a high pulmonary vascular resistance is clinically identical with Eisenmenger's complex. Skiagrams, however, may show the narrow vascular pedicle described by Taussig (1938), when the aorta lies immediately anterior to the pulmonary artery (Fig. H): or a left-sided ascending aorta forming a long slightly convex shadow below the aortic knuckle and overlying the left branch of the pulmonary artery, for which it may well be mistaken—indeed, its true identity may not be revealed until its continuity with the great vessels is demonstrated during cardiac catheterization or by means of angiocardigraphy (Fig. I). Good examples were described by Goodwin *et al.* (1949) and by Astley and Parsons (1952). Corrected transposition may be suggested by partial or complete atrio-ventricular block (Walker *et al.*, 1958).*

Atrial septal defect with reversed shunt secondary to a high pulmonary vascular resistance is unusual in men. Symptoms, especially cyanosis, are rare in infancy and childhood, and commonly do not appear before adult life. A late onset is always strongly in favour of atrial septal defect. It is probable that most of those that do begin in infancy are persistent ostium primums or common atrio-ventricular canals. Of the physical signs, a giant *a* wave and right atrial gallop are very suggestive, and a well-split second sound which does not widen on inspiration is virtually diagnostic. The right ventricle and atrium are usually larger in atrial septal defect than in other members of the Eisenmenger group, particularly in those in which cyanosis began in adult life; this is reflected in both the electrocardiogram and the skiagram. A dense dilated right pulmonary artery is also very suggestive.

Single atrium with pulmonary hypertension is indistinguishable from atrial septal defect as just described; *hemianomalous pulmonary venous drainage* closely resembles atrial septal defect clinically, but splitting of the second heart sound may vary with respiration. No cases with the Eisenmenger reaction were recognized in the present series. *Total anomalous pulmonary venous drainage* into the superior vena cava or inferior vena cava also resembles atrial septal defect clinically, but is easily recognized by the characteristic skiagram; no such distinguishing feature marks total anomalous pulmonary venous drainage into the coronary sinus. Severe pulmonary hypertension is also rare in these cases.

Physiological Findings

As defined in the introduction, the Eisenmenger syndrome is pulmonary hypertension at or around systemic level due to a high pulmonary vascular resistance (over 10 units) associated with reversed or bidirectional shunt through a large communication between the systemic and pulmonary circulations at aorto-pulmonary, ventricular, or atrial level: occasionally the physiology of the two circulations is so precisely balanced that there is no shunt in either direction. Each member of the group, however, tends to have its own distinctive characteristics.

TABLE V.—Eisenmenger Syndrome. Physiological Data

	Duct.	V.S.D.	A.S.D.
Defect catheterized	90%	28%	66%
L.A. samples: O ₂ sat. %	—	90-96	—
Pul. venous samples: O ₂ sat. %	—	95-99	95-99
Pul. cap. ven. pres. mm. Hg.	-1 to 6	0-8	0-6
B.P. minus P.A.P.	Zero	Zero	27/34 in 70%
Bidirectional shunt	42%	90%	84%
Av. increase in O ₂ sat. % in chamber receiving direct shunt	8.6	14.5	13
Pul. Sys. flow ratio	—	0.9	1.0
Pul. blood flow, l./min.	2-7	2.1-7.4	2.1-5.5
Pul. vasc. resistance (units)	22	20	17
Arterial O ₂ sat. %	77 (Fem.)	79	82

General Characteristics of the Eisenmenger Syndrome (Table V)

1. The catheter passed through the defect in 90% of the ducts, one-third of the aorto-pulmonary windows, 28% of ventricular septal defects, and two-thirds of atrial septal defects.
2. A patent foramen ovale was penetrated in four cases of Eisenmenger's complex, but in no case of patent ductus. Left and right atrial pressures were similar and left atrial samples were 90 to 96% saturated with oxygen. In these cases, and also in atrial septal defect with reversed shunt, pulmonary venous samples were fully saturated (95 to 99%). This proves that there is ordinarily no pulmonary factor contributing to the cyanosis of the Eisenmenger syndrome.
3. The pulmonary capillary venous pressure was uniformly normal or low, averaging 2 mm. Hg. and ranging between -1 and 6 mm. Hg. with reference to the sternal angle in all groups. Only in one case with heart failure was it elevated. It is presumably raised, however, in those cases of total anomalous pulmonary venous drainage in which the

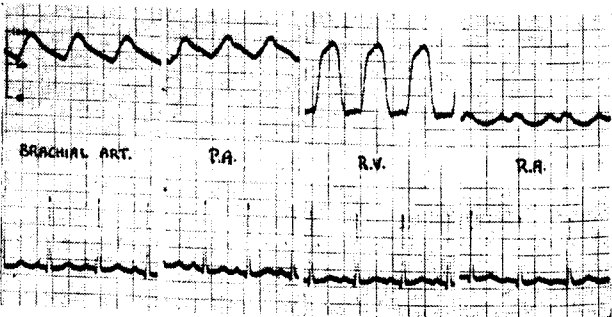


FIG. 8.—Identical systolic pressures in the brachial artery, pulmonary artery, and right ventricle in a case of Eisenmenger's complex. Note the normal right atrial pressure pulse.

common vein carrying all the blood from the lungs is stenosed at its junction with the superior or inferior vena cava.

4. Pulmonary and systemic blood pressures were practically identical in all varieties of Eisenmenger's syndrome in which the shunt was at aorto-pulmonary or ventricular level (Fig. 8). Their unity was preserved in the presence of any agent which normally influences one or other circulations more or less selectively—for example, exercise, pulsus alternans, ectopic beats, systemic vasodilators such as amyl nitrite, and systemic vasoconstrictors such as noradrenaline. This is well illustrated by the effect of the Valsalva manoeuvre (Fig. 9).

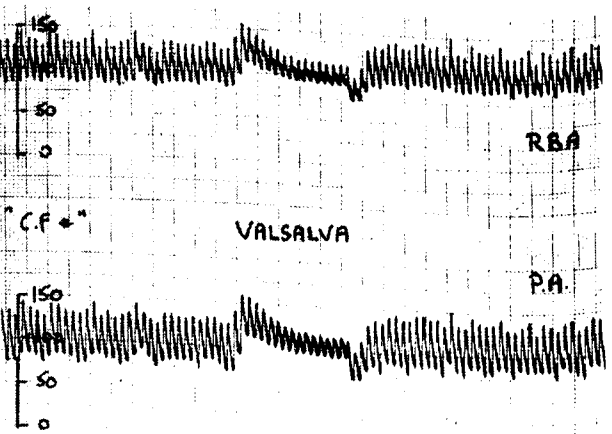


FIG. 9.—Identical pressures in the right brachial artery and pulmonary artery during the Valsalva manoeuvre in a case of Eisenmenger's complex.

5. Shunts were bidirectional rather than wholly reversed in 42% of cases with patent ductus, 90% of those with ventricular septal defect, and 85% of those with atrial septal defect. The left-to-right component of a bidirectional shunt commonly increased the oxygen saturation of samples from the relevant chamber and beyond by about 10%; the average increase was 8.6% in patent ductus, 14.5% in ventricular septal defect, 16% in single ventricle, and 13% in atrial septal defect, omitting from the calculations cases in which the shunt was wholly reversed or absent altogether. In two cases of patent ductus there was no shunt either way.

6. Pulmonary incompetence increased the oxygen saturation or right ventricular samples in cases with aorto-pulmonary bidirectional shunt, and tricuspid incompetence influenced right atrial samples similarly in cases with bidirectional ventricular shunt.

7. The pulmonary blood flow ranged between 2 and 7 litres per minute in all groups, and averaged 4 litres per minute. The pulmonary/systemic flow ratio averaged close to unity, and never exceeded 1.75. The oxygen saturation of samples from the pulmonary artery rarely exceeded 75 to 80%.



FIG. A.—Skiagram showing a "double aortic knuckle" above a dilated pulmonary artery in a case of patent ductus.



FIG. B.—Typical radiological appearances in Eisenmenger's syndrome; the pulmonary arc is conspicuous, and the pulmonary vascular markings are fairly normal. A case of aorto-pulmonary septal defect.



FIG. C.—Skiagram showing gross dilatation of the pulmonary artery and the right branch in a case of pulmonary hypertension with reversed interatrial shunt.



FIG. D.—Diminished pulmonary vascular markings in a case of Eisenmenger's complex with corrected transposition.

PAUL WOOD: THE EISENMENGER SYNDROME

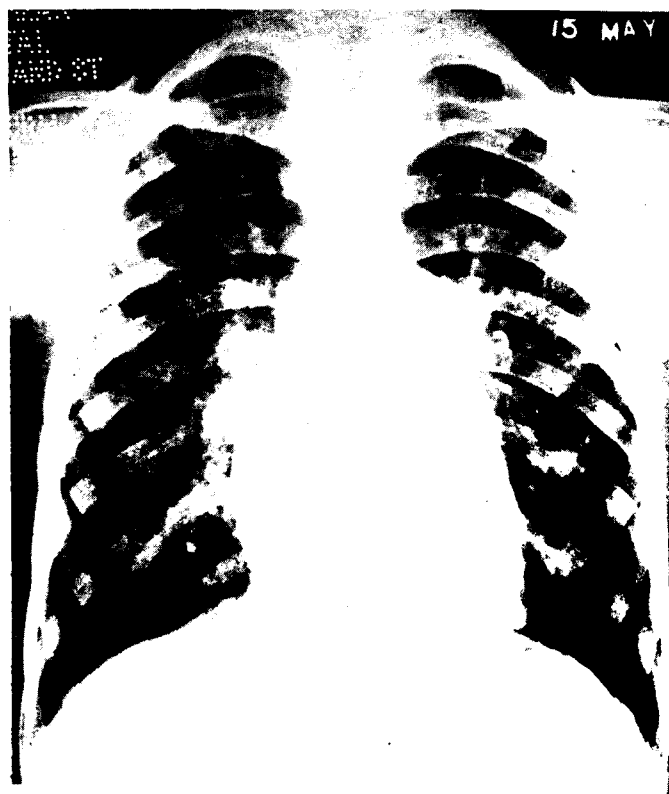


FIG. E.—Moderate pulmonary plethora and slight dilatation of the left atrium in a case of Eisenmenger's complex with increased pulmonary blood flow, probably associated with a single ventricle.

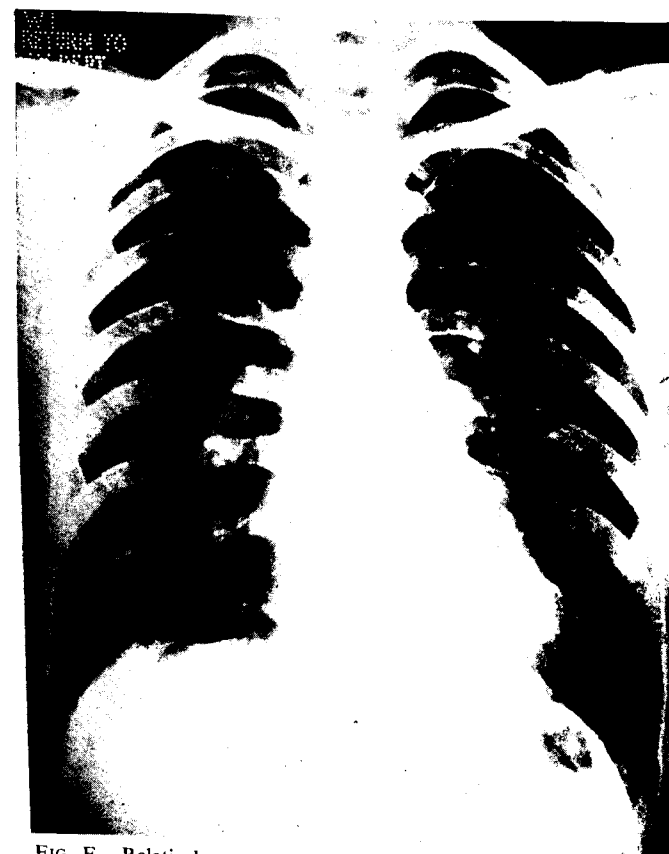


FIG. F.—Relatively normal pulmonary vascular markings in a case of Eisenmenger's complex.

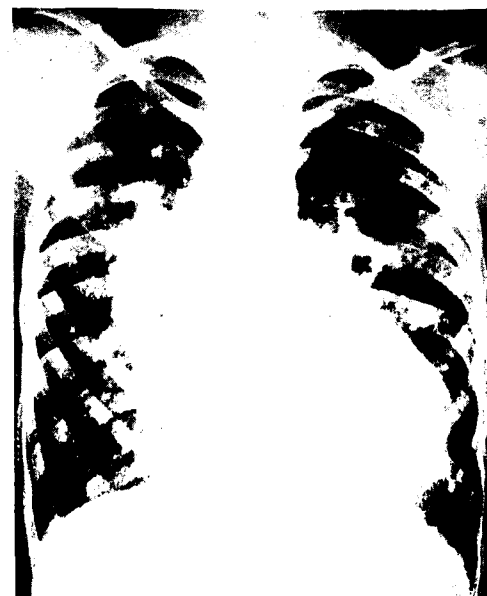


FIG. G.—Persistent truncus arteriosus showing a bay in the region of the pulmonary arc and considerable dilatation of the proximal pulmonary artery branches which are coming off the trunk.

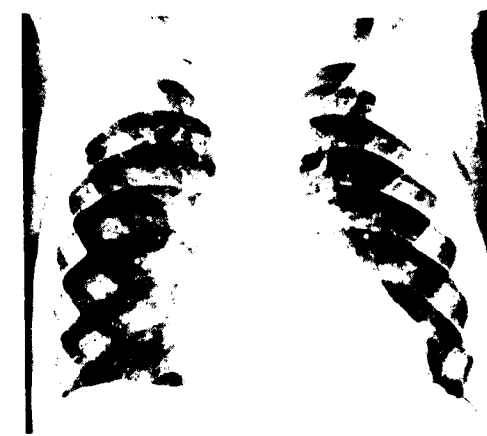


FIG. H.—Transposition of the great vessels, showing the slender waist and slight pulmonary plethora despite the high pulmonary vascular resistance.



FIG. I.—Angiocardiogram showing a left-sided ascending aorta in a case of Eisenmenger's syndrome associated with transposition or corrected transposition.

8. The pulmonary vascular resistance ranged between 10 and 45 units (800 to 3,600 dynes sec./cm.²), and averaged 22 units in patent ductus, 20 units in Eisenmenger's complex, and 17 units in atrial septal defect. When considering the resistance, due allowance should be made for the smaller blood flows of infants and small children.

9. The arterial oxygen saturation (femoral in cases of patent ductus) averaged between 77 and 82% in all groups, and was remarkably close to the mean in three-quarters of all cases.

[The second part, together with a list of references, will appear in our next issue.]

ARTERIAL OCCLUSION COMPLICATING THORACIC OUTLET COMPRESSION SYNDROME

BY

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It is well known that a cervical rib, a fibrous band in the anterior border of the scalenus medius, or an enlargement on the first rib may cause symptoms of vascular disease in the upper limb, but it is less well appreciated that the result may be a major amputation, ischaemic contracture of the fingers, or ischaemic muscle pain in the forearm and hand. Three cases have been recorded in the literature in which proximal spread of arterial thrombosis had reached the bifurcation of the innominate artery and caused hemiplegia. We believe that this complacency may be attributed to the excellent collateral circulation in the upper limb, which in the more minor lesions leads to minimal symptoms and spontaneous recovery; to the still widely held theory of a nervous origin for these symptoms, leading possibly to inadequate examination of the patients' vessels; and to the paucity of cases of major arterial occlusion due to cervical rib recorded in the literature. The admission of six such patients to this unit within the past 12 months, however, suggests that the incidence of these major occlusions may be higher than is generally realized.

In 1911 Todd, having noticed that the lowest trunk of the brachial plexus is intimately related to a cervical rib more often than is the subclavian artery, suggested that vascular symptoms associated with such a rib might be due to paralysis of the sympathetic fibres running in this trunk. With increasing knowledge of the function of the autonomic system, Telford and Stopford (1931) rightly pointed out that the colour changes induced are those of overactivity, not of paralysis, of the sympathetic fibres. By administration of ergot they induced end-arteritis and thrombosis of the vessels in the combs of cocks and concluded that if arterial "spasm" be continued for a long period occlusion of the affected vessels can occur, and that irritation of the sympathetic fibres can occur, and that irritation of the sympathetic fibres crossing the cervical rib in the lowest trunk of the brachial plexus would thus explain all the vascular features seen in these patients, including disappearance of the brachial pulse. Moreover, they showed by a series of dissections that in some subjects the sympathetic fibres are aggregated into a bundle in the lower

part of this trunk, and argued that only in such a patient could these fibres be irritated, thus explaining the much greater incidence of neurological than of vascular symptoms associated with cervical rib.

Lewis and Pickering (1934) exposed the shortcomings of this theory by pointing out, firstly, that chronic irritation of a nerve trunk results in paralysis, not stimulation, of the fibres, and that there appears to be no reason why autonomic fibres should behave differently; and, secondly, that in cases of cervical rib the patients with vascular symptoms rarely have neurological features, whereas on the basis of this theory mixed cases should be regularly seen. Their own patient showed periarterial fibrosis, and it was demonstrated at operation that the subclavian artery was nipped between the abnormal rib and the clavicle when the arm was abducted. They suggested, therefore, that in these cases damage to the subclavian artery is followed by local mural thrombosis and that all the vascular features can be explained by embolism or by spreading thrombosis. Eden (1939) strongly supported this theory with the evidence of two further cases, and we submit that our experiences can be explained on no other basis. Support for this theory is also to be found in the not infrequent occurrence of a systolic murmur over the subclavian artery in these patients, indicating turbulence in the blood flow at this point.

Brachial Artery Occlusion

In patients with occlusion of the brachial artery a careful history revealed that a sudden onset of ischaemic symptoms in the hand and forearm was followed by a gradual recovery which may have been marred by one or more further acute episodes. On examination a powerful brachial pulse ceased abruptly in the vicinity of the lower border of the pectoralis major or the middle of the arm, points corresponding approximately to the origins from the brachial artery of major collateral vessels. After treatment, or even spontaneously, pulsation may return in the radial artery, though not in the lower brachial artery. These are the typical history and findings of a brachial embolus, which affords a much more convincing explanation of such a clear-cut picture than does a series of events consequent on sympathetic irritation. Injury may play a part in liberating an embolus, as illustrated by Cases 1 and 2, and may be a single blow or the repeated minor traumata associated with a particular occupation.

Case 1

A man aged 46 gave the history that following a fall on to his outstretched left hand at the end of February, 1957, the hand had suddenly become "numb," painful, cold, and white. On March 3 at another hospital a left upper thoracic ganglionectomy was performed, following which he noticed a pulsating swelling in his neck but no improvement of his hand. On March 17 he again had sudden severe pain in his hand, with marked pallor and coldness, and a brachial embolectomy was attempted but with only transient success.

He was admitted to our wards on June 28 with gangrene of the tips of the thumb and index and middle fingers and ischaemic atrophy of the hand. All the interphalangeal joints were almost fixed and movements at the metacarpophalangeal joints were greatly restricted by ischaemic contractures. The hand was white when elevated, cyanosed when dependent. The pulsation in the neck was the subclavian artery, which showed no aneurysm but was more prominent following division of the scalenus anterior at the sympathectomy. The brachial pulse ceased abruptly at the middle of the arm. X-ray examination showed no cervical rib, but a large boss on the first rib in the region of the subclavian groove.

At operation on July 10 the left first rib was removed, following which the colour and temperature of the hand

slowly improved, but when last seen there had been little improvement in the movement of his fingers.

Comment.—The sequence of events in this case appears to have been mural thrombosis of the subclavian artery, dislodgment by the fall of an embolus which lodged at the brachial bifurcation, and consecutive thrombosis to involve collaterals on March 17, removal of this clot being followed by thrombosis. The end-result is loss of the tips of the thumb and index and middle fingers and of 75% of the function of the hand.

Case 2

A man aged 22 was transferred to our ward from another hospital on May 11, 1957. In November, 1956, he used a Kanga drill at work for a day and a half, but thereafter did not use it again, as it caused considerable discomfort in his right upper limb. In December he suddenly developed pain in the right hand and numbness and tingling of the fingers, but spontaneous recovery began a few hours later. At the beginning of May, 1957, he experienced pain of sudden onset in his right hand and forearm, which became white and cold as high as the elbow, but, anticipating spontaneous cure as on the previous occasion, he did not seek advice for several days, by which time established gangrene of the fingers was found. He was at once admitted to hospital, where a brachial plexus block was performed and tolazoline hydrochloride injected intra-arterially. These measures had little effect and he was immediately transferred to St. Mary's Hospital.

On admission he complained of pain in the hand at rest, with severe pain in the forearm on movement of the fingers or wrist. The limb was cold and blue from the elbow downwards with diminution of sensation to pinprick and complete loss to light touch. There was dry gangrene of the three middle fingers and of the terminal phalanges of the little finger and thumb. The axillary pulse was strong but ceased abruptly at the lower border of the pectoralis major muscle. X-ray examination revealed a complete cervical rib.

The limb was cooled by exposure to a stream of air from an electric fan and vasodilatation encouraged by applying heat to the body and remaining limbs and by the administration of alcohol. Heparin was given intravenously to diminish the risk of arterial thrombosis in those vessels still patent. These measures produced little change in the appearance of the limb but averted spread of gangrene. On May 13 the cervical rib was excised with its periosteum and upper thoracic ganglionectomy performed. Post-operatively reflex vasodilatation and anticoagulant therapy were continued, and gradually the area of threatened gangrene receded distally. Amputation was postponed until July 24, when a line of demarcation was well established and it was possible to save the proximal part of the hand and portions of the thumb and little finger as a basis for later fashioning of a claw hand.

Comment.—This case also shows how a warning embolus may be followed by a more serious one with disastrous results. It also points the moral that amputation in embolic vascular disease should be delayed until the gangrenous tissue is clearly demarcated, for the line is almost invariably much more distal than the initial appearance would suggest. On admission the general impression was that nothing could save this young man from a formal below-elbow amputation.

Case 3

A girl of 15 years was admitted to hospital on January 26, 1957. Eight months previously she had developed tingling in the right hand and fingers and had noticed that the hand became white and painful if held above her head. Six weeks before admission the tip of her little finger became blue, as did the middle one shortly afterwards. Two weeks before admission she developed sudden severe pain in the forearm and hand, which became cold and white and later became cyanosed.

On admission the right forearm and hand were colder than the left and there was gangrene of the tips of the middle and little fingers. The whole hand was a dusky blue colour and little movement of the fingers was possible. On the right side of the neck a cervical rib was palpable with a prominent subclavian artery, over which a systolic murmur was clearly heard. No pulsation could be felt below the middle of the arm, at which point the brachial pulse ceased abruptly.

On January 28 a complete cervical rib was removed and upper thoracic ganglionectomy performed. The hand immediately became much warmer, finger movements rapidly improved, and the gangrenous areas became demarcated.

Comment.—This case also illustrates the probability of further embolism if the first one is ignored, but fortunately in this case the result was less serious.

Case 4

A man aged 46 was operated upon elsewhere in February, 1956, for bilateral inguinal hernia and developed post-operative pulmonary collapse. Serial chest x-ray films revealed that during this period he sustained a stress fracture of the right first rib near the scalene tubercle. Just before Christmas, 1957, he noticed considerable aching in his right forearm during shaving, and he had to rest several times during this operation with the arm hanging down, but as he often suffered from rheumatic myalgic pains he was not unduly alarmed. As symptoms persisted, however, he reported to his surgeon at the end of January, 1958, and was referred to us with the correct diagnosis, for examination showed that the brachial pulse ceased abruptly just below the lower border of the pectoralis major and x-ray examination for cervical rib revealed a large mass of callus on the first rib. On admission to hospital on February 25 we confirmed these findings, but, in addition, pulsation had returned in the radial artery and a pulsating collateral vessel was found in front of the medial epicondyle of the humerus.

At operation on March 3 the subclavian artery was found to have a soft friable wall, and in fact ruptured when depressed by a finger. Upper thoracic ganglionectomy was performed after suture of the artery, but it was deemed wiser not to interfere with the first rib. Post-operatively the hand was warmer and was no longer cyanosed when dependent.

Case 5

A woman aged 32 was awakened by sudden severe pain along the inner border of the forearm and hand and she noticed that the hand quickly became cold and white. Attempts to use the hand increased the pain. The condition improved gradually during the next two weeks, but on raising the arm above the head the hand still became white and numb.

On admission to hospital at this stage in February, 1952, the left hand and forearm were paler and colder than the right and no pulsation was palpable below the middle of the arm. Cervical ribs were palpable on both sides of the neck with prominent subclavian arteries overlying them.

At operation the subclavian artery on the left side was found to be constricted between the scalenus anterior and the abnormal rib. Division of the muscle was followed by vessel. A complete cervical rib was excised and upper thoracic ganglionectomy performed. Post-operatively the hand became warm and pink and pulsation returned in the radial artery. Unfortunately it has not been possible to see this patient since her discharge from hospital.

Subclavian Artery Thrombosis

Complete occlusion of the subclavian artery is less common than embolism in these patients, but may occur as a consequence of local mural thrombosis in one of two ways. Firstly, the thrombus may increase in size until it

occludes the vessel. If this process occurs gradually one would expect the collateral circulation to increase steadily with decrease of the flow in the main vessel, and the distal vessels to remain patent. Symptoms would develop gradually and probably would remain minimal. On the other hand, rapid occlusion of the subclavian artery would cause symptoms of sudden onset with gradual improvement as the collateral vessels dilated. Stammers (1950) records such a case. Secondly, a brachial bifurcation embolus could be followed by consecutive thrombosis, in which case a sudden onset of symptoms would be followed by deterioration, either steadily or spasmodically, depending on the rate of spread of thrombosis. It is in this group that the risk of gangrene is greatest, for the major collateral channels are occluded at their origins from the main artery. Reviewing 29 cases which they were able to trace in the literature, Schein *et al.* (1956) point out that two out of four patients under 35 years sustained major amputations, and 11 of the 29 had minor amputations.

Case 6

A woman aged 37 was admitted to hospital in September, 1957. In 1947 she had noticed a hard swelling above the left clavicle which had been removed at another hospital but had recurred. At this time she had been told that she had an extra rib. In January, 1957, tingling in the fingers of the left hand, with a feeling of numbness, and pain in the forearm and hand on use developed, and the hand became cold. All these features began simultaneously and suddenly and she noticed that if she used cold water the hand rapidly became blue, but a pink colour was restored by warmth. Since January the symptoms had become gradually worse and the hand constantly blue and cold.

On examination there was a palpable left cervical rib with a visible subclavian pulse medial to it. There was no palpable pulse beyond the rib and the axillary artery could be felt as a solid cord as far as the lower border of the pectoralis major. The hand was cold and blue, the grip weak, ischaemic pain came on rapidly, and there was impaired sensation of the fingers.

At operation on September 18 the subclavian artery was found to be thrombosed from the point at which it crossed a cervical rib. The rib was removed and upper thoracic ganglionectomy performed. Post-operatively the hand became warm and pink but no pulsation had returned to the distal vessels when the patient was discharged from hospital.

Comment.—The original operation in 1947 was excision of a cervical rib, presumably subperiosteal as the rib re-formed, and the subclavian artery thrombosis may have been induced by the operative trauma. The interval of 10 years between operation and the onset of vascular symptoms, however, suggests that it was spontaneous. It is clear that subsequently thrombosis had spread distally to the upper arm.

Case 7

A man aged 55 was admitted to hospital on September 10, 1957. Four months previously he had dropped a cup of tea because his right hand had suddenly become weak, and soon afterwards his fingers began to tingle. Since that time he had noticed difficulty in using his right hand, numbness of his fingers, and pain in his forearm and hand on use. More recently the hand became blue but the other features remained unchanged.

On examination the right hand was cold and the fingers were blue. No pulsation could be felt in the limb or root of the neck. X-ray examination revealed a short cervical rib on the right side.

At operation the subclavian artery was found to be acutely kinked and narrowed over a stout cord-like structure passing from the end of the cervical rib to the first rib, and was thrombosed from this point distally. The rib and cord were excised and upper thoracic ganglionectomy was per-

formed. Post-operatively the hand became pink and warmer, but the tingling persisted in the fingers. Use of the hand was being regained slowly two weeks later.

Comment.—The severity of the initial symptoms suggests that they were due to a brachial embolus from the obviously traumatized subclavian artery, which in turn became thrombosed either by consecutive thrombosis or, less likely, by spread of the intramural clot, consequent on the reduced blood flow through the vessel.

Vascular Symptoms Associated with Cervical Rib

The majority of cervical ribs cause no symptoms, but their owners are no less liable to other disease than are their fellows. Consequently it is not surprising that patients are sometimes seen with both vascular symptoms and cervical ribs which are no more than coincidental.

Case 8

A woman aged 70 was admitted to hospital in the afternoon of October 11, 1957. At lunch her hand became suddenly cold and white and the least movement of her fingers caused acute pain in the forearm.

Examination revealed that the right hand and forearm were colder and paler than the left, the brachial pulse ceased at the elbow, and there was no radial pulse. X-ray examination showed bilateral incomplete cervical ribs. The limb was kept cool, the body heated, vasodilatation encouraged with brandy and tolazoline hydrochloride, and anticoagulants were given to limit thrombosis. Symptomatic recovery proceeded steadily and the radial pulse became palpable on October 18.

One month later the patient was readmitted with congestive heart failure, and it appears likely that the source of the brachial embolus was a myocardial infarct.

Case 9

A man of 75 years was referred to the out-patient department with gangrene of the tips of his middle and little fingers. The radial pulse was palpable and the hand warm, but the affected fingers were cold and blue. X-ray examination revealed bilateral cervical ribs. The diagnosis of digital artery thrombosis due to atherosclerosis was made and recovery ensued without active treatment.

Case 10

A girl of 19 years was admitted to hospital on December 6, 1956, with a typical history of Raynaud's phenomenon in the hands, and complaining also of cold feet and blue legs. On examination all the peripheral pulses were palpable, the subclavian arteries were elevated on cervical ribs, and over the left one a systolic murmur was clearly heard. X-ray examination confirmed the presence of bilateral complete cervical ribs.

At operation the left subclavian artery presented a palpable thrill and was nipped between the rib and a band passing over the vessel. The ribs were excised and upper thoracic ganglionectomy was performed.

Comment.—This girl had the sympatheticotonic conditions of Raynaud's phenomenon of the hands and also cyanosis of the legs in association with cervical ribs. Nevertheless, the subclavian murmur and the operative findings strongly suggest that mural thrombosis had developed as a result of the rib on the left side, and it may be that timely operation has prevented embolus or major thrombosis. When last seen in January, 1958, the upper limbs were symptom-free and the pulses normal.

Discussion

Normally the subclavian artery passes from the thorax to the arms in a smooth curve over the broad surface of the first rib. The effect of a cervical rib is to raise the artery in the neck, thus sharpening the curve, and it now crosses the comparatively narrow surface of the cervical rib or the

narrow rigid band connecting the tip to the first rib. Any drag on the arm, therefore, will angulate the artery over a rigid structure, and a common complaint of these patients is inability to carry a heavy package on the affected side. Case 7 illustrates this point well, and it affords a probable explanation of the attacks of Raynaud's phenomenon which form the only symptoms of an occasional patient with cervical rib. Eden (1939) described a case in which scalenotomy was ineffective in relieving symptoms and a second operation was required for removal of the underlying rib, and Smith (1940) recorded a case of subclavian artery thrombosis due to kinking of the vessel by a fibrous band in the anterior border of the scalenus medius.

Clearly, then, angulation alone by an abnormal structure may be sufficient in time to damage the vessel, but there is evidence obtained at operation in such patients that the artery may also be subjected to further compression between the abnormal structure and the overlying scalenus anterior or clavicle. Case 5 is an example of this, and Lewis and Pickering (1934) were able to demonstrate the nipping of the subclavian artery between a cervical rib and the clavicle in their patient when the arm was abducted. Patterson (1940) describes an interesting case in which symptoms occurred on the second side three years after operation on the first, and it was seen at operation that the artery was greatly compressed between a cervical rib and the scalenus anterior. Division of the muscle afforded only partial relief of the compression, but the artery became 40% larger when the rib was removed.

Periarterial fibrosis may or may not be present in these cases, but appears to afford no indication of the severity of damage to the artery. In Case 4, for example, little or no fibrosis was present, yet the artery was soft and dilated and so friable that it ruptured at the touch of a finger. Stammers (1950) had a similar experience, and Adson (1947) reported two cases of rupture of the artery after scalenotomy, one as the operation was being concluded and the second on the twelfth post-operative day. That Telford (Telford and Mottershead, 1947) found no periarteritis in many of his cases cannot, therefore, be used to support his theory.

It has been suggested as an objection to the occlusive explanation of vascular symptoms in these cases that ligation of the subclavian artery distal to the thyrocervical trunk causes no symptoms and hence a mural thrombus should not do so. In fact, it does not, until either it becomes a complete occlusion or is cast off as an embolus, when symptoms of some duration are produced. Transient Raynaud attacks are due to intermittent occlusion of the artery by increased angulation or compression. Hyperhidrosis is quoted as evidence in favour of Telford and Stopford's (1931) theory, but this is an uncommon symptom in cervical rib patients with vascular features and we see sporadically patients with hyperhidrosis but no evidence of cervical rib. It is our opinion that when the two conditions occur in the same patient they are not cause and effect but are purely coincidental.

Whichever theory one believes, there can be no doubt that once vascular symptoms appear the rib should be removed. To add upper thoracic ganglionectomy takes only a few extra minutes, and in our opinion should always be done to secure rapid and maximal dilatation of the collateral vessels around the block in the main channels. Theoretically, one should also excise the affected segment of subclavian artery to prevent further emboli or thrombosis, and replace it with a homograft to restore normal blood flow, and this is advocated by Schein *et al.* (1956). We believe, however, that these advantages are largely theoretical. In cases of brachial embolus the distal vessel is blocked and a graft will do no more to improve the circulation to the hand and forearm than a sympathectomy. After removal of the traumatizing rib it is probable that the mural thrombus will organize, that the risk of a further embolus is small, and hence there is little to be gained by thromboendarterectomy. On the other hand, there is an appreciable incidence of thrombosis of grafts in vessels of this size,

particularly if end to end; the collateral circulation in this region is excellent and we believe the extent and duration of the operation are not justified by the slight improvement to be expected over a sympathectomy.

The ideal would be to remove the cervical rib before vascular complications occur, but, as the great majority of these ribs never cause symptoms, clearly some selection would be required. We suggest that the presence of a murmur over the subclavian artery indicates turbulence in the blood flow due to the rib (or to athero-sclerosis) and that in such a patient serious consideration should be given to the advisability of operation. Telford and Mottershead (1947) have shown that so many normal persons can obliterate the radial pulse by various postural manoeuvres that these are quite valueless in cases of cervical rib. Adson's deep-breathing test, however, does not fall into this class, for it depends on the action of the scalenus anterior as an accessory muscle of respiration, and obliteration of the radial pulse by this means suggests compression of the subclavian artery between a cervical rib and the muscle. We suggest that, while this does not in itself constitute an indication for operation, such a patient should be watched for the development of a subclavian murmur or of vascular symptoms, and operation advised should either appear.

Summary

Attention is drawn to the serious results which may ensue if vascular symptoms in association with a thoracic outlet compression syndrome pass unrecognized or are disregarded; for, though they may be coincidental, not infrequently they provide the initial evidence of damage to the subclavian artery. The end-result may be loss of fingers, ischaemic contracture of forearm and hand, or a major amputation, following occlusion of the main vascular channels by embolism or thrombosis: examples of each are described.

Further evidence of the purely vascular origin of these symptoms as distinct from an indirect autonomic effect is presented.

Treatment is briefly discussed and suggestions are made for the selection of those patients with cervical ribs in whom vascular complications may arise and for whom excision of the rib should be advised.

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Two new training films for nurses, on lifting patients, have been made by the Ministry of Health, with the help of the Central Office of Information. The first deals with the lifting of patients in hospital, and demonstrates diagrammatically with an animated skeleton the effect on the body of a good and bad lift, and how the latter can cause injury. Two basic ways of lifting are shown, the usual hospital one, and the shoulder (or Australian) lift. The second, which is primarily to help district nurses and health visitors, could also be of use to relatives who are nursing patients at home. Various everyday situations are illustrated, including the lifting by a district nurse of a helpless patient in a low bed, and in a double bed, in cramped surroundings and without other help. Both these films are 16 mm. and can be hired from the Central Film Library, Government Building, Bromyard Avenue, Acton, London, W.3, at 5s. for the first day and 1s. for subsequent days. The films may be purchased for £10 12s. 6d. for Part I and £8 10s. for Part II.

EFFECTS OF SALTS OF NICOTINIC ACID ON SERUM CHOLESTEROL

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In 1955, 1956, and 1958 we reported that nicotinic acid (niacin) in relatively high doses—in man 1 g. or more per 50 lb. (44 mg. per kg.) body weight per day—in many instances decreases the serum cholesterol in man and rabbits, and in rabbits inhibits experimental cholesterol atherosclerosis. This has been fully confirmed by other authors (for man by Parsons *et al.*, 1956; Achor *et al.*, 1957; O'Reilly *et al.*, 1957; Parsons and Flinn, 1957; Goldner and Vachalek, 1958; and for rabbits by Merrill and Lemley-Stone, 1957).

There is the question whether such a high dosage is toxic, especially for the liver. A number of liver-function tests and other routine examinations on patients who were being given this treatment for relatively long periods revealed nothing abnormal. In experimental animals which had received still larger doses the results were most contradictory. In 1939 Unna pointed out that the toxicity of nicotinic acid, as reported by Elvehjem *et al.* (1938) for one single dog, was likely due to the high acidity of nicotinic acid rather than to a specific action. This was borne out by the innocuity of sodium nicotinate used by Ackermann (1912), whose experiment had been repeated by Elvehjem *et al.*, but substituting nicotinic acid for the sodium salt. Unna showed that the acid has a pH of 3.3, whereas a solution of sodium nicotinate, corresponding to 10% of the acid, has a pH of 7-7.1. Unna stated further: "Sodium nicotinate is completely dissociated in solution, and thus no difference in the action of this compound from that of the acid itself is to be expected."

Even after Unna had explained the toxic action of very large doses of nicotinic acid by its high acidity and suggested the use of its sodium salt in animal experiments, a number of authors have continued to study the toxic effect of large doses of nicotinic acid and to ascribe this effect to a specific action, thus disregarding the findings of Unna. Handler and Dann (1942) reported that rats fed a diet containing 2% nicotinic acid gained weight, but developed fatty livers, as established by their increased content in fatty acids. No microscopical examination was done. On the other hand, nicotinamide did not produce fatty livers, but arrested the growth of the animals. Contrariwise, Aschkenasy and Mignot (1946) found that nicotinamide did not arrest growth, but produced necrotic foci in the liver and an increase of its fat content. These last two changes were conspicuous when the animals were given a protein-free diet, less so when the feed contained casein. Finally, Janes (1953) found no alteration of liver lipids after injection of nicotinic acid into rats. There are also many contradictory reports on blood-sugar levels and

on liver glycogen after administration of nicotinic acid. Hallay (1957) and other physicians prescribe in many instances nicotinic acid for lowering the blood sugar in humans.

Animal Experiments

In animal experiments which we have performed in our laboratory on rabbits and on rats we have found that feeding of high doses of nicotinic acid caused no morphological or biochemical changes which could be ascribed to the nicotinic acid. This was especially clear in nine rabbits which had shown no pathological changes whatever, in spite of the fact that during 90 days they had received not only 45 mg. of nicotinic acid daily but also cholesterol. In four young rats, fed for 14 days a balanced diet containing 2% nicotinic acid, to duplicate the experiments of Handler and Dann (1942), the animals continued to gain weight, just as theirs did. When the rats were killed the microscopical examination showed, however, no signs of fatty liver and the chemical analysis gave no increase of total fat. It should be pointed out that in the experiments of Handler and Dann the dose of nicotinic acid per kilogram of body weight of the animal would correspond in an adult man of 70 kg. to 154 g. daily.

However, there are human cases reported in which the treatment with large doses (3 to 6 g. daily of nicotinic acid) had to be interrupted for certain periods, or discontinued altogether, because of intervening gastro-intestinal disturbances. According to Achor *et al.* (1957), in a series of 45 patients the treatment had to be abandoned in three cases on account of nausea and diarrhoea. In our opinion this may be due to the high acidity—that is, to an unspecific factor—rather than to a specific action of nicotinic acid. Therefore we decided to test large doses of buffered nicotinic acid in order to find out whether or not their effect on serum cholesterol is comparable to that of pure nicotinic acid. As a matter of fact, many clinicians who treat various diseases, but mainly such of the circulatory system, with small—that is, "vitamin"—doses of nicotinic acid do not use the acid proper, but either sodium or magnesium nicotinate, and that per os or by injections.

Present Investigation

We submitted a group of university students to a test in which they received 1 g. of buffered nicotinic acid (0.6 g. of sodium bicarbonate for each gramme of acid) three times a day for two weeks. This test is explained in Table I and

TABLE I.—Serum Cholesterol* Before and After Administration of Buffered Nicotinic Acid (3 g. per day)

Subject No.	Cholesterol (mg./100 ml. Serum)		
	Initial	After 7 Days	After 14 Days
1	218	160	142
2	178	143	132
3	252	225	235
4	175	152	132
5	223	214	196
6	198	182	162
7	232	195	188
8	222	166	156
9	162	176	167
10	178	141	135
11	149	130	132
12	230	335	163
Mean	201.4	184.9	161.7

* Determination by Schönheimer-Sperry's method, as modified by C. S. McArthur.

shows that relatively large doses of buffered nicotinic acid decreased serum cholesterol in young healthy adults. The decrease compares well with two previous tests on similar and partly identical groups in which unbuffered nicotinic acid had been used.

Treatment with buffered nicotinic acid for two weeks lowered the mean cholesterol level for the 12 subjects from

201.4 to 161.7 mg. per 100 ml. This difference is highly significant ($k=2.44$, $P=0.01$). The decrease after one week is statistically not significant, owing apparently to one very high reading for subject No. 12.

Six of the subjects had participated in an earlier experiment in which they received nicotinic acid. The change in cholesterol observed during the previous experiment is shown in Table II. Subject numbers for both tables are the same.

TABLE II.—Serum Cholesterol Before and After Administration of Nicotinic Acid (3 g. per day) (from Altschul and Hoffer, 1958)

Subject No.	Cholesterol (mg./100 ml. Serum)		
	Initial	After 7 Days	After 14 Days
1	202	179	148
2	200	160	146
3	200	182	161
4	235	207	200
5	206	155	148
6	197	157	173
Mean	206.7	173.3	162.7

The changes in cholesterol levels were practically identical in both experiments. In five of the subjects the decrease in cholesterol was within 8%.

In a previous study Hoffer and Callbeck (1957) found the following regression equation relating initial cholesterol level to expected decrease after two weeks' treatment:

$$y = 0.52x - 71,$$

where y = decrease in mg./100 ml.
 x = initial cholesterol level in mg./100 ml.

With this equation the predicted value in this study is 167.7, the actual 161.7.

These observations show that the response to both nicotinic acid and nicotinic acid buffered with sodium salts is practically identical.

Obviously, in those cases in which sodium intake should be kept low potassium bicarbonate can be substituted in any desired proportion for the sodium bicarbonate. A very practical preparation seems to be the following: to 500 ml. of distilled water containing 32 g. of sodium bicarbonate (or 16 g. of NaHCO_3 and 16 g. of KHCO_3) is added slowly 50 g. of pure nicotinic acid, preferably in a wide container, to avoid "overbubbling." Of this solution, 1 tablespoonful of 10 ml. will contain buffered nicotinic acid corresponding to 1 g. of pure nicotinic acid. The best way to take this seems to be 1 tablespoonful diluted in one glass of water after lunch, 2 tablespoonfuls in one glass of water after the evening meal. In case larger doses are required, the amount is increased in proportion. Sipping of this solution over a prolonged period (approximately 60 minutes) may decrease the vascular dilatation, which is in some sensitive people an unpleasant side-effect. Since this vascular reaction usually disappears after three to seven days, the precaution of sipping the solution may then be discontinued. Of course, for practical reasons, especially in those cases where the patients do not take their meals at home, nicotinic acid, sodium (and potassium) bicarbonate, and some starch may be pressed into effervescent tablets and dissolved prior to taking the drug, possibly again after the main meals.

Finally, sodium nicotinate may be prescribed in the pure form, but it seems to us that in this case an unnecessarily large amount of sodium is being given.

Summary

It seems well established that nicotinic acid in relatively high doses decreases serum cholesterol in healthy and sick human beings. The toxicity of the substance is discussed, and it is pointed out that the high acidity rather than a specific action may be responsible for the occasional disturbances, such as gastro-intestinal reactions.

Tests on 12 healthy young individuals showed that a buffered solution of nicotinic acid is as efficacious in decreasing serum cholesterol as is the pure nicotinic acid.

In cases of poor tolerance of nicotinic acid a solution of nicotinic acid buffered with NaHCO_3 (or NaHCO_3 and KHCO_3) deserves to be tried.

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ELECTRODIAGNOSTIC STIMULATORS

A REPORT BY A SUBCOMMITTEE* OF THE MEDICAL RESEARCH COUNCIL'S NERVE INJURIES COMMITTEE

Electrical methods have long been used in the diagnosis and prognosis of lower motor neurone disorders. Erb, in 1883, described the classical faradic-galvanic test, which until recently has been the main stand-by in the electrodiagnosis of neuromuscular disorders. It is now known that this test is merely an abbreviation of the full excitability characteristics of nerve or muscle as demonstrated by the intensity-duration curve. Serious criticism has been levelled against the faradic-galvanic test (Wynn Parry, 1953; Ritchie, 1954), and the test is now regarded as obsolete. The first attempt to describe the characteristic excitability of nerve and muscle was the voltage-capacity curve (Cluzet, 1903). The curves plotted by this means, however, are not reliable, as the normal error range overlaps intermediate zones between denervated and innervated ranges. Furthermore, there are considerable technical drawbacks to the test. This technique has now been superseded by the plotting of a full intensity-duration curve using valve-controlled generators. Bauwens (1941) was the first to design an accurate electronic stimulator for this purpose.

An intensity-duration curve allows the expression of the characteristic excitability of the tissue under test in graphic form. An electrical impulse lasting 100 milliseconds or longer is applied to the muscle under test. The strength of current required to elicit minimal contraction (rheobase) is measured and expressed in milli-amperes, or the potential difference required to produce this current is measured and expressed in volts. The

*The Subcommittee was appointed with the following membership: Professor J. Z. Young (chairman), Dr. P. Bauwens, Professor R. E. M. Bowden, Dr. E. A. Carmichael, Dr. F. S. Cooksey, Dr. G. D. Dawson, Sir Bryan Matthews, Professor A. E. Ritchie, Squadron-Leader C. B. Wynn Parry, and Dr. E. F. Mason (secretary).

duration of impulse is progressively shortened and the intensity of current required to produce minimal contraction is measured for each duration. A curve relating strength of current and duration of impulse is drawn.

In normally innervated muscles the intensity of current for minimal contraction is the same over a wide range of pulse durations, and has only to be increased when very short pulse durations are used. When muscle alone is being stimulated—that is, denervated muscle—the curve is no longer a horizontal straight line but rises steeply and no response is elicited at the shorter pulse durations. This is due to the much lower excitability (longer chronaxie) of muscle compared with that of nerve. During recovery—that is, partial innervation—the curve is broken, showing elements of each excitable tissue, muscle, and nerve. Fig. 1 shows the three classical

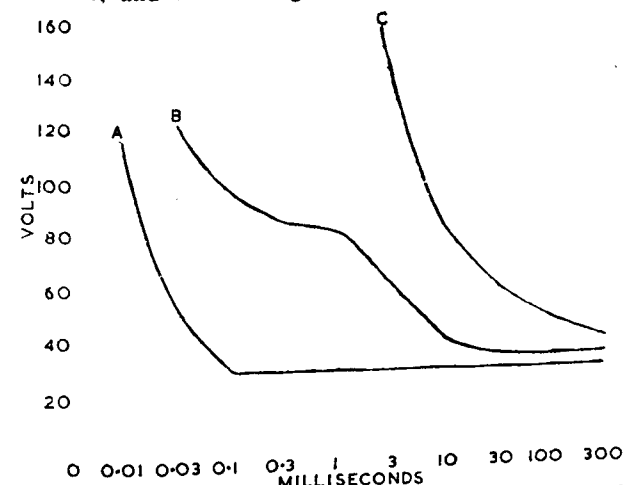


Fig. 1.—The three classical curves of normal, denervated, and recovering muscle. A=Normal curve. B=Partial denervation or reinnervation. C=Denervation.

curves of normal, denervated, and recovering muscle. It is shown that slight changes in the curve are significant, and are reliable indicators of changes in innervation. The main changes seen are in slope and threshold, and the appearance of kinks and discontinuities.

Current- and Voltage-calibrated Generators

Two main types of generator are used in clinical electrodiagnosis—the current-calibrated and the voltage-calibrated generator. The voltage-calibrated generator is one in which the output impedance is low (500 ohms or less at maximum output) and a known voltage is produced across the output terminals. A current-calibrated generator is one which has a high output impedance (100,000 ohms or more) and the current in the tissues between the electrodes is closely defined.

In 1948 the Ministry of Health asked the Medical Research Council for guidance concerning the best type of stimulator for routine clinical electrodiagnosis. The Medical Research Council, through its Nerve Injuries Committee, appointed a subcommittee on electrodiagnosis, whose deliberations are the subject of the present report. The first duty of the Committee was to review existing apparatus for electrodiagnosis and to produce a detailed specification for a diagnostic generator. A report (1948) on a widely used voltage-calibrated generator was made available to the Committee, and from this it was clear that it had several technical shortcomings, including errors in the pulse output. It was considered that a higher degree of precision was required in an instrument to be used for clinical electrodiagnosis, and also that more pulse durations should be available. The Committee accepted that a satisfactory

current-calibrated generator, designed by Dr. P. Bauwens, was in routine clinical use at St. Thomas's Hospital and elsewhere.

The Committee decided that the two types of generator should be critically compared. In view of the fact that no satisfactory voltage-calibrated generator existed for comparison with the current-calibrated generator, the Committee decided to draw up a specification and to subject a voltage-calibrated generator, made to this specification, to technical trials. The specification was that (a) there should be ten pulse durations of 300, 100, 30, 10, 3, 1, 0.3, 0.1, 0.03, 0.01 milliseconds; (b) three pulse repetition frequencies of 0.5, 5, and 50 pulses per second; (c) the generator should be accurate to plus or minus 10%; and (d) it should remain reliable over a long period of time.

In response to the Committee's request, the Technical Repair and Development Section, Royal Air Force No. 248 Maintenance Unit, Chessington, made a prototype to the above specification (R.A.F. stimulator type V). This apparatus was tested by Professor Ritchie in the physiology department of St. Andrews University. Professor Ritchie subjected the generator to ten months' continual laboratory use and pronounced the stimulator satisfactory (Report, 1950a). At the end of this period a technical check was made at Chessington and none of the parameters was found to have altered by more than 10% (Report, 1950b).

After consultation with Professor F. C. Williams, of Manchester University, an opinion on the circuit diagrams of the prototype voltage-calibrated generator was sought from the Telecommunications Research Establishment (T.R.E.), at Great Malvern, and the following comments were made: (1) The input could be improved by incorporating a voltage stabilizer. (2) The output impedance could be made lower with advantage. (3) The apparatus might not be easy to produce commercially.

Accordingly, T.R.E., in an attempt to overcome these criticisms, constructed their own apparatus according to the specifications laid down by the Committee. The T.R.E. stimulator and the R.A.F. type V stimulator were then subjected to comparative clinical and technical tests at R.A.F. Chessington (Report, 1952). It was found, as a result of these tests, that identical curves could be drawn with each stimulator (Fig. 2). It was concluded that, although the T.R.E. stimulator was theoretically more accurate, in practice the degree of accuracy provided was not called for, and therefore the considerable extra expense was not justified. (It has subsequently been found that the R.A.F. generator has presented no problems in commercial manufacture.)

The Committee was thus in possession of an accurate and satisfactory voltage-calibrated generator. The current-

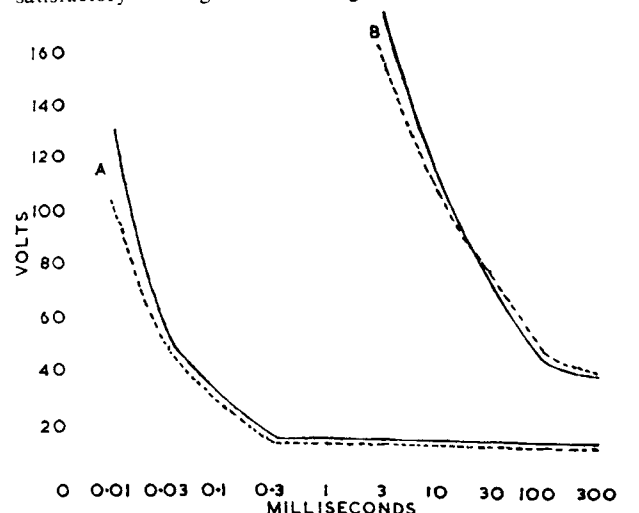


Fig. 2.—Curves of the T.R.E. and the R.A.F. Type V stimulator. ———=T.R.E. stimulator. ———=R.A.F. stimulator. A=Normal curves. B=Denervation curves.

calibrated generator had not, however, been subjected to the same tests, and it was next decided to compare the current-calibrated generator of Dr. Bauwens and the voltage-calibrated generator produced by the R.A.F. at three centres—St. Thomas's Hospital, St. Andrews University, and the Medical Rehabilitation Unit, Royal Air Force, Chessington.

Results

Comparison of current-calibrated generator and voltage-calibrated generator (R.A.F. Chessington) (Report, 1953a).—Intensity-duration curves were plotted with both stimulators on 77 subjects, divided as follows: 50 subjects with normal muscles; 19 subjects with partially innervated muscles (peripheral nerve injuries and poliomyelitis); and 8 subjects with denervated muscles (peripheral nerve injuries and poliomyelitis). Each subject was tested first with one stimulator, and then immediately afterwards, without moving the electrodes, with the other stimulator, using the longitudinal reaction. The experiment was so arranged that each stimulator was used alternately first and second. Experiments were carried over a period of several months. Comparison of normal curves, plotted with the two stimulators, showed that the chronaxie estimated by means of the current-calibrated generator was some 40 times that of the voltage-calibrated generator, and thus the curves using the voltage-calibrated generator were further over to the left than the other (Figs. 3 and 4). Results on the abnormal muscles showed that the curves obtained with the current-calibrated generator tended to rise more steeply and at a longer pulse duration than those when the voltage-calibrated generator was used. It was found that the

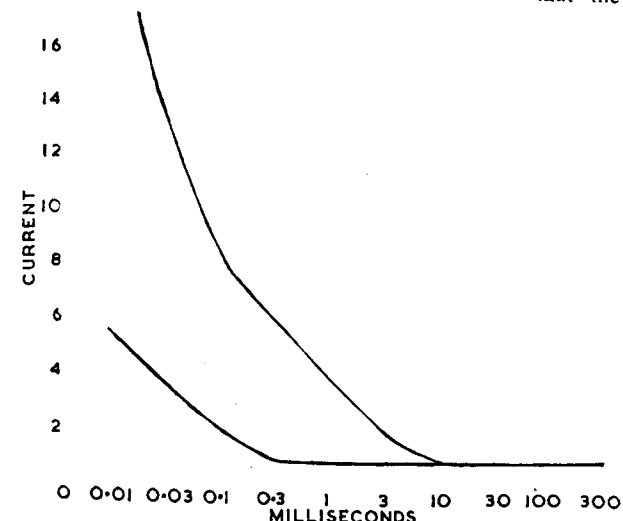


FIG. 3.—Limits of normal current-calibrated generator.

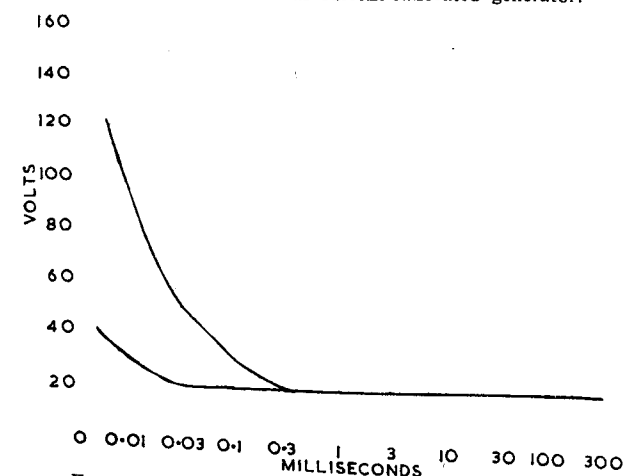


FIG. 4.—Limits of normal voltage-calibrated generator.

voltage-calibrated generator was apt to reveal kinks and discontinuities more readily than the current-calibrated generator. In the 77 subjects tested in these experiments, all preferred the voltage-calibrated generator to the current-calibrated generator. In 9 patients (excluded from the series) the current-calibrated generator was not well enough tolerated for intensity-duration curves to be plotted. As one of the criticisms of the voltage-calibrated technique has been the supposed necessity for careful skin preparation prior to test, it was decided to determine the effect of not lowering the skin resistance. Experiments showed that, although the threshold of the intensity-duration curve might be higher without previous preparation, the shape of the curve was identical in every respect with curves plotted after the skin was prepared (Figs. 5-7).

Comparison of Current-calibrated Generator and Voltage-calibrated Generator (St. Andrews University).—Intensity-duration curves on 38 normal subjects were plotted, using both stimulators alternately. The results are shown in the Table. Conclusions from these experiments were as follows. (1) The voltage-calibrated instrument has an impor-

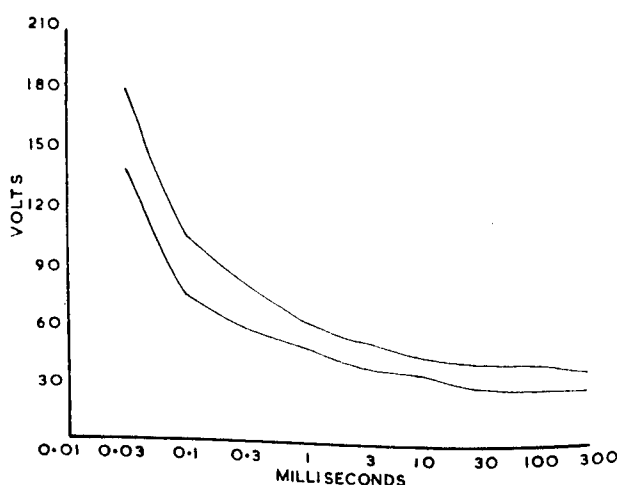


FIG. 5.—Intensity-duration curves using the constant-voltage stimulator on the right quadriceps muscle in a patient with poliomyelitis. The curves are characteristic of partial innervation. No skin preparation was used. The upper curve was the first curve obtained, and the curves were repeated with successive tests until they gave identical readings. After the fourth test, successive tests gave the same curve, represented in the lower curve. It is seen that, although the threshold is lower, the shape of the curve is the same.

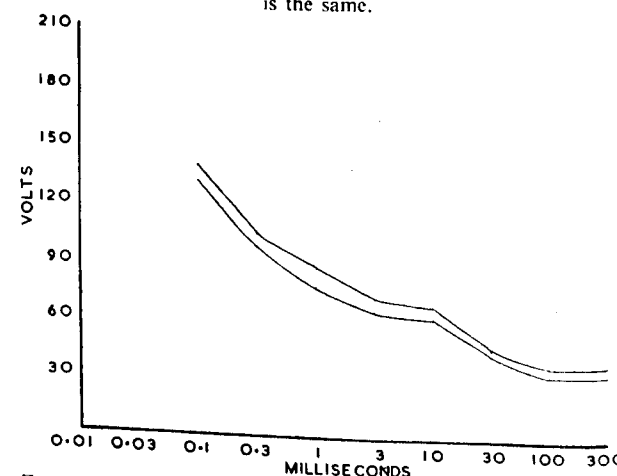


FIG. 6.—Intensity-duration curves using the constant-voltage stimulator on the right quadriceps in a patient with poliomyelitis. The curves are characteristic of partial innervation. Electrical stimulation (faradism) was given immediately before the test. No other skin preparation was used. The upper curve was the first curve obtained. The test was repeated until successive readings gave identical results. The second and third curves were identical, and are represented in the lower curve. The skin resistance has been lowered appreciably by the electrical treatment.

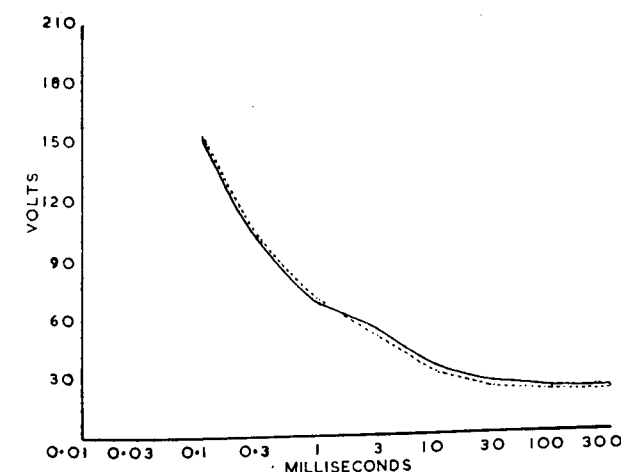


FIG. 7.—Intensity-duration curves using the constant-voltage stimulator on the right deltoid of a patient with a partial lesion of the brachial plexus. Infra-red radiation was applied to the muscle for 15 minutes immediately before the test. Dotted curve—first curve obtained. The test was repeated until successive readings gave identical curves. The second and third curves were identical, and are represented by the continuous curve. The infra-red radiation has successfully lowered skin resistance.

Results in 38 Normal Subjects

	Preferred C.V.	Preferred C.C.	Indifferent
Radial muscle (minimal preparation)	31	2	5
" (thorough ")	25	5	8
Facial muscle (minimal ")	38	(6 would not tolerate)	None
" (thorough ")	32	(4 would not tolerate)	2

tant advantage as regards comfort, which in a number of cases makes all the difference between getting a good record and getting none. (2) Thorough skin preparation tends to diminish the discomfort discrepancy, but not significantly. (3) Skin preparation has very little effect on the slope of the curves; in both cases the rheobase is lowered with preparation, and is more lowered in the case of the voltage-calibrated output. The rheobase of the current-calibrated instrument is not in practice sufficiently independent of preparation to make this an important claim. (4) The curve slope is influenced by pain to a greater extent than might be supposed. No doubt this is due to tenseness on anticipation of the shock, and we are devising experiments to show whether this is so or not. It was the impression that the "current" curves were less regular (and therefore less apt to reveal discontinuity in pathological cases) because of the increased tone of the muscle (due to discomfort), and that this was especially so in the important "middle region" of the curve.

Report of Comparison of Voltage-calibrated Generator and Current-calibrated Generator (Report, 1953b). (St. Thomas's Hospital).—Experiments conducted at this centre showed that when all precautions were taken with a voltage-calibrated generator it was as reliable and would give the same information as the current-calibrated generator. Tests were made in which the two electrodes connected to the sub-output terminals of the generator were applied to the subject's cheek while two pick-up electrodes connected to a D.C. amplifier proceeding into a cathode-ray oscilloscope were introduced into the mouth. With the voltage-calibrated generator it was clear that a very large peak occurred during pulse rate before the wave form reached a plateau. During pulse decay a surge in the opposite direction was noted. The current-calibrated machine gave a substantial rectangular voltage wave form. Except for a slight rounding off at the upper limit of the rising part of the pulse, the current-calibrated machine produced rectangular waves.

Conclusions

The following general conclusions were reached.

1. That both types of stimulator can provide the information required for assessment of the extent of muscle denervation.

2. For practical purposes of diagnosis, there appears to be no real sacrifice of accuracy by utilizing a voltage-calibrated stimulator. In fact, on sensitive subjects the voltage instrument is better tolerated, and this practical advantage from the subject's point of view outweighs any theoretical advantage of the high-impedance current-calibrated generator.

3. The detection of discontinuities in intensity-duration curves is the most reliable indication of partially innervated states. These discontinuities can be demonstrated by the use of both current- and voltage-calibrated generators. There is some evidence to suggest that they are better seen when using a voltage-calibrated generator. The absolute values of the curve points are of relatively little significance in determining the presence or absence of partial denervation. When the voltage-calibrated generator is used the alterations in skin resistance do not affect the shape of the intensity-duration curves, although there is a slight effect upon the threshold of such curves. Alterations in skin resistance do not significantly alter the threshold or shape of the intensity duration curve when the current-calibrated generator is used.

4. On the evidence presented above the voltage-calibrated generator has the following positive advantages over the current-calibrated generator: (a) the impulse is better tolerated by sensitive patients; (b) the instrument may be easier to construct; and (c) it is more satisfactory for routine clinical electrodiagnosis.

5. While the balance of evidence might appear to be in favour of the voltage-calibrated generator for routine purposes, some authorities have a preference for current-stabilized rectangular pulses. In view of the valuable work which has been and is being done with equipment generating such pulses, it is not intended to suggest that the voltage-calibrated generator should invariably supersede the current-calibrated generator.

In the light of these general conclusions, the subcommittee considers the voltage-calibrated generator to be an adequate instrument for general use for the electrodiagnosis of neuromuscular disorders according to the following specification.

I. ELECTRICAL PERFORMANCE REQUIREMENTS

(a) **Pulse Duration.**—10 pulse widths shall be available as follows: 300, 100, 30, 10, 3, 1, 0.3, 0.1, 0.03, 0.01 milliseconds. Pulse width accuracy shall be $\pm 5\%$ or 1 microsecond, whichever is the greater.

(b) **Pulse repetition frequencies** shall be 0.5, 5, and 50 pulses per second.

(c) **Pulse amplitude** shall be 200 volts maximum for all pulses. An amplitude control in conjunction with a calibrating system shall be employed to set the output to the maximum value of 200 volts.

(d) **Output Control.**—The delivered output shall not differ from the indicated output by more than 10% for all pulses and repetition frequencies, including switching transients. An output dial, directly calibrated in volts, shall be employed in order to provide a greater effective scale length than the size of meter commonly employed.

(e) **Wave Form.**—This shall be essentially flat-topped for all pulses. Amplitude droop shall not exceed 10% on the 300 milliseconds and 5% on the remaining pulses. Rise and decay times shall be negligible compared with pulse width. In the case of the 0.01 millisecond pulse, permissible rise and decay times are 0.001 millisecond. Leading and trailing edges shall have no more than a single overshoot which shall not exceed 10% of amplitude.

(f) **Output impedance** shall not exceed 500 ohms at any point on the scale.

(g) *Audible Monitoring*.—There shall be an optional audible monitoring signal synchronized with the pulses.

(h) *Safety Precautions*.—One of the patient terminals shall be connected to earth and the case. Dangerous potentials shall be excluded from the patient's circuit in the event of valve or component failure.

II. CONSTRUCTIONAL REQUIREMENTS

Minimum constructional requirements shall be those set out in Inter-Service Specification R.C.S. 1,000. The subcommittee reports that one prototype fulfilling the above specification has worked satisfactorily for over five years.

The Subcommittee is greatly indebted to the following co-opted members who gave valuable assistance in the work: Messrs. Bannister, Bowes, Galloway, Spencer W. Noble, and Sutton (Technical Research Establishment, Great Malvern); Mr. R. Brennan (R.A.F.); and Mr. P. Stiles (St. Thomas's Hospital).

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CULLEN'S SIGN

BY

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In 1918 T. S. Cullen reported a case in which a blue discoloration of the umbilicus was noted. By analogy with a case described earlier by Ransohoff (1906), in which a localized yellow umbilical stain occurred, free bile being found in the peritoneal cavity at operation, Cullen correctly postulated the presence of a haemoperitoneum and, from other evidence, deduced the cause of this to be a ruptured tubal pregnancy. A number of similar cases have since been reported (Novak, 1922; Strube, 1923; Tanner, 1932; Smith and Wright, 1935). The operative findings of Stabler (1934) and Way (1941) showed that the skin discoloration was due to blood in the subcutaneous tissue, as in an ecchymosis. In the same way, therefore, as in this latter condition, the exact colour of the sign may vary (Jackson, 1922; Neumann, 1928; Fallon and Manning, 1949). The abnormal staining of the subcutaneous tissue need not be confined to the umbilicus (Neumann, 1928; Stabler, 1934; Fallon and Manning, 1949), and may even involve previous abdominal operation scars (Gold, 1926; Schmitz, 1932; Smith and Wright, 1935). In all, it has been possible to trace about 30 reported cases of Cullen's sign associated with ruptured tubal pregnancy, though Fallon and Manning (1949) claim to have found 70 such instances.

Two years after Cullen's original description, Turner (1920) described two cases of acute pancreatitis. The first exhibited a somewhat extensive Cullen's umbilical sign accompanied by free intraperitoneal fluid, and eight similar cases have since been recorded (Johnston, 1930; Petrivalsky, 1931 (3 cases); Stutzer, 1931; Fallis, 1937 (3 cases)). Turner's second case showed a dirty green loin discoloration due to direct tracking of pancreatic fluid to the subcutaneous tissue. It is to this latter sign

that the eponym "Grey Turner's sign" has been applied (Wakeley, 1952; Bailey, 1954). Only two other examples of this sign have been traced in the literature (Cox, 1945; Kelley, 1957) and only the former was associated with pancreatitis. Although both signs are rare, Cullen's sign would appear to be more common in acute pancreatitis than Grey Turner's sign.

In view of the above discussion it is not surprising that Cullen's sign is commonly regarded as being due to a haemoperitoneum associated with a ruptured tubal pregnancy or, less commonly, acute pancreatitis (Bailey, 1954). The problem is not quite so simple, however, as the presence of Cullen's sign with either a ruptured tubal pregnancy or acute pancreatitis does not invariably imply the presence of a haemoperitoneum (Pfeiffer, 1923; Smith and Wright, 1935; Fallis, 1937). Further, the sign has been reported with numerous other conditions, with and without an accompanying haemoperitoneum.

Of these alternative causes, the most frequent is rupture of the rectus abdominis muscle, when the skin discoloration may occur at the umbilicus (Perman, 1922; Von Renner, 1924; Halperin, 1928; Way, 1941) or elsewhere (Stoeckel, 1901; Cullen and Brödel, 1937 (Case 2); Teske, 1946). No blood was present in the peritoneal cavities of any such cases except for that described by Toft (1915).

The occurrence of Cullen's sign with ante-partum rupture of a caesarean section scar was first reported by Gerrard (1938), no free blood being present in the peritoneal cavity. Similar cases have since been recorded (Galloway, 1939; Gough, 1939; Way, 1941). Finally, Cullen's sign has been noted in association with the following conditions: acute salpingitis (Schumann, 1923; Hadley, 1940); haemorrhagic ascites (Sternberg, 1922; Kapsinow, 1925); haemorrhage in association with acute yellow atrophy of the liver (Schumann, 1936); ovarian cyst (Busch, 1922); and traumatic haematoma of the cave of Retzius (Goinard and Curtillet, 1934).

The exact significance of Cullen's sign is thus open to doubt. Interest in the mode of production and significance of the sign was stimulated by the observation of Case 1 described below. Two earlier examples were then reviewed (Cases 2 and 3). It is considered that a study of these three cases throws light on some of the unanswered problems. The present paper is only the fourth occasion on which as many as three cases of Cullen's sign have been reported together (Petrivalsky, 1931; Fallis, 1937; Way, 1941). In none of these 12 patients was the cause a ruptured tubal pregnancy.

Case 1

One week before being seen on August 18, 1956, a 67-year-old man suddenly developed severe lumbar backache radiating into the left leg. He was tender over his left sacro-iliac joint and there was limitation of the straight-leg raising test on the same side.

He improved with bed rest, but had a severe recurrence on October 21 and morphine was required. The next day he had a florid complexion with a B.P. of 120/80 mm. Hg and a haemoglobin of 8.7 g./100 ml. He was tender in the left loin posteriorly, and anteriorly a large tender non-pulsatile mass was palpable. An x-ray film showed a large calcified abdominal aortic aneurysm extending to the left of the spine. Two days later the abdominal mass was more tender, there was blueing at the umbilicus, and the central part of the mass was pulsatile. Twenty-four hours later

shock developed, the blood pressure falling to 90/60 mm. Hg, the pulse rate rising to 104, and the haemoglobin falling to 4.8 g./100 ml. Blood transfusions and morphine were given, but he died the following day.

Post-mortem examination revealed an obese pale man with umbilical blueing which on incision was seen to be due to blood in the subcutaneous tissues. The heart showed evidence of an old coronary thrombosis, and there was some pulmonary congestion. On opening the abdominal cavity dark blood was seen extraperitoneally on the left side deep to the abdominal muscles. Anteriorly this could be followed to the extraperitoneal tissue deep to the umbilical scar, superficial to which was the blood-stained area of subcutaneous tissue. There was a small break in the continuity of the blood about 1 cm. wide. This was situated about 3 cm. from the umbilicus, but on massaging this area the two patches of blood easily joined. Posteriorly the extraperitoneal blood was continuous with a large retroperitoneal haematoma migrating from a ruptured saccular aneurysm, 10 cm. in diameter. This arose from the abdominal aorta below the left renal artery. There was no blood in the peritoneal cavity.

Case 2

A 39-year-old woman was first seen in March, 1949, being under the care of Lord Cohen of Birkenhead. Three months previously she had developed an influenzal-like illness followed one month later by diarrhoea which had persisted. A month before she was seen, swelling of the legs and face developed. Clinically her general condition was quite good, but some oedema of the lower trunk, legs, and face was present. There was a suggestion of ascites, but nothing else abnormal was detected in the heart, lungs, or abdomen. Urinalysis revealed a trace of albumin. A little later a blue discoloration was noted at the umbilicus and a vague mass was felt under the right costal margin. Vaginal examination suggested the presence of a high pelvic mass. Abdominal paracentesis was carried out, 7 pints (4 litres) of heavily blood-stained fluid being obtained. Following this the liver was felt to be enlarged. Later the patient developed jaundice, finally dying 15 days after Cullen's sign had been noted.

Post-mortem examination showed a body with marked icterus and Cullen's sign still visible. The abdomen was distended and 3½ pints (2 litres) of blood-stained peritoneal fluid was present. Nodules of tumour were revealed in the fluid was present. Nodules of tumour were revealed in the liver and over the pelvic organs. A large carcinomatous ulcer was present in the hepatic flexure of the colon with extensive retroperitoneal haemorrhage arose from these. There was widespread lymph node involvement of the para-aortic chain. A little fluid was present in the left pleural space and a terminal bronchopneumonia was also found. Histologically the growth was a spheroidal cell carcinoma.

Case 3

On April 8, 1954, a 71-year-old woman was admitted to the Liverpool Royal Infirmary under the care of the late Mr. M. Silverstone. She had always been constipated, but more recently had developed periumbilical pain radiating round from the back and she had noted that her abdomen was swollen. The patient was pale (haemoglobin 7.5 g./100 ml.). The abdomen appeared distended and there was doubtful shifting dullness. A barium-enema x-ray examination was normal apart from evidence of a large soft-tissue pelvic swelling lifting up the colon. A few days later a blue discoloration was noted around the umbilicus. Vaginal examination confirmed the presence of a mass to the left of the uterus. After blood transfusions, operation was performed on April 20. A haemoperitoneum was found with old blood adherent to the small bowel and sigmoid colon. Blood adherent to the uterus, which was itself enlarged. Total hysterectomy was performed, including most of the mass but leaving behind the tubes and ovaries. Some of the mass had to

be left in the outer end of the broad ligament into which it extended. The patient made a good recovery.

Examination of the specimen showed a uterus enlarged (10 by 5 by 7 cm.) by several intramural fibromyomas and containing in the cavity two large endometrial polyps and one small endocervical polyp. Adherent to the left and posterior surfaces of the uterus was a collapsed cystic tumour, 10 cm. in diameter. It was continuous with a soft intramural fibromyoma. The wall of the cavity was thick and ragged, suggesting a degenerated fibromyoma. Histologically it was an undifferentiated tumour, probably of mesenchymal origin (Mr. S. Bender).

Discussion

Two earlier theories have been propounded to explain the development of Cullen's sign, but each of these immediately runs into difficulties, as the presence of a haemoperitoneum is essential to both. As is emphasized by Case 1 (and others already enumerated) this is not an invariable accompaniment of the sign. Conversely, the sign is very uncommon in the presence of the relatively frequent states of haemoperitoneum (Case 3) or haemorrhagic ascites (Case 2; Sternberg, 1922; Kapsinow, 1925).

In the first theory the presence of an anatomical defect of the umbilical parietal peritoneum was suggested. There are undoubtedly small blind pits in this region (Cullen, 1916) but the peritoneum is intact in them. This is true even in the case of an umbilical hernia, and, in any event, on embryological grounds no such defect is to be expected.

The alternative theory assumes a physiological breach in the umbilical peritoneum whereby blood pigment is taken up by the local lymphatic vessels and deposited in the nearby subcutaneous tissue. That such lymphatic vessels exist is well known (Cullen, 1916), but there is no evidence that selective absorption takes place at the umbilicus (Higgins and Graham, 1929); and, secondly, it is the role of lymphatic vessels to remove such pigment to the regional lymph nodes and not to deposit it *en route* in the subcutaneous tissue.

The occurrence of secondary carcinomatous deposits at the umbilicus lends little support to the above theories, as in the first place such tissue is invasive and need not necessarily follow anatomical pathways. Secondly, it is rarely certain whether the spread has been transperitoneally or extraperitoneally, from the upper abdomen via the liver and its round ligament, or from the pelvis via the obliterated hypogastric arteries or urachus. Likewise the exact reason for the development of umbilical endometriosis is unknown.

Theory of Extraperitoneal Spread of Blood

The findings in Case 1 were unique. In this example blood could be traced extraperitoneally (with only two small interruptions) from a retroperitoneal source (ruptured aortic aneurysm) to a Cullen's sign. An abdominal wall ecchymosis with a ruptured abdominal aortic aneurysm is extremely rare (Beebe, Powers, and Ginouves, 1958). Case 1, therefore, gave powerful support to a third theory that the basic underlying cause of Cullen's sign was the extraperitoneal spread of blood and that the occurrence of a haemoperitoneum was purely fortuitous. This hypothesis was originally proposed by Fallis (1937), who described two cases of acute pancreatitis which showed the sign. Although neither had any free intraperitoneal fluid, both did exhibit extensive retroperitoneal and extraperitoneal haemorrhage. In the same way, Cases 2 and 3 described above did show possible essential prerequisites for the production of the sign, though both also exhibited intraperitoneal fluid. In Case 2 there was extensive retroperitoneal and mesocolon haemorrhage, whilst in Case 3 the vascular tumour burrowed out into the broad ligament towards the lateral pelvic wall. In neither case was there a simple clear-cut rupture of a blood vessel into the peritoneal cavity.

There is much additional evidence to support this theory. The anatomy of the extraperitoneal space has recently been

1956-7.—The scope of the investigation was changed during this period. At two recruit stations, between November, 1956, and April, 1957, throat swabs were taken from all patients admitted to sick-quarters with respiratory illness for more than 48 hours; standard record cards were again completed by the unit medical officer. At one of these stations all patients had their chests radiographed within seven days of admission, and paired samples of blood were taken from all patients with evidence of pneumonia. Detailed results of this study are to be reported elsewhere (J. N. C. Cooke and J. Gilroy, 1958, personal communication). At two other recruit stations visits were made by one of us at two-weekly intervals. Throat swabs and records were obtained at this time from all patients admitted with acute respiratory illness within the previous 48 hours. Twenty-seven other stations of various types—boys' units, technical training schools, and operational units—notified their weekly incidence of respiratory disease. Whenever there appeared to be an outbreak the station was visited and a number of patients were examined and records and specimens obtained.

Records of Invaliding.—The records were examined of all Service men with more than two weeks' service invalided in 1953 and 1954 for any respiratory illness except tuberculosis and cancer.

Laboratory Methods.—Throat swabs and sera were stored at -30°C . until tested; details of the tests used have been described previously (Kendall *et al.*, 1957) and are therefore only outlined here. Serological diagnosis was made by means of the complement-fixation test. Partially purified soluble antigens prepared in fertile hens' eggs were used for influenza viruses A and B, and heated but otherwise untreated fluids from HeLa cell cultures infected with RI-67 (adenovirus type 4) were used as the adenovirus group antigen. Adenovirus isolation tests were done in HeLa cell tube cultures which were kept a minimum of 10 days before being reported negative. Adenovirus strains were identified by the complement-fixation test and were typed in HeLa

cell cultures by neutralization tests using specific rabbit sera. Two hundred and fifty-seven serum pairs, comprising almost all those collected between February 10 and March 19, 1958, were also tested by Dr. P. S. Gardner for evidence of Sendai virus infection (Gardner, 1957).

Results

1. Prevalence of Respiratory Illness

Fig. 1 shows respiratory disease admission rates for periods of four weeks in various types of unit in the two winters studied. Incidence was highest in recruit stations in both winters, reaching 9% to 10% of the population at risk, but persisting longer in 1955-6 than in 1956-7. Non-recruit units had a much lower incidence, rising to just over 1% in February, 1956, and in March, 1957. Admission rates in boys' units lay between these two, and ranged from 2% to 6%; rates were high in the autumn of 1955, in March, 1956, and in February, 1957.

2. Laboratory Results

1955-6.—In recruit units, of 281 pairs of serum tested, 72 (26%) were positive for adenovirus and 13 (5%) for influenza A. In non-recruit units the proportion positive for adenovirus was much lower. Of 379 pairs of serum from boy entrants, 12 (3%) were positive for adenovirus and 15 (4%) for influenza A. Of 1,015 pairs from patients in operational units, 44 (4%) were positive for adenovirus and 146 (14%) for influenza A, and one was positive for both; in addition two patients showed a rising titre against influenza virus B, and five against Sendai virus. Fifty-two adenovirus strains were isolated, all but one from recruits; 35 of these were typed, and all belonged to type 7. The time distribution of the main serological results is shown in Fig. 2.

These findings probably give a reasonable indication of the relative frequency of adenovirus and influenza A infections in the three types of unit. But the considerable differences in the incidence of respiratory illness shown in Fig. 1 must influence any estimates of illness attack rates due to these agents. The proportion of illness due to influenza A was lower in recruits than in non-recruits, but the attack rate due to this virus must have been almost twice as high. By the same argument the influenza A attack rate in non-recruits was probably very little higher than in boy entrants. The adenovirus experience was quite different, both the proportion of illness and attack rates being much higher in recruits. During the months of February, March, and April, when monthly respiratory admission rates in recruit units approached 10%, over half the paired sera tested were positive for adenovirus. On the other hand, the incidence of illness due to adenovirus among non-recruits and boy entrants was low.

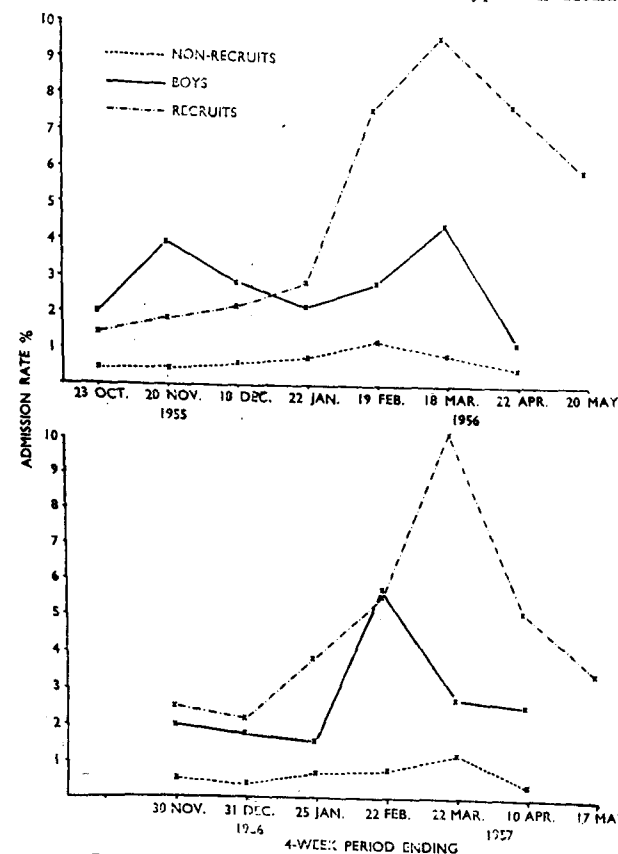


FIG. 1.—Respiratory illness admission rates, 1955-7.

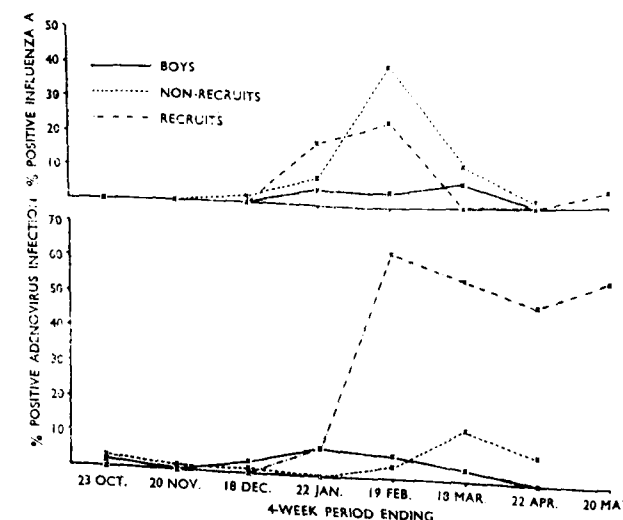


FIG. 2.—Serological results, 1955-7.

Excluding recruits, the age of patients with adenovirus infection tended to be lower than that of those with influenza A. Only 3 (5%) of the 56 positive for adenovirus were over 25 years of age, and two of these were medical officers; 28% of those with influenza A were over this age.

1956-7.—The most notable feature of the results obtained during this winter was the almost complete absence of adenovirus infection in the recruit units. From 1,110 throat swabs tested in HeLa cells only four strains were isolated—three of type 3 and one of type 4. The only other evidence of adenovirus infection was at a station for boy entrants where four strains—two of type 4 and two of type 7—were isolated during a small outbreak of respiratory illness at the end of March. Influenza A, on the other hand, was responsible for several outbreaks investigated at non-recruit and boys' units during February, March, and April, and in March it accounted for about half the cases with physical or x-ray changes in the chest at the recruit unit where paired sera from such patients were collected as a routine.

Clinical Observations

The symptoms and signs of acute respiratory illnesses due to a single agent vary considerably, and this tends to obscure differences between illnesses caused by one agent and those caused by another. No great diagnostic accuracy in the individual case can therefore be expected from clinical examination alone. Some differences were apparent, however, in the frequency of certain symptoms and signs between groups of patients with adenovirus infection, influenza A, and other acute respiratory illnesses—almost all of unknown aetiology. This may be seen in the Table, which

Clinical Findings and Serological Results on Non-recruit Units, 1955-6

	Influenza A	Adenovirus Infection	Remainder*
No. illnesses	161	56	1,177
No. with adequate record	161	56	1,140
Symptoms present (%):			
Headache	82	71	75
Sweating	57	64	47
Shivering	61	57	43
Muscular pains	54	25	32
Sore throat	63	89	72
Cough	80	59	45
Nasal symptoms	48	37	41
Diarrhoea	1	2	6
Vomiting	9	5	8
Conjunctivitis	20	11	
Fever: 102° F. (38.9° C.) or more	28%	18%	16%
Average duration	2.6 days	3.1 days	2.1 days

* All serologically negative except two patients with a rising titre to influenza virus B, five to Sendai virus, and one to both adenovirus and influenza virus A.

summarizes the clinical records of non-recruits during the 1955-6 survey. Cough, muscular pains, and a temperature of 102° F. (38.9° C.) or more were rather more frequent in those with influenza, and sore throat in those with adenovirus infection. It is interesting that conjunctivitis was more frequent in those with influenza, but it is doubtful whether the conjunctivitis seen in Service men during the winter months was of the same type as that noted in schoolchildren during summer outbreaks of pharyngo-conjunctival fever (Kendall *et al.*, 1957).

Invaliding

In the years 1953 and 1954, 195 men and women were invalided from the R.A.F. because of disease of the respiratory tract other than tuberculosis or cancer, and a disability pension was awarded to most of them. At least 90% of these were discharged because of bronchitis, bronchiectasis, these were discharged because of pneumonia, pulmonary fibrosis, or empyema. More than 40% served less than six months, and all of these had suffered as recruits from an acute respiratory illness from which they did not fully recover and which led directly to invaliding. A further 14% who had served less than one year had mostly been ill as recruits and spent almost the

entire period of their service in hospital. Recurrent respiratory disease played little part in the causes of invaliding; two-thirds suffered from only one illness during their service. A history of pneumonia or bronchitis before entry into the R.A.F. was recorded in 44% of those invalided with less than six months' service, but it is hard to know what importance to give to this observation.

The acute illness that led to invaliding was usually in the winter or early spring, during those months when the incidence of respiratory diseases is highest at recruit stations. About one in every 250 acute respiratory admissions at a recruit station led to invaliding before the completion of six months' service. This amounts to the permanent loss of perhaps one in every 1,000 airmen recruited during the first quarter of the year.

Discussion

Acute respiratory disease in military personnel is a serious problem. Not only is time lost during training but a substantial number are invalided with serious lung damage before any useful service has been performed. Among air crew respiratory infections have special importance because of pressure effects on the middle ear at high altitudes. In the Royal Air Force, the incidence of acute respiratory disease is highest by far in the recruit units. This is not an isolated finding, and has been reported not only in the United States of America but also in Switzerland (Löffler *et al.*, 1956) and Holland (van der Veen and Kok, 1957). The major cause of respiratory diseases invaliding in the R.A.F. is illness acquired at recruit camps. Time spent at these stations represents at most one-twelfth of the total service, whereas approximately two-thirds of all illness leading to this type of medical discharge is acquired during this period.

The adenoviruses and influenza viruses may well account for at least half the illnesses during the severe and protracted winter epidemics in recruit stations. In non-recruit units, as in the adult civilian population, the adenoviruses do not appear to be a frequent cause of illness; though most outbreaks were due to influenza virus, the cause of a relatively high proportion of acute respiratory disease requiring admission to sick-quarters remains unknown. Adenovirus infection may only be able to spread readily under the exceptional conditions of a recruit camp with its large and rapidly changing population of young men drawn from all parts of the country and introduced to residential community life for the first time. Apart from some radical change in recruit reception and training, effective vaccines, used if possible before arrival at the recruit units, would appear to offer the best hope of reducing the problem. Much can already be expected from influenza A vaccines, and field trials in the United States have shown that adenovirus vaccines are capable of affording a high degree of protection against viruses of the same type (Bell *et al.*, 1956; Stallones *et al.*, 1957).

Summary

In surveys of acute respiratory illness in selected R.A.F. stations in 1955-7 it was found that the incidence of sickness requiring admission to sick-quarters was far higher in recruit units than in operational stations.

Adenovirus infection was probably responsible for at least half the respiratory disease admissions in recruit units during the periods of highest prevalence in 1956, but was completely absent from the same units in 1957; it was responsible for very few admissions in other types of unit.

Influenza virus A was an important cause of illness among recruits in both winters, and accounted for at least 12% of respiratory admissions in other units in 1955-6 and for outbreaks at several stations in 1956-7.

More than half those invalided from the R.A.F. in 1953 or 1954 with a respiratory disease, other than

tuberculosis or cancer, were discharged as a result of an acute respiratory illness contracted during their recruit training.

We are indebted to the P.M.O. Technical Training Command, R.A.F., and other medical officers for granting us facilities to conduct these studies; to many station medical officers and in particular to Wing Commander M. Robertson, Wing Commander M. O. Richardson, and Squadron Leader W. G. Cooke for their co-operation in taking blood samples and completing the special records required; to Wing Commander R. J. A. Morris for help with records of invaliding; to Sergeant A. T. Coukham for valuable technical assistance; and to Dr. P. S. Gardner and Dr. G. B. Bruce White, of the Public Health Laboratory Service, for help with special laboratory tests.

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DINITROPHENOL AND DIABETES MELLITUS

A COMPARISON WITH SALICYLATE

BY

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Salicylate and 2:4-dinitrophenol (D.N.P.) both inhibit oxidative phosphorylation (Loomis and Lipmann, 1948; Brody, 1956). Salicylate also controls the clinical and biochemical abnormalities in moderately severe diabetes mellitus (Reid, Macdougall, and Andrews, 1957). The question that arises is whether D.N.P. has a similar action in this disease.

D.N.P., a powerful metabolic stimulant, was grossly misused in the 1930's as a slimming agent. The principles for prolonged use of a dye substance in clinical medicine put forward by Shannon *et al.* (1944) were not fully appreciated, and the high incidence of serious toxic effects from prolonged administration led to its withdrawal as a therapeutic agent. Since then it has been used only occasionally in clinical practice, although it is still extensively employed in biological investigations.

A short, carefully controlled trial of D.N.P. in diabetes mellitus has been carried out to discover its effect on blood sugar, glycosuria, and glucose tolerance. Six elderly ladies with mild to moderately severe diabetes were investigated along the lines previously described in the aspirin trial. They were given a constant low carbohydrate diet (150 g.) for at least 10 days before starting D.N.P., to establish the effect of diet alone, and the same diet was maintained throughout the whole investigation.

D.N.P. was given for 14 days in doses of 100–300 mg. in capsules daily, actual doses being controlled by

repeated plasma drug levels (Parker, 1949) and by measurement of oxygen consumption of fasting, resting patients with a Benedict-Roth machine to calculate the basal metabolic rate (B.M.R.) (Robertson and Reid, 1952). An attempt was made to induce the same order of metabolic stimulation with D.N.P. as was previously induced in diabetics successfully treated with aspirin. The effects of D.N.P. on fasting blood sugar estimated by Lehmann and Silk's (1952) modification of Folin and Wu's method, on glycosuria determined by Benedict's (1911) method, and on oral glucose tolerance were examined. Since none of the patients had abnormal quantities of ketones in the urine, quantitative measurement was not undertaken.

Results

Dose of D.N.P., Plasma Level, and B.M.R.—Frequent determinations of plasma D.N.P. level and oxygen consumption were necessary to control therapy and to avoid

TABLE I.—Dose and Plasma D.N.P.

Day	Plasma D.N.P. (mg./litre)					
	Case 1 55 yrs. (5)*	Case 2 55 yrs. (52)	Case 3 57 yrs. (2)	Case 4 59 yrs. (96)	Case 5 60 yrs. (12)	Case 6 76 yrs. (12)
1	—	—	21	24	—	15
2	45	40	47	31	40	30
3	45	40	47	31	40	30
4	46	—	54	29	43	44
5	45	—	54	38	41	43
6	49	33	47	—	—	—
7	—	—	—	32	36	32
8	57	36	38	38	45	15
9	—	—	—	47	43	—
10	49	33	42	34	39	48
11	—	48	—	38	—	—
12	45	—	52	40	37	46
13	—	43	—	—	—	—
14	40	50	48	35	41	39
Mean (2–14 days)	47	40	48	35	40	34
Total dose (g.)	2.8	3.1	2.25	3.5	2.9	3.05
Maintenance dose (mg. daily)	150–200	200–300	100–200	200–300	200–300	150–300

* Duration of diabetes in months.

undesirable reactions. Table I gives relevant clinical particulars as well as doses and plasma levels of D.N.P. A fairly steady plasma concentration of D.N.P. was reached in each patient after the first day's dosage: the mean values of the six patients between the second and fourteenth days ranged from 34 to 48 mg./litre. The relation between plasma D.N.P. and the B.M.R. is shown in Fig. 1: an obvious and expected rise in B.M.R. accompanied an increase in plasma D.N.P. concentration. The regression line and its 95% confidence limits are shown. No toxic effects from D.N.P. were encountered, and the results, in addition to defining a significant relation between plasma D.N.P. and B.M.R., indicate that the same order of metabolic

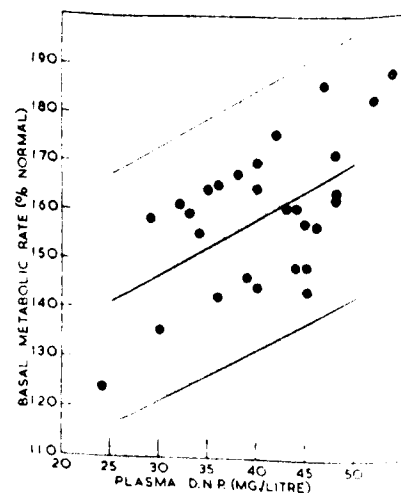


Fig. 1.—Relation between the rise in B.M.R. from D.N.P. and the plasma concentration of the drug in six female diabetics. The regression line and its 95% confidence limits are shown. The coefficient of correlation, r , was 0.54 with $p > 0.01$, but < 0.001 ($t_{0.05} \times \sigma r = 26.5$).

stimulation has been obtained with D.N.P. as in an earlier investigation with aspirin in diabetes mellitus.

Fasting Blood Sugars.—Fasting blood sugars of the six patients at intervals throughout the investigation are shown in Table II. The values of each patient towards the end of the control dietetic period were close enough to one another

TABLE II.—D.N.P. and Fasting Blood Sugar

Case No.	Fasting Blood Sugar (mg./100 ml.)					
	Before D.N.P.		During D.N.P.			After D.N.P.
	Days 4–5	Days 0–1	Days 3–4	Days 7–8	Days 13–14	Days 3–4 Day 6
1	146	136	158	152	152	133
2	157	228	212	202	196	208
3	224	250	200	133	124	129
4	307	304	214	222	204	—
5	325	293	293	289	252	278
6	279	262	241	211	190	189
Mean	240	246	220	202	186	192

to indicate that a comparatively stable state had been reached from which the effect of D.N.P. could be judged. In the two weeks that D.N.P. was given the fasting blood sugar of the patient with the mildest diabetes increased a little. The values of the other five patients fell slightly, but in no patient did they reach normal. The group mean concentrations were: 246 mg. per 100 ml. on the day before or on the actual day D.N.P. was started and 186 mg. per 100 ml. after 14 days of D.N.P. administration. The hypothesis that the difference between the mean blood sugars immediately before and at the end of the D.N.P. course was zero was rejected because the t -test gave a value of p between 0.05 and 0.02. The fall in mean fasting blood sugar was therefore just significant.

Glycosuria.—The amount of sugar in the urine was estimated before, during, and after administration of D.N.P., and the results, shown in Table III, agree with the fasting

TABLE III.—D.N.P. and Glycosuria

Case No.	Urinary Sugar (g./24 hours)					
	Before D.N.P.		During D.N.P.			After D.N.P.
	Days 4–5	Days 0–1	Days 3–4	Days 7–8	Days 13–14	Days 3–4 Day 6
2	12	8	6	3	4	9
3	10	10	3	3	0	0
4	23	14	12	16	4	—
5	39	34	63	36	29	20
6	44	32	39	16	17	18
Mean	26	20	25	15	11	9

blood sugars just described. The mildest diabetic had no glycosuria before, during, or after D.N.P. Glycosurias of the other five patients progressively fell during the period the other five patients progressively fell during the period D.N.P. was given, but only one patient was sugar-free at the end of the course. The mean fall was from 20 g. of glucose in the 24 hours immediately before D.N.P. to 11 g. at the end of the D.N.P. course. Again the hypothesis that the difference between the mean urinary sugars before and after D.N.P. was zero had to be rejected since p was between 0.02 and 0.01 by t -test. The reduction of glycosuria from D.N.P. was significant.

TABLE IV.—Oral Glucose Tolerance Test

	Blood Sugar (mg./100 ml.)											
	Case 1		Case 2		Case 3		Case 4*		Case 5*		Case 6*	
	Before D.N.P.	After D.N.P.	Before D.N.P.	After D.N.P.	Before D.N.P.	After D.N.P.	Before D.N.P.	After D.N.P.	Before D.N.P.	After D.N.P.	Before D.N.P.	After D.N.P.
Fasting	136	152	228	196	224	138	304	204	293	289	214	190
1/2 hour	244	206	288	276	288	185	442	304	350	338	342	296
1 hour	304	248	344	304	324	219	428	363	408	408	342	296
1 1/2 hours	292	259	400	328	332	193	372	356	428	423	384	296
2 hours	240	208	364	384	296	159	338	282	428	446	328	296

* Consecutive course of D.N.P. and aspirin given.

Oral Glucose Tolerance.—The blood-sugar values immediately before and at half-hour intervals for two hours after an oral dose of 50 g. of glucose are presented in Table IV. The only difference before and after the course of D.N.P. was that glucose tolerance improved a little in two of the six patients: improvement was slight in one and moderate in the other. In the other four patients there was no noteworthy change.

Body Weight.—The weights of the patients before, at the end of the D.N.P. course, and five days after it had been discontinued are shown in Table V. The weights before D.N.P. were steady. Three patients lost 1.3 to 2.1 kg. in

TABLE V.—D.N.P. and Body Weight

Case No.	Body Weight (kg.)		
	Before D.N.P.	End of D.N.P. Course	Five Days After D.N.P.
1	56.9	55.6	56.5
2	78.0	75.9	75.5
3	79.4	77.5	77.4
4	67.4	67.8	67.6
5	55.1	55.0	54.8
6	42.9	42.2	42.0
Mean	63.3	62.3	62.3

the 14 days D.N.P. was given. The weights of the other three were not materially altered. In the five days immediately after D.N.P. there was no significant change, so that, unlike salicylate, discontinuation of D.N.P. is not followed by diuresis and slight weight loss (Reid *et al.*, 1957). No serious weight changes resulted or followed the 14-days course of D.N.P.: the mean weight loss was 1 kg.

The results so far presented suggest that D.N.P. lowers fasting blood sugar, diminishes glycosuria, and may or may not improve oral glucose tolerance without materially altering body weight. In all these respects it resembles salicylate except that salicylate is much more potent and effective. Nevertheless the qualitative similarity has made it necessary to compare D.N.P. and aspirin. Firstly, the effects on fasting blood sugar and oral glucose tolerance of both substances, given consecutively to four patients in the present study, was examined, and, secondly, the changes in fasting blood sugar in the present group of six patients receiving D.N.P. has been compared with those of a previous group treated with aspirin.

Comparison between Aspirin and D.N.P.

Four of the patients given a 14-days course of D.N.P. were treated with aspirin for a similar period. A short interval of a few days elapsed between stopping D.N.P. and starting aspirin, to allow the D.N.P. to be cleared from the body. This was judged by its disappearance from the plasma or by a fall in plasma concentration to a low value. Comparison between D.N.P. and aspirin on fasting blood sugar and on oral glucose tolerance was undertaken. Measurement of urinary sugar was not considered necessary because it followed the blood-sugar changes induced by D.N.P. and aspirin and also because of the difficulty of making proper allowance for the non-glucose reducing substance which appears in the urine during intensive salicylate therapy.

Table VI compares the effect of both drugs on fasting blood sugar; it will be seen that the mean value, 272 mg. per 100 ml. just before D.N.P. fell to 211 mg. per 100 ml.

TABLE VI.—Comparison of Consecutive Courses of D.N.P. and Aspirin

Case No.	Fasting Blood Sugar (mg./100 ml.)							
	Before D.N.P.				Before Aspirin			
	Days 0-1	Days 3-4	Days 7-8	Days 13-14	Days 0-1	Days 3-4	Days 7-8	Days 13-14
2	228	212	202	196	185	104	104	90
4	304	214	222	204	185	115	143	101
5	293	293	289	252	278	268	138	109
6	262	241	211	190	189	127	118	95
Mean..	272	240	231	211	209	154	126	99

after the 14 days' course. The mean fasting blood sugar just before aspirin was 209 mg. per 100 ml. and this fell to 99 mg. per 100 ml. after 14 days' therapy. The fall with aspirin was greater and more rapid than with D.N.P., though the pre-treatment level was lower. When the t-test was applied to the fasting blood sugar before and after D.N.P. the hypothesis that the difference between the means was zero had to be rejected because *p* was between 0.05 and 0.02. The same hypothesis had to be rejected before and after aspirin, since *p* was between 0.02 and 0.01.

Oral glucose tolerances with a test dose of 50 g. of glucose were carried out in three patients before and after D.N.P. and then after a consecutive course of aspirin (Table IV). Slight improvement in glucose tolerance was noted in one patient after D.N.P. All three showed pronounced improvement from aspirin, which just fell short of a normal response in two.

These findings indicate that, while consecutive courses of D.N.P. and aspirin both reduce fasting blood sugar, the main difference between them is that the reduction from aspirin is more rapid and complete in that fasting blood sugar returned to normal in all four patients. It did not even approach the normal value in any of the four patients treated with D.N.P. This qualitative similarity but quantitative difference in favour of aspirin was emphasized by the results of the oral glucose-tolerance tests.

The increases in oxygen consumption expressed as basal metabolic rates from the third to fourteenth days during consecutive courses of aspirin and D.N.P. to the same patients have been examined in relation to changes in fasting blood sugar. The results presented in the scatter diagram (Fig. 2) emphasize the difference in potency

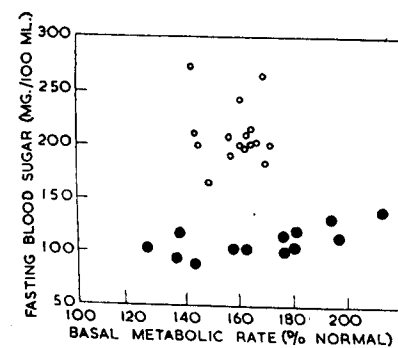


FIG. 2.—Relation between oxygen consumption expressed as B.M.R. and fasting blood sugar during consecutive courses of D.N.P. and aspirin to four diabetic patients is shown. D.N.P. (open circles) is associated with abnormally high fasting blood sugars; aspirin (solid dots) with normal values for the same increase in oxygen consumption.

increased oxygen consumption in diabetes mellitus from D.N.P. does not reduce the high fasting blood sugar of the diabetic below a certain level, while a similar increase in oxygen consumption from aspirin brings it right down to normal. In both cases the increase in oxygen consumption was as great as would be tolerated in practical therapy.

The superiority of aspirin over D.N.P. in lowering fasting blood sugar may in part be due to the advantage of lower initial fasting blood sugars, since aspirin therapy always followed D.N.P. The importance of this factor has been examined by comparing fasting blood sugars of two groups of six patients treated with D.N.P. or aspirin. One group comprised the six patients in the present investigation who received D.N.P.; the other group was treated with aspirin, and their particulars have already been published (Reid *et al.*, 1957). The patients were all mild to moderately severe diabetics, and on clinical assessment they were comparable. The mean fasting blood sugar just before D.N.P. was 245 mg. per 100 ml.; that before aspirin was 190 mg. per 100 ml. The difference between these means is not significant, since the t-test gave a value of *p* greater than 0.05 and a preliminary F test indicated that *p* was more than 0.05. This is consistent with the suggestion that the two groups were clinically comparable before the treatments. The higher value of the mean fasting blood sugar in the D.N.P. group is at least partly accounted for by the greater mean carbohydrate intake of this group over the aspirin group. The actual figures were 150 g. and 130 g. per day respectively.

The mean fasting blood sugars fell during treatment with D.N.P. and aspirin. The fall in the aspirin group, from 190 to 92 mg. per 100 ml. in 14 days, was greater than that in the D.N.P. group, which was from 245 to 186 mg. per 100 ml. in the same period. Aspirin's obvious superiority was borne out by the values of *p* when t-tests were applied to fasting blood sugar before and after D.N.P. and aspirin. The hypothesis that the difference between the means before and after the two treatments was zero had to be rejected. The value of *p* in the D.N.P. group was between 0.05 and 0.02; in the aspirin group it was less than 0.001.

Discussion

The fall in fasting blood sugar and the reduction in glycosuria from D.N.P. were not expected. MacBryde and Taussig (1935) reported a slight rise in fasting blood sugar and lowered glucose tolerance in two pre-diabetics and one frank diabetic who were given similar doses of D.N.P. The discrepancy between their findings and ours may be more apparent than real, since one patient in our group, comparable to their pre-diabetics, also showed a slight increase in fasting blood sugar after D.N.P. (Table II). It may be that the milder the diabetes the less likely is the blood sugar to fall, for we have observed that rheumatic patients while receiving full doses of salicylate may show a rise in fasting blood sugar associated with diminished glucose tolerance (Cochran, Watson, and Reid, 1950). Indeed, the action of salicylate in diabetes could not have been predicted from its effect in the non-diabetic, emphasizing once again the danger of premature generalization from incomplete data. No subject is richer in examples of this than the literature on salicylate, where it is almost impossible to make a new discovery, but where so much has still to be correctly interpreted.

The similarity in biological effects between salicylate and D.N.P. is most remarkable. Both increase oxygen consumption of cells and mitochondria, and at the same time reduce uptake of inorganic phosphate (Loomis and Lipmann, 1948; Brody, 1956). This inhibition of oxidative phosphorylation is, in biochemical terms, the basic property shared by them. Sodium salicylate and D.N.P. have the same effect on oxygen uptake by certain tissues with a variety of substrates (Sproull, 1957). Both substances stimulate oxygen consumption in animals to the extent of causing death in hyperpyrexia with high doses (Reid, 1957a). They also inhibit plant growth (Reid, 1957b). In all their similarities over a wide biological field, ranging from wheat coleoptile sections, tissue slices, to whole animals, including man, the effective concentrations remain remarkably constant. The current investigation with diabetes brings out yet another similarity in that both lower fasting blood

sugar and glycosuria, though for the same order of increase in oxygen consumption the effect of D.N.P. is slight compared with that of aspirin, and would in itself have no practical value in the treatment of the disease. This raises the question, Is it enough to say that the fundamental action of both D.N.P. and salicylate is inhibition of oxidative phosphorylation without further specification to account for quantitative differences?

Summary

Salicylate and 2:4-dinitrophenol (D.N.P.) inhibit oxidative phosphorylation. Salicylate also controls moderately severe diabetes mellitus. The effect of D.N.P. in the disease has been investigated.

Increased oxygen consumption from D.N.P. of the same order as is required with aspirin to control moderately severe diabetes lowered fasting blood sugar and glycosuria of six elderly diabetics. The reduction was, however, less than that achieved with aspirin, and would have no practical value in treatment.

This difference between D.N.P. and salicylate in diabetes makes it difficult to account for the action of both substances on the basis of inhibition of oxidative phosphorylation, at least, without further specifications.

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A CASE OF CONJOINED TWINS

BY

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Aird's (1954) remark, that owing to the greater accessibility of large groups of populations in Africa and Asia conjoined twins are seen with increasing frequency, is supported by the birth of the Kano and Port Harcourt twins in Nigeria, the case of the twins in Singapore (Roddie, 1957), and our own case as described below.

Case Report

An African woman, gravida-3, about 25 years of age, was seen in the antenatal clinic of our hospital on May 22. She gave a history of 32 weeks' amenorrhoea. On examination the fundus was felt three fingerbreadths under the ensiform cartilage. There was hydramnios, and two hard parts were felt in the fundus. No foetal heart was heard. Twin pregnancy was suspected, and an x-ray film, taken to confirm the diagnosis, showed two foetuses with the heads *in fundo* and the legs well down in the pelvis. The twins were in perfect apposition. Apart from this abnormal position, the vertebral columns showed a peculiar curve, suggesting that the twins were joined at the level of the sternum, thus not allowing the vertebral columns to assume their normal curvature. A presumptive diagnosis of con-

joined twins, with fairly firm union in the region of the sternum, was made, and the woman was admitted.

The next morning an oblique x-ray film was taken. This view showed the details even better, but no definite union could be diagnosed. Several student-midwives were allowed to examine the patient, and a few hours later she com-



Photograph of the conjoined twins.

plained of lower abdominal pains. Very soon the membranes ruptured and a large quantity of blood-stained liquor amni was drained away. One foot presented at the vulva. Examination *per vaginam* showed that there was full dilatation.

Having read Wilson Roddie's report on a similar case, I decided to follow the same method, and the patient was taken to the theatre, where she was anaesthetized. The remaining three feet were brought down, one of them causing considerable difficulty. Then the four legs were delivered simultaneously. Hardly any traction was used, the only force being firm expression. The bodies now descended parallel to each other without any difficulty. It became obvious that the twins were joined together, for they had one abdominal cavity, with imperfect closure in the lower part. When the scapulae were well visible, the legs and trunks were lifted right forward over the symphysis pubis. The posterior head engaged and came out without difficulty, immediately followed by the anterior head. Both foetuses were dead and showed signs of maceration.

A bilateral episiotomy was repaired with catgut. The puerperium was uneventful.

The twins, both girls, had a total weight of 2,350 g. (5 lb. 4 oz.). There was a single placenta with velamentous insertion of two cords. The distance between the insertion of the two cords was 2 cm. The placenta showed small infarcts.

Anatomy

The two female foetuses were preserved in formol-saline and examined after a few weeks. They were joined from the manubrium sterni to just under the umbilicus. The union at the level of the sternum was cartilaginous.

Dissection showed that each twin had its own lungs. The right lungs showed only two lobes, although there was an indication of a third lobe (partial fissure). It seemed that they had one heart in common, but after opening of the

Reviews

PIONEER NEUROSURGEON

Selected Writings of Walter E. Dandy. Compiled by Charles E. Troland, M.D., and Frank J. Otenasek, M.D. (Pp. 789+vii; illustrated. £5 12s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

Walter Dandy (1886-1946) graduated from the Johns Hopkins Medical School; his ability attracted the attention of Professor Halsted, and he was among those of his year who were selected for training in surgery. It was customary for the first year after graduation to be spent in experimental surgery, and this brought him into contact with Harvey Cushing, who was responsible for introducing this feature. The following year Dandy was selected as hospital resident to Cushing. The next year, 1912, Cushing became professor of surgery at Harvard, while Dandy continued in Baltimore, completing his training in general surgery and gradually confining his attention to neurosurgery. The introduction to his life's work appears to have occurred during the year following graduation, when he shared with others an investigation of the blood supply of the pituitary gland. Also during that year of experimental work he studied the absorption of phenolsulphonphthalein from the pleural and peritoneal cavities. This line of thought led him shortly afterwards to investigate cases of hydrocephalus, and with Blackfan he published papers on hydrocephalus which have become classics.

These and many other writings of Dandy have been selected for republication, dedicated to the memory of "a pioneer and most gifted neurosurgeon." Perusing this volume, one realizes how completely justified is this quotation. His outstanding and perhaps unsurpassed contributions to neurosurgery seem to have been due to originality of thought. This has, broadly speaking, shown itself in two ways: (1) the application of novel methods of diagnosis—for instance, the use of air as a contrast medium in radiology—and the value of dye studies (P.S.P.) in hydrocephalus; and (2) the introduction of brilliant techniques in the craft of surgery. The latter has had great influence in the improvement of neurosurgical operations, and it is likely that many neurosurgeons are unaware of the debt they owe to Walter Dandy. This can now be easily remedied, and they will be fascinated by the scope of these papers and by the freshness of outlook which he brought to various problems. He was, of course, particularly interested in the difficulties presented by vascular lesions of the brain, and one can readily imagine how eagerly Dandy would have grasped the possibilities which have been created by the modern adjuncts of anaesthesia—hypotension and hypothermia. One small criticism of this memorial volume—it is a pity that some of the smaller and less important papers were not omitted in favour of a full list of his publications.

D. W. C. NORTHFIELD.

SHORT TEXTBOOK OF OBSTETRICS

A Modern Practice of Obstetrics. By D. M. Z. Stern, M.A., M.B., B.Ch.(Cantab.), F.R.C.S., F.R.C.O.G., and C. W. F. Burnett, M.D.(Lond.), F.R.C.S., F.R.C.O.G. Second edition. (Pp. 258+ix; illustrated. 45s.) London: Baillière, Tindall and Cox. 1958.

This textbook, now in its second edition, provides the medical student with a concise, well-balanced account of present-day obstetrics. Based on the very wide clinical experience of the authors at the West Middlesex Hospital during the last 22 years, it is essentially a practical book. Theories have been avoided except in so far as they have a direct bearing on practical obstetrics, while details of pure anatomy and physiology have been omitted. Largely because of this the book is of small compass compared with

most undergraduate textbooks, but it must be emphasized that it is in no way a "synopsis." Though it runs to only some 250 pages, the format is unusual—with a larger page than is the custom and the type in double columns. As a result the reader will find that a surprising amount of information is contained within its covers, and it provides a very readable and, for the most part, adequate account of the subject, sufficient for the needs of most qualifying examinations. Indeed, with the ever-widening complexity of modern medicine and the increasing demands made upon medical students, its reasonable size is to be regarded as a welcome feature which will commend the work to many readers.

The authors state in the preface that they have aimed "to write upon the subject from a new aspect" and avoid the common failing whereby unsubstantiated statements "have found their way from the pages of one textbook to those of another." In this they have to a large extent succeeded, and most readers will agree that few, if any, clinical myths have in fact been perpetuated. The style of the text is direct and forthright—always a commendable feature, and particularly in a student's textbook of modest proportions. However, on some controversial topics the authors' opinions, dogmatically expressed, may not meet with general acceptance. For example, their preference for face-to-pubes forceps delivery in persistent occipito-posterior cases, the implication that uterine inertia is common in multiparae, their approval of a laterally placed episiotomy, and their condemnation of all mucus extractors are all matters which will provoke criticism. Because of the omission of the basic sciences the uninitiated student may sometimes be a little bewildered when confronted with a new term without explanation, but this disadvantage is largely offset by an appended glossary of terms. Despite the promise contained in the preface, the balance between common and uncommon conditions is not always well preserved. The sections on normal pregnancy, labour, and the puerperium are adequate for the needs of the undergraduate. Most of the common abnormal conditions too are fully described, and the chapters on some of these complications—for example, that on toxæmia of pregnancy—are particularly good. Yet antepartum haemorrhage—surely an important subject—receives only a brief description and is altogether over-simplified. Surprisingly there is no mention of contraction ring (except as a phenomenon of the third stage). On the other hand, space is given to the mention of some rare conditions such as the Chiari-Frommel syndrome.

This textbook is well written, the production is of a high order, and with its unusual format it is a refreshing break-away from the "traditional" student's handbook. There are numerous line drawings, most of which are clear and explanatory. The book is well documented, and an engaging feature is that each chapter is headed by an appropriate Shakespearean quotation. Pleasing additions are an appendix on "Obstetrical Terms Defined" and another on etymology. Such criticisms as are advanced are not intended to detract from the considerable merits of this book. It is a welcome production and can be recommended to those desiring a short textbook that is "different."

M. P. EMBREY.

DIABETES IN THE YOUNG

Diabetes Mellitus: With Emphasis on Children and Young Adults. By T. S. Danowski, B.A., M.D. (Pp. 510+xxiv; illustrated. £5 8s.) London: Baillière, Tindall and Cox. 1957.

The title of this book suggests a somewhat artificial subdivision of a disease of which the two main types are better differentiated by their clinical manifestations than by the age of the patient; in fact, there is often a marked similarity between diabetes in the very young and the very old. This impression is at once dispelled by the first seven chapters, which deal broadly with the biochemical and hormonal aspects of diabetes, and present a concise and up-to-date account which alone makes the book a valuable

NEW THEORY OF SCHIZOPHRENIA

A New Approach to Schizophrenia. By Julius I. Steinfeld, M.D. (Pp. 159. 21s.) London: Hutchinson Medical Publications. 1958.

The author was director of the American Forest Sanitarium, "an institution noted for its research in schizophrenia," so that his views would seem to deserve careful consideration. He regards schizophrenia as a return to infantile behaviour, to the vegetative state, a state prior to ego development, to a state which is called oral, and agrees with Freud that this regression owes its appearance to two factors—a fixation on some object and the occurrence of frustration which makes the individual return to earlier modes of satisfaction. The author's theory deals with the manner in which this fixation occurs. It is regarded as being due to a hunger trauma occurring within a few hours of birth. This produces a ketosis to which infants, especially the premature, are especially liable. Ketosis at this critical period produces some sort of change in the limbic system, the diencephalon, or the hypothalamus. It is impossible to say where, as the author uses these terms indiscriminately. The precise nature of this change is also vague. At times it is said that the diencephalic compensatory mechanisms are exhausted; at others, that the vegetative mechanisms are overstrained. More psychodynamically, there is an overly high cathexis of the diencephalon or an over-catheted hypothalamic mechanism. Anyhow, whatever it is, it leaves the individual vulnerable, and schizophrenia consists in the reappearance, for reasons not specified, of a disequilibrium between cortical functions and diencephalic regulation.

On the basis of this theory the author makes several suggestions for treatment. The object of treatment is to produce ketonaemia. He regards all the current organic therapies as doing this, and mentions several other equally effective methods—for example, starvation, a protein-fat diet, "effective E.C.T." (by continuing to stimulate at a lower amperage after a regular E.C.T. until a picture of decerebrate rigidity is produced), or the inhalation of acetone. As he says, there is no standard treatment in schizophrenia. Strangely enough, he also finds "serpasil" and "thorazine" of value, though he says that these depress the hypothalamus (already depressed or overstrained).

Such a novel theory needs to be buttressed by solid evidence. In an attempt to provide this the author investigated 134 chronic schizophrenics from the point of view of six factors: (1) early hunger trauma; (2) early digestive difficulties, usually called colic; (3) reappearance of abdominal symptoms before the onset of psychosis; (4) overeating or self-starvation; (5) preference for carbohydrates; and (6) attachment to mother or mother-figures. In 61 of these patients no early life history could be obtained, but of the other 72 (one patient seems to have been mislaid) every one showed all of these six features. This is indeed remarkable, but it is a pity that the author did not have any controls. The author's conclusion is that "we believe we must have convinced the reader of the existence of the early hunger trauma and the relationship of such trauma to the later schizophrenia." At least one reader is not convinced.

A. W. BEARD.

asset to anyone with an interest in the scientific side of the subject. The modern views on the pathways of carbohydrate metabolism, the intermediary metabolism of amino acids and proteins, and the actions of insulin are clearly set out in some 20 pages, while the account of the metabolic effects of the pituitary, adrenal, and thyroid hormones is equally condensed, but quite comprehensible. The view that in man total pancreatectomy produces mild diabetes is based on insulin requirement, which is an unreliable criterion of severity.

Part II deals with the manifestations, diagnosis, and therapy of juvenile diabetes, and, under the heading of mortality, surprisingly attributes many of the deaths to coma without, however, specifying whether it is diabetic or hypoglycaemic. The author's attitude towards the aims and objects of treatment is thoroughly sane and realistic, but in the description of treatment itself it is difficult in places to distinguish between theory and practice.

The third and last part is devoted to developmental aspects and complications, including diabetic coma. The dosage of insulin advocated seems to be unnecessarily large, but the danger of hypoglycaemia is reduced by frequent blood-sugar estimations. The statement that "virtually no patient escapes retinopathy after twenty-five or more years of diabetes irrespective of its severity" is not supported by our experience in Great Britain, and would seem to be unduly pessimistic.

There is so much in this book which is vital to the understanding of diabetes, and so relatively little that applies only to children and young adults, that one wishes that the author had allowed himself to cover the whole field. This is a book for the specialist, but much of it, especially Part I, should appeal to all physicians interested in metabolism and endocrinology.

WILFRID OAKLEY.

VIRUS DISEASES

Textbook of Virology for Students and Practitioners of Medicine. By A. J. Rhodes, M.D., F.R.C.P.(Edin.), F.R.S.C., and C. E. van Rooyen, M.D., D.Sc.(Edin.), M.R.C.P.(Lond.), F.R.C.P.(C.). Third edition. (Pp. 642+xv; illustrated, 80s.) London: Baillière, Tindall and Cox. 1958.

In this new edition of their textbook Professors Rhodes and van Rooyen have kept pace with the rapid advances in knowledge of virus diseases. The general layout remains unchanged: there is a comprehensive general introduction on the nature and properties of viruses and the methods of laboratory study, followed by a description of the virus diseases of man arranged primarily on clinical grounds. The text is generously illustrated, and the mass of material is presented in a way which makes it acceptable both for continuous reading and for intermittent reference (though some of the lists for further reading are curiously selected). In the section on respiratory diseases there is a valuable account of the epidemiological behaviour of influenza in the light of current knowledge about the emergence of new strains; it takes the reader just up to the appearance of Asian influenza in 1957. The authors have introduced a full chapter on the diseases caused by adenoviruses, and there is a valuable review of the causes of so-called virus meningitis. This includes the newly discovered enteric or ECHO viruses and a comprehensive account of the Coxsackie viruses. The comprehensive section on poliomyelitis will be particularly welcome from such an authoritative source. Besides a full discussion of modern views on pathogenesis and immunity in poliomyelitis, it includes a description of the Salk vaccine and the results of its use up to 1957. The authors have stressed the great change brought about by the widespread introduction of tissue culture into laboratory diagnosis of virus diseases, and without going into great detail have outlined the techniques which are now available. It is to be hoped that this textbook will help to dispel some of the mystery with which virus diseases are commonly regarded.

M. G. P. STOKER.

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FUTURE OF ASIAN INFLUENZA

It is always easier to see a pattern in the behaviour of influenza when looking backwards than when peering into the future. He would therefore be a rash man who would stake his reputation on his ability to forecast the behaviour of influenza in the coming winter. But it is possible to weigh up the probabilities and tempting to make some guesses.

Asian influenza has recently been reviewed at a meeting of experts in Stockholm under the aegis of the World Health Organization, and there was no dispute among them that the Asian virus, or influenza virus A2 as it may come to be called, showed a greater antigenic deviation from previously current strains than has been observed during the twenty-five years since laboratory study of the virus became possible. Because of its great antigenic novelty, and not because of any other advantage over other strains, the Asian virus "put a girdle round the earth" within six months. It found virtually no specific resistance, except possibly in some old people, and in consequence the morbidity was high in many countries. Now the situation is different. Populations have had experience of Asian flu; they will be encountering a familiar enemy. The situation should be much as in other years.

Two factors, however, urge a little caution. Nowhere, over large sections of a population, was the attack rate of Asian flu higher than about 50%. Different countries have given different reports on whether much subclinical immunization occurred. Where two waves occurred in 1957, as in Japan, victims of the first wave were usually spared in the second; so those who suffered last year may be regarded as having a good chance of escaping in this coming winter. But there may well remain some 50% of fully susceptible people among us. This need not make us too gloomy, for it is a well-known principle of epidemiology that a fair proportion of immunes will effectively damp down the spread of an infection. We can thus reasonably expect that an outbreak, if it comes, will be much less extensive than

¹ Mulder, J., *Lancet*, 1957, 2, 334

a year ago. The second factor to consider is the possibility, suggested by J. Mulder on serological evidence,¹ that the Asian flu may represent a recurrence of the epidemic strain of 1889. And this outbreak was followed by second and third waves in the following year or so, each rather worse than its predecessor. Anyone who revels in despondency may dwell on this unhappy precedent, but there are at present no indications of any important changes in the virus, though these must be carefully watched for. We may take comfort from the fact that, though the Asian virus seems to be persisting in more than one country, no serious outbreaks have been reported during the southern hemisphere winter from Australia, South Africa, or elsewhere.

Past experience has shown that, with the appearance of antigenically novel strains, earlier ones seem to disappear. Isolations of A viruses since the Asian one appeared in the spring of 1957 have been almost entirely of this new type. We may therefore expect that viruses closely related to the Asian will dominate the scene, perhaps for a decade. In any case the attack of influenza is usually much the same from the patient's point of view. Many doctors will be asked about vaccination. Last year's experience showed that a vaccine made against the current strain and given in time generally diminished incidence by about two-thirds. The chances of catching flu are presumably less than last winter; it is therefore a matter for personal choice rather than for a country-wide campaign whether, this coming winter, it is worth a needle prick to reduce to one-third the chances of catching a tiresome disease which may never turn up.

EMOTIONS AND MINERS' NYSTAGMUS

Miners' nystagmus, now on the decline, is an interesting example of a psychosomatic disease, and its cause is debated afresh from time to time.¹⁻⁴ The question has again been raised whether it originates primarily in men of emotional instability,⁵ or whether its psychological symptoms are the outcome of an organic disturbance in ocular function—that is, of the continuous rotary oscillations.⁴

The psychological aspect of the disease has been accentuated by the inclusion, under the terms of certification, of patients with active oscillations but with secondary signs of blepharospasm and photophobia, for these are signs common also to other forms of psychoneurosis. To the undiscerning examiner the terms of certification in fact allow the inclusion of patients with poor visual acuity whose complaint of

blurred vision and headache may be due solely to errors of refraction.⁶

The oscillations can be produced experimentally in animals⁷ by prolonged exposure to darkness, and in man are due to working over a long period in a level of illumination which is below the foveal threshold.^{8,9} Not all miners or experimental animals are affected by these conditions, but the incidence of new cases of miners' nystagmus has certainly decreased since the introduction of better illumination in the mines.

The subjective effect of rotary oscillations is to cause a continuous movement of everything which is seen, and this is accentuated when the miner emerges into daylight. He cannot go out into the streets after dark and is often obliged to sit in a dark room at home. He is thus cut off from the society of his family and of his friends. His final breakdown is often preceded by a long period of partial absenteeism. This state of affairs is in marked contrast to congenital nystagmus, in which objects do not appear to move; in these cases it is rare to find psychoneurosis or a failure to continue in employment. It can well be imagined that a moving world can seriously disturb the emotional and physical stability of the miner, in spite of the fact that he develops certain defensive mechanisms by which he can steady his eyes.

In the earliest stage of the disease visual fixation is unsteady. This may be followed by uniocular nystagmus in either a vertical or a horizontal plane. Rotary oscillations begin in the upward gaze, and the eyes can be steadied by a backward tilt of the head, a posture which was at first attributed to photophobia. When oscillations spread to the horizontal gaze, they can again be controlled by "locking" the eyes in a position of lateral deviation, and this is accompanied by the posture so characteristic of miners' nystagmus—namely, lateral rotation of the head and body and a crab-like walk. In the late stages some miners develop generalized tremors while managing to keep the head and eyes still, or their oscillations become so uncontrollable that work is no longer possible.⁶

¹ Culpin, M., *Brit. J. Ophthalmol.*, 1925, 9, 564.
² Miners' Nystagmus Committee, *Report to the Medical Research Council* (London), 1932, No. 176, 16.
³ Halliday, J. L., *Psychosom. Med.*, 1943, 5, 71.
⁴ Storn, E. S., *Brit. J. Ophthalmol.*, 1948, 32, 209.
⁵ Lion, J. S., *Brit. J. Industr. Med.*, 1958, 15, 204.
⁶ Campbell, D. A., *Med. Press*, 1954, 232, 12.
⁷ Browne, R. C., *Lancet*, 1951, 1, 721.
⁸ Miners' Nystagmus Committee, *Report to the Medical Research Council* (London), 1922, No. 65.
⁹ — *ibid.*, 1923, No. 80.
¹⁰ Calger, H., *Med. Press*, 1941, 208, 152.
¹¹ Stern, E. S., *Brit. J. Ophthalmol.*, 1950, 34, 385.
¹² Heron, A., *Brit. J. Psychol.*, 1956, 47, 243.
¹³ Wallen, R., *J. abnorm. soc. Psychol.*, 1945, 40, 271.
¹⁴ Eysenck, H. J., *Dimensions of Personality*, 1947, London.
¹⁵ Campbell, D. A., *Trans. ophthalm. Soc. U.K.*, 1954, 74, 79.
¹⁶ Ohm, J., *Albrecht v. Graefes Arch. Ophthalmol.*, 1952, 152, 477.
¹⁷ — *ibid.*, 1952, 153, 321.
¹⁸ B.M.A. Committee Report on Miners' Nystagmus, *Brit. med. J.*, 1936, 1, suppl. p. 238.

Since oscillations in themselves give rise to a grave disability, it is desirable that any comparison of the physical and psychological aspects of miners' nystagmus should be made on cases which show active oscillations. This unfortunately has seldom been done. The establishment of the disease as a psychosomatic disorder was based on an analysis of certified cases of all types,¹ some of which conformed to the grouping of hysteria, anxiety, and obsessional states. It was observed that miners could continue to work underground with oscillations unless fear supervened,¹⁰ and conversely that the disappearance of oscillations could culminate in the development of psychoneurosis. There is evidence that anxiety concerning the hazards of underground work will precipitate a breakdown, but a high percentage of normal colliers who were examined at the same time as those with oscillations also showed evidence of emotional stress.⁴ It would thus appear that the dangers of the occupation are also significant.¹¹

The recent application of standardized tests of emotional stability has shown that men with nystagmus are more emotionally unstable than men without the disease.⁵ They gave a significantly higher number of neurotic responses to Heron's test¹² (consisting of a questionnaire as to physical health) and to Wallen's test¹³ (of food aversions), and to Eysenck's tests¹⁴ (of hand and leg persistence). No relationship was found between the emotional stability revealed by these tests and the severity or duration of the disease.⁵ Unfortunately, no criteria of the severity of the disease were given, and no information on whether oscillations or tremors were present, though the latter might well affect the ability to maintain a hand grip or to hold a leg fully extended as required by Eysenck's tests.

The mining industry is notoriously affected by economic conditions, but it is now generally agreed that unemployment is not a contributory factor to the incidence of new cases of miners' nystagmus,¹⁵ though it may play its part in the development of neurosis in long-standing cases. In the years 1930-3, when there was a steep rise in unemployment among miners, the number of certifications for nystagmus actually fell from 41.5 to 25.0 per 1,000 men underground. Conversely they rose by 110% in the war years 1939-43, when unemployment was virtually nil and wages were good, but the stress of work was such that absenteeism, injuries, and deaths rose alarmingly and coal production fell.

If emotional instability is the basic cause of miners' nystagmus, then it is difficult to understand why it does not usually develop before the age of 40, or until 25-30 years have been spent underground. The

presence or absence of oscillations cannot be regarded as unimportant. It has been suggested that they are a stage in the hysterical conversion of symptoms,¹¹ but J. Ohm,^{16 17} who has spent a lifetime in the observation of the disease, has presented evidence that nystagmus is due to a disturbance of the ocular sensory-motor impulses in which the physiological rate of frequency is converted to a pathological one of lower rate. The disturbance is undoubtedly cortical, since it affects integrated movements.¹¹ Whatever the nature of the balance between organic and psychological factors, ophthalmologists at least would still uphold the recommendation made by the Special Committee appointed by the B.M.A. in 1936¹⁸ that "cases should not be certified as miners' nystagmus unless definite oscillation of the eyes can be detected," since any nervous symptom or neurosis exhibited by a miner suffering from nystagmus presents nothing peculiar to his calling, "but has the ordinary features of an anxiety or other neurosis due to other causes."

SURGERY IN PARKINSONISM

The story of the surgery of Parkinsonism begins with the work of R. Meyers,^{1 2} who tried several operative procedures on the basal ganglia and found that section of the efferent fibres of the globus pallidus gave most benefit. He divided these fibres (the ansa lenticularis and the fasciculus lenticularis) through the lateral wall of the third ventricle. The operation was based on the assumption that the globus pallidus is in a state of degeneration in Parkinsonism, though this is now disputed.³ Of twenty-two cases, Meyers obtained much improvement in eight; they were free of tremor but still had some rigidity. In ten cases improvement was not so great; a further two were not improved; and two patients died. Meyers has recently been successful in abolishing tremor and rigidity contralaterally in three patients by subjecting the ansa lenticularis and the fasciculus lenticularis to multibeam ultrasonic waves. Good results are also claimed with other methods of destroying these fibres.⁴⁻⁷

While attempting section of the lateral two-thirds of one cerebral peduncle for contralateral tremor as described by A. E. Walker,⁸ I. S. Cooper⁹ inadvertently damaged the anterior choroidal artery and was obliged to coagulate it. (The anterior choroidal artery arises from the internal carotid just above the posterior communicating artery and is adjacent to the cerebral peduncle.) The pedunculotomy was then abandoned, but the patient was found to be free from tremor on the opposite side and no

abnormal neurological signs were produced. As a result of this experience Cooper continued to coagulate the anterior choroidal artery for Parkinson's disease. The beneficial effects of this operation are due to infarction of the globus pallidus, as experiments on chimpanzees have shown.¹⁰ This operation has a 10% mortality, and it sometimes causes a contralateral hemiplegia and other serious neurological disturbances. It has therefore been given up in favour of less risky methods of destroying the globus pallidus, such as injection of procaine in oil¹¹ and injection of alcohol.¹² The most favoured method is injection of alcohol and is termed chemopallidectomy. It is carried out through a burr-hole, and orientation is obtained by means of pneumoencephalography. The mortality in a series of 245 cases was 2.8%; post-operative hemiplegia occurred in 2%; relief of contralateral tremor and rigidity was obtained in 70%.¹³

Victor Horsley¹⁴ showed in 1909 that removal of the precentral gyrus, area 4 of Brodmann, abolishes contralateral athetosis, and a few years ago P. C. Bucy^{15 16} confirmed this and also succeeded in eliminating tremor by the same procedure, but the involuntary movements are abolished at the expense of spastic paralysis of the affected limbs.

One of the patients whose record appears in James Parkinson's monograph¹⁷ had a cerebral haemorrhage and immediately lost the tremor on the hemiplegic side. This fact, together with the observation that section of the pyramidal tract in monkeys causes little or no lasting disability, led T. J. Putnam^{18 19} to divide the crossed pyramidal tract unilaterally at the second cervical level for unilateral tremor. There was reduction of tremor in 15 out of 22 patients, and most of the patients made a complete recovery from the post-operative hemiplegia. After this operation complete relief of tremor is not obtained and it tends to return to its former amplitude.^{20 21} L. C. Oliver has shown

¹ Meyers, R., *Arch. Neurol. Psychiat. (Chicago)*, 1940, **44**, 455.

² — *N.Y. St. J. Med.*, 1942, **42**, 317.

³ Greenfield, J. G., and Bosanquet, F. D., *J. Neurol. Neurosurg. Psychiat.*, 1953, **16**, 213.

⁴ Fénelon, F., *S. m. Hôp. Paris*, 1952, **28**, 3775.

⁵ — *Rev. neurol.*, 1953, **89**, 580.

⁶ Guiot, G., and Brion, S., *ibid.*, 1953, **89**, 578.

⁷ Spiegel, E. A., and Wycis, H. T., *Arch. Neurol. Psychiat. (Chicago)*, 1954, **71**, 598.

⁸ Walker, A. E., *Acta psychiat. (Kbh.)*, 1949, **24**, 723.

⁹ Cooper, I. S., *Psychiat. Quart.*, 1953, **27**, 317.

¹⁰ Mettler, F. A., Cooper, I. S., Liss, H., Carpenter, M., and Noback, C., *J. Neuropath. exp. Neurol.*, 1954, **13**, 528.

¹¹ Narabayashi, H., and Okuma, T., *Proc. imp. Acad. Japan*, 1953, **29**, 134.

¹² Cooper, I. S., and Poloukhine, N., *J. Amer. Geriat. Soc.*, 1955, **3**, 839.

¹³ — *ibid.*, 1956, **4**, 1171.

¹⁴ Horsley, V., *Brit. med. J.*, 1909, **2**, 125.

¹⁵ Bucy, P. C., *Amer. J. Surg.*, 1948, **75**, 257.

¹⁶ — *J. Neurol. Psychiat.*, 1951, **14**, 108.

¹⁷ Parkinson, J., *An Essay on Shaking Palsy*, 1817, London.

¹⁸ Putnam, T. J., *Arch. Neurol. Psychiat. (Chicago)*, 1940, **44**, 950.

¹⁹ — and Herz, E., *ibid.*, 1950, **63**, 357.

²⁰ Oliver, L. C., *Lancet*, 1949, **1**, 910.

²¹ — *Parkinson's Disease and Its Surgical Treatment*, 1953, London.

²² Sjöqvist, O., *Zbl. Neurochir.*, 1954, **14**, 16.

²³ Gaches, J., Le Beau, J., and Tavernier, J. B., *Sem. Hôp. Paris*, 1955, **31**, 1850.

²⁴ Oliver, L. C., *Lancet*, 1958, **1**, 1121.

that unilateral tremor can be entirely eliminated by complete section of lateral column of the cervical part of the spinal cord.^{21 22} Operations on any part of the pyramidal system are best performed only on patients who have had hemiparkinsonism for at least five years without the slightest evidence of involvement of the other side. The price of eliminating tremor by section of a lateral column is some permanent hemiparesis and contralateral analgesia as well as loss of temperature sensation extending up to a variable level but usually reaching the inner border of the arm. Out of 20 patients, 18 were entirely relieved of tremor and 2 were only partially relieved. Other surgeons have obtained comparable results.^{23 24}

Chemopallidectomy is the most promising advance in the treatment of Parkinsonism and is the most generally applicable procedure.²⁵ It can be used in unilateral or bilateral disease. It has a more lasting beneficial effect on rigidity and motor function than on tremor. In long-standing unilateral Parkinsonism in which tremor is the presenting symptom, either because it is embarrassing to the patient or because it is sufficiently severe to interfere with function, section of a lateral column is the more effective operation. But unilateral pallidectomy is worth trying first in such cases, for the patient may be satisfied with this, and damage to the pyramidal system is usually avoided.

ENTEROVIRUSES AND DIARRHOEA

There are now about fifty serologically distinct viruses grouped together as enteroviruses.¹ They include polioviruses, Coxsackie viruses, and ECHO viruses. The enteric cytopathogenic human orphan (ECHO) viruses were so named because they were found by inoculating human faeces into tissue cultures and were "orphans" in the sense that they were "in search of diseases," since most of them were first found in the faeces of normal children. We have recently reviewed² the evidence that some serotypes (4, 6, and 9) apparently cause the aseptic meningitis syndrome. It now appears that some of these orphans may have other "homes." M. Ramos-Alvarez,³ working in Cincinnati in 1955, noted that far more children with summer diarrhoea were excreting ECHO viruses than might have been expected from earlier studies on healthy children. In June, July, and August, 1956, in collaboration with A. B. Sabin, this finding was followed up by studying in detail 97 children admitted to or attending hospital for acute diarrhoea (often associated with fever, vomiting, and dehydration) and 100 other children attending the hospital at the same time but not for "acute illness." About 75% were under 1 year of age. Rectal swabs were collected and examined for the presence of poliomyelitis viruses, Cox-

sackie viruses, and ECHO viruses and for enteric bacteria. The results of both investigations have now been reported in full.⁴ The main points of aetiological importance which emerged seem to be the following. ECHO viruses were isolated in 1956 from 31% of the children with diarrhoea and from 5% of the children without it. The serotypes of ECHO virus found were quite different in 1955 and 1956. They included 5 isolations of type 6, which causes aseptic meningitis. Few polioviruses or Coxsackie viruses were found, and the frequency was the same in both groups of children. In most of the 13 children tested, antibody directed against the ECHO virus which was found in their own faeces appeared in the patients' blood stream after the illness. *Salmonella* and *Shigella* were uncommon, but *E. coli* type O.111 B. 4 was found in 19% of children with diarrhoea and in 3% of those without, though the total frequencies of all types of pathogenic *E. coli* were similar in the two clinical groups. On the clinical side it was noted that children infected with viruses but not with pathogenic *E. coli* were dehydrated in 29% of cases and had blood-stained stools in 20%, whereas children infected with pathogenic *E. coli*, with or without viruses, were dehydrated in about 90% of cases and none had blood-stained stools. There were no deaths. On the data presented by Ramos-Alvarez and Sabin a good case can be made for the conclusion that infection of infants and small children with any ECHO virus may produce a mild summer diarrhoea. This is supported by the report⁵ that ECHO virus type 18 was isolated from 15 cases in a circumscribed outbreak of diarrhoea in a unit caring for premature and older infants in New York. Many more controlled studies on this subject are needed.

It is not surprising that ECHO viruses may cause diarrhoea in small children; symptoms from the alimentary tract are common in the minor or prodromal illnesses produced by polioviruses and Coxsackie viruses. It looks as though many different viruses and bacteria, alone or in combination, can cause the summer diarrhoea syndrome. At the moment it is difficult to guess how frequently this illness is produced by ECHO viruses. If they had used faeces instead of rectal swabs, Ramos-Alvarez and Sabin would probably have found more children infected with enteroviruses. If they had made their study earlier or later in the year, they would probably have found enteroviruses much less frequently than they did in summer. In a series (unpublished) of about 30 English children admitted to hospital in the first three months of the year suffering from diarrhoea without an ascertainable bacterial cause, no enteroviruses were isolated from the faeces. In addition, viruses which are apparently not enteroviruses have been shown to cause acute gastro-enteritis. The viruses cannot be isolated

¹ Committee on Enteroviruses, *Amer. J. publ. Hlth*, 1957, **47**, 1556.

² *Brit. med. J.*, 1958, **1**, 330.

³ Ramos-Alvarez, M., *Ann. N.Y. Acad. Sci.*, 1957, **67**, 326.

⁴ — and Sabin, A. B., *J. Amer. med. Ass.*, 1958, **167**, 147.

⁵ Eichenwald, H. F., Abadio, A., Arky, A. M., and Hartman, A. P., *ibid.*, 1958, **166**, 1563.

⁶ Jordan, W. S., Jr., *Proc. Soc. exp. Biol. (N.Y.)*, 1957, **94**, 692.

⁷ Gordon, I., Patterson, P. R., and Whitney, E., *J. clin. Invest.*, 1956, **35**, 200.

⁸ Jordan, W. S., Gordon, I., and Dorrance, W. R., *J. exp. Med.*, 1953, **98**, 461.

⁹ Cramblett, H. G., Rosen, L., Parrott, R. H., Bell, J. A., Huebner, R. J., and McCullough, N. B., *Pediatrics*, 1958, **21**, 168.

¹⁰ Philipson, L., and Wesslén, T., *Arch. ges. Virusforsch.*, 1958, **8**, 77.

¹¹ — *ibid.*, 1958, **8**, 204.

in tissue cultures or other laboratory hosts,⁶ so human volunteers have to be used, and progress is very slow. However, clinical observations and cross-protection tests indicate that at least two strains of virus exist.^{7 8}

Recent work also suggests that some enteroviruses may cause respiratory illnesses in children. A new strain, JV 1 (ECHO type 20), was found in six infants with feverish colds and coughs.⁹ L. Philipson and T. Wesslén¹⁰ have isolated an apparently new virus named U virus (after Upsala, Sweden). This is almost certainly an ECHO virus, and there is evidence that it is able to cause non-diphtheritic-croup and a cold-like illness in children.¹¹

TREATMENT OF PHENYLKETONURIA

An inborn error of metabolism, phenylketonuria is inherited as a simple recessive characteristic, and it commonly runs in families.¹ The central biochemical abnormality appears to be an inability to oxidize phenylalanine to tyrosine because of absence or inactivity of the enzyme phenylalanine hydroxylase normally found in the liver.² While it is not fully understood how the resultant production of abnormal metabolites brings about the various clinical features of phenylketonuria, particularly the severe mental deterioration, it is probable that they are all due ultimately to the deficiency of phenylalanine hydroxylase, which can be formed only by the action of a single normal gene, which these patients lack.¹

As it is impossible to supply the missing enzyme, the only treatment is to try to correct the biochemical abnormalities. The deficiency of tyrosine can be corrected by giving large quantities of it in the diet. Although this darkens the typically ash-blond hair and fair skin of these patients, it has been of no avail against the amentia.¹ An alternative approach is to reduce the very high levels of phenylalanine in the blood and urine by feeding a diet which is low in phenylalanine. As all dietary proteins are rich in phenylalanine, a suitable diet can be prepared only by supplying the bulk of the nitrogen as amino-acids. This is achieved by freeing an acid casein hydrolysate of phenylalanine, tyrosine, and tryptophan by passing it through a column of charcoal. Tyrosine and tryptophan are then added back, along with glucose, vegetable margarine, wheat starch, and various salts and vitamins to supply a synthetic and highly artificial diet which is, none the less, compatible with a normal rate of growth. Such a preparation is now commercially available.

In 1953 H. Bickel and his colleagues³ reported improvement in a child's mental condition on this diet. Other workers have confirmed this finding, although the degree of mental improvement obtained was widely variable.⁴⁻⁶ It would appear that all the features of the disease except the amentia can be reversed in a short period by a diet low in phenylalanine.¹ The degree of improvement in the amentia must depend on various factors. These children are probably not mentally

deficient at birth, but if treatment is long delayed irreversible brain damage will ensue. The degree of biochemical control of the diet has to be adequate. Although L. I. Woolf and colleagues⁴ obtained considerable improvement in three patients by keeping the phenylalanine content of the diet at such a level that phenylpyruvic acid never appeared in the urine, J. D. Blainey and R. Gulliford⁶ preferred to control the intake of phenylalanine by regular estimations of the phenylalanine levels in the plasma by microbiological assay. Apparently the simple ferric chloride test for phenylpyruvic acid in the urine may be negative in the presence of abnormally high levels of phenylalanine in the plasma. The latter workers found that intakes of phenylalanine as low as 15 mg./kg. a day were fully adequate to permit normal growth provided a high intake of carbohydrate was also ensured.

This year L. I. Woolf and his colleagues from Great Ormond Street⁷ have reported the results of treating eleven patients for periods varying from 11 to 34 months. Their patients were submitted to careful psychometry at regular intervals, and the phenylalanine intake was controlled by frequent estimations by paper chromatography of the concentrations of phenylalanine in the blood and urine. They stress that too low an intake of phenylalanine will result in an unsatisfactory rate of growth. The results give clear evidence of the effect of the diet on the mental condition. In most cases there was a sharp rise in mental age as against chronological age as soon as the diet low in phenylalanine was started, and the improvement was maintained while the child stayed on the diet. None the less, in all but two patients the mental age remained well below the mean for the population as a whole. In one of these treatment was started at the age of 5 weeks. The other was atypical in that her intelligence before treatment was unusually high. The overall results indicate that there is an irreversible component in the mental deterioration which appears at a very early age. It seems unfortunately to be the case that by the time phenylpyruvic amentia is established a low-phenylalanine diet is likely to raise a child's mental rating only from idiot to imbecile level, hardly a very gratifying achievement.

If the intelligence is to be preserved, dietary treatment must start before measurable mental deterioration has occurred—that is, before the diagnosis can be suspected by simple observation of the patient. The Great Ormond Street workers recommend that every child's urine should be tested at the age of 21 days by the ferric chloride test. This would require organization on a national scale to detect somewhere between 20 and 40 new cases each year. Certainly the urine of a sib of a known phenylketonuric should be tested frequently during the first 3-4 weeks of life, because the chances that he also will be affected are one in four. It is worth

¹ Knox, W. E., and Haia, D. Y.-Y., *Amer. J. Med.*, 1957, 22, 687.
² Jervis, G. A., *Proc. Soc. exp. Biol. (N.Y.)*, 1953, 82, 514.
³ Bickel, H., Gerrard, J., and Hickmans, E. M., *Lancet*, 1953, 2, 812.
⁴ Woolf, L. I., Griffiths, R., and Moncrieff, A., *Brit. med. J.*, 1955, 1, 57.
⁵ Armstrong, M. D., and Tyler, F. H., *J. clin. Invest.*, 1955, 34, 365.
⁶ Blainey, J. D., and Gulliford, R., *Arch. Dis. Childh.*, 1956, 31, 452.
⁷ Woolf, L. I., Griffiths, R., Moncrieff, A., Coates, S., and Dillstone, F., *ibid.*, 1958, 33, 31.

emphasizing, too, that low-phenylalanine diets can be controlled only in a children's hospital or department with generous laboratory facilities. Unfortunately the difficulties of managing the diet when the patient goes home will inevitably result in some patients being inadequately controlled.

RADIOACTIVE STERILIZATION OF INSECT PESTS

In the past decade new synthetic insecticides have achieved great success in the control and eradication of insect-borne disease, but already their powers are seriously threatened by the emergence of many resistant strains. This intensifies the interest in an entirely new method of attacking insects by liberating large numbers of radioactively sterile individuals. The method depends on the well-known sensitivity of reproductive tissues to radiation. Doses of about 5,000 r (ten times the dose lethal to most mammals) can be given to certain insects in the pupal stage without greatly curtailing their lives; but the resulting adults are generally sterile. The females of many insects allow only a single mating, and if this has been with a sterile male the act is sufficient to prevent reproduction. To eradicate a pest, then, it is necessary to liberate sufficient numbers of sterile males to compete successfully with normal wild ones.¹ That this is sometimes feasible has been shown by American workers who have exterminated the "screw worm" fly (which breeds in wounds and sores of animals) from the island of Curaçao,² which has an area of 170 square miles (440 square kilometres). The flies were reared in vast numbers, sterilized in a cobalt-60 irradiator, and released at the rate of about 400 males per square mile (150 per sq. km.) weekly for about 20 weeks.

Blowflies, like the screw worm, are particularly vulnerable to attack by this means, since their wild populations are naturally small (a few hundred to the square mile). Many pests are much more numerous; and it would seem impossible to produce enough sterile mosquitoes to compete with natural populations estimated at three-quarters of a million per square mile³ mated at three-quarters of a million per square mile (300,000 per sq. km.), or midges, which may reach a figure of 3 million per square mile (1-2 million per sq. km.).⁴ One of the most hopeful possibilities is the tsetse fly (which is normally sparse in nature), and this is being investigated by British workers at the present time.⁵ Certain difficulties arise at once: for example, the long life cycle of the tsetse would require the release over a long period of the sterile males; and, more important, great difficulty attends the breeding in large numbers of tsetse flies in captivity, so that at present wild pupae of unknown age must be collected for irradiation. A further drawback is that female tsetse can mate more than once, though they seldom do so more than twice.

¹ Knipling, E. F., *J. econ. Ent.*, 1955, 48, 459.
² Baumhover, A. H., et al., *ibid.*, 1955, 48, 462.
³ Eyles, D. E., and Cox, W. W., *J. nat. Malar. Soc.*, 1943, 2, 71.
⁴ Department of Health for Scotland, *2nd Report on the Control of Midges*, 1948, H.M.S.O., Edinburgh.
⁵ Potts, W. H., *Proc. roy. Ent. Soc. C.*, 1947, 22, 2 and 9.

The possibilities of radioactive sterilization are being studied with other insect pests as well as tsetse. Success of the method clearly depends on the interaction of many factors, including the ease of sterility without curtailment of life, the frequency of mating of the females, the length of the life cycle, and, above all, the ease of rearing for irradiation numbers large enough in relation to natural populations. Unlike insecticidal control, the method becomes progressively more efficient as the natural populations decline. Perhaps, therefore, it may be most feasible against residual populations, after decimation by intensive insecticide campaigns.

UNITY IN FIRST AID

As our correspondence columns have shown from time to time, opinions on first aid are apt to be expressed with uncommon emphasis. Perhaps this is a reflection of the circumstances in which it is often rendered. Drastic action must be taken quickly, possibly in co-operation with other first-aiders, who may have been taught to apply different methods. To a sense of urgency must be added a facility in recalling almost automatically what the correct procedure is; and the first-aider's exertions may easily make all the difference between life and death. An important advance towards achieving a common practice of first aid has now been taken in the publication of a single, joint manual¹ by the St. John Ambulance Association, the St. Andrew's Ambulance Association, and the British Red Cross Society. Slightly larger than the older manuals, this nevertheless fits the pocket neatly, is easy to read and well illustrated, and is strongly stitched and bound. Expert (though anonymous) contributors have supplied the text, which has been edited by Dr. L. S. Potter, and it naturally reflects modern views on the subject. In the treatment of shock, for instance, hot-water bottles are barred, and the flow of hot, sweet tea is reduced to sips (but in the treatment of "minor burns" this is given in "large quantities"). Pressure points at which to arrest blood flow in the arteries are described and illustrated for the carotid, subclavian, brachial, and femoral arteries. Modesty seems to prevail over clarity in that pressure to the femoral artery is shown being applied through the subject's trousers, though the advantage of illustrating these points with the unclothed body is evident from the neighbouring diagrams. In teaching how to stop bleeding from a varicose vein in the leg the booklet rightly lays emphasis on raising the leg and keeping it raised. All the usual features of first aid are set out—various methods of artificial respiration, bandaging, and carrying casualties—and among the appendices is one on first aid in hot climates. Here the treatment of snake-bite finds its place. But what to do in Great Britain when an adder fastens on the leg that disturbs it is probably one of those parts of first aid that are still open to debate.

¹ *First Aid*, 1958. First edition. The authorized manual of the St. John Ambulance Association, the St. Andrew's Ambulance Association, and the British Red Cross Society. Price 4s. net; postage extra. 1958.

BIOCHEMISTRY'S EXPANDING HORIZONS

FOURTH INTERNATIONAL CONGRESS

[FROM A SPECIAL CORRESPONDENT]

Three years have elapsed since the Third International Congress of Biochemistry, in Brussels, which over 3,000 scientists attended. The Fourth International Congress, just finished, took place in Vienna from September 1 to 6, and 6,000 went to it. Over 1,700 papers were received and there were five colloquia and twelve symposia. The subjects considered ranged, to mention but a few, from the carbohydrate chemistry of substances of biological interest, such as the carbohydrates of the nucleic acids, to the biochemistry of the central nervous system, the steroids, antibiotics, morphogenesis, viruses and proteins, blood-clotting factors, and vitamin metabolism. The inevitable overlapping made it impossible to attend all the sessions one would have liked, as at times papers were being read simultaneously in twenty different lecture theatres. Indeed, the choice was often embarrassingly difficult. For example, papers on brain metabolism and the effects of neurotropic agents by Professor J. H. QUASTEL, F.R.S. (Montreal), the modes of action of antibiotics by Dr. F. E. HAHN (Washington, D.C.), and the genetic control of the protein structure of abnormal haemoglobins by Dr. V. M. INGRAM (Cambridge) were read simultaneously.

Chemistry of Heredity

The inaugural session was opened with speeches of welcome by Professor F. BRÜCKE (Vienna), Professor O. LOEWI (New York), and others, and by Professor C. F. CORI (St. Louis), president of the Congress, who emphasized the need to translate biochemical knowledge to practical problems. The inaugural lecture was then given by Professor E. W. CHARGAFF, of New York, on "First Steps Towards a Chemistry of Heredity." In his cautious survey of present knowledge and future hopes Professor Chargaff pointed out that, despite the considerable increase in biochemical knowledge since the time when vitalists fought one another in ignorance and fog, we were still very far from the biochemistry of individuality; while a ladder might by now have been placed towards the heavens, it would be a hundred years before we should have passed the first one or two rungs on it. We had some appreciation of the interrelationships and the biochemistry of heredity of deoxyribonucleic acids (D.N.A.), ribonucleic acids (R.N.A.), proteins, lipids, and polysaccharides, but very many questions had to be answered, among which was whether the D.N.A.s were the genetic carriers.

The Congress then divided into the various symposia and colloquia. The papers reflected a very active period of increased knowledge, although no major advances were recorded. Several of the findings reported in the virus field may pave the way towards further research on virus diseases and eventually, perhaps, to their treatment. It is by now generally accepted that the crucial event in viral infection is the introduction of the viral nucleic acid into the host cell, and a number of papers were concerned with aspects of this phenomenon. In the bacterial field, where considerable evidence has already been gathered in favour of the view that D.N.A. alone is involved in the transmission of hereditary characteristics, Dr. L. M. KOZLOFF (Chicago) described the changes in the tail structure of bacteriophage during invasion, the phage's action on its host's cell wall, and the forces involved in the passage of the viral D.N.A. from the head of the phage particle through its tail into the host cell. He drew attention to recent experiments indicating that there is a contractile protein in the tail of the bacteriophage T2 which plays an important part in all the three phases of the invasion.

Viral Infectivity

Viral infection had also been studied by several other workers using tobacco mosaic virus (T.M.V.). The finding

that it is possible to dissociate a number of viruses, including T.M.V., each into their separate protein coat and nucleic acid component, and to recombine them, has raised the problem of whether the whole of the virus particle, or only a small part of it, is essential for its biological activity. Dr. H. FRAENKEL-CONRAT (Berkeley, U.S.A.), and Drs. J. GIERER (Stockholm) and G. SCRAMM (Tübingen), recorded originally that properly isolated viral nucleic acid alone was able to initiate the infective process and the reproduction of the virus. Its activity was, however, only of the order of 0.1% to 0.5% of that of the original virus; and, though these results were confirmed by other laboratories, the problem remained of why it should not be possible to obtain more highly infective preparations of the isolated T.M.V. nucleic acid. Dr. FRAENKEL-CONRAT thought the explanation might be the great lability of the pure nucleic acid material to various agents—the foremost of which is ribonuclease—which it might encounter on the leaf surface. Dr. B. COMMONER (St. Louis), on the basis of experiments he described, thought we must distinguish between two types of infectivity: inherent and acquired. For inherent activity the presence of an intact or nearly intact R.N.A. (virus R.N.A. and some of the virus protein) chain was essential, any process which broke part of the chain reducing this inherent activity nearly to zero. He put the amount of protein needed at as little as, possibly, a single sub-unit of molecular weight 20,000. How such a single protein sub-unit—which is quite small compared with the entire R.N.A.—could endow the total nucleotide chain with the virus generative configuration was answered by the suggestion that the protein sub-unit might act as a movable templet over which the R.N.A. chain could pass, thereby acquiring a continuous series of repetitive local patterns. Although the structure of the protein was fixed, the configuration of the protein-R.N.A. complex would be expected to vary continuously as a function of the linear sequence of the polynucleotide chain. A crude analogy to this process is what happens on a tape recorder. Acquired infectivity, resulting perhaps from the interaction of host tissue with invading particle, was found only in shortened rods of T.M.V.; and in this case the replication of the virus nucleic acid might be a linear rather than a side-to-side process.

Dr. P. ALEXANDER and Dr. K. A. STACEY (London) reviewed the evidence on the ability of ionizing radiations and certain mutagenic chemicals to modify D.N.A. Treatments which altered its physico-chemical properties had been shown to destroy at the same time its power of transformation. The parallelism between mutagenicity and tumour inhibition might be due to a similarity in mechanism and the difference depend only on the extent of the damage or change in the D.N.A.

Antibiotics against Cancer

Dr. G. F. GAUSE (Moscow) reviewed the biochemical basis of the search for antibiotics against cancer, relating the screening of substances for selective cytostatic or cytotoxic effects on tumour cells to biochemical differences between normal and malignant cells. He compared cancer cells and possibly equivalent mutated micro-organisms, and discussed the use of the latter for screening purposes. He remained cautious, however, on the question of whether chemicals that inhibit the growth of these biochemically mutant micro-organisms would prove of practical importance in the treatment of malignant growth.

The general impression left by the Congress is that the progress reported represents steady, and in places considerable but by no means major, advance. A sobering thought, however, is that the frontiers of biochemical knowledge may soon advance at such a rate as to outstrip man's capacity to correlate the information acquired. At the Third Congress over 500 papers were read, at the present Congress over 1,700. How many papers will be presented at the next one, which, it has just been announced, is to take place in Moscow in 1961?

HEALTH OF THE AGED

Europe's ageing population and the pressing health problems it raises were the subject of debate in two international forums recently: the first an advisory group convened by the European Office of W.H.O., which met in Oslo from July 27 to August 2; and the second the European League for Mental Health, which met in Vienna on August 23.

Forced Retirement

The European League for Mental Health discussed the mental health problems of the older worker and those of retirement. Dr. DORIS ODLUM defined "an older worker" as one who, on account of age, met any special difficulties in obtaining or retaining employment or who on this account was less able to do satisfactory work. While more people of both sexes now lived longer and retained much of their vigour and working capacity until the late sixties or even older, many, she said, even in their fifties or early sixties could not obtain suitable employment, and a number were arbitrarily retired long before their capacity to do efficient work had diminished. This often produced mental distress. Investigation showed that few people gave up work voluntarily merely because they wanted more leisure. In fact, many dreaded the prospect of idleness: they felt discarded and tended to lose their incentive to keep active. This could lead to premature deterioration and early senescence. Older women, because they had their homes and husbands to care for and often other interests as well, tended to suffer less than men. Besides supplying him with money and material advantages, his work was the main means of fulfilling a man's ego. The retired man not only had to diminish his style of living because he had less income but he was not wanted in the home or indeed anywhere, and the greatest enemy to mental health was the feeling of being redundant. In the case of the widowed or unmarried loneliness was often a great problem. Dr. Odlum's proposals for mitigating these situations included the provision of more suitable and more part-time work and the avoidance of compulsory retirement so far as possible. The preparation of a man for his retirement was also vitally important, since his personality and the attitude with which he faced the new situation would largely decide how far he could adapt to it.

Professor PAUL REITER, of Copenhagen, said they had a very similar problem in Denmark, which was rapidly changing from an agricultural to an industrial economy. He described some of the mental and emotional disturbances affecting the older and retired worker seen in his clinic, and said it was now realized that many cases thought previously to be senile psychoses were really psychogenic and could be greatly helped by medical and social care.

Dr. ANDRÉ REPOND, Switzerland, said that the problems of the agricultural communities were considerable and not to be ignored. Their pattern of life was also changing. Dr. VEIL, France, said that preparation for ageing really began in childhood and at school: the lower the standard of education and cultural background, the earlier the decline of mental powers.

W.H.O. Regional Group

The W.H.O. group consisted of experts in various aspects of gerontology and geriatrics from Finland, France, Germany, Italy, Netherlands, Norway, Sweden, U.S.S.R., the United Kingdom, and Yugoslavia under the chairmanship of Dr. JEAN HUET, of Paris. Professor W. HOBSON, of Sheffield University, was the United Kingdom representative. They had the task of surveying the present health needs of the aged in Europe and of framing recommendations for the W.H.O. European Regional Office and for governments. Having cleared the ground by reviewing the demographic trends in different countries and the existing provision for the aged, the group discussed in detail the planning and organization of health and medical services for the elderly.

Education of the public about the problems of the elderly was thought a useful preventive measure for some of their disabilities, but more information was needed on such questions as the value of routine health examinations and multiphasic screening procedures. The group's recommendations will be the subject of a special report.

APPROVED NAMES

"Approved names" are devised or selected by the British Pharmacopoeia Commission, and the intention is that if any of the drugs to which these approved names are applied should eventually be described in the *British Pharmacopoeia* the "approved name" should be its official title.

The previous supplement to the consolidated list of "approved names" was published in the *Journal* of May 17 (p. 1175). A new supplement, dated August, 1958, is printed below. Communications relating to "approved names" should be addressed to the Secretary, British Pharmacopoeia Commission, General Medical Council, 44, Hallam Street, London, W.1.

Approved Name	Chemical and Other Names	Notes
Ambazone	1: 4-Benzoquinone amidino-hydra-zine thiosemicarbazone hydrate "Iversal"	Antiseptic for local treatment of buccopharyngeal infections
Beclamide	N-Benzyl-β-chloropropionamide "Nydrane"	Anticonvulsant
Benztropine	3-Diphenylmethoxytropine "Cogentin" is the methane-sulphonate	Symptomatic relief of Parkinson's syndrome
Bisacodyl	Di-(p-acetoxypheyl)-2-pyridylmethane "Dulcolax"	Laxative
Chlorphenesin	3-p-Chlorophenoxypropane-1: 2-diol	Fungicide
Clemizole	1-p-Chlorobenzyl-2-pyrrolidino-methyl-benzimidazole "Allercu" is the hydrochloride	Antihistamine
Clemizole Penicillin	Benzylpenicillin combined with 1-p-chlorobenzyl-2-pyrrolidino-methyl-benzimidazole "Megacillin"; "neopenyl"	Antihistamine penicillin with prolonged depot action
Deanol	2-Dimethylaminoethanol "Atrol" is the bitartrate	Treatment of schizophrenia and other mental disorders
Dimethisterone	6α: 21-Dimethylethisterone "Secrosteron"	Progestational agent
Ethioheptazine	Ethyl(1-methyl-4-phenylazacycloheptane-4-carboxylate "Zaciane"	Analgesic
Framycetin	An antibiotic derived from <i>Streptomyces decarls</i> "Soframycin" is the sulphate	Treatment of cutaneous infections
Furazolidone	3-(5-Nitrofurfurylideneamino)-oxazolidin-2-one "Furoxone"	Treatment of bacterial diarrhoeas and enteritis
Inproquone	2: 5-Bisethylethimino-3: 6-dipropoxy-1: 4-benzoquinone	Cytostatic agent
Pempidine	1: 2: 2: 6: 6-Pentamethylpiperidine "Perolysen" is the hydrogen tartrate; "tenormal" is the hydrogen tartrate	Treatment of hypertension
Phytomenadione	2-Methyl-3-phytyl-1: 4-naphthoquinone "Vitamin K ₁ "; "konakion"; "mephyton"	Treatment of hypoprothrombinaemia
Piprinhydrinate	Diphenylpyralline salt of 8-chlorotheophylline 4-Diphenylmethoxy-1-methylpiperidine salt of 8-chlorotheophylline "Koltan"; "mepedyl"	Antihistamine
Sulphaethidole	5-p-Aminobenzenesulphonamido-2-ethyl-1: 3: 4-thiadiazole "Sehadil"	Treatment of infections of the respiratory tract
Sulphathiourea	p-Aminobenzenesulphonylthiourea "Badional"	Bacteriostatic
Trimethidinium Methosulphate	(+)-3-(3-Dimethylaminopropyl)-1: 8: 8-trimethyl-3-azabicyclo[3: 2: 1] octane di(methyl methosulphate) "Camphidonium"	Treatment of hypertension

The International Academy of Gynecological Cytology has published the first number of *Acta Cytologica*, which will appear three times a year. Besides reports of the Academy's symposia the *Acta* will print only articles written by invitation. Subscription is \$4.50, and the editorial address is 5841, South Maryland Ave., Chicago 37, U.S.A.

To-day's Drugs

Correspondence

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Otamidyl (May and Baker Ltd.).—Ear drops containing dibromopropamide isethionate 0.15% and di(p-aminophenyl)amine dihydrochloride 0.5% in propylene glycol. Otamidyl is intended for the treatment of otitis externa and chronic suppurative otitis media. After the meatus is cleaned, the preparation is instilled as drops or inserted into the meatus soaked on ribbon gauze. Application should be carried out once to three times daily, depending on the severity of the infection.

The aromatic diamidine series of drugs, which include the two used in this preparation, are claimed to have an antibacterial action against pyogenic cocci and some of the Gram-negative bacilli, particularly, in adequate concentration of the drugs, *Pseudomonas pyocyanea*, *Proteus vulgaris*, and *Escherichia coli*. The *E. coli* organisms are of importance in chronic ear infection. Di(p-aminophenyl)amine dihydrochloride is active in the presence of pus and tissue debris against those pathogenic fungi which are occasionally found in ear infections. However, fungi are rarely the primary infecting agent in temperate climates, though in the tropics they are occasionally found.

The meatal skin is known to be more readily sensitized to chemicals than other areas, and, while the agents present in otamidyl are probably no more irritant than others in common use, careful supervision is necessary. Application should be discontinued at the first sign of sensitization. If no improvement takes place after one week, other agents should be tried.

N.H.S. basic price: 15 ml. (with dropper), 3s.

Cafdis (Reckitt and Sons Ltd.).—Each tablet contains aspirin, phenacetin, and caffeine in the same dose as in the standard preparation of compound aspirin tablets, *B.P.C.*, with the addition of 63 mg. calcium carbonate and 21 mg. citric acid. This is an elegant foil-wrapped preparation in which the additional components render the constituent aspirin soluble and possibly less irritant. They might well be prescribed as an alternative to *A.P.C.* tablets, *B.P.C.*, if the therapeutic benefit achieved justifies the higher cost.

N.H.S. basic price: 500 tabs., 16s.

ORDER OF ST. JOHN OF JERUSALEM

Those recently appointed to, or promoted in, the Venerable Order of the Hospital of St. John of Jerusalem include the following members of the medical profession:

As Knights: Colonel F. A. Bearn and Mr. H. S. Taylor-Young. *As Commanders (Brothers):* Surgeon Rear-Admirals D. M. Beaton, Q.H.P., and D. F. Walsh, Major-General A. E. Campbell, Q.H.P., Colonels M. MacEwan and G. E. Wight, and Drs. E. C. Brewis and T. W. A. Gray. *As Commander (Sister):* Dr. Elsie C. Hanson. *As Officers (Brothers):* Major-General T. F. M. Woods, Q.H.P., Brigadier C. S. Thompson, Colonel G. Anderton, Lieutenant-Colonel D. H. D. Burbridge, Mr. J. B. Dobson, and Drs. K. H. Blaauw, A. D. Griffith, A. Russell, D. P. Kennedy, J. G. Stewart, T. H. Pullar, J. Moffat, W. A. Hogg, H. J. Hoby, D. S. Napier, L. S. Potter, F. E. Fletcher, J. W. Pickles, C. D. Short, and M. G. Townsend. *As Associate Officer (Brother):* Mr. S. Bloom. *As Officer (Sister):* Dr. (Mrs.) Marguerite F. E. Wylie. *As Serving Brothers:* Colonel K. J. Coates, Lieutenant-Colonel G. S. Michelson, and Drs. C. G. Cassar, A. I. McKendrick, A. G. B. Minn, J. W. Ridley, A. Iredale, T. R. Bryant, J. Griffiths, T. O. Jones, D. E. P. Pritchard, I. N. Anastasiades, D. A. McCracken, J. H. Haldane, R. C. Williams, J. H. Pattison, R. Stanford, R. P. Graham, C. N. Suter, G. W. May, R. Caille, A. N. Coondoo, J. H. Chambers, J. A. C. Burridge, R. Hickey, A. J. Mascari, H. Marshall, B. P. R. Hartley, W. Brown, J. F. Baker, W. M. Farr, J. F. Haszard, E. R. Hicks, A. C. Martin, H. A. Myers, P. E. Vaillancourt, and J. S. Young. *As Associate Serving Sisters:* Drs. S. Gordon and A. Epstein. *As Serving Sister:* Dr. Elizabeth O. N. Armstrong.

Attempted Suicide

SIR.—I read with interest the article by Mrs. Moya Woodside on attempted suicide (*Journal*, August 16, p. 411). The problem presented by the patient who attempts to take his own life is difficult, and to a greater or lesser extent unresolved by all who come into contact with it. By and large the experience of the workers at Guy's would seem to be somewhat general: that the police are very considerate regarding this problem.¹ In many cases the predicament of the accused is due in large measure to the lack of effort made in the general hospital to which the prisoner was first taken: no effort made to admit for investigation, no effort made to organize psychiatric care, and little practical concern for the social welfare of the patient.²

A number of attempted suicides, on remand, that I have occasion to see working in one of H.M. Prisons are without fixed abode, without relatives, and without friends. They are not certifiable under the Lunacy Act, 1890, and support for this contention is that they have not been admitted to an observation ward via the Duly Authorized Officer even, having been first seen in a general hospital. Further, these prisoners either will not accept the offer of voluntary admission to a mental hospital under the Criminal Justice Act, 1948, Sec. 4, or the appropriate mental hospital for their catchment area will not agree to their admission. What can, and what should, be done under these circumstances?

If one accepts (as I do) the remark made by Mrs. Woodside that an unsuccessful suicide may represent "a desperate and final appeal for help," often unconscious, then some action must be taken. Stengel and Cook³ make a similar statement that the appeal to society is "inherent in most suicidal attempts irrespective of the mental state and the personality of the person." Faced with answering this *cri de cœur* from the unconscious, either admission to hospital as a voluntary or certified patient, or the recommendation of probation with or without a condition of out-patient psychiatric treatment, is arranged whenever possible. When, however, one is presented with a prisoner not certifiable but not "well" enough to be placed on probation (still a suicidal risk) who refuses voluntary admission, or is refused such admission, then I submit he should properly be sentenced to imprisonment and that where possible he should receive treatment within that setting. The sentence passed should be sufficiently long to allow of there being time for adequate treatment to be instituted. I am not advocating a long sentence for a suicidal attempt on purely punitive grounds. Further, I would add that the remarks of Chapman that are footnoted by Williams in his book⁴ are not to be taken seriously to-day, whether or not they were true when first written some 26 years ago. What I have so far stated is applicable only to those prisoners who are "treatable" as assessed by fairly general criteria. What of those who cannot be so described? Without being apologist for the present law, the words of Williams⁵ are again convenient, "... people are never sent to prison for attempted suicide except in the fullness of Christian love." East⁶ would also see in a period of institutionalization (imprisonment) real value and pay tribute to rest, good food, quiet, and medical attention as an opportunity "to recover their normal emotional level."

Thus far I have written in terms of the present law, the policy of the majority of the Benches and mental hospitals accepting that one has a duty to answer the symbolic appeal in the attempted suicide. Changes that I would like to see would be more medical appraisal on bail, with, if necessary, a condition of residence in a hospital. This would be very much better than spending one, two, or three weeks in prison. There is no reason why, at the present time, these persons could not be reported on whilst on bail, but the

possible explanation of why outside clinics are so little used by the Benches has been set out by Scott.⁷ There is little doubt, however, that most people to-day feel that attempted suicide (and successful suicide) should be outside the province of the criminal law. That they should not be regarded as criminals but, as Larremore⁸ has suggested, unfortunate persons who might possibly benefit from a temporary deprivation of liberty. Other similar proposals have been made.⁹ Again, as Williams⁵ states, "... there would be no need for the hearing by the magistrates to take place in public ..." and thus no need for press reporting or an order to be made unless specially needed. Further, "A very short time limit should be placed on the detention order. ... Ultimately society cannot stop a free man from committing suicide, nor should it try. What can be done is to make sure that the determination upon self-destruction is fixed and unalterable."

I would accept this myself, but would make the plea that at present in an endeavour to treat the patient, or make certain that the resolve of self-destruction was truly fixed, the psychotherapeutic units within the prison framework have a very real part to play in the case of a number of prisoners. In other words, simply taking the act of attempted suicide outside the criminal law would not be of great benefit unless some agency were created to fill the gap that would be left in the case of a number of patients.

I must point out that the views expressed in this letter are my own and do not necessarily represent the opinion of the Prison Commissioners.—I am, etc.,

London, S.W.2.

ALLEN A. BARTHOLOMEW.

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2. Epps, P., *Proc. roy. Soc. Med.*, 1958, 51, 298.
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5. East, W. N., *Medical Aspects of Crime*, 1936. Churchill, London.
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Beds for the Aged

SIR.—In his letter (*Journal*, August 30, p. 567) Dr. W. H. Lloyd rightly stresses the importance of better use of existing hospital beds, and the need for adequate nursing, medical, and ancillary staff, if the problem of hospital accommodation for the aged is to be solved. Some facts to show what was achieved by the late Dr. O. Olbrich in Sunderland may be an encouragement to others to adopt a more "active" approach to the problem.

During the years 1950 to 1957 Dr. Olbrich was able to transform a department consisting of 571 beds for the chronic sick, with a long waiting-list for admission, into an active medical department with no waiting-list. During this time the number of admissions increased from just over 500 to over 3,300 a year, and the average days of stay of a patient have diminished from over 2½ years to 28 days. In addition, 74 beds were given up as redundant. Quick reference to the weekly cost of this type of bed in any area will show that the closure of this number of beds results in the saving of well over £40,000 a year.

To save money on medical and nursing staff and equipment is false economy, as it results in inefficient use of beds, which is inherently more expensive per patient. Rehabilitation must begin with diagnosis. If any area wishes to transform a hospital for the chronic sick into an active geriatric unit, the first essential is to appoint a consultant geriatrician, who has had at least two fully trained in general medicine, who has had at least two years' experience in an efficient and active geriatric department. He may then be supported fully in his requirements for staff and equipment, with confidence that the money so spent will be recovered by reduction in the number of beds required, or where the original number of beds is grossly inadequate by the provision of a greatly improved service.—I am, etc.,

Sunderland.

ELUNED WOODFORD-WILLIAMS.

Test for Completeness of Vagal Section

SIR.—Burge and Vane¹ described a test for completeness of nerve section which could be used during the operation of vagotomy in the treatment of duodenal ulceration. Prior to this the only means of assessing completeness was the insulin test meal carried out post-operatively. It is clear that incomplete nerve section may lead to recurrent ulceration. There is evidence that in the past vagotomy has carried a high incidence of incompleteness as judged by the insulin test.^{2,3} If we conclude that section of all nerve trunks is desirable it follows that the use of a test during operation is essential.

We have found, and all surgeons who saw the test agreed, that the original method needed simplification. Filling, emptying, and refilling the stomach with water from a large reservoir was unsatisfactory for routine theatre use. We now use air in place of water for gastric distension, and a simple manometer for pressure measurement. In cats, comparing the sensitivity of air and water methods, we found that the amplitude of gastric contractions on vagal nerve stimulation is only slightly less with air. Fig. 1 shows kymograph tracings of gastric pressure responses to stimulation of the right cervical vagus nerve in a cat. Responses of the water-distended stomach (upper trace) are compared with those obtained using an equivalent volume of air (lower trace): stimulus applied for 1½ mins. It is fortunate that good responses are obtained over a wide range of gastric filling.

Our experience has been that the human stomach behaves in a similar way. Fig. 2 shows tracings of the gastric pressure response to stimulating a single vagal nerve trunk in man with different volumes of air in the stomach (stimulus applied for 1½ mins.). The optimum volume of air to be introduced is difficult to assess because of individual variation in stomach size. In practice we find the intragastric pressure a reliable guide, and we are well within the range of satisfactory response when this is between 15 and 20 cm., measured on the water manometer. The volume required to achieve this may vary from 500 to 1,200 c.c., and in the partially resected stomach may be as little as 200 c.c. At no time should the stomach wall feel tense.

The details of premedication and anaesthesia are as described in the original paper. We have incorporated muslin in the latex of the cuff on the stomach tube, a factor designed to prevent overdistension. The 5-inch (12.5 cm.) bag is filled with water rather than with air and stimulation details are as before. Fig. 3 shows the stomach tube connected to a water manometer (E), and by means of a side-arm air is introduced with a sphygmomanometer bulb (D). The

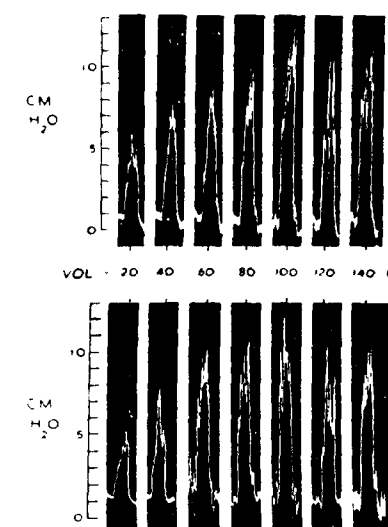


FIG. 1

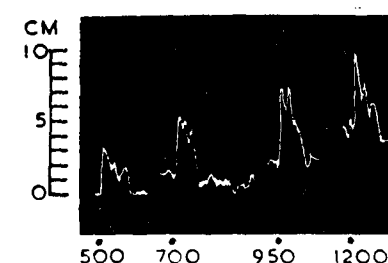


FIG. 2

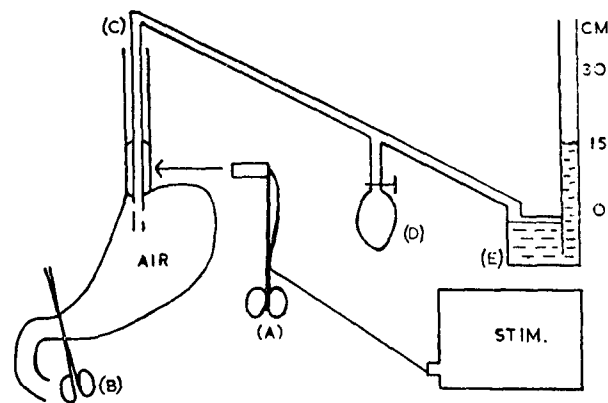


FIG. 3

electrode (A) is placed round the lower oesophagus. The stomach is occluded at the pylorus by clamp (B), and the cuff of the gastric tube (C) inflated. The stomach is distended with air by the bulb (D) until a pressure of 15 to 20 cm. is recorded on the water manometer. The responses of the stomach to stimulation are measured on the manometer and noted. This is less satisfactory than a continuous written record, but it is inexpensive and virtually infallible, thereby differing in our experience from mechanical recording systems. The method has been tested in intact and partially resected stomachs. We are satisfied that this test is safe and reliable. With these modifications it is now well suited for general surgical use.

We wish to thank the Dan Mason Research Foundation of the West London Hospital Medical School for financial help in this work. We thank Wm. Warne & Co. for making the gastric tube, and Mr. D. Green for constructing the manometer.—We are, etc.,

London.

HAROLD BURGE,
CHARLES G. CLARK.

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- ¹ Burge, H., and Vane, J. R., *Brit. med. J.*, 1958, 1, 615.
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Excision of Atrial Myxoma

SIR,—The method of removal described by Mr. L. Fatti and Dr. F. P. Reid (*Journal*, August 30, p. 531) requires comment. One of the main characteristics of myxomata of the atrium is their extreme friability. They have been likened to aspic, and even at open operation they have had to be removed piecemeal, as they have broken up at the slightest touch. There also seems to be a less common group which is firmer and which it may be possible to remove in one piece. Mr. Fatti had the good fortune to encounter one of these.

Any method which entails manipulation of these tumours should not be used if widespread emboli are to be avoided. The "considerable reorganization" required for hypothermia and open removal is more than justifiable, as it must be the method carrying the least risk, and it can and should be undertaken at once if a myxoma is encountered.—I am, etc.,

London, E.2.

J. R. BELCHER.

Anorexia Nervosa

SIR,—I am surprised that Dr. D. Stafford-Clark and others (*Journal*, August 16, p. 446) have bitten the unwitting cherry offered to them by Dr. Eirian Williams in his article on anorexia nervosa (*Journal*, July 26, p. 190). It would appear that he has not only succeeded in giving his patients something which they cannot swallow without assistance but also given certain reputable members of the profession dysphagia.

On reading the article I note that "psychiatrists, on the other hand, have claimed the illness in all its aspects as their own." In my very limited experience psychiatrists never

claim illnesses, only patients, and this artificial division between psychiatry and clinical medicine will continue whilst physicians, psychiatrists, and people like Dr. Williams try to divorce the mind from the stomach tube.—I am, etc.,

Bristol, 1.

A. D. M. SMITH.

SIR,—In his anxiety to score debating points off his colleagues Dr. Eirian Williams appears to me to overstep the limit set by ordinary courtesy when, in his letter (*Journal*, August 30, p. 563) he stigmatizes the nursing staff in psychiatric observation wards as "a pack of purposeful warders." Whether or not Dr. Williams has ever worked in an observation ward I do not know. From his remarks, which appear to be informed by ignorance as well as prejudice, I should judge that he has not. Had he done so he would be well aware that cases of anorexia nervosa are not among those cases of acute psychosis and other mental illness which are admitted by the Duly Authorized Officer or by the police to observation wards.

The number of cases in my experience requiring tube-feeding is very small, being limited to those suffering from severe depression or other forms of stupor. When tube feeding is used, there is no question of it being performed under barbiturate narcosis, as Dr. Williams implies. I doubt if the procedure differs in any way from that adopted in Dr. Williams's own wards, except that we prefer, for the sake of the patient, to carry out this distasteful procedure in the privacy of a side-ward rather than in the presence of 27 other patients. That tube-feeding is a rare necessity is due largely to the efforts of the nursing staff, who with great patience and skill manage to persuade the majority of the severely disturbed patients under their care to take adequate nourishment. They have no more enthusiasm for forcible tube-feeding than has the patient.

That patients in psychiatric observation wards are detained against their wishes is a fact. Nevertheless, it is, so far as the nursing staff are concerned, quite the least important aspect of their duties, which are therapeutic rather than custodial. During their period of duty they are constantly with severely disturbed patients whose behaviour is often characterized by gross degradation of habits and physical assaults upon the staff. For the most part these problems are dealt with with great patience, tact, and good humour, facts which are recognized not only by relatives but also, in many instances, by the patients themselves. If the uninformed layman can be generous in his appreciation of the work of the observation ward nursing staff, one would hope and expect that they could be spared the ill-informed strictures of Dr. Williams.—I am, etc.,

London, S.E.22.

F. A. WHITLOCK.

SIR,—I am reluctant to prolong this correspondence. Having written his article (*Journal*, July 26, p. 190) and essayed a spirited riposte to the reasoned but unanimous criticism it received, Dr. Eirian Williams had only to confine his reply (*Journal*, August 30, p. 563) to answering the criticism—if he could—or clarifying and consolidating his own position, however provocative, to have been gladly accorded the last word on this occasion. But instead he has chosen once again to make sweeping and unfounded assertions which are not only unsupported but are in fact insupportable. Observation wards are not staffed by "packs of purposeful warders" (whatever this is supposed to mean): like the wards of his own hospital, and of mine, they are staffed by nurses. Disagreement with his views does not necessarily imply remarkable ignorance, timidity, or covetousness; it could conceivably be the outcome of wider experience. Indeed, such experience may suggest that a doctor is not always wise to regard his patients as predestined losers in a contest in which he holds the trumps; so that he can blithely dismiss their helpless distress as mere chagrin that "the game, after all, was up." Medicine has never been as simple—or as insensitive—as that.—I am, etc.,

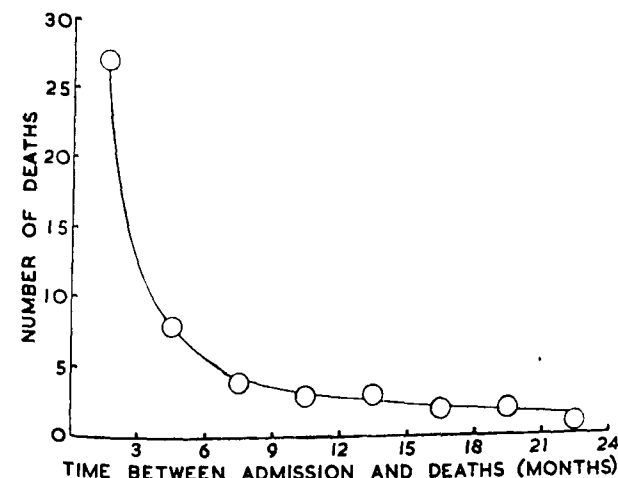
London, S.E.1.

D. STAFFORD-CLARK.

Imbecile Children

SIR,—Dr. John Burkinshaw (*Journal*, June 28, p. 1543) has stressed the value to parents of the recent provision by institutions of facilities for temporary admission. He also advocates use of mental deficiency hospitals for out-patient sessions and as a place for permanent admission only if the need eventually arises.

Dr. J. M. Crawford (*Journal*, July 26, p. 245) suggests that many ineducable children do better in hospital, if there is no occupation centre near their home. He says that he



would rather catch them young if they have to come to hospital, though he modifies this by saying that they should either go daily from home or live in hostels.

The danger of admitting young children to the large institution with big overcrowded wards is shown by the attached graph of deaths at the Fountain Hospital, 1955-8 (total 100), which demonstrates the high mortality in the immediate post-admission period. Only those deaths within two years of admission are charted, showing relationship to time of admission. The average age on admission was 2½ years, so that there is no adequate control group of older children available in this series, but our experience suggests that death and serious illness are more likely to occur among the younger and less mobile children. These considerations provide an additional reason for postponing the permanent admission of mentally defective children to institutions and for increasing the advice and assistance available to parents for their care at home, including the provision of additional occupation centres.—We are, etc.,

London, S.W.17.

EVELYN B. LIND,
BRIAN H. KIRMAN.

Arresting an Outbreak of Poliomyelitis

SIR,—Many of your readers will doubt whether I (*Journal*, August 2, p. 325) or Dr. M. Agerholm (*Journal*, September 6, p. 638) are qualified to comment on the virological and epidemiological problems of poliomyelitis. Our knowledge of these aspects is second-hand, and as mere dabblers in these fields we are inclined to pluck the flowers we like the look of. However, there are so many facets of a disease like poliomyelitis that the free-lance who can say what he likes may contribute to current problems, for the reason that he can express opinions which more important people that he can be debarré from communicating. This is specially noticeable when politics comes into the picture, but unfortunately, when this happens, an increasing number of experts are silenced, and public opinion is apt to be influenced less by the expert than by the amateur. This is a dangerous situation which I for one have no wish to aggravate.

As a student of poliomyelitis in its various aspects I have doubts about the ultimate efficacy of the present vaccination programme, and yet at the same time fully support what is

being done, for it seems to be the best available. I anticipate, however, that the shortcomings of the present vaccine will become even more apparent in the next year or two. I have often expressed dismay at the inadequacy of the research effort being devoted to the development of an oral vaccine, for I do not share the timidity which many feel in connexion with this method. Most experts agree that alimentary canal infection with polio viruses is an essential contribution to the maintenance of immunity in the community, so why not introduce this infection on one's own terms? Hence my delight that Dr. H. Koprowski and his colleagues (*Journal*, July 26, p. 187) have had the courage to make what still seems to me to be a very important contribution, and which I hope will boost the amount of research being done on the development of oral vaccines. Perhaps I may add that an Expert Committee of W.H.O. also advocates more work in this field.—I am, etc.,

Oxford.

W. RITCHIE RUSSELL.

Contraception by Inhibition of Ovulation

SIR,—Dr. B. H. Kirman's conscience seems troubled about the "permissibility" of the trial in Puerto Rico of an oral contraceptive (*Journal*, August 30, p. 565). On re-reading your annotation to which he refers (*Journal*, August 2, p. 297) I fail to understand this; it reports that many substances had been studied, and a field trial of one of them, "enavid," was only made after it had proved harmless in extensive animal tests and trials in women. Dr. Kirman implies that, because others have reported that substances not used in this trial have proved harmful, therefore the favourable reports of the value of enavid are somehow suspect. He may have special knowledge to support his doubts, but his letter does not show this.

The last sentence of Dr. Kirman's letter reads strangely. He says that a contraceptive pill is not a substitute for radical and costly measures to improve living standards in underdeveloped countries. I do not know that it had been suggested otherwise: but there is wide agreement on the urgent need to control the rapid increase in the population of these countries if social conditions are to improve.—I am, etc.,

St. Paul's Cray.

L. M. FRANKLIN.

Congenital Dislocation of the Hip

SIR,—I read your annotation (*Journal*, July 5, p. 38) with special interest, and venture to set out here some family data concerning congenital dislocation of the hip in three generations which might perhaps serve as case-material for research into this abnormality.

My sister was born in 1896 with a right-sided dislocation. So was I in 1900. There were no more children. Both deliveries were normal in every respect. There was no other case in our family. My sister's second son was born in February, 1926, after half an hour of labour: normal delivery, normal weight. I was in hospital for surgical treatment of my hip when my sister became pregnant. She visited me there, and my surgeon then impressed on me strongly that her infant should be x-rayed within six weeks of its birth, as only very early treatment gave any hope of complete success. Yet the parents refused to do so when the child was born. Nor did my sister's accoucheur, family doctor, and paediatrician advise the parents accordingly. I was absent from home at the time of delivery and saw my nephew for the first time when he started to walk. His waddling gait filled me with grave forebodings. I renewed my efforts and finally succeeded in having the child examined. It was ascertained that he had a left-sided dislocated hip. He was manipulated some months later by Professor Bruno Valentin, of Hanover. I do not know my nephew's radiological status, but he walks with a marked limp, tires easily, and is often in pain. He is now 32, a broad-chested six-footer. He managed to become a fine gymnast as a boy.

This nephew had his first child, a daughter, last February. At the father's request she was x-rayed at 8 or 9 weeks and

for he was convinced of India's need for gifted medical teachers. The Postgraduate Medical Institute which is coming into being at Delhi owes much to his proposals. In 1946 Hance came home to the India Office as Medical Adviser to the Secretary of State for India and as President of the India Office Board. At first he was closely concerned with finding suitable posts for officers of the I.M.S. retired from India on Independence Day, and his successful efforts on their behalf were greatly appreciated.

When the Commonwealth Relations Office was established Hance was appointed medical adviser to the Secretary of State, and he had to turn his attention to the medical aspects of the new high commission posts all over the Commonwealth. He was also concerned with the Colombo plan for technical aid and co-operation in South and South-east Asia. A pneumonectomy performed eleven years ago for proved bronchial carcinoma hardly interfered with his activities. He was at work again in a few months, travelling over the world on many occasions. On these journeys he found an oxygen mask helpful. Much of his time was given to interviewing overseas students with a view to advising them on suitable training. Three years ago the Government of Ceylon asked for his services under the Colombo plan to advise on the reorganization of the health services there. Promoted K.C.I.E. in 1946, he was created K.C.M.G. in the Coronation honours list in 1953. He was also a Knight of the Order of St. John of Jerusalem.

Increasing dyspnoea on exertion made him abandon his only recreation, fly-fishing, last year. To the very end he continued regularly to attend meetings of the Board of Governors of the Brompton Hospital and of the Institute of Ophthalmology, the Postgraduate Federation, and other bodies on which he served, facing his inevitable fate with resolution and deceiving his most intimate colleagues by his bold front. Sir Bennett Hance was twice married, first in 1916 to Catherine, only daughter of Dr. C. L. Leonard, of Philadelphia, by whom he had two daughters, and secondly in 1938 to Frau Richildis von Kaan, of Vienna, who survives him.

W. M. FRAZER, O.B.E., M.D., M.Sc., D.P.H.

Professor William Frazer, formerly medical officer of health for the City and Port of Liverpool and professor of public health at the University of Liverpool, died on September 8 in the Royal Southern Hospital, Liverpool, after a short illness. He was 70 years of age.

William Mowl Frazer was born in Liverpool on March 7, 1888, and was educated at the Oakes Institute, Liverpool, and later at the Universities of Liverpool and London. He graduated M.Sc. at the former university in 1909, and shortly afterwards obtained a post in the education officer's department of the London County Council. It was not until he returned from service in the King's (Liverpool) Regiment during the first world war that he became a medical student. Having graduated M.B., Ch.B. at Liverpool in 1921 at the age of 33, he took the D.P.H. in the following year and proceeded to the degree of M.D. in 1928. He was called to the Bar by Gray's Inn in 1923. After holding several resident appointments in hospitals in Liverpool he



[Liverpool Daily Post and Echo]

became assistant medical officer at the Manchester Sanatorium at Baguley before being appointed assistant medical officer of health at Blackburn. In 1925 he was appointed medical officer of health for the county borough of Dewsbury, and four years later he moved to Hull, where besides

being M.O.H. of the city he was medical officer to the Goole Port Sanitary Authority.

In 1931 he was appointed medical officer of health for the City and Port of Liverpool and medical officer to the Liverpool Education Authority, holding these posts until his retirement in 1953. When he went to Liverpool he was appointed senior lecturer in public health at the university, and in 1933 he became professor of hygiene (later of public health). On his retirement he was appointed emeritus professor.

Frazer soon became one of the leading public health workers in the British Isles. A gifted writer, he contributed many articles to medical and other journals, and he was also author of several books, including a textbook of public health. He served on numerous committees, including committees of the Ministry of Health and of the Medical Research Council. A medical officer of the health committee of the Association of Municipal Corporations, he was also honorary treasurer of the Association of Sea and Air Port Health Authorities of the British Isles. In 1948 he became a member of the Liverpool Regional Hospital Board and of the Board of Governors of the United Liverpool Hospitals, and until his death he acted as chairman of the establishment committees of both bodies. Vice-president of the Section of Public Health at the Annual Meeting of the B.M.A. in 1933, he was president of the Section of Preventive Medicine at the Liverpool Meeting in 1950. Four years later he was News-holme lecturer at the University of London, choosing for his subject "State Medicine in the Nineteenth Century." Professor Frazer was an honorary fellow of the American Public Health Association.

He married in 1917 Gladys Mary Gubbins, who survives him with a son and a daughter, both of whom are graduates in medicine of Liverpool University.

A.B.S. writes: During his official life in Liverpool Professor Frazer was concerned mainly with the development of the hospital service and with slum clearance. In 1931 the Local Government Act of 1929 had placed under the health department some 21 hospitals and institutions containing about 10,000 beds which were underdeveloped and understaffed. It was his duty to survey these hospitals and plan improvements. He instituted laboratory facilities and x-ray departments, and built up specialist teams in the various municipal hospitals. As a result, when war broke out in 1939 the hospital service of Liverpool was well prepared to undertake the strain that was put upon it during the early years of the second world war. In particular he emphasized the importance of co-operation with the voluntary hospitals and the university, and encouraged the use of the municipal hospitals in the training of medical and other students. It was he who suggested to the vice-chancellor of the university the formation of the body which became known as the Liverpool Hospitals Joint Advisory Committee. He also was active in the founding of the chair of child health in Liverpool. During the second world war he was responsible for the casualty services in Liverpool, and for services to civil defence he was awarded the O.B.E. in 1939.

In the field of housing, great strides were made between 1935 and 1939. During that period he represented more than 12,000 slum houses for demolition. This campaign, the largest in the history of Liverpool, would have probably solved Liverpool's slum problem had it not been interrupted by the outbreak of war.

Professor Frazer was a man of high principles and a strict ethical code. He will long be remembered not merely for outstanding academic merit, brilliance of intellect, and a phenomenal memory, but also for profound wisdom which inspired his resolute approach to the practical problems of public health administration. He was not an easy man to get to know, but with knowledge of the man came a real affection for his abilities and intellect.

We are indebted to Sir ALLEN DALEY for the following appreciation: The death at the age of 70 after three days'

illness of Professor W. M. Frazer will leave a sad gap in the ranks of those prominent in public health a generation ago. He did not make friends quickly or easily, but all who knew him well were devoted to him. My first contact with him was when I was M.O.H. of Blackburn. I was on the look-out for talent and heard from one of my assistants that Dr. Melville Mackenzie had been greatly impressed by a very bright young man named Frazer whom he had met at a Liverpool Fever Hospital and who was then at the Baguley Sanatorium, Manchester. I arranged to see him and received so favourable an impression that I got him appointed as assistant medical officer of health of Blackburn when the next vacancy occurred. After passing in rapid succession through other appointments in the public health service he became M.O.H. of the City and Port of Liverpool. He filling that post with great distinction for 22 years. He was appointed O.B.E. in 1939—an honour which many hoped would have been added to in his later years.

He was always interested in hospitals, and, along with his deputy, Dr. C. O. Stallybrass, did much to improve the Liverpool municipal hospitals. Though, like many of his generation, he deplored the nationalization of the hospitals, he maintained his zest for hospital administration after the start of the National Health Service in 1948, and after his retirement the work of the Liverpool Regional Hospital Board occupied the greater part of his time. He was among the few medical officers of health appointed in 1948 to a regional hospital board. For some years before his retirement he was the trusted adviser of the health committee of the Association of Municipal Corporations and was a member of the Committee on the Health of Seamen of the International Labour Office. He always had a deep interest. He was the successor of the first M.O.H. of this country, as befits the history of public health, and in 1947 he wrote an excellent biography of Dr. W. H. Duncan, who was M.O.H. of Liverpool from 1847 until 1863. His appetite thus whetted, he embarked on his monumental work, *A History of English Public Health: 1834-1939*. For many months he spent every Saturday afternoon in the library of the Liverpool Athenaeum reading old records. A very long time ago Livingstones of Edinburgh first published Husband's *Handbook of Forensic Medicine and Medical Police* (later named *Forensic Medicine, Toxicology and Public Health*): and some forty years ago it was split into separate volumes, and Dr. E. W. Hope, then M.O.H. of Liverpool, was responsible for the one on public health. After Frazer became M.O.H. of Liverpool the revision of further editions was entrusted to him. He almost rewrote several of them, including the thirteenth.

H. B. RODERICK, O.B.E., M.D., M.Chir., F.R.C.S.
Mr. H. B. Roderick, formerly honorary surgeon on the staff of Addenbrooke's Hospital, Cambridge, died at the age of 84 in the hospital to which he had given so many years of service.

Henry Buckley Roderick was born at Llanelly on August 19, 1874, the son of a banker and nephew of a general practitioner in that town. From Bath College he went on to Emmanuel College, Cambridge, at the age of 17, and graduated B.A., with honours, in 1894. Going to St. George's Hospital for his clinical training, he took the degrees of M.B., B.Ch. in 1898, proceeding to the M.D. in 1902 and the M.Chir. in 1916. He took the D.P.H. in 1903. At St. George's he held house appointments and then became surgical registrar. In 1900 he returned to Cambridge, starting in general practice and taking over the post of police surgeon. Within a year, however, he was appointed to a demonstratorship of surgery in the university medical school to assist Mr. Joseph Griffiths, who was acting as deputy professor of surgery after the death of Sir George Humphrey. He continued in this appointment when Howard Marsh became professor of surgery in 1903.

and, although the professorship of surgery was suspended after the death of Marsh in 1915, Roderick continued to hold the demonstratorship after his return from military service, lecturing in operative surgery and surgical pathology until 1926. From 1928 to 1939 he served the medical school further as supervisor and examiner in surgery.

Roderick's early interest in military medicine was shown by his service as medical officer to the University Rifle Volunteers from 1901 to 1908, and from 1908 to 1914 as C.O. of the medical contingent of the University O.T.C. In 1914 he joined the 1st Eastern General Hospital, R.A.M.C., T.A., with the rank of major. He was with this unit in Cambridge until 1917, when he went to France as lieutenant-colonel commanding the 55th General Hospital until the end of the war. He was twice mentioned in dispatches and his services were rewarded with the O.B.E. (Mil.) and the T.D. On his return to Cambridge in 1919 he was appointed honorary surgeon to Addenbrooke's Hospital. In 1932 he was elected F.R.C.S.

Roderick had always been interested in the surgery of bones and joints, and, although essentially a general surgeon by training, he set out to promote in every way the interests of orthopaedic and traumatic surgery in the Cambridge area. He started special orthopaedic out-patient sessions at Addenbrooke's Hospital, where he also used many of his beds for orthopaedic patients, and with the help of voluntary workers in the Cambridge branch of the B.R.C.S. he organized orthopaedic clinics in the rural areas and at the hospitals at Wisbech and Huntingdon, where he held honorary appointments. His constant enthusiasm acted as a great stimulus to public interest in the prevention and treatment of crippling disease, not only in Cambridgeshire but in the neighbouring counties also, and left lasting results in the foundations from which the present area orthopaedic services have developed. Although his constant campaign for provision of a long-stay orthopaedic hospital for East Anglia was defeated, when it at last seemed about to succeed, by the outbreak of war in 1939, he lived to see adequate provision for such patients through the increase of hospital beds under the E.M.S. and their reorganization in the National Health Service, and his work was not in vain, for it had shown where the need lay. In 1939 he had reached retiring age from the hospital staff, but carried on as a voluntary deputy surgeon until the return of others who had gone on military service made his presence unnecessary, when he quietly dropped out.

A leading figure in medical affairs in East Anglia, Roderick was president of the Cambridge and Huntingdon Branch of the B.M.A. in 1933, when he also acted as chief host for the British Orthopaedic Association at its annual meeting held that year in Cambridge. Three years later he was a vice-president of the Section of the History of Medicine at the Annual Meeting of the B.M.A. Outside his professional work he was a man of wide knowledge, with many interests and activities. For many years he was a churchwarden of Great St. Mary's, the University Church. An ardent Freemason, he was a Past Grand Deacon of England and a Past Deputy Provincial Grand Master. A founder member and past president of the Cambridge Rotary Club, he was a strong supporter of the British Legion and a past president of the Cambridge branch.

Among his innumerable friends there must be many Cambridge medical graduates and past examiners in surgery who remember with affection his constant helpfulness and his whimsical humour. It is good to know that he had so many years of active and happy retirement before failing health in the last three years limited his capacity for enjoyment. Much of the last months of his life was spent in hospital, but he kept his courage and his thoughtfulness for others to the end. His long life was one of good service which brought him much happiness.

In 1908 Mr. Roderick married Hilda, daughter of John Clay, of Cambridge. She survives him. They had four sons and three daughters.

E. W. B.

**CHRISTINE M. STACEY, M.B., B.S.
M.R.C.O.G., M.M.S.A.**

Dr. Christine M. Stacey, whose death occurred last month, was gynaecological surgeon at St. Olave's Hospital and consultant venereologist at King's College Hospital.

Christine Margaret Stacey was born on September 24, 1910, and studied medicine at the London School of Medicine for Women and the Royal Free Hospital. After qualifying in 1936 and graduating M.B., B.S. in the following year, she held resident posts at the Royal Free Hospital, the Royal Northern Hospital, and the Mothers' Hospital, Clapton. Some years later she joined the staff of this last hospital as obstetric surgeon. Having passed the examination for the D.R.C.O.G. in 1941, she took the M.R.C.O.G. and M.M.S.A. in 1948, and was elected to the staff of St. Olave's Hospital as gynaecological surgeon. She was especially interested in problems of fertility and had had long experience in the diagnosis and treatment of venereal diseases. She joined the staff of King's College Hospital as a consultant venereologist in 1952. Dr. Stacey married in 1940 Mr. A. J. Heriot, who is a surgeon on the staff of King's College Hospital. They had two sons.

Dr. FRANCIS L. LYDON writes: It was with great regret that I learned of the recent death of Dr. C. M. Stacey, whom I first met some six years ago on her appointment as consultant to the special department at King's College Hospital. Her wide knowledge of the venereal diseases was only to be expected, as she previously held the post of registrar to the female venereal clinic at Guy's Hospital, but, since she held higher degrees in gynaecology and surgery, with much practical experience in these branches, her appointment was especially gratifying. During our few years together I was constantly grateful to her for her advice and help in the many difficult cases attending the department, and her early realization that diseases such as lymphogranuloma venereum and granuloma venereum were likely to increase owing to the movement of peoples led to their rapid diagnosis and treatment—which is so important in preventing their spread. Opportunities for research are few in a busy department, but Dr. Stacey was ever ready to co-operate in trying to elucidate the many gaps in our knowledge of our particular specialty. I shall always remember her as a kind and gracious lady who in her last few years tried to continue her work with great and uncompromising courage in the face of illness. I am sure that all my colleagues at King's and her many friends would wish to join me in extending to her husband and her family our deep sympathy and our great affection.

DUNCAN DAVIDSON, M.C., D.M., D.P.H.

Dr. Duncan Davidson, who died at his home in Kenilworth on September 2 at the age of 78, will be sadly missed by his many friends and patients in the city of Coventry and in Warwickshire.

Born in Coventry, the son of Dr. Charles Davidson, who had formerly been a surgeon in the Royal Navy, Duncan Davidson was educated at Malvern College and at Brasenose College, Oxford, which he left in 1901 to fight in the South African war. Returning to Oxford in 1902, he completed his preclinical course and went on to the London Hospital, graduating B.M., B.Ch. in 1906. After holding the appointments of house-physician, receiving-room officer, and ophthalmic house-surgeon at the London, he became a clinical assistant in the medical out-patients department of the Hospital for Sick Children at Great Ormond Street. In 1910 he joined his father in practice in Coventry, taking the D.P.H. in the following year. During the first world war he was a captain in the R.A.M.C.(T.) attached to the Howitzer Brigade, serving in France and Italy, and was awarded the Military Cross. After the war he proceeded to the degree of D.M. at Oxford, and was appointed assistant ophthalmic surgeon to the Coventry and Warwickshire Hospital, an appointment he held until his retirement in 1950.

He was chairman of the Coventry Division of the British Medical Association in 1926 and 1927. Among his many other activities he was a justice of the peace, a Freemason, and a member of various City Guilds, and he served on the boards of governors of many schools and charities. A sincere Christian, he was formerly treasurer and vicar's warden of Holy Trinity Church, Coventry.

Duncan Davidson, in spite of increasing pain and ill-health, was a man who never spared himself in working for the well-being of his fellow men. His wide interests and his unfailing kindness and modesty tended to mask the tremendous courage which was the true essence of his great spirit. One cannot write of him without thinking of his wife, whose love and devotion has radiated throughout their lives together. Our great sympathy goes out to her and her family.—G. C. V.

S. KATE K. HASLAM, L.S.A., M.D.

Dr. Kate Haslam, who was formerly in practice in North London and assistant school medical officer under the London County Council, died on August 24 at the age of 85.

Sarah Kate Keeling Haslam was born in 1873. She studied medicine at the London School of Medicine for Women, qualifying L.S.A. in 1901 and in the same year taking the degree of M.D. of Brussels. After qualification she held a number of junior hospital posts, including those of clinical assistant in the maternity department at the New Hospital for Women and clinical assistant in the skin department at the Royal Free Hospital. She was also for a time a medical officer at the Retreat, at York. After holding these appointments she went into general practice in North London, where she remained for a number of years. Much admired for her wisdom and kindness, she thoroughly approved of the suffragette movement, though she could not actively participate in it. After the first world war Dr. Haslam worked as an assistant school medical officer in London, a post which she held until she retired from practice, though not from active work. She was much loved by patients and medical colleagues alike, and was one of a fine generation of women doctors who had much to contribute in what was then a new field of work.

SIR DARCY COWAN, M.B., F.R.A.C.P.

The obituary of Sir Darcy Cowan was printed in the *Journal* of June 21 (p. 1484). Sir HENRY NEWLAND and Dr. ROGER ANGOVE, the authors of the following appreciation, wish to acknowledge with thanks the information supplied by many friends of the late Sir Darcy Cowan.

No obituary of the late Sir Darcy Cowan would be complete without some reference to the personality and career of his father, whose capacity and sterling character were notable in his son. James Cowan was born in Ulster in 1848 and four years later came with his parents to South Australia. He entered his father's coaching and farming business, but before he was out of his teens he started business on his own account as a mail contractor and small farmer. His enterprise led him to purchase a flour-mill, which proved to be a very profitable investment. Within a few years James Cowan was the proprietor of mills in four country towns and also of wharves at Port Pirie and Port Gawler. The mills were merged into the Adelaide Milling Co. By his investments in pastoral properties he accumulated considerable capital. He assisted in the formation of a coke company at Port Pirie, the genesis of the huge smelting works of to-day. In 1890 Mr. James Cowan was elected Member of Parliament for Yatala, and at once made a great impression on the House in debates, and was regarded as a possible Minister of the Crown. He had been a Member of Parliament for only a few months in 1890 when he had a fatal accident.

The fine career of James Cowan reveals a strength of purpose that resided in his son Darcy in great measure.

Neither was daunted by opposition or failure, but pressed on to his objective and ultimate success. Darcy Cowan's crusade against tuberculosis began after he had attended the famous clinic of Dr. Philip at Edinburgh, and he never wavered in his quest. The genesis of the National Association for the Prevention of Tuberculosis in Australia dates back to the formation of the South Australian Tuberculosis Association in 1943. Dr. (later Sir) Darcy Cowan planned the State body on the model of others he had studied in overseas centres.

A little later a similar association was formed in Western Australia and approaches were made to the B.M.A. to give official support to a national organization. At the Medical Congress held in Perth in 1950 a resolution was carried approving the proposals submitted. A provisional committee was formed to draft a constitution. Medical men from each capital city returned to their homes determined to assist in this sponsorship. Sir Henry Newland was appointed as president and Dr. Darcy Cowan as honorary secretary, *pro tem*. At the first meeting of the National Council in Adelaide the constitution was formally adopted and Sir Henry Newland named as Foundation President. Dr. Cowan continued in the guiding role of honorary secretary. Affiliation was immediately granted by the National Association for the Prevention of Tuberculosis in London and the International Union, and a Council of Honour formed on which the Governor-General and the Governors of each of the six States accepted seats. The new body found great assistance from the ready co-operation given by older-established national associations in other lands. Films, printed matter, and radio platters were made available by N.T.A., New York, which enabled N.A.P.T.A. to extend propaganda work within the Commonwealth. From his own membership and knowledge of the work of the American Trudeau Society, Dr. Cowan sought next to establish a similar medical section in Australia. Thus was the Australian Laennec Society organized. To-day the society has a branch in most states of the Commonwealth, and undertakes studies at scientific levels. Darcy Cowan served as president of the Laennec Society in 1955. In 1957 his fellow workers determined to show him honour by offering a prize for graduates, to be known as "the Sir Darcy Cowan Prize." This will be awarded for the first time this year.

It seems fitting to record at random some of the miscellaneous achievements and positions which Sir Darcy held. He was one of the very few triple blues of the Adelaide University. His love of tennis persisted throughout his life. He became a member of the Grounds Committee of the South Australian Lawn Tennis Association in 1920, and was chairman for many years. He was then vice-president for 20 years, and an honorary organizer for the 1952 Davis Cup challenge round. As a player, he will be remembered as a skilful exponent of the game who always enjoyed a match and played it in true sporting spirit. It was his policy and direction as chairman of the Grounds Committee which brought the Memorial Drive courts to a state described by overseas authorities as "as good as any courts in the world, not excluding Wimbledon."

He served his own teaching hospital, the Royal Adelaide, for many years as honorary physician and later as honorary consulting physician, and was also the first person to be appointed senior physician to the chest clinic and Frome ward. During this time he was the lecturer in pulmonary tuberculosis at the University of Adelaide. He was president of the South Australian Branch of the British Medical Association in 1935 and 1936.

My (H.S.N.) more intimate association with Darcy Cowan began when he invited me to be president of the South Australian Tuberculosis Association. This post I accepted on two conditions: one, that a more militant attitude should be adopted in the prevention of tuberculosis, and that an Australian National Association for the Prevention of Tuberculosis should be formed to co-ordinate the activities of the states of the Commonwealth and to be the medium of approach to the Commonwealth Government. Sir Darcy agreed to these conditions and most loyally sought

to fulfil them. It was a notable triumph for him when the National Association for the Prevention of Tuberculosis in Australia met in Sydney and was attended by delegates not only from Australia and New Zealand but from several Asian countries.

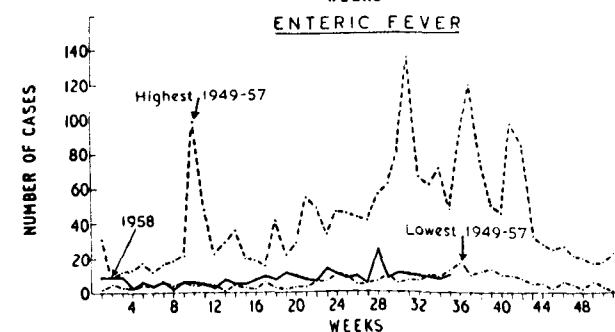
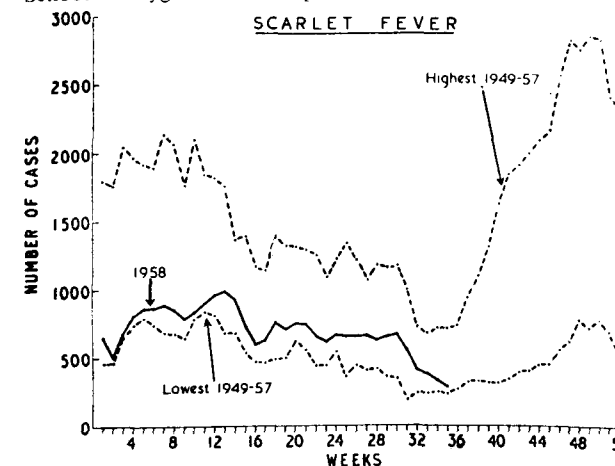
Until the time when failing health forced him to retire from all offices, Sir Darcy Cowan fought the good fight with vigour. His remarkable knowledge and enthusiasm made him a most acceptable leader of the various councils in both national and State spheres. He expected action and constant progress, and fearlessly criticized any appearance of *laissez-faire* or complacency in either official or voluntary quarters. With his old friend and associate, Sir Harry Wunderly, he planned for the time when tuberculosis might be eradicated in Australia. He constantly "prodded" Ministers of the Crown, members of the profession, his colleagues, and subordinates to improve the lot of sufferers and to assist in the final victory over this disease.

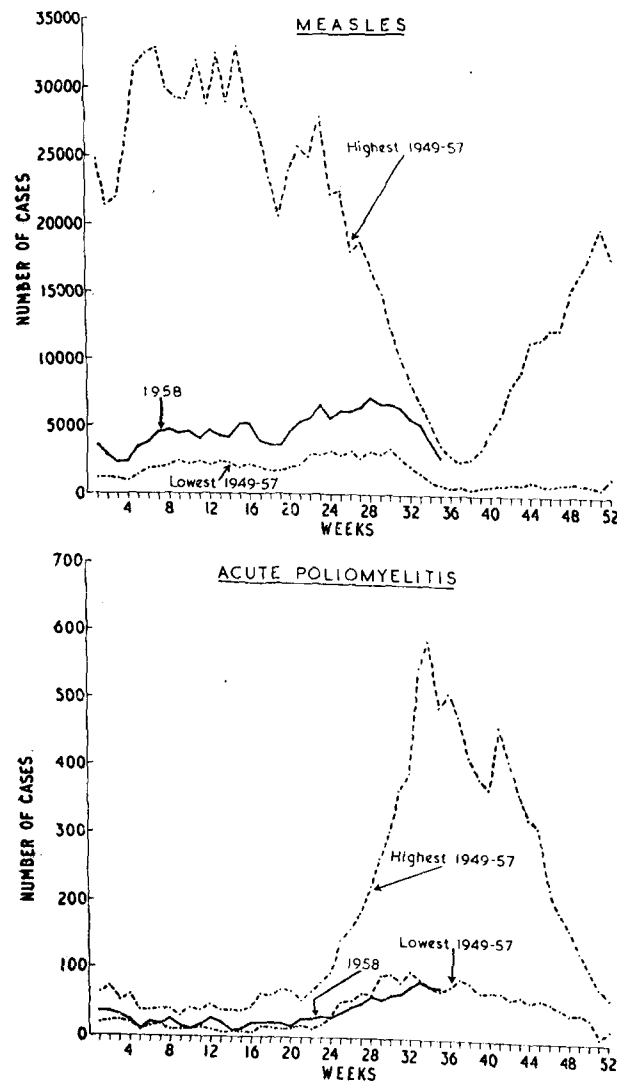
Sir Darcy Cowan was for years the official Australian correspondent for N.A.P.T. London, and he was a member of the American College of Chest Physicians and of the Trudeau Society. He was known and respected by leaders in the campaign in many lands. At the first International Conference on Tuberculosis in Sydney in 1955 Sir Darcy played a great part in the organization, and he personally went to live in the residential college so that he could develop his knowledge of fellow-workers from all Asian countries. Sir Darcy was a great Australian, and truly a great world citizen.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus ----, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Week Ending September 6

Infectious diseases were less prevalent in England and Wales during the week ending September 6. The largest falls in the number of notifications were 833 for measles, from 2,810 to 1,977, 122 for food-poisoning, from 397 to 275, and 60 for dysentery, from 376 to 316.

The largest declines in the incidence of measles were 96 in Lancashire, from 411 to 315, 81 in London, from 199 to 118, 49 in Middlesex, from 156 to 107, and 49 in Warwickshire, from 124 to 75. The number of notifications of scarlet fever, 304, was 18 more than in the preceding week; there were no large fluctuations in the local returns. 791 cases of whooping-cough were notified, and these were 19 fewer than in the preceding week; the largest fluctuation in the local trends was a rise of 61 in Lancashire, from 58 to 119. 3 cases of diphtheria were notified compared with 0 in the preceding week; 2 of the cases were notified in Plymouth C.B.

The notifications of acute poliomyelitis numbered 80, and these were 14 more for paralytic and 12 fewer for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 17 (Leeds C.B. 8, Castleford M.B. 2), Lancashire 14 (Burnley C.B. 5, Manchester C.B. 2, Kirkby U.D. 2), Devonshire 13 (Plymouth C.B. 11), Essex 4, and Kent 4.

The largest centres of dysentery were Yorkshire West Riding 63 (Thorne R.D. 17, Leeds C.B. 10), Lancashire 52 (Liverpool C.B. 16, Blackpool C.B. 10), London 36, Devonshire 27 (Paignton U.D. 23), and Warwickshire 21 (Coventry C.B. 12).

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending August 30 (No. 35) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria	0	0	1	0		6	0	0	0	
Dysentery	376	41	150	17	3	224	11	115	6	5
Encephalitis, acute	4	1		0		11	0		0	
Enteric fever:										
Typhoid	6	1	1	0		2	1	0	1	
Paratyphoid	4	1	0	0	1 (B)	11	2	0	0	
Food-poisoning	397	31	37	1		266	49	35	1	
Infective enteritis or diarrhoea under 2 years					14				10	32
Measles*	2,810	199	12	17	39	3,005	60	19	12	13
Meningococcal infection	10	0	9	0		17	3	10	0	
Ophthalmia neonatorum	21	0	3	0		37	2	5	0	
Pneumonia†	135	7	102	1	1	184	13	128	0	
Poliomyelitis, acute:										
Paralytic	46	2	26	0	7	151	15	5	29	1
Non-paralytic	32	0				156	7			
Puerperal fever‡	214	27	8	0		237	42	18	1	
Scarlet fever	286	24	44	11	10	245	17	47	11	11
Tuberculosis:										
Respiratory	447	48	53	30		501	70	71	14	
Non-respiratory	63	6	10	8		70	7	11	5	
Whooping-cough	810	53	78	63	17	1,010	54	87	0	22

DEATHS	1958					1957				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	1	0		0		0				
Encephalitis, acute		0				0				0
Enteric fever	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years	5	0	1	0	0	0	0	0	0	1
Influenza	2	0	0	0	0	0	1	0	0	
Measles		0	0	0	0	0	0	0	0	
Meningococcal infection		0	1			0	0			1
Pneumonia	276	18	8	9	6	17	12	11	0	
Poliomyelitis, acute	5	1		0	0	0			0	0
Scarlet fever		0	0	0	0	0	0	0	0	
Tuberculosis:										
Respiratory	59	2	9	2	5	8	3	2	5	
Non-respiratory		1	0	0	0	1	0	0	0	
Whooping-cough	1	0	0	0	0	0	1	0	0	
Deaths 0-1 year	253	25	22	5	15	34	29	6	11	
Deaths (excluding stillbirths)	7,889	632	460	76	142	666	452	115	133	
LIVE BIRTHS	13,570	1,133	956	199	438	11,231	927	214	471	
STILLBIRTHS	286	15	26			17	26			

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

Medical News

Postgraduate Travelling Fellowships.—Details of postgraduate travelling fellowships offered by the British Postgraduate Medical Federation to registered medical and dental practitioners holding appointments at the teaching hospitals, medical or dental schools, and postgraduate institutes of the University of London are given in the advertisement columns (page 53). These are tenable at other centres in the United Kingdom or abroad.

Buswell Fellowships.—The University of Rochester School of Medicine and Dentistry announces a series of Buswell Fellowships for graduates of approved medical schools who wish to carry out research there. The object of the fellowships is to assist well-qualified doctors to prepare for academic careers. Junior fellowships carry a basic stipend of \$4,500 \$6,000 a year, senior fellowships \$5,500-\$8,000. Applications will be received at any time. Further details and application forms are obtainable from Dr. L. E. YOUNG, University of Rochester Medical Center, 260, Crittenden Boulevard, Rochester, 20, New York.

Films for G.P.s.—A film on the physio-pathology of hypertension, made for Pfizer Ltd. by Dr. N. P. SCHENKER, was shown to an invited audience in London last week. This film is one of a series intended primarily for the general practitioner and designed to offer a concise 30-minute refresher course on the latest developments in important fields of medicine. "The Physio-pathology of Hypertension" surveys the present state of knowledge of the reflex regulation of arterial pressure. The principal technical adviser during the making of the film was Professor C. HEYMANS, of Ghent, whose work on the carotid sinus won him the Nobel Prize in 1938. Before the film was shown Professor Heymans gave a short talk on the place of the baroreceptors of the carotid sinus and aortic arch in the control of arterial pressure, and the film itself demonstrated the animal experiments on which modern views on this subject are based. Professor J. McMICAL, F.R.S., took the chair at an informal discussion after the film.

International Children's Centre.—Applications are invited for the 1959-60 Nestlé Fellowship (one million francs) from physicians wishing to specialize in nutrition. Candidates, who must have a command of French, may obtain further information about the fellowship from the International Children's Centre, Château de Longchamp, Bois de Boulogne, Paris, 16. Among other activities the centre holds international training courses on medical, psychological, and social aspects of maternal and child welfare. These courses are for the discussion of recent technical advances and their practical application. Details of these courses may also be obtained from the centre.

Paediatric Dietary.—A third edition of *Diets for Sick Children* has been published from the Hospital for Sick Children, Gt. Ormond Street, London, W.C.1 (pp. 16; 1s. net). It includes diets and recipes for use in such metabolic disorders as coeliac disease, galactosaemia, and phenylketonuria, for diabetes, and for children with diseases of the liver or kidneys.

Dental Radiology.—A British Society of Dental Radiology has been established. This follows meetings at the Royal Dental Hospital, London, under the chairmanship of Dr. SYDNEY BLACKMAN, of representatives from the radiological departments of dental schools and hospitals in the United Kingdom. The society's objects include the promotion of dental radiology and research and the establishment of dental radiology as a specialty with a registrable diploma. A programme of scientific meetings is being arranged for next year. Those interested should apply to Mr. GUY POYTON, F.D.S., Eastman Dental Hospital, Gray's Inn Road, London, W.C.1.

All-India Institute of Public Health, Calcutta.—A small team of W.H.O. consultants is shortly visiting the All-India Institute of Public Health and Hygiene, Calcutta, to advise on the educational facilities there. Two of the team are from Britain, Colonel C. A. BOZMAN, director of the Wellcome Museum of Medical Science, London, and Professor T. MCKEOWN, professor of social medicine at Birmingham.

Osborne.—With the approval of the Queen, the Minister of Works has appointed Surgeon Rear-Admiral E. T. S. RUDD to be house governor and medical superintendent of King Edward VII Convalescent Home for Officers at Osborne, Isle of Wight. He succeeds Lieutenant-General Sir NEIL CANTLIE. Admiral Rudd will take up his appointment on November 1.

Professor M. E. DeBakey, of Houston, U.S.A., has been awarded the 1958 Alvarenga prize of the College of Physicians of Philadelphia.

COMING EVENTS

Royal College of Obstetricians and Gynaecologists.—Tickets for the Green-Armytage Anglo-American Sterility Lecture on September 26 (see *Journal*, September 13, p. 699) are obtainable from the secretary of the College, 58, Queen Anne Street, London, W.1.

Medical Protection Society.—Annual meeting, 3 p.m. on October 1, at the society's offices, Victory House, Leicester Square, London, W.C.2.

Association of Clinical Pathologists.—61st general meeting, October 2-4, at the Royal College of Surgeons. The meeting will include a symposium commemorating the centenary of the publication of Virchow's *Die Cellularpathologie*. Details from Dr. J. N. CUMINGS, The National Hospital for Nervous Diseases, Queen Square, London, W.C.1.

Institute of Diseases of the Chest.—Clinical demonstrations (without fee) for medical practitioners, on Fridays at 5 p.m. from October 3 to December 12. Details from the secretary of the Institute, Brompton, London, S.W.3.

Course in Hypnosis.—Week-end course on hypnosis in medicine and dentistry, Manchester, October 4 and 5. Details from hon. secretary, North-western Branch of Dental and Medical Society for the Study of Hypnosis, 105, Cavendish Road, Salford, 8.

Birmingham University, Faculty of Medicine.—Sir ERIC JAMES, High Master of Manchester Grammar School, will give the inaugural address on October 6, at 3 p.m., at Nuffield House, Queen Elizabeth Hospital.

Royal College of Surgeons of England.—Monthly subscription dinners (30s.) will be held on October 8, November 12, and December 10. Details from the deputy secretary of the College, Lincoln's Inn Fields, London, W.C.2.

Sheffield University, Faculty of Medicine.—Mr. WILLIAM DOOLIN, editor of the *Irish Journal of Medical Science*, will give the inaugural address in the Firth Hall on October 10, at 5 p.m.

British Postgraduate Medical Federation.—Sir EDWARD SALISBURY, F.R.S., will give the inaugural lecture of the 1958-9 series on the "Scientific Basis of Medicine," on October 16, at 5.30 p.m. at the Senate House, London University. His subject will be "The Influence of Botany on Health and Disease."

British Council for the Welfare of Spastics.—One-day conference in Bristol for members of the medical profession, November 8, under the chairmanship of Professor A. V. NEALE. Tickets from the council, 13, Suffolk Street, London, S.W.1.

St. John Ambulance Brigade.—Surgeons' week-end conference and dinner, November 1 and 2, at B.M.A. House. Details from the conference secretary, 8, Grosvenor Crescent, London, S.W.1.

OUR EXPERT replies: One of the greatest possible tragedies in a child's life is for there to be delay in the diagnosis of a congenital dislocation of the hip, since the prognosis is almost universally excellent in the first few months of life but with an increasingly high failure rate if treatment is instituted later than this. The main essential, therefore, is to attempt early diagnosis. Even in these days it is frequently not diagnosed before walking starts. Two of the most obvious signs are abnormal creases in the leg and limited abduction. Caffey's figure refers to infants on

the leg and limited abduction. Caney's figure refers to infants on

the whole younger than 5 months, and if these skin creases persist at 5 months they often indicate a congenitally dislocated hip. It is appreciated that abnormal creases may occur in the presence of a normal hip; on the other hand, it is rare to see an abnormal hip without abnormal skin creases. Equally abduction may be normal in a hip which goes on to subluxation, and in the same article by Caffey he mentions two such cases; conversely, he states that 44.2% of infants had restriction of abduction, although the hips were normal. We are faced with the situation of trying to find which cases give us enough doubt to advise x-ray examination. Abnormal skin creases and limited abduction are in themselves not infallible but are certainly most suspicious.

REFERENCE

¹ Caffey, J., Ames, R., Silverman, W. A., Ryder, C. T., and Hough, G., *Pediatrics*, 1956, 17, 632.

Chemotherapy for Pulmonary Tuberculosis.—Dr. ROIF OESTREICHER (Baltimore, Maryland, U.S.A.) writes: I cannot but voice my objections to the views presented in an answer to a question ("Any Questions?" July 19, p. 179). Since 1955 determinations of biologically effective isoniazid serum levels have been in clinical use. On the average, 30% of adults are "rapid inactivators" of isoniazid—i.e., they metabolize this drug to such an extent as to be biologically ineffective. The daily dose of isoniazid, therefore, must be determined by serum level determinations. To treat a case of pulmonary tuberculosis with 1 g. of streptomycin and 200 mg. of isoniazid daily is to invite the emergence of streptomycin-resistant organisms, because under these conditions isoniazid has a very small chance to reach therapeutic levels. Indeed, among several hundreds of patients whose isoniazid serum levels were determined and who were under my care, only one had a biologically effective isoniazid serum level (without concomitant administration of aromatic amines) with a "loading" dose of 2 mg./kg. body weight, a dose which corresponds to a daily dose of 200 mg. for the average adult. I do realize, however, that isoniazid level determinations by bioassay are not readily available in many institutions. Therefore a therapy for a person under 40 years of age, excreting presumably drug-sensitive organisms, should consist of streptomycin 1 g. and isoniazid 8–16 mg./kg. body weight daily, and P.A.S. 10–12 g. daily. Should the patient have gastro-intestinal difficulties due to P.A.S., P.A.B.A. in the same dosage may be given. To avoid the neurotoxic effects of isoniazid, pyridoxine hydrochloride 50–100 mg daily should be given in every case. I subscribe wholeheartedly to the view that streptomycin for long periods of time will cause serious cochlear or labyrinthine damage in the elderly.

I think that the question itself brings up once more the sad theme of the ever-increasing number of patients who excrete drug-resistant organisms, who cannot be operated on for various reasons, and who thus join the ranks of custodial cases for the remainder of their wretched lives. The question could have been answered with one sentence: admit the patient to a chest hospital, where he will be treated by competent chest physicians.

OUR EXPERT replies: Dr. Oestreicher raises an important theoretical point. It is, of course, well known that some 30% of adults are "rapid inactivators" of isoniazid. On theoretical grounds it is certainly reasonable to expect that such patients would require higher doses of isoniazid. But in practice this seems unlikely. In the British Medical Research Council series, and in many centres in this country, the standard dose of isoniazid has been 100 mg. twice daily. Yet when this dose is combined with streptomycin 1 g. daily the incidence of drug resistance is very low indeed,¹ and in some series nil.^{2,3} In the latter two series the rate of sputum conversion to negative was 100%. Although isoniazid serum levels were not carried out on these patients, it seems probable that there were an appreciable number of "rapid inactivators" among them. Yet the relatively small dose of isoniazid appears to have been entirely effective. Such a dose also avoids the risk of peripheral neuritis and the necessity of giving pyridoxine. It is far more dangerous to follow the practice, unfortunately so widespread, of giving intermittent streptomycin with daily isoniazid. The relatively high incidence of drug resistance on this regime was demonstrated in the British Medical Research Council controlled trials over five years ago. In tuberculosis, as in other diseases, it is important that treatment should be founded not on purely theoretical considerations but on properly designed practical trials. As a result, at least in some areas of this country, the number of patients who excrete drug-resistant organisms is steadily decreasing, not increasing as Dr. Oestreicher suggests.

REFERENCES

- ¹ Medical Research Council, *Brit. med. J.*, 1955, 1, 435.
² Ross, J. D., Horne, N. W., Grant, I. W. B., and Crofton, J. W., *ibid.*, 1958, 1, 237.
³ Crofton, J. W., *Amer. Rev. Tuberc.*, 1958, 77, 869.

Brucella Abortus in Milk.—Dr. J. M. ROSS (Senior Medical Officer, Ministry of Health, London, W.1) writes: May I draw your attention to a somewhat misleading answer to the question on the action necessary on finding *Br. abortus* in milk ("Any Questions?" July 26, p. 260)? Regulation 20 of the Milk and Dairies Regulations, 1949, empowers local authorities to impose control measures when there is danger of any disease being contracted by man through the consumption of milk: this covers the risk of milk-borne human brucellosis, whether due to *Br. abortus* or *Br. melitensis*. If a medical officer of health has evidence which satisfies him that any person is suffering from disease caused by the consumption of milk, or that milk is being sold which is infected with disease communicable to man, he can either stop the sale or allow such sale only on the condition that the milk is first so treated as to be made safe; in practice, this means pasteurization. If the medical officer of health has no more than reasonable grounds for suspecting a milk supply either of having caused disease in a consumer or of being pathogenic to man, he can only impose treatment of milk before sale: he cannot stop sale on suspicion. Milk whey and other agglutination tests are useful for detecting brucella infection in dairy herds. They demonstrate the presence of brucella agglutinins, but they are not evidence of the presence of the organism itself in the milk. The "ring" test provides a valuable and simple means of screening milk samples and selecting those which should be submitted to the longer techniques of special culture methods or guinea-pig inoculation; only such techniques can provide satisfactory evidence that a milk is infected, or, at least, was infected when the sample was taken. The selective medium which Mair¹ recommends for the isolation of *Br. abortus* in herd milk gives a result in 4–5 days. Guinea-pig inoculation takes some 6–7 weeks to give results, and the length of this interval creates certain administrative difficulties in dealing with milk-borne brucellosis, because the secretion of the organism in the milk is limited to certain periods, some 6–8 weeks, at calving time. The milk concerned may well have ceased to be infected by the time that the result of the biological test has become available some six weeks after the sample has been taken. To keep the picture in proper perspective, one should add that (1) over 92% of all milk sold in this country is now heat-treated, and (2) the evidence suggests that most current cases of undulant fever are not due to the ingestion of infected milk but to contact with infected material from occupational or other circumstances.

REFERENCE

¹ Mair, N. S., *Monthly Bull. Minist. Hlth Lab. Serv.*, 1955, 14, 184.

Gluten-free Diets.—Mr. J. K. FLEMING, chief chemist of A. & R. Scott Ltd., writes: In their article on gluten-free diets (August 2, p. 299) Dr. R. F. Fletcher and Miss Marjorie Y. McCrick give a list of the gluten-free products of various manufacturers. In case there is any possibility of confusion between those of our products which do not or do contain gluten, I should like to point out that A. & R. Scott Ltd. market a product called "Baby Cereal Twin-Pack," the wheat cereal of which does contain gluten.

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The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

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Clinical Pathology in General Practice (22s. 3d.).

Any Questions?, Volumes 2 and 3 (8s. 3d. each).

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THE EISENMENGER SYNDROME

OR PULMONARY HYPERTENSION WITH REVERSED CENTRAL SHUNT*

BY

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Distinctive Characteristics of Individual Members of the Eisenmenger Group

Patent Ductus.—(1) The catheter passed through the duct more easily than through any other central communication between the two circulations. It did so in 90% of cases, and usually took an anticlockwise course to enter the descending aorta. (2) The shunt was wholly reversed far more frequently (50%) than with other defects. (3) Patent ductus was the only lesion which was occasionally associated with no shunt in either direction. (4) Differential oxygen desaturation between right brachial and femoral samples was pathognomonic of patent ductus, and occurred in all but two cases in which there was no shunt in either direction. The oxygen saturation of samples from the right brachial artery averaged 89.6% (range 81 to 96%), and from the descending aorta or femoral artery 77.1% (range 65 to 88%).

Aorto-pulmonary Septal Defect.—(1) When the catheter passed through the defect it entered the ascending aorta from the pulmonary artery. (2) In other respects the findings were similar to those of patent ductus with bidirectional shunt but no differential desaturation.

Eisenmenger's Complex.—(1) Passage of the catheter via the defect (28%) into the ascending aorta followed a characteristic medial course as in Fallot's tetralogy. (2) An appreciable left-to-right shunt at ventricular level, as described by Bing *et al.* (1947), could be detected in all but two cases, in both of which the diagnosis was subsequently proved at necropsy. (3) Pulmonary artery samples were always between 5 and 20% less saturated than aortic or arterial samples.

Single Ventricle.—In all respects but one these cases resembled Eisenmenger's complex. The increase in oxygen saturation at ventricular level averaged 16%. The one distinctive feature was the similarity of aortic (or arterial), pulmonary artery, and ventricular samples. The arterial oxygen saturation was no lower than in other members of the Eisenmenger group, averaging 82%. Three such cases were proved at necropsy.

Transposition of the Great Vessels.—These cases also resembled Eisenmenger's complex in all major respects but one. The distinctive feature was the higher oxygen saturation of samples from the pulmonary artery compared with those from the aorta and right ventricle. In the three cases studied the difference was 32, 17, and 5%. The rise in oxygen saturation at ventricular level averaged 20%. Three cases in the series resembled Eisenmenger's complex in all respects except that the catheter took a left antero-lateral convex course as it entered the ascending aorta (Plate).

*Conclusion of the Croonian Lectures delivered before the Royal College of Physicians of London on May 15, 1958. See last week's *Journal* (p. 701) for first part.

Fig. 1, *Journal*, September 20, facing p. 709), characteristic of one type of corrected transposition. The pulmonary artery is not readily entered in such cases.

Persistent Truncus.—There were three characteristic features in the two cases studied. (1) The physiological situation was similar to that in aorto-pulmonary septal defect with the addition of a second left-to-right shunt at ventricular level. As the catheter passed from the right atrium, through the right ventricle, into the truncus, the oxygen saturation of respective samples rose first by 10 and 12.5%, and then by a further 10 and 14%. (2) The catheter entered the pulmonary arteries from the "aorta," instead of vice versa as in aorto-pulmonary septal defect. (3) Samples from the "aorta" and pulmonary arteries were identical.

Atrial Septal Defect.—(1) The catheter passed through the defect in two-thirds of 18 proved cases. (2) The pulmonary artery pressure was less than the systemic pressure by an average of 27/34 mm. Hg in 70% of the cases; in 10% it was higher; and in the remainder about the same. When mean pressures were similar the pulse pressure was usually greater in the pulmonary artery, the systolic pressure being higher and the diastolic lower than in the systemic arteries. Agents affecting pulmonary or systemic flow or resistance selectively usually altered the pressure relationship between the two circulations. (3) A direct shunt at atrial level was demonstrated in 84% of the cases, right atrial samples being on the average 13% more saturated than samples from the superior vena cava (range 6 to 21%). (4) The oxygen saturation of left atrial samples averaged 81% in the eight cases in which they were obtained (range 72 to 88). Left ventricular samples were similar when secured, and arterial samples likewise (average 82% saturated; range 70 to 88%).

Persistent Ostium Primum.—The physiological findings in four cases could not be distinguished from a combination of low atrial septal defect and ventricular septal defect, there being bidirectional shunts at both atrial and ventricular levels. The rise in oxygen saturation averaged 10% in the right atrium and 7.5% in the right ventricle. The lie of the catheter when it entered the aorta was similar in both groups to that in Fallot's tetralogy and Eisenmenger's complex.

Common Atrioventricular Canal.—A single proved case that came to necropsy had virtually both a single atrium and a single ventricle. The rise in oxygen saturation resulting from the left-to-right component of the bidirectional shunt occurred at atrial level and measured 23%. Samples from the common ventricle, pulmonary artery, and femoral artery were similar at around 80% saturated.

Anomalous Pulmonary Venous Drainage.—As a cause of the Eisenmenger reaction both total and hemianomalous pulmonary venous drainage must be rare, for no case was recognized amongst the 127 studied in this paper. One of

the additional necropsies, however, previously diagnosed as an ostium secundum type of atrial septal defect, was found to have total anomalous pulmonary venous drainage into a relatively small vein joining a locally dilated right superior vena cava. This female infant died at the age of 1 year with a pulmonary artery pressure of 105/60. No wedge pressure was recorded, but the pulmonary venous pressure must have been high in view of the small calibre of the single vein joining the superior vena cava, and this must have excited reactive pulmonary hypertension as described by Johnson *et al.* (1958) in four similar cases in which the single anomalous vein carrying all the blood from the lungs was stenosed where it joined the inferior vena cava or porta hepatis.

Dye-dilution Curves

The best method of identifying the site of the reversed shunt in Eisenmenger's syndrome is to inject a suitable dye first into the root of the pulmonary artery, then into the right ventricle, and finally into the superior vena cava, and

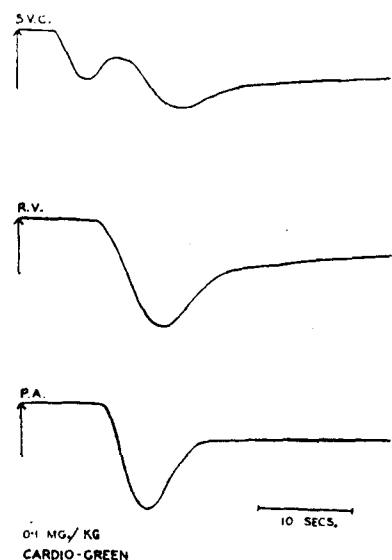


FIG. 10.—Dye-concentration curves from the radial artery after injecting cardio-green first into the superior vena cava, then into the right ventricle, and finally into the pulmonary artery: the double hump in the top tracing is due to the early appearance (time) of the dye when it has been injected proximal to the reversed shunt. Eisenmenger's syndrome associated with an atrial septal defect in a man aged 30.

has passed through the lungs in normal time (Fig. 10). In the case illustrated the double hump so formed appeared only when the dye was injected into the superior vena cava, proving that the reversed shunt was at atrial level.

While offering a highly satisfactory method of determining the site of a reversed shunt in Eisenmenger's syndrome, dye-concentration curves do not distinguish between individual members of each group, at least when the shunt is at atrial or ventricular level.

Angiocardiography

Selective angiocardiography may also resolve the site of a reversed shunt, and not infrequently distinguishes between individual members of each group. With atrial septal defect, for example, diiodone appears in the aorta and pulmonary artery more or less simultaneously only when injected into the superior vena cava (or high right atrium), not when injected into the right ventricle or pulmonary artery. Angiocardiography usually distinguishes patent ductus, transposition, corrected transposition, and persistent truncus from ventricular septal defect, and retrograde aortography separates aorto-pulmonary window from ventricular

septal defect (Fig. 11). Selective angiocardigrams, however, give no information about pressure, and reversed shunts are encouraged by transient overfilling of the chamber into which the contrast medium is injected; moreover, the danger of an overdose of x rays may limit the number of angiocardigrams to which a patient should be exposed, especially after cardiac catheterization. Dye-dilution curves have no such disadvantage.



FIG. 11.—Retrograde aortogram in a case of Eisenmenger's syndrome associated with an aorto-pulmonary window (with acknowledgments to Mr. Walter Somerville).

Necropsy Findings

Death occurred in 18 of the 127 cases of Eisenmenger's syndrome, and necropsy was carried out in 15 of them. Details of 38 additional necropsies of cases studied during life were sent to me by many kind colleagues in Britain, making a total of 53.

Mode of Death

The cause of death was known in 42 of these cases. Haemoptysis was the commonest natural cause, and was responsible in 29%; it was usually profuse and caused death within a few minutes, as in Eisenmenger's case. The nature of the collapse has already been discussed. Necropsy proved that the cause of the haemoptysis was usually pulmonary infarction from arterial thrombosis. In some cases, however, this was not established, and rupture of a thin-walled dilated arteriole immediately distal to the end of a thick muscular artery, as described by Dammann and Ferencz (1956) and Edwards (1957), could not be excluded. In a case described by Selzer and Lewis (1949) death was due to rupture of an aneurysm of the pulmonary artery, but this is most unusual.

Surgical repair of the defect was responsible for 26% of the fatal cases, and congestive failure for 17%; death was abrupt, presumably from ventricular fibrillation, in 14%. No other single cause, such as bacterial endocarditis, cerebral abscess, cerebral thrombosis, or pregnancy accounted for more than 5%.

Accuracy of Diagnosis

Of the 15 necropsied cases in the series fully analysed, the clinical diagnosis was wholly correct in nine, wholly wrong in two, and correct in respect of the site of the shunt but wrong in respect of the nature of the defect in four. A 40% error after full investigation is embarrassing; it was no less in the 38 borrowed cases nor in published reports in the literature. What is even worse is the high frequency of false pathological reports. The last two patients that died, for example, were diagnosed clinically as ? total anomalous pulmonary venous drainage in one case, and persistent ostium primum with bidirectional shunt

at atrial and ventricular levels in the other; the pathological reports from the hospitals where they died concluded that the first had nothing more than a simple atrial septal defect of the secundum type, and that the second had a single ventricle with intact atrial septum.

When a pathologist more accustomed to congenital heart disease examined the specimens he showed conclusively that the first had total anomalous pulmonary venous drainage into a normal right superior vena cava and the second a common atrioventricular canal with a functionally single atrium and virtually single ventricle. This is salutary experience, and emphasizes the very great care and knowledge that are needed to work out the precise physiological and anatomical situation in the Eisenmenger syndrome.

Size of the Defect

It has been stated, not infrequently, that the size of the defect is less important than the pulmonary vascular resistance in determining the Eisenmenger syndrome. This is a half-truth, for the size of the defect may very well determine the pulmonary vascular resistance. A major difficulty here is that measurements of the size of the defect vary considerably according to the circumstances under which the measurements are made. Surgical estimates in the live heart during repair work, for example, are always larger than post-mortem measurements; and post-mortem measurements are larger when made immediately after death, when the heart is fresh, than when made subsequently after the heart has been fixed. Discrepancies relating to size of defects in reported cases, therefore, are bound to arise. Nevertheless, the following statements are secure. (1) No case of patent ductus with the Eisenmenger reaction has ever been reported with a lumen less than 5 mm. in diameter. (2) No case of Eisenmenger's complex has ever been reported with a ventricular septal defect less than 1 cm. across. (3) The size of an atrial septal defect has relatively little bearing on the presence or absence of a high pulmonary vascular resistance, and varies freely between 3 and 8 cm. in both uncomplicated and pulmonary hypertensive groups.

The size of the defect in the 53 necropsies under review is given in Table VI, where it is compared with the common size of defects in uncomplicated cases as given by Abbott

TABLE VI.—Size of Communication

	Normal Resistance. Usual Range	Eisenmenger Range
Duct.	0.1 to 1.0 cm.	0.7 to 1.5 cm.
V.S.D.	0.1 to 2.0 cm.	1.5 to 3.0 cm.
A.S.D.	3 to 8 cm.	3 to 8 cm.

(1927), Taussig (1947), and Brown (1950). The figures agree fairly closely with those given for ventricular septal defect by Selzer and Laqueur (1951).

Ducts under 1 cm. across with the Eisenmenger reaction were short, and the smallest were specifically stated to have had no length. Aorto-pulmonary windows are usually large—up to 5 cm. or so in their long diameter—but probably need to be no larger than the smaller ducts, since they have no length. That ventricular septal defects averaged twice the diameter of the ducts is attributed to the fact that aorto-pulmonary shunts continue throughout the whole cardiac cycle, whereas interventricular shunts are believed to be chiefly systolic.

As pointed out by Selzer and Laqueur (1951), there is no gradual transition between a large ventricular septal defect and single ventricle. The former rarely, if ever, exceeds 3 cm. in diameter and occupies no more than 10% of the septal area in a fully grown heart; the latter has a ridge where the septum should be, but that is all. Single ventricle is always complicated by pulmonary stenosis, as in the six cases described by Campbell *et al.* (1953), or by a high pulmonary vascular resistance (Rogers and Edwards, 1951). Transposition of the great vessels may be associated, but is obviously unimportant physiologically.

Elastic Arteries

Atheroma of the large elastic arteries was common, as reported by all writers, and as originally described by Eisenmenger. Secondary thrombosis and pulmonary infarction were increasingly common after the age of 20.

Of exceptional interest is the state of the elastic fibres in the main trunk of the pulmonary artery itself. Heath (1958) pointed out that in the foetus and newborn babe these elastic fibres were long and densely packed as in the aorta. As the pulmonary artery pressure falls the fibres seem to break up, shorten, and become loosely arranged, so that they no longer resemble the aortic pattern. Heath found that sections of the pulmonary artery in Eisenmenger's complex and patent ductus with reversed shunt always resembled the foetal (or aortic) pattern, whereas in atrial septal defect with pulmonary hypertension and reversed shunt, and in all forms of pulmonary hypertension known to be acquired, the appearances were more like those in a normal pulmonary artery. He concluded that pulmonary hypertension in the Eisenmenger syndrome must be present from birth with ventricular septal defect and patent ductus, but must be acquired in atrial septal defect—at least in the great majority of cases. It should be understood that the function of elastic fibres is to prevent distension from high pressure.

Muscular Arteries

In Eisenmenger's complex pulmonary arteries with a diameter of less than 1 mm. have a thick muscular media very similar to their structure in the foetus. Civin and Edwards (1950, 1951) suggested that it was the persistence of the foetal type of muscular artery that was responsible for the high resistance, and that this saved infants with large ventricular septal defects from dying as a result of an inadequate blood flow into the aorta. In their own words, "the pulmonary vascular bed of patients with the Eisenmenger complex who survive infancy maintains its foetal function." They assumed that the thick muscular arteries of the foetus were responsible for the high pulmonary vascular resistance necessary to deflect blood from the right ventricle away from the lungs into the descending aorta via the ductus arteriosus.

Thick muscular arteries have been demonstrated also in children with a single ventricle (Edwards and Chamberlin, 1951; Heath, 1957), large patent ductus (Whitaker *et al.*, 1955), and all other members of the Eisenmenger group (Edwards, 1957).

During the first two years of life the intima usually remains normal; thereafter, however, and with varying degree and tempo from case to case, progressive intimal fibrosis develops (Edwards, 1957). This is the pulmonary vascular disease that has been regarded by some as the chief cause of Eisenmenger's syndrome—for example, Whitaker (1958). Subscribers to this hypothesis do not say how these intimal changes have come about.

Arterioles

The arterioles of the lung are vessels less than 100 μ in diameter, and consist of endothelium, a single elastic layer, and adventitia; they are not supplied with muscle. Dammann and Ferencz (1956) support Edwards in his belief that the arterioles are usually thin-walled and dilated in Eisenmenger's syndrome, and that thick-walled vessels within the usually accepted compass of an arteriole are really muscular arteries in a state of contraction, an interpretation which has been extended by Short (1957) to embrace larger arteries with thick muscular coats.

The Overriding Aorta

The following observations may clarify the position in respect of the override.

1. Ventricular septal defect is but one of a total of some 12 kinds of communication between the two circulations, all of which may be complicated by a high pulmonary vascular

resistance and reversed shunt of similar magnitude. An overriding aorta or its physiological equivalent is absent in seven of these conditions.

2. When the pulmonary vascular resistance is high the arterial oxygen saturation averages close to 80% in transposition with ventricular septal defect, persistent truncus, single ventricle, the so-called Taussig-Bing syndrome (in which the pulmonary artery is supposed to be overriding the defect in cases of transposition), and Eisenmenger's complex with or without apparent override.

3. Eisenmenger's complex with all the classical features may be associated with a defect in the muscular part of the interventricular septum as in the cases described by Weiss (1927) and Heath *et al.* (1956). There can be no overriding of the aorta in such instances.

Experimental Physio-pathology

The reaction of the pulmonary circulation in Eisenmenger's syndrome to pulmonary vasoconstrictor and vasodilator drugs seemed worth investigating.

Oxygen

In adults and in the great majority of children over the age of 5, 100% oxygen fails to lower the pulmonary artery pressure (Fig. 12) or to influence the magnitude of the shunt, as first demonstrated by Burchell *et al.* (1950).

On the other hand, breathing 10% oxygen raises the pulmonary vascular resistance and increases the reversed shunt, at least in cases with patent ductus (Burchell *et al.*, 1953).

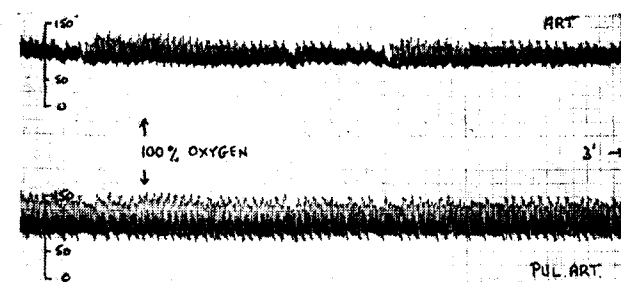


FIG. 12.—Failure of 100% oxygen to lower the pulmonary artery pressure in a case of Eisenmenger's complex.

In infants under 2 and occasionally in small children, when intimal fibrosis in the pulmonary circulation is negligible, breathing 100% oxygen almost halves the resistance and increases the pulmonary blood flow (Edwards, 1957).

Acetylcholine

Acetylcholine, when injected direct into the pulmonary artery in a dose of 0.5 to 1.5 mg., is an ideal selective pulmonary vasodilator, for this quantity is usually inactivated by cholinesterase by the time it reaches the systemic circulation (Wood *et al.*, 1957).

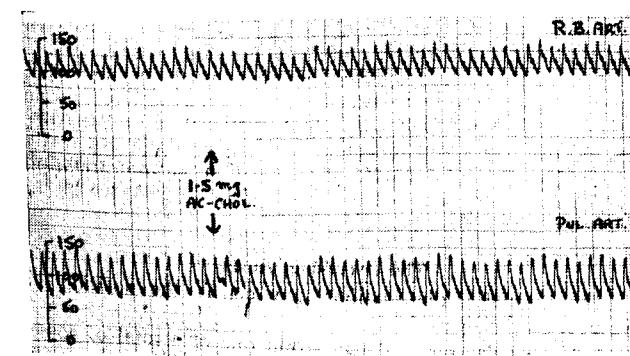


FIG. 13.—Failure of acetylcholine to lower the pulmonary artery pressure in a case of Eisenmenger's complex.

When severe pulmonary hypertension was primary, or due to mitral stenosis or cor pulmonale, acetylcholine lowered the pulmonary artery pressure and resistance, and raised the cardiac output in 85% of cases (Wood, 1958). In 13 cases of Eisenmenger's syndrome, however, no such effect could be demonstrated in a single instance (Fig. 13). The youngest patient in the series, however, was 5 years old, and it is probable that infants under 2, without intimal fibrosis, would react differently. This belief is founded on the different response of these infants to 100% oxygen, as described previously, and on the fact that acetylcholine lowers the pulmonary vascular resistance sharply in the foetal lung (Dawes, 1958).

Negative reactions to tolazoline hydrochloride ("prisol") and aminophylline have also been without exception in cases of Eisenmenger's syndrome in patients over the age of 5.

Protective Effect of Stenosis

One case of aorto-pulmonary septal defect had moderate stenosis of the origin of the right branch of the pulmonary artery (Fig. 14). The pressure fell from the systemic level of 85/55 mm. Hg in the pulmonary artery to 60/40 beyond the stricture in the right branch. The nature of the defect

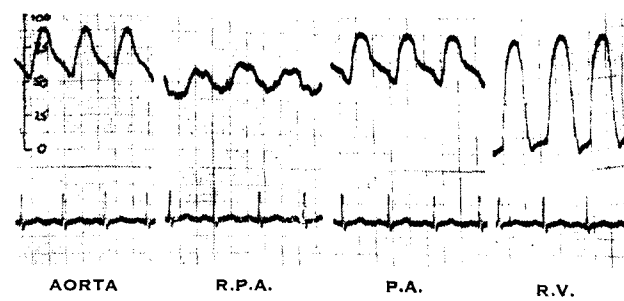


FIG. 14.—Pressure pulses in a case of Eisenmenger's syndrome associated with an aorto-pulmonary septal defect and stenosis of the right pulmonary artery near its origin.

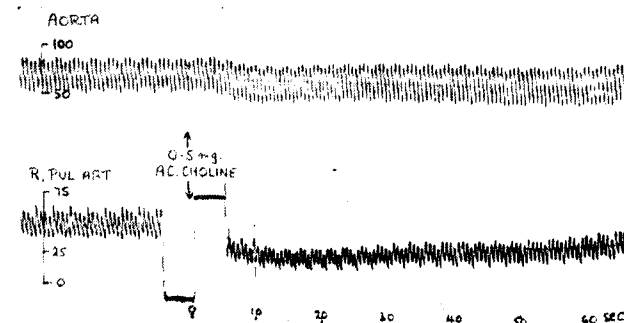


FIG. 15.—Pressure pulse from right pulmonary artery beyond the stricture, showing a marked reduction of pressure following the injection of acetylcholine. The pulmonary vessels have been protected by the stenosis and are functioning normally.

was demonstrated by passing the catheter through it. When acetylcholine was injected into the right pulmonary artery the pressure fell sharply from 55/38 to 30/18 (Fig. 15). It is true that the child was also the youngest in the series investigated, being only 3 years old, but that does not alter the conclusion that vessels which are protected from extreme pulmonary hypertension, or which have not had time to develop serious intimal fibrosis secondary to the hypertension, respond briskly to acetylcholine. This disposes of the idea that there is anything fundamentally wrong with the pulmonary vessels at birth in the Eisenmenger syndrome.

This functional evidence stands solidly side by side with the anatomical observation that when the origin of the left pulmonary artery is atresic in Eisenmenger's syndrome its distal branches and muscular arteries, which are not subjected to high pressure, are perfectly normal, whereas the vessels on the other side have all the features characteristic of Eisenmenger's complex (McKim and Wigglesworth, 1954).

Similar anatomical evidence was provided by Civin and Edwards (1950) in a case of large ventricular septal defect (2.5 cm.) with marked overriding of the aorta associated with mild infundibular stenosis of the fibrous diaphragm type, the orifice being 1.5 cm. in diameter and above the level of the shunt. This man died from carcinoma of the bladder at the age of 47, and at necropsy the pulmonary vascular tree was normal.

The protective effect of stenosis is the basis of modern surgical therapy in the Eisenmenger group (Civin and Edwards, 1950; Dammann and Ferencz, 1956).

Course and Prognosis

As previously stated, the Eisenmenger syndrome is commonly established at birth or during the first two years of life when the shunt is aorto-pulmonary or interventricular, but is typically acquired when the shunt is interatrial. In the present series, for example, cyanosis dated from infancy in 80% of those with ventricular septal defect, but did not start until adult life in 92% of those with atrial septal defect. The onset of reversed shunt in patent ductus is more difficult to establish, because differential cyanosis is usually overlooked. Aorto-pulmonary septal defects, however, behave like ventricular septal defects.

The majority of those who have studied the Eisenmenger syndrome at all closely have come to the same conclusion. Thus 8 out of 13 acceptable cases of Eisenmenger's complex collected from the literature by Selzer and Laqueur (1951) dated their cyanosis from infancy, as did at least 50% of all 29 clinical cases studied by Donzelot *et al.* (1949), and all except 2 out of 20 cases reported by Kohout *et al.* (1955).

As a general rule neither cyanosis nor breathlessness changes appreciably during childhood or adolescence, but deterioration sets in sooner or later in adult life. The onset of recurrent haemoptysis may signal the downward trend, which is due in many cases to the development of thrombo-obstructive lesions.

The average age of natural death in the 18 fatal cases in this series and the 38 additional cases from elsewhere, omitting three which died in infancy, was 33 for both aorto-pulmonary and ventricular defects, and 36 for atrial septal defects. The cases in which death occurred in infancy included one severe ostium primum, one common atrio-ventricular canal with what was virtually cor biloculare, and one total anomalous pulmonary venous drainage into a stenosed vessel joining the right superior vena cava.

The maximum age reached was 65 for both the ventricular and the atrial cases, and 55 for the ducts.

The downhill course was usually punctuated with haemoptyses, which when severe sometimes caused sudden collapse and death within a few minutes, as previously described.

Bacterial endocarditis occurred in only 5% when it was responsible for death; cerebral abscess from paradoxical embolism occurred once and proved fatal; cerebral thrombosis also occurred in one case, but was not fatal. An appreciable number (14%) died abruptly, presumably from ventricular fibrillation.

As many as 26% of the fatal cases died from a surgical attempt to repair the defect, mostly from ligation of a patent ductus.

Patients who survive these risks develop congestive heart failure sooner or later, and this was the cause of death in 17% of the fatal cases.

Treatment

Medical treatment aims at preventing secondary thrombo-obstructive lesions by means of permanent anticoagulants, such as phenindione ("dindevan"). Pulmonary vasodilators, such as tolazoline, aminophylline, and reserpine, fail to lower the pulmonary vascular resistance, and do not influence the course of the disease (Rudolph *et al.*, 1958). Small venesections, repeated from time to time, may be helpful in cases with gross polycythaemia, but should be

undertaken very slowly and with the utmost vigilance. Heart failure requires the usual remedies.

Surgical repair of the defect has been responsible in recent years for more deaths in the Eisenmenger syndrome than any other agent except haemoptysis. Ellis *et al.* (1956) stated that the surgical mortality in cases with reversed shunt through a patent ductus was 56%, and Anderson *et al.* (1956), after reviewing 45 such cases in the literature, could find only four good results. Similar fatalities and poor results in the survivors are now taking place with repair of ventricular septal defect and atrial septal defect complicated by pulmonary hypertension and bidirectional shunt.

Direct repair of a defect, without the special preparation that is justified only when it can be predicted with confidence that its closure must result in a fall of pulmonary blood pressure because a hyperkinetic factor of sufficient magnitude has been eliminated. In practice this prediction can be made when the pulmonary blood flow is at least twice the systemic flow at rest, and the pulmonary vascular resistance does not exceed 10 units (800 dynes sec./cm.²). Borderline cases have pulmonary/systemic flow ratios of 1.75 to 2, and resistances of 10 to 12 units. No case with a pulmonary blood flow less than 1.75 times the systemic flow or with a resistance over 12 units should have the defect repaired in the ordinary way, whether the shunt is reversed, direct, or bidirectional.

Observance of this law since its introduction on theoretical grounds in 1950 has resulted in a mortality rate of zero for cases of patent ductus in this class. Several of them just within the limits outlined, and with samples from the femoral artery having oxygen saturations between 82 and 85%, have been cured by duct ligation. In these instances the pulmonary artery pressure fell, and the systemic pressure rose, when the duct was compressed manually. A year later the pulmonary vascular resistance was either normal or close to normal. In cases unsuitable for duct ligation identical pulmonary artery and aortic blood pressures do not separate favourably when the duct is manually occluded. Precisely the same criteria must apply to cases with interventricular or interatrial shunt.

Synthesis

The cardiac output of the newborn babe is about 0.5 l./min. (Prec and Cassels, 1955), and is presumably much the same in the foetus at term; if the situation is similar to that in the lamb, about 0.1 l./min. passes through the pulmonary circulation (Dawes *et al.*, 1954). Since the mean pulmonary artery pressure is the same as the aortic, about 50 mm. Hg at birth, the foetal pulmonary vascular resistance must be about 500 units (40,000 dynes sec./cm.²).

During the first three hours after birth a reversed shunt through a patent ductus is invariable (Eldridge *et al.*, 1954); from 3 to 72 hours after birth the shunt may be direct, bidirectional, or reversed (Eldridge *et al.*, 1954; Prec and Cassels, 1955; Amoroso *et al.*, 1958); and by the end of the third day the duct is usually closed. It follows that in newborn infants the pulmonary vascular resistance is more or less the same as the systemic—that is, about 100 units (800 dynes sec./cm.²)—for, as previously stated, the cardiac output is about 0.5 l./min., and the mean pressure around 50 mm. Hg.

Within a remarkably short time after birth, then, probably within a few minutes of independent life, a pulmonary vascular resistance around 500 units falls to about 100. Four questions clamour for an answer: (1) What is the cause of the fantastic pulmonary vascular resistance in the foetus? (2) Why does it drop so precipitously at birth? (3) Why is the rapid fall halted temporarily more or less at systemic level? (4) What is responsible for the subsequent slower decline to normal?

In the correct answer to these four questions lies the secret of the Eisenmenger syndrome.

An answer to the first has been offered by Alan Burton (1958), who points out that resistance to flow in a tube is

an adverse hyperkinetic factor, and gradual involution of the muscular pulmonary arteries.

In Eisenmenger's syndrome with aorto-pulmonary or interventricular shunt, this favourable cycle is prevented by a powerful hyperkinetic factor which maintains the pulmonary artery pressure at systemic level. So long as pulmonary hypertension is maintained vasoconstrictor tone is not inhibited and the muscular pulmonary arteries do not involute.

Obliterative pulmonary vascular disease due to reactive "endarteritis fibrosa" is secondary and is rarely found in infancy.

Thrombo-obstructive lesions are relatively late and may not be demonstrable before adult life.

The different behaviour of cases with atrial septal defect may be explained by the relatively slow involution of the right ventricle after birth. The pulmonary vascular resistance may well fall to normal before right ventricular diastolic tone is reduced sufficiently to allow a critical interatrial shunt, and, once the resistance is truly normal, flows up to 24 litres per minute do not cause pulmonary hypertension.

The practical application of these observations to the treatment of the Eisenmenger syndrome is discussed.

This analysis was begun in 1948 and two attempts at synthesis were made previously; the first in conjunction with Dr. J. B. Lowe in 1950, the second with Dr. H. Gilmour in 1953; and, though both attempts proved unsatisfactory owing to lack of sufficient data, I want to express my great indebtedness to these two colleagues.

Details of necropsies on cases well investigated during life were sent to me by Drs. I. M. Anderson, D. Evan Bedford, Wallace Brigden, Maurice Campbell, William Evans, Frances Gardner, C. J. Gavey, Ronald Gibson, Frederick Jackson, and Walter Somerville; I am very grateful to all of them for their trouble and generosity.

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LOCAL TREATMENT OF BRONCHIAL ASTHMA WITH HYDROCORTISONE POWDER

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The fact that bronchial asthma can be greatly improved by systemic treatment with cortisone and its derivatives is well established. This treatment, however, demands high dosage and thus has the disadvantage of causing cortical atrophy, and of other risks. Its continued use must therefore be limited to patients whose life is endangered by the asthma or where invalidism is threatening.

If a similar therapeutic effect could be achieved by local instead of systemic treatment the dosage could be expected to be much lower, and the risks connected with high dosage would be avoided. A local effect of hydrocortisone has been well known for some time in allergic disorders of the eye and of the skin. In hay-fever a similar effect has been reported more recently and has been confirmed (Herxheimer and McAllen, 1956; Godfrey, Maunsell, and Pearson, 1957; Lake, Logan, and Peters, 1957; Morris-Owen and Truelove, 1958; Findeisen, 1958). Some of these reports include a number of cases in which pollen asthma was present and which were benefited by the treatment. Apart from

these, reports on the local treatment of bronchial asthma with cortisone derivatives are scanty, and, in their conclusions, tentative only.

In this paper we report a number of therapeutic trials undertaken at different centres with the aim of contributing to this question.

Methods

Although the method of selecting patients differed in the three places of trial (London, Cardiff, and Berlin), the treatment was always the same. The patients were advised to inhale one capsule of micronized hydrocortisone snuff from a powder inhaler. A capsule containing 15 mg. of hydrocortisone and 85 mg. of lactose was placed in this inhaler; half of the contents of a capsule was inhaled orally in the morning and half in the evening. The dose of 15 mg. was chosen on the assumption that only a small part of this amount would be distributed systemically and that this part would be well below the body's own hydrocortisone production, which has since been shown to be about 14 mg. a day (Cope and Black, 1958). In many cases the patient served as his own control. In a few cases he was given hydrocortisone powder for a certain time (two weeks), followed by a similar period without powder; in most cases the hydrocortisone period was followed or preceded by an equal period of placebo snuff. In one group no attempt at control was made, and the groups of controlled patients and others will be reported separately.

The greatest difficulty was the selection of patients for the trial. Only those whose condition was a chronic one and moderately severe could be used—that is, the condition had to be fairly uniform throughout the year and severe enough to require continuous treatment. In addition, patients must have been under observation for some years, so that the variations in their condition were well known to the medical observer. Such patients are comparatively rare, as those with frequent and violent ups and downs must be excluded. Their exclusion is an absolute necessity for a trial like this, because violent spontaneous variations might be attributed to the trial substance. But even if patients are selected who conform to the conditions mentioned, there is no safeguard against intercurrent upper respiratory infections with their almost unavoidable temporary deterioration and subsequent improvement, which may mask the influence of the trial substance.

The investigation was started first at University College Hospital with the selection of a group of 12 patients, most of whom we had known for a number of years, and whose condition was stable. They were all under continuous standard treatment, usually on antihistamine drugs at night, sometimes combined with ephedrine or aminophylline during the day. As a stand-by the patients used inhalations of isoprenaline; the number of inhalations required by them during an average day and an average night was fairly constant, so that a change in the condition would be immediately reflected by a change in the number of inhalations. We were fairly confident that these patients would permit a good if provisional impression of the efficiency of the snuff. The patients in this group acted as their own controls.

The second group, containing 53 patients, was formed at Cardiff. It consisted of chronic cases—some of the allergic type and some of the infective type. Nineteen patients were controlled—that is, they had placebo capsules at some time or other, often for several periods—and 34 were uncontrolled—that is, no attempt was made to find out whether they were better or worse without the snuff. Four patients in the controlled group had only mild perennial asthma, but it became severe seasonally. All four of them were mould-sensitive.

The third group, comprising 14 patients, was selected in Berlin after some experience had been gained with the previous groups. They were chronic asthmatics of moderate severity, and in all but three its allergic character was certain.

Results (Table I)

First Group.—Five of the 12 patients were better with the snuff than without it. Their condition had improved so much that other anti-asthmatic medication was required only occasionally. In three others the improvement was moderate: the symptoms were definitely less severe, but

TABLE I.—Results of Treated Cases

Patient	Age and Sex	Age at Onset of Asthma	Skin Tests	History of Allergy	Hypersecretion	Result of Treatment
London (12):						
Be	44 M	20	Pos.	Pos.	No	Neg.
Cr	28 M	2	Pos.	Pos.	Yes	Pos. +
God	30 M	8	Neg.	Neg.	No	Neg.
Goo*	37 F	20	Pos.	Pos.	Yes	Pos. +
Ha	36 M	17	Pos.	Pos.	Yes	Pos. +
La	31 M	23	Pos.	Pos.	Yes	Neg.
Le	26 M	2	Pos.	Pos.	No	Pos. +
Li	29 F	25	Pos.	Pos.	Yes	Pos. +
Ru	53 M	4	Pos.	Pos.	Yes	Pos. +
Sw	51 M	35	Pos.	Pos.	Yes	Pos. +
Wo*	43 M	34	Pos.	Pos.	Yes	Pos. +
Ra	31	3	Pos.	Pos.	Yes	Neg.
Cardiff (19):						
Al	26 F	22	Neg.	Neg.	No	Pos. +
An	54 F	51	Pos.	Pos.	Yes	Neg.
Ba	31 F	2	Pos.	Pos.	Yes	Pos. +
Ha	60 F	46	Neg.	Neg.	Yes	Pos. +
Je	32 M	3	Pos.	Pos.	No	Pos. +
Jo	39 F	24	Pos.	Pos.	Yes	Pos. +
Ke	45 F	32	Pos.	Pos.	Yes	Pos. +
Le	30 F	17	Pos.	Pos.	Yes	Pos. +
Lo	48 F	43	Neg.	Neg.	Yes	Pos. +
Ma	59 F	53	Pos.	Pos.	Yes	Pos. +
O'N	74 F	69	Pos.	Pos.	Yes	Neg.
Pe	37 F	5	Pos.	Pos.	No	Pos. +
Ric	27 M	12	Pos.	Pos.	Yes	Pos. +
Ria	49 F	16	Pos.	Pos.	Yes	Neg.
Sc*	27 M	3	Pos.	Pos.	No	Pos. +
Si	58 F	38	Pos.	Pos.	Yes	Pos. +
Th	54 F	51	Neg.	Neg.	No	Neg.
Zo	58 F	49	Pos.	Pos.	Yes	Pos. +
Xi	60 F	23	Pos.	Pos.	No	Pos. +
Berlin (14):						
Ca	50 F	29	Pos.	Pos.	Yes	Pos. +
El	37 F	4	Neg.	Neg.	Yes	Pos. +
En	23 M	13	Pos.	Pos.	Yes	Neg.
Fo	30 M	5	Pos.	Pos.	No	Pos. +
Gro	24 F	13	Pos.	Pos.	Yes	Pos. +
Ha	53 F	41	Pos.	Pos.	Yes	Neg.
Hu*	26 M	23	Pos.	Pos.	No	Pos. +
Ka	52 M	15	Pos.	Pos.	Yes	Pos. +
Kl	31 F	8	Pos.	Pos.	Yes	Pos. +
La	41 M	9	Neg.	Neg.	Yes	Neg.
Le	22 F	19	Pos.	Pos.	Yes	Neg.
Ra	22 F	4	Pos.	Pos.	No	Pos. +
Se	32 M	7	Pos.	Pos.	Yes	Pos. +
So	15 M	13	Pos.	Pos.	Yes	Pos. +

Pos. + = Considerable improvement. Pos. = moderate improvement.
* "Dry" asthma.

* Relapsed after being on placebo for two months.

other anti-asthmatic remedies were still required, though not so much as before. In the remaining four the result was plainly negative. Of the five considerably improved patients, two had hypersecretion, and another, who had one of the rare "dry" asthmas, showed an extremely impressive improvement. She had been known to us for 12 years, and her history of perennial asthma with peaks in April and August had been longer. She had required frequent injections of adrenaline, these being replaced later by isoprenaline inhalations. A few years ago her condition gradually deteriorated, and she was put on maintenance doses of corticotrophin. She never expectorated any mucus except during rare and short periods of upper respiratory infection. When she was put on hydrocortisone snuff she was soon able to leave off corticotrophin and the frequent isoprenaline inhalations. At the time of writing she was free of asthmatic symptoms with 10 mg. of hydrocortisone snuff a day.

Second Group.—Of the 34 uncontrolled cases, 15 showed or reported an improvement which was judged to be moderate. Often this improvement did not last long and was followed by a respiratory infection and deterioration which took a long time to subside. As no control was possible in these cases, we do not regard them as evidence for the efficacy of the snuff. Of the 19 controlled cases, 13 showed a considerable improvement, in two the improvement was only moderate, and in four there was no improvement. The four patients with seasonal mould allergy are among those with considerable improvement. They were free of symptoms so long as they took the powder. A fifth patient with a very long history of asthma belonged to the dry type, and he also became completely symptom-free. His asthma was so severe that his chest had become deformed and his nutritional state impaired. It was most surprising to see that he no longer required any antispasmodic treatment.

Third Group.—Of the 14 patients, 10 improved considerably; five of them had no symptoms so long as they took the snuff, whilst the other five still had to use antispasmodics, though much less than before. Of the four not improved two belonged to the infective type. Only two of the improved patients had hypersecretion and continued to require potassium iodide. The patient with dry asthma improved a great deal.

Discussion

Although more than two-thirds of our patients have benefited from the treatment, the interpretation of this result requires caution. These patients were not average asthmatics, but a selected group. Many of them were selected because, according to our initial experience, they were likely to respond to the treatment. In contrast to these, the 34 patients who formed the uncontrolled part of the Cardiff experiment were unselected patients. Here the number of failures (19) exceeds the number of patients improved (15), and it is by no means certain that all the positive cases would have been proved positive if they had been in a controlled trial. It follows that this treatment cannot be expected to help the average chronic asthmatic but only certain types, and our investigation has aimed at defining these types as clearly as possible. From Tables II and III it can be seen that we have treated more allergic (33) than infective (12) cases, and that 82% improved in the

TABLE II.—Results Separated for Allergic and Infective Asthma

	Total	Improved	Unimproved
Allergic asthma	33	27 (82%)	6 (18%)
Infective asthma	12	6 (50%)	6 (50%)

TABLE III.—Results Separated for Asthma With and Without Hypersecretion

	Improved	Unimproved
<i>Patients with hypersecretion</i>		
Allergic	6 (55%)	5 (45%)
Infective	4 (50%)	4 (50%)
Total	10 (53%)	9 (47%)
<i>Patients without hypersecretion</i>		
Allergic	21 (95%)	1 (5%)
Infective	2 (50%)	2 (50%)
Total	23 (89%)	3 (11%)

allergic group as against 50% in the infective group. If we divide our patients into those with hypersecretion and those without, we find that of the 19 patients with hypersecretion only 53% improved, whereas 89% of the 26 patients without hypersecretion showed an improvement.

Although our figures are too small to permit definite conclusions, they show that the allergic type is more likely to respond than the infective type, and that the presence of hypersecretion is a handicap to the success of the treatment.

The allergic type without hypersecretion is likely to do best: there was only one failure in 22. Our experience with the three completely "dry" asthmatics is in accordance with this. The improvement of these three patients in spite of their long history was particularly impressive, because their condition was far more severe than that of the average patient in our trial. In the presence of hypersecretion, however, only half of the patients improved, whether of the infective or of the allergic type. As hypersecretion is more frequent in the infective type, the less favourable response in this type may be due to the hypersecretion. There are too few patients in the group of infective type without hypersecretion to be certain on this point.

Only a few earlier experimental observations in this field are on record. Foulds *et al.* (1955) in a preliminary communication reported an uncontrolled trial of 15 patients with hydrocortisone snuff, of whom 12 improved. Herxheimer and McAllen (1956) have observed that, in 4 out of 10 hay-fever patients who also suffered from pollen asthma, the asthma disappeared after nasal insufflation of hydrocortisone snuff, and they assumed that this was because the snuff was inhaled into the bronchi. Morris-Owen and Truelove (1958) have made similar observations. Brockbank and Pengelly (1958) reported improvement in 17 out of 24 asthmatics with hydrocortisone snuff, but prednisolone snuff had no effect in six out of seven patients. Franklin *et al.* (1958) have also reported success with topical hydrocortisone, given as a suspension, in a majority of patients. These two groups of authors do not specify the type of asthmatic patient used in their studies. For this reason it is not possible to compare our results with theirs.

Our experience shows that the result of topical treatment in any group of asthmatics will mainly depend on the type of asthma involved. Originally we had hoped that the topical treatment of bronchial asthma might replace steroid systemic therapy in most cases and might thus avoid the dangers of continuous large systemic maintenance doses. This hope has not materialized. Only a minority of patients appear to be benefited by corticoids given topically.

It is particularly disappointing that the hypersecretory type, which is normally more difficult to treat, does not respond well. The reason for this is not clear. One might think that the blockage of many bronchi and bronchioli may prevent the action of the corticoid snuff, or that the mucus covering the mucous membrane may prevent its action. If the mucus is the principal obstacle, it should be possible to achieve success by its removal or reduction. In order to test this we have attempted to decrease the hypersecretion in four severe cases by systemic prednisone, and then to replace the systemic prednisone gradually by local hydrocortisone. In three of these cases, however, this substitution was not successful: three of the patients became gradually worse on reducing systemic prednisone from 10-12.5 mg. a day to 5 mg. a day or lower, and the previous systemic maintenance doses had to be resumed. This negative outcome is in contrast to the positive result of Franklin *et al.* (1958) in six out of seven cases. However, these authors have used a prednisolone suspension and not hydrocortisone snuff in their cases, and their type of patient may have been different from ours. Further experiments will be needed to elucidate this question.

Summary

A total of 79 chronic asthmatic patients were treated with hydrocortisone powder, 45 of them in a controlled trial.

In 33 of these 45 patients a definite improvement of symptoms occurred. This improvement was seen mainly in patients with evidence of allergic aetiology and in those without hypersecretion.

Improvement was seen to a much less extent in infective asthma than in allergic asthma.

Cases of "dry" asthma responded dramatically.

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BRONCHIAL ASTHMA AND CHRONIC BRONCHITIS TREATED WITH HYDROCORTISONE ACETATE INHALATIONS

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Foulds *et al.* (1955) reported good results in 12 out of 15 patients with asthma who were treated with inhalations of hydrocortisone acetate in fine-particle powder. Brockbank and Pengelly (1958) and Helm and Heyworth (1958) carried out short-term controlled trials which showed that a statistically significant number of patients responded well to these inhalations as compared with the number responding to inhalations of placebo powder.

The purpose of the present paper is to record the results of two years' experience with inhalations of hydrocortisone acetate powder in patients with asthma and wheezy bronchitis and to suggest some indications for this treatment. An attempt has also been made to estimate the quantity of "inhaled" powder which enters the stomach rather than the tracheo-bronchial tree.

Material

The patients selected had all suffered from asthma or wheezy bronchitis for at least one year, and their condition had been severe enough to necessitate periods off work, except in two patients whose asthma was almost entirely nocturnal. There were 25 men and 28 women treated. The ages varied between 15 and 61 years, the mean being 40 years.

Groups and Definitions. Bronchial infection was judged to be present if the sputum contained macroscopic pus. Where necessary the pus was examined microscopically to differentiate pus due to eosinophils rather than true pus. For convenience of analysis the cases were divided into five groups: (1) recurrent acute asthma without significant bronchial infection; (2) chronic asthma without significant intermittent infection; (3) recurrent acute asthma with significant intermittent infection but little persistent sputum; (4) chronic wheezy bronchitis with significant persistent and (5) chronic wheezy bronchitis with significant intermittent infection and more than $\frac{1}{4}$ oz. (7 ml.) of sputum daily. The main difference between patients in groups 4 and 5 was in regard to the daily quantity of sputum, but infection tended to be a more prominent feature in group 5 than in group 4.

Method

All patients with significant bronchial infection when first seen were admitted to hospital for investigation and treat-

ment with antibiotics and routine antispasmodic drugs before receiving hydrocortisone inhalations, and patients whose signs and symptoms cleared completely concurrent with elimination of pus from the sputum were excluded. If the sputum rapidly became purulent again on stopping the antibiotic it was restarted and the patient remained on a small maintenance dose while starting hydrocortisone inhalations. All patients with infection were instructed to start antibiotics again should an exacerbation of infection occur while remaining on the inhalations after discharge from hospital. Patients with severe asthma (without infection) when first seen were admitted to hospital and were treated routinely with antispasmodic drugs for a few days before inhalations were given.

The patients inhaled fine hydrocortisone acetate powder from a "pabracort" inhaler, the powder being in capsules containing 15 mg. of hydrocortisone and 75 mg. of lactose powder, both being ground fine to a mean particle size of 5 microns. The initial dose varied between one capsule three times a day and one capsule daily given as half a capsule twice daily according to the severity of the wheezing at the beginning of treatment. The dose was reduced to the minimum maintenance necessary as soon as improvement occurred. Most patients were able to reduce the dose to half a capsule twice daily within the first week; this was the usual maintenance dose, although some needed to continue with two capsules daily, and some were able to reduce to half a capsule daily.

Treatment was stopped entirely in patients with recurrent acute asthma once the attack had been relieved for a week, and they were provided with capsules and instructed to restart at the onset of symptoms in a dose of between one and three capsules daily according to the severity of the attack. All patients were given any other routine treatment necessary, and this often included an antispasmodic drug before the hydrocortisone inhalation in order to facilitate deep inspiration. Those who responded well but later relapsed while continuing treatment were given prednisone by mouth in addition to the inhalations.

Patients who had failed to make any definite improvement during two weeks' treatment with inhalations were assessed as failures and the treatment was stopped.

Follow-up and Assessment of Results

The assessment of the results of treatment was made on both subjective and objective grounds. All patients had had prolonged routine treatment before starting the inhalations, and this provided a baseline from which the changes in signs and symptoms could be judged. All patients were seen by the same physician at monthly intervals or less while remaining on the treatment. Special attention was paid to the symptoms of dyspnoea and tightness of the chest, to exercise tolerance, and to the need for bronchodilator drugs. On physical examination the presence or absence of wheeze was noted and, if present, was assessed as slight, moderate, or severe on each visit.

Patients with significant bronchial infection (groups 3, 4, and 5) were instructed to bring a 24-hour specimen of sputum for inspection on each visit.

The results of the inhalation of hydrocortisone acetate powder in bronchial asthma and wheezy bronchitis are shown in the Table.

Of the 53 patients, 43 (81%) improved on hydrocortisone inhalations, whereas 10 (19%) were no better. Of the 43 patients who improved, 13 (30%) relapsed after periods of 1 to 11 months, whereas 30 (70%) maintained the improvement up to the time of writing for between two months and two years. The best results were obtained in group 1 patients with recurrent acute asthma without infection, whereas the results in group 5 patients with wheezy bronchitis were disappointing.

Complications. There were no definite complications in the present series, but one man had mild dyspepsia for a few weeks which may have been due to the hydrocortisone.

Several patients put on weight, which was probably due partly to improved health and partly to the effects of hydrocortisone absorption.

Table of Results

Group	No.	Not Improved	Improved but later Relapsed	Improved and maintained improvement to Present	Duration of Improvement in Patients	
					Relapsing	Remaining Well
1	12	1	11	1	10	9 months
2	18	3	15	5	10	2 months to 2 years.
3	7	0	7	2	4	Mean 1 year 3-18 months.
4	7	0	7	4	4	Mean 7 mths. 2-5 months.
5	9	6	3	1	2	Mean 3½ mths. 1-6 months.
Total	53	10	43	13	30	Mean 3 mths. 2 months.

Case Histories

Group 1.—A 20-year-old girl had had eczema, hay-fever, and intermittent asthma all her life. In March, 1955, she started a course of mixed inhalant desensitization, but after a short period of apparent improvement she became worse than ever in the autumn, and had three months of almost continuous wheezing which was little affected by routine measures. She was then started on hydrocortisone inhalations, and the symptoms rapidly resolved. She continued to use the inhalations on about two days out of three in a dose of one capsule daily for the next two years, and remained very much improved during this period, with only six weeks off work, compared with eight months off work in the previous two years.

Group 3.—A 37-year-old woman with no relevant family history had begun to get asthma at the age of 13. The attacks remained fairly mild and were precipitated mainly by emotion or exertion until the age of 18, when she had several years of freedom. At the age of 25 she again began to get attacks of asthma following colds and bronchitis. In November, 1956, she had a cold followed by persistent bronchitis with fever and purulent sputum; the infection finally cleared after several courses of antibiotics, but she continued to have attacks of wheezing, especially at night, and failed to respond to energetic routine measures, including antispasmodic and antihistamine drugs. After two weeks of continued night attacks with little sleep, she started hydrocortisone powder inhalations; she took one capsule in the afternoon and another in the evening. She slept well for the first time that night and had no further wheezing while carrying on with the inhalations for the next two weeks. After stopping the inhalations she remained free of asthma until a further attack following a cold one year later. This attack was again relieved by a few days of hydrocortisone inhalations.

Group 4.—A 61-year-old woman with no relevant family history had begun to have a slight cough and sputum at the age of 18. At 38 she first began to have severe wheezing attacks with no known precipitating factors; the attacks were intermittent for many years, but at the age of 58 the wheezing became almost continuous, with intermittent severe attacks necessitating weeks in bed. Finally she was confined to bed for three months with chronic status asthmaticus, and was admitted to hospital. On admission she was acutely short of breath and had a marked expiratory wheeze; she had 2 to 3 oz. (60-85 ml.) of mucopurulent sputum daily, a culture from which yielded pneumococci. She was treated with antibiotic and routine antispasmodic drugs, and, concurrent with the clearing of the pus from the sputum, she greatly improved. Two days later, however, in spite of continued penicillin and the fact that her sputum remained mucoid, she relapsed severely, with a return of severe wheezing. She started hydrocortisone inhalations in a dose of one capsule three times a day and

made steady improvement, becoming almost symptom-free at the end of a week. She continued on daily inhalations, the dose varying between one and two capsules daily, and remained greatly improved for 18 months up to the time of writing, although with considerable day-to-day variation. She continued to need antispasmodic drugs, but no further antibiotic treatment has been necessary.

Assessment of Proportions of "Inhaled" Powder

Entering the Stomach and Tracheo-bronchial Tree

It seemed certain that some of the "inhaled" powder would be swallowed whatever method of inhalation was used, since some would become arrested in the mouth, pharynx, and glottis.

An attempt was made to estimate, roughly, the relative proportions of powder entering the stomach and the tracheo-bronchial tree in two normal subjects who "inhaled" fine powder, propylidone ("dionosil"), in exactly the same manner as used for the hydrocortisone. It was hoped that a partial bronchogram might be obtained in this way, but, in spite of the fact that 4 to 5 g. of the powder was "inhaled," subsequent chest x-ray pictures showed only a few small opacities in the bronchial tree, probably due to clumping of the powder. It could be seen, however, that there was a considerable quantity of the opaque medium in the stomach of both subjects. This experiment was therefore repeated at a later date. Ryle tubes were passed and the stomach's contents aspirated, and the quantity of propylidone present was estimated. It was found that about half the "inhaled" powder was present in the stomach in each case.

Although this powder was finely ground, the experiment was hardly comparable to the hydrocortisone lactose inhalations because the propylidone was far more irritating, and necessitated considerable local anaesthetization of the throat and larynx before it could be "inhaled" at all. In addition there was a greater tendency for the powder to form "clumps." In view of these facts, three normal subjects each "inhaled" 1 g. of finely powdered lactose, having already swallowed a Ryle tube, and after drinking 4 oz. (114 ml.) of water the stomach contents were aspirated as thoroughly as possible. It was found that about 20% of the total powder "inhaled" had entered the stomach of each subject. This lower proportion was expected in view of the comparative ease of inhalation of the lactose powder as compared with propylidone.

Discussion of Results

The early results of treatment were remarkably good and many patients obtained rapid relief of wheezing, often within a few hours and after days of unsuccessful preliminary routine treatment. Once relief had been achieved, it was unusual for further acute attacks to occur for a time, provided the inhalations were continued. In the groups with chronic asthma, however (groups 2 and 4) and the group with recurrent acute asthma and intermittent infection (group 3), relapses began to occur after the first month, and became more frequent the longer the follow-up continued. These relapses were not necessarily complete, however, and some of the patients classified as having relapsed were confident that they remained better than before starting the inhalations. On the other hand, some of the patients regarded as having maintained their improvement up to the time of writing were certainly not so well at the time of assessment as they had been earlier in their treatment.

It is clear that in these groups of patients there is a tendency to relapse if treatment is maintained in the same way as was shown to occur in the Medical Research Council's (1956) trial in chronic asthma, where the advantage of patients receiving cortisone by mouth over those receiving placebo tablets rapidly diminished after the first two months until at the end of six months there was no significant difference between the two groups. In the group with recurrent acute asthma without infection however the

improvement has been maintained in all but one patient over a mean period of 10 months. All these patients have been able to stop the inhalations as soon as relief of the bouts of wheezing has been obtained and to restart at the onset of the next attack, whereas the patients with chronic asthma usually found it impossible to stop the inhalations without rapid return of wheezing, although they were able to vary the daily dose according to their symptoms.

The results were very disappointing in the patients with wheezy bronchitis (group 5), and only three out of nine improved, and the disability in these three was relatively mild. This result is not surprising, since we have found, in agreement with Moyes and Kershaw (1957), that little or no benefit is obtained in patients with chronic wheezy bronchitis and infection by the addition of oral corticosteroid drugs to long-term antibiotic therapy. It would also seem that the presence of considerable secretion in the bronchial tree is against successful local action of hydrocortisone. We have, however, treated a few very early cases, in which cough, sputum, and wheezing have been present for only a few weeks or months, with combined antibiotics and hydrocortisone inhalations with encouraging results, and it seems possible that at this stage local hydrocortisone may help in the resolution of the hypersensitive and irritable state of the bronchial mucous membrane during and after infection.

Reason for Relapse.—The reason for relapse in some of our patients who did well for a time is uncertain. It is possible that local tolerance to the hydrocortisone in the bronchial mucous membrane develops, but it would certainly not appear to be due to the development of a general tolerance to the corticosteroid group of drugs, as nine of these patients, after relapse, responded very well to the addition of a relatively small dose of oral prednisone (5 to 10 mg. daily) while continuing with hydrocortisone inhalations. One of these patients developed a gastric ulcer while taking prednisone, and, after a period of hydrocortisone inhalations only, oral cortisone (25 mg. daily) was added with maintained benefit and absence of gastric upset.

Local or General Action

Cotes *et al.* (1956) showed that there was a rise in urinary excretion of 17-hydroxycorticosteroids after the inhalation of fine particle hydrocortisone powder. This demonstrated that some general absorption had taken place, but the site of the absorption was uncertain. From our observations there would seem to be little doubt that a considerable proportion of the inhaled powder enters the stomach and is absorbed. This proportion probably varies greatly according to the condition of the patient and the technique followed by him, but is probably in the region of 20-50%. Most of the remainder must enter the tracheo-bronchial tree, and the depth of penetration probably also depends on the preceding factors. It would seem a fair assumption that some of this powder will be absorbed from the bronchial mucous membrane, and highly probable that some will be expelled by cough and cilia action and finally swallowed and absorbed from the stomach. If the dosage is large, therefore, there must be some general action from absorption of the hydrocortisone, and doubt may arise about whether or not any local action occurs.

Assuming that about 75% of the "inhaled" powder is absorbed, we can perhaps compare the results of the inhalations of hydrocortisone with those likely to be obtained by the same dose of oral cortisone, since oral hydrocortisone is recognized to be somewhat more powerful than cortisone: the starting dosages in the M.R.C. trials in chronic asthma and status asthmaticus were 300 and 350 mg. of cortisone daily respectively, and on the seventh day patients in the chronic asthma group were still receiving 100 mg. of cortisone daily, the dosage after this being left to the physician in charge of the patient. Foulds *et al.* (1955) gave 15 mg. of hydrocortisone acetate powder by inhalation daily and had good results in 12 out of 15 patients. Our starting dosage scheme was varied according to the patient's condition and the technique followed by him, but the maximum was

45 mg. daily for the first week, and the maximum maintenance dose was 30 mg. daily, the usual maintenance dose being 15 mg. daily.

The early results in our series were good in most patients, and often remarkably rapid, with relief of previously intractable wheezing within a few hours in some. We doubt whether similar results would have been obtained with a starting dose of 15 to 45 mg. of oral cortisone daily. We therefore believe that in successfully treated patients a considerable local action takes place. Further strong confirmation of this was obtained by Brockbank and Pengelly (1958), who report good results in a controlled trial using a much lower dosage of hydrocortisone powder than in the present investigation.

Indications for Hydrocortisone Inhalations

It would appear that hydrocortisone powder inhalations have most chance of maintained beneficial effect in patients with recurrent acute asthma with symptom-free intervals. In these cases the treatment can be used to break the individual attack and then be stopped, thereby reducing the chance of loss of the local effect of the powder. The results in chronic asthma are clearly not so good, for, although most of these patients improved with the inhalations for a time, relapse was more frequent, and in advanced cases the improvement did not appear to be as great as may occur with oral prednisone. However, the treatment is relatively cheap and certainly far less likely to produce severe complications; it would therefore seem well worth while trying as a first measure, since relapse does not seem in any way to jeopardize the chances of success with oral prednisone.

In patients with intermittent infective bouts followed by acute asthma, very good results can often be obtained by hydrocortisone inhalations in combination with antibiotic treatment.

Nine of our patients were seriously ill and could be classed as being in status asthmaticus at the onset of treatment, and only two failed to respond; but we feel that the ability to inhale the powder is so restricted while the extreme wheezing continues that it is probably preferable and safer to use intravenous hydrocortisone and aminophylline, or oral cortisone, or prednisone in such severely ill patients, at least until some partial relief has been obtained, when treatment could be continued with hydrocortisone inhalations with or without combined oral treatment. The two patients who failed to respond were obese middle-aged women with marked wheezing and extremely poor respiratory movements.

This treatment is unlikely to be effective in patients with advanced wheezy bronchitis, but is probably worthy of trial in combination with antibiotics in patients with symptoms of mild bronchitis which have been present for only a few weeks or months.

Summary

53 patients with asthma or bronchitis were treated for periods of two months to two years with inhalations of fine-particle hydrocortisone acetate powder.

These inhalations were found to be an effective form of treatment in many patients with bronchial asthma. There is a strong tendency to relapse if the treatment has to be maintained, but prolonged benefit may continue if the inhalations can be used intermittently for recurrent attacks of asthma.

Although this treatment may be successful in status asthmaticus, it is probably less effective in this condition than intravenous or oral corticosteroid drugs, and its use is not recommended if the patient is dangerously ill.

A considerable proportion of the "inhaled" hydrocortisone is probably absorbed, but the dosage is low compared with that used in oral corticosteroid therapy.

and the chance of toxic effect is therefore much less. The optimum dosage is uncertain, but it probably varies from patient to patient.

Little or no benefit is likely to be obtained from this form of treatment in patients with established chronic bronchitis.

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INHALATION OF HYDROCORTISONE ACETATE FOR BRONCHIAL ASTHMA A SHORT-TERM CONTROLLED TRIAL

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The beneficial effects of oral cortisone in some asthmatic patients have been clearly demonstrated by the Medical Research Council (1956). Hydrocortisone, when given locally as a surface application on the skin or by injection into the joints and tendon sheaths, is of value in many allergic and inflammatory conditions, and when inhaled into the nose as a powder may considerably improve allergic conditions of the nasal mucous membrane, including hay-fever (Foulds *et al.*, 1955); Herxheimer and McAllen, 1956). It would therefore seem reasonable to expect a favourable response in allergic bronchial asthma if, by inhalation, sufficient hydrocortisone could be brought into contact with the surface of the bronchial mucous membrane.

Foulds *et al.* (1955) used hydrocortisone acetate in fine-particle powder for 15 patients with bronchial asthma, with encouraging results in 12. Brockbank *et al.* (1956) found no evidence of benefit in patients treated with inhalations of hydrocortisone succinate solution in a "blind" controlled trial; but in a similar trial, using hydrocortisone acetate powder inhalations, Brockbank and Pengelly (1958) report improvement in a statistically significant number of patients on the hydrocortisone as compared with a placebo powder.

The assessment of benefit from any form of "new" treatment in bronchial asthma is notoriously difficult, since so many factors, including emotion, may be important in precipitating attacks and prolonged natural remissions may occur. It is therefore desirable to submit any method of treatment to a controlled trial before a fair assessment of its value can be made.

The purpose of the present investigation is to test by a controlled trial the short-term effect of the inhalation of hydrocortisone acetate in fine-particle powder in cases of bronchial asthma.

Material and Method

The patients selected for the trial had been subject to bronchial asthma for at least one year, and with one exception the condition had been severe enough to necessitate periods off work. The exception was a patient whose attacks were almost entirely nocturnal. In no instance was the history or the state of the sputum indicative of the presence of considerable recurrent or chronic bronchial infection. Patients who had more than $\frac{1}{4}$ oz. (7 ml.) of mucoid sputum daily or who had had any previous treatment with corticosteroid preparations or corticotrophin were excluded.

The "double blind" method of trial was used and patients regarded as suitable were placed by random selection by the hospital group pharmacist into either the hydrocortisone or the placebo group. Both groups were treated by the inhalation of powder from capsules with the aid of a "pabracort" inhaler. The capsules contained either 15 mg. of hydrocortisone acetate (ground to a main particle size of 5 microns), together with 75 mg. of lactose or, in the case of the placebo, 100 mg. of lactose, also in fine particle powder. It was not felt necessary to adopt a rigid dosage scheme, since previous experience with this treatment had suggested that the number of capsules used each day probably bore no close relationship to the quantity of powder reaching the bronchial mucous membrane, and that this depended to a considerable extent on the intelligence of the patients and their ability to inspire deeply.

It was noted in this respect that no settled regime of dosage of oral cortisone was adopted in the Medical Research Council (1956) trial in chronic asthma after the first week of treatment.

The starting dose therefore varied between three capsules a day in severe cases that began the trial during an exacerbation, and one capsule a day taken as half a capsule twice daily in those beginning during a relatively mild phase. The maintenance dose was adjusted according to response, the maximum being two capsules daily and the minimum half a capsule daily. Most patients were maintained on one capsule daily. Patients were given any other routine treatment thought necessary, and where severe wheezing was present bronchial dilator drugs were used directly before the inhalation of the trial powder to facilitate deep inspiration.

In patients who remained severely ill and who had failed to improve on general treatment together with trial inhalations after several days, a "blind" change of treatment was made to the other half of the trial, the patient being unaware that any change had been made. In less severely ill patients who were progressing satisfactorily, but in whom the response was not very clear-cut, a "blind" change of trial treatment was made after one to two months.

Results

The assessment of the results of treatment was made both on subjective and on objective grounds. All patients had had prolonged routine treatment before starting the trial inhalation, and this provided a baseline from which the changes in signs and symptoms could be judged. All patients were seen by the same physician at monthly intervals or less while remaining on the trial. Special attention was paid to the symptoms of dyspnoea and tightness of the chest, to exercise tolerance, and to the need for bronchodilator drugs. On physical examination the presence or absence of wheeze was noted and, if present, was assessed as slight, moderate, or severe, on each visit. In patients with recurrent acute asthma, considerable reliance often had to be placed on the history concerning the frequency, length, and severity of the attacks before and during treatment, and a relatively longer period of observation was usually neces-

sary. The assessment of the result of treatment was made in each patient as soon as it was felt that there was adequate evidence one way or the other. The length of treatment before assessment varied between one week in two severely ill patients who had failed to respond, and whose trial treatment was therefore changed, and six months in a patient with recurrent acute asthma who continued to improve on placebo capsules. The mean period before assessment was six and a half weeks. In all patients whose trial treatment was changed, a separate assessment was made at the end of each individual trial period, and the trial remained "blind" until the second assessment had been made.

TABLE I

	Improved	Not Improved	Total
Hydrocortisone	19	4	23
Placebo	6	9	15
Total	25	13	38

The results of inhalation of hydrocortisone acetate powder and of placebo powder in 38 trial periods in 26 patients (14 men, 12 women) with bronchial asthma are shown in Table I. If the χ^2 test with Yates's correction for continuity is applied we get a value for χ^2 of 5.5, which is significant at the 2% level.

These results are perhaps open to the criticism that the treatment of 12 patients was changed from one part of the trial to the other, and that the effect of the first treatment might persist after the change had been made. The exclusion of the results of the second period in treatment in these 12 patients gives the figures shown in Table II. The value of χ^2 for these figures is 4.3, which is significant at the 5% level.

TABLE II.—Results of Inhalation of Hydrocortisone Acetate Powder and of Placebo Powder in 26 Patients (14 Men, 12 Women)

	Improved	Not Improved	Total
Hydrocortisone	14	3	17
Placebo	3	6	9
Total	17	9	26

Change of Trial Treatment

Twelve patients were changed "blindly" and without their knowledge from one-half of the trial to the other. Six of these changed from the placebo to the hydrocortisone powder; all had been no better on the placebo and one remained unchanged on the hydrocortisone; the other five made definite improvement on the hydrocortisone. Two of these patients had been very seriously ill despite energetic of these patients before the trial started and during the routine measures before the trial started and during the placebo inhalations, but both responded dramatically when changed to hydrocortisone after one week, and on the night for the change was made both slept well for the first time for many days. Six patients were changed from hydrocortisone to placebo inhalations; three of these had improved on the hydrocortisone, but the asthma had been relatively mild and the change was made in order to obtain a more clear-cut result. One of these immediately relapsed on the placebo, but the other two maintained their improvement until the trial was terminated after two and three months respectively. Two patients were not improved on either half of the trial. One man, after an initial good response to hydrocortisone in hospital, relapsed on returning home and was therefore assessed as "not improved"; he was changed to the placebo powder, on which he has remained well until the time of writing, a period of two months.

Discussion

It is unfortunate that by chance 17 patients should have been allocated to the hydrocortisone and only nine to the placebo inhalations, but we feel there is little doubt that the

inhalations have a beneficial effect for a time in some patients with bronchial asthma. The rapid improvement of five patients when changed from the placebo to the hydrocortisone was especially impressive. For success it is essential that enough powder should contact a wide surface area of bronchial mucous membrane. The powder is therefore ground fine in order to allow penetration to the small bronchioles.

Foulds *et al.* (1955) suggested that there was no advantage in the inhalation of more than 15 mg. of hydrocortisone daily. Although we have made no specific tests on these lines, the method of inhalation is so inexact, and the ability of the patients so variable in spite of careful training, that we feel this quantity may be insufficient in some patients, especially where in the initial stages of treatment chest movements are very poor and respiration is shallow owing to bronchial spasm. One of the four patients assessed as being no better on hydrocortisone, and another who improved slowly, were obese, middle-aged women with severe wheezing and distended chests who found it almost impossible to inspire deeply even with the help of preceding bronchial dilator drugs. We think that in this type of patient at least three capsules—that is, 45 mg. of hydrocortisone powder—should be inhaled daily at first to give a fair chance of success.

The disadvantage of the bigger dose is that the absorption will be higher and toxic effects more likely, and doubt may arise whether any benefit is due to local or general effects. In successfully treated patients, however, the dose can be reduced to one capsule daily (15 mg.) within a few days, and it would seem unlikely that this dosage would produce sufficient general absorption to have significant side-effects or influence on the asthma. There were no complications in the present series.

Summary and Conclusion

A short-term "blind" controlled trial of inhalations of hydrocortisone acetate in fine-particle powder has been carried out in 38 periods of treatment in 26 patients. The number of patients improved in the hydrocortisone group as compared with the placebo group was at a statistically significant level.

It is therefore concluded that hydrocortisone acetate powder inhalations are an effective form of short-term treatment in some patients with bronchial asthma.

We are indebted to the late Dr. W. J. Dunn, Dr. J. Shafar, and the many other doctors for their co-operation; to Dr. J. Edge for helpful criticism; to Dr. E. Tallett, the hospital group pharmacist, for his enthusiastic co-operation throughout; to Mrs. J. Withnell for the secretarial work; and to Messrs. Paines & Byrne Ltd. for providing the "pabracort" inhaler, and the material for the trial.

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The Care of the Elderly is the report of the Ninth Conference of the National Old People's Welfare Council. This was held on April 17 and 18, 1958, in London. The conference included discussions on the future pattern of care for the elderly through health and welfare services (opening speaker, Mr. Derek Walker-Smith, Minister of Health); preparation for retirement (opening speaker, Mr. W. A. Sanderson); the housing of the elderly (opening speaker, Mr. J. R. Bevins, parliamentary secretary to the Ministry of Housing and Local Government); recruitment and training of workers among the elderly; problems of communal homes; visiting; surveys and research; and the changing pattern of comprehensive care (opening speaker, Professor R. E. Tunbridge). This report is obtainable from the National Old People's Welfare Council, 26, Bedford Square, London, W.C.1, price 3s. 6d., quoting ref. no. 534.

FOETAL CELLS IN THE MATERNAL CIRCULATION DURING PREGNANCY

BY

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Levine, Katzin, and Burnham's (1941) brilliant exposition of maternal iso-immunization during pregnancy as the cause of haemolytic disease of the newborn has been vindicated in thousands of cases. Direct proof that this iso-immunization was due to an antigenic stimulus from the foetus was produced by Chown's (1954) investigation, which demonstrated foetal cells in the maternal circulation. A further paper on this subject was published by Dunsford (1957), who also found foetal cells amongst the maternal cells. In both cases the foetal cells were discovered in a blood specimen obtained after the birth of the baby. Chown's patient developed, after the usual latent period, an anti-rhesus antibody, thus making the picture complete. Bromberg, Salzberger, and Abrahamov (1956) succeeded in demonstrating foetal haemoglobin in the maternal circulation during some pregnancies, and as this could be shown not to be a normal occurrence it was also very suggestive of a "leak" in the placenta.

Case Report

A married woman aged 32 had an abortion at three months in 1953 and expected her first baby in June, 1955. Her blood group was determined on two occasions during this pregnancy as group A, rhesus negative. The serum gave no evidence of the presence of any abnormal antibodies. The baby was stillborn, but no cause for this stillbirth was found.

The patient became pregnant again in 1957, but her dates were quite uncertain; she thought that her E.D.D. was approximately mid-February, 1958, but when she attended for her first antenatal investigation on January 5, 1958, this did not seem to correspond to the clinical findings. A blood specimen gave both unexpected and unusual findings. The specimen grouped both by cell and by serum grouping as group A. However, when the cells were investigated for their rhesus group, an anti-C plus anti-D and an anti-D testing serum produced some agglutination, which to the technician seemed to be a result conflicting with our previous findings. A full investigation was therefore carried out, and this showed that both anti-C and anti-D sera produced small agglutinates "in a sea of unagglutinated cells," the typical picture of a "mixed field." Anti-E gave a negative result and anti-c almost complete agglutination. (All sera used were saline agglutinating "genotype" sera.) This investigation was repeated twice on cells from the same specimen and identical results were obtained. At the same time an investigation of the serum gave definite evidence of the presence of a low-titred blocking anti-rhesus antibody of anti-D specificity.

The presence of D-positive cells together with an anti-rhesus antibody caused us to investigate the cells for "coating," and the direct Coombs test was in fact found to be

quite strongly positive, though again a "mixed field" was noted. The specimen which had given these results was a small specimen of clotted blood, and to prepare an eluate the clot was passed through an ordinary tea sieve. The cells thus obtained were thoroughly washed and an eluate was prepared from them by the method previously described (Weiner, 1957). The eluate had typical anti-D activity when tested by means of the indirect Coombs test.

The patient was immediately written for and a further specimen was obtained (approximately eight days after the specimen described above). This further specimen, however, showed no trace of any D-positive cells in spite of the exhibition of very strong antisera. All cells were found to be rhesus negative (cde/cde). Also an indirect Coombs test with very strong blocking anti-D gave a negative result. The titre of the anti-rhesus antibody in the serum had, however, increased considerably in the meantime.

A specimen from the husband was found to be group O, rhesus positive, phenotype CcDEe (most likely genotype CDe/cDE).

From the results obtained it was concluded that the agglutinated cells in the first specimen had been derived from the baby and that these cells had been coated by a preformed maternal antibody. From the results obtained one could even predict the genotype of the baby as CDe/cde, though it was not possible to say anything about the baby's ABO group.

It was thought inadvisable to allow the pregnancy to go to full term, and a caesarean section was performed on February 8, when clinically it was thought that she was not at term. The baby's blood group was found to be A (identical with the mother's group) and to have the predicted genotype CDe/cde. The direct Coombs test was very strongly positive. Bilirubin was 7.9 mg. per 100 ml., but the haemoglobin was found at the very low level of 5.1 g. per 100 ml. The baby, a girl, weighed 6 lb. 11 oz. (3.04 kg.). Her clinical condition was very poor from the moment of birth. She was pale, grey, and oedematous. She was kept in continuous oxygen, and nikethamide was injected into the umbilical vein. An exchange transfusion was started as soon as possible. Although the exchange was smooth, it was stopped after about 65 ml. of blood had been exchanged per pound (143 ml. per kg.) body weight, because of the extremely bad condition of the baby. It was intended to repeat the procedure if her condition should show even a slight improvement after this initial exchange. However, the condition deteriorated still further, and the baby died approximately 15 hours after birth.

At necropsy a small tentorial tear, together with a large cerebral haemorrhage around the cerebellum and the base of the brain, was found. There were no effusions, the lungs were atelectatic and showed petechial haemorrhages. The liver and spleen showed the typical changes of haemolytic disease of the newborn with very active extramedullary haematopoiesis.

Discussion

Previous authors have reported foetal cells in the maternal circulation after the birth of the baby. These cells might, of course, have entered the maternal circulation during delivery, and the finding of these cells in the maternal circulation was most suggestive but not absolute proof of the presence of foetal cells in the maternal circulation during the pregnancy. We could demonstrate these cells, however, during the pregnancy and even describe their genetic make-up.

The exact date when the mother developed the anti-rhesus antibody is not known, and it is, of course, possible that it had developed after the second pregnancy—that is, before this baby was conceived. The antigenic stimulus could have been provided by the stillborn baby in 1955, similar to the cases described previously (Weiner and Hallum, 1950). We did not attempt to estimate the amount of foetal blood which had been "transfused" into the mother, as we were aware of the simultaneous presence of the maternal antibody

against them, making a quantitative assessment quite unreliable. The baby must, however, have bled extensively, as the extremely low level of haemoglobin (5.1 g. per 100 ml.) is unlikely to have been produced by haemolysis only. It seems much more likely that this low level was the result of blood loss plus haemolysis. The production of anaemia in babies through blood loss into the maternal circulation had been suggested by Wiener (1948), and we think that this case is a further example, though no doubt haemolysis played some part in the production of the anaemia.

Summary

A case of foetal blood loss into the maternal circulation is described. The foetal cells were recognized during the pregnancy in the blood stream of an immunized mother.

The maternal serum contained an anti-rhesus antibody which coated the foetal cells in the maternal circulation and gave rise to a positive direct Coombs test. It was successfully eluted from the coated cells.

We thank Mrs. June Wingham for much technical assistance.

ADDENDUM.—Since this paper was submitted a further article on transplacental bleeding from the foetus (Goodall *et al.*, 1958) has appeared.

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INTRAVENOUS PHENTOLAMINE FOR PHAEOCHROMOCYTOMA AND "ADRENALINE SHOCK"

BY

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The management of the usual patient with phaeochromocytoma is now well established, with a welcome improvement in mortality (Kvale *et al.*, 1957). The most significant factor in this success has probably been the use of oral or intramuscular phentolamine ("rogitine") to block the effects of circulating adrenaline and noradrenaline (Iseri *et al.*, 1951; Emlet *et al.*, 1951; Newton *et al.*, 1955).

We wish to focus attention on the management of the unusual patient with phaeochromocytoma in whom the

*Known as "rogitine" in the U.S.A.

classic symptomatology of the disease is punctuated by wild unpredictable fluctuations of the systemic blood pressure with periods of alarming hypertension alternating with periods of profound shock. Such a patient has recently been under our observation, and in this instance the usual doses of phentolamine intramuscularly were found to be ineffective; however, a continuous intravenous phentolamine infusion produced dramatic improvement and, we believe, was life-saving. It enabled us effectively and leisurely to organize a programme of therapy for the operative and post-operative periods.

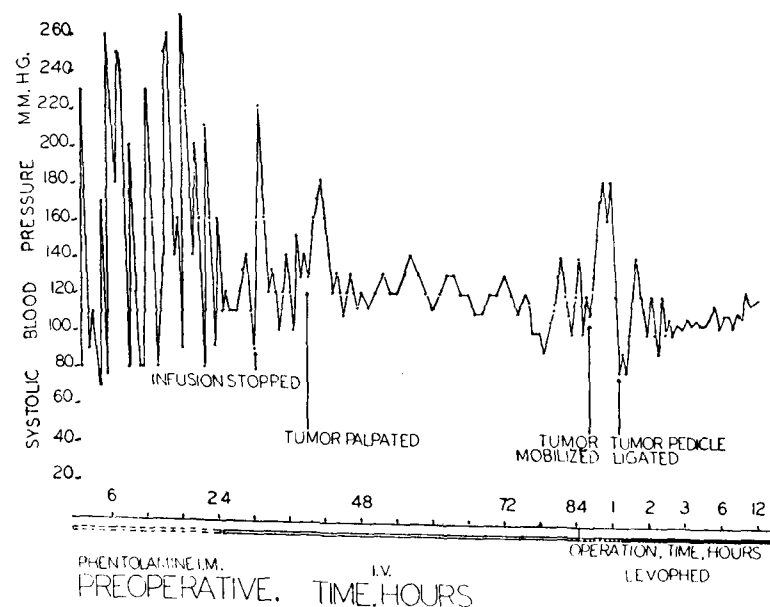
Case Record

The patient, an 18-year-old coloured girl, was first seen at the Cook County Hospital on January 8, 1957. She complained of nervousness, sweating, difficulty in breathing, severe lower abdominal pain, and vomiting of four hours' duration. For one year prior to admission she had had daily episodes of sweating and nervousness which began on arising and persisted until noon. Upon inspection she was seen to be orthopnoeic, grey, cold, and perspiring. The oral temperature was 101° F. (38.3° C.). The blood pressure was 80/0. The pulse was barely perceptible, with a rate of 140. The cardiac rhythm was regular. The left heart border was 3 cm. left of the mid-clavicular line in the fifth interspace. The heart tones were not unusual. Auscultation of the lungs disclosed fine and coarse moist rales throughout both lung fields. Upon palpation of the abdomen, a rounded mass, approximately 3 cm. in diameter, was detected in the left upper quadrant; it was in close proximity to the left kidney. The remainder of the physical examination showed nothing of importance.

Following palpation of the left upper quadrant of the abdomen, the patient began to tremble, her dyspnoea increased, and she sat bolt upright. She complained of a "nervousness," first in her abdomen and then "all over." This sensation was followed by increasing abdominal pain. The blood pressure was recorded as 230/17. The symptomatology suggested the presence of phaeochromocytoma complicated by acute left ventricular failure. Immediate therapy directed towards the relief of the left ventricular failure was successful. Additional therapeutic measures included sedation, complete bed rest, and elimination of all procedures which might augment tumour secretion. The patient's condition remained grave. Hypertensive-hypotensive swings in the systemic pressure continued, despite the administration of phentolamine intramuscularly in amounts of 5 mg. every four hours. For a period of 24 hours the blood pressure fluctuated between 290/140 and 80/0.

One of us (R. B. T.) suggested that phentolamine be given by continuous intravenous infusion. A solution of 30 mg. of phentolamine in a litre of 10% dextrose and water was infused intravenously at a rate of 20–80 drops a minute, depending upon the systemic blood pressure. The response was dramatic. The patient's sweating, pallor, coldness, and weakness disappeared, and within two hours she complained of hunger and was able to eat with obvious pleasure.

After surgical consultation, all agreed that the patient should be explored, but in view of her response to intravenous phentolamine there seemed to be no reason for hasty action. Two and a half days were allowed to elapse before the condition of the patient was considered to permit laparotomy. We were thus able to alert all personnel who were to be concerned with her care; and detailed check lists were prepared of all the procedures and medications necessary for proper management during and following surgery. During the 60 hours prior to surgery the patient received 250 mg. of phentolamine, and the blood pressure and pulse were recorded approximately every half-hour. Adjustments in the rate of flow of the infusion served to control all signs of tumour secretion. The patient had no symptoms, and there were no further hypertensive-hypotensive swings in the blood pressure (see Chart).



The systolic blood pressures recorded during the pre-operative period demonstrate the effect of continuous intravenous infusion of phentolamine. Also shown are the moderate blood-pressure excursions encountered during removal of the phaeochromocytoma.

Surgical premedication was by scopolamine and meperidine (pethidine) hydrochloride. The method chosen was thiopentone sodium for induction, followed by maintenance of anaesthesia with nitrous oxide through an endotracheal airway (Zintel and Bottie, 1956). Muscular relaxation was provided by an intravenous drip of suxamethonium. During induction of anaesthesia and throughout the operative period the systolic blood pressure was utilized to regulate the phentolamine infusion (30 mg. per 1,000 ml. of 5% dextrose and water). The abdomen was explored through a horizontal upper abdominal incision, and a phaeochromocytoma was found medial to the lower pole of the left kidney. The phentolamine infusion effectively controlled all hypertensive swings of the blood pressure during the period of anaesthesia induction and tumour manipulation. When the pedicle of the tumour was ligated the systolic blood pressure fell precipitously and was unobtainable for two minutes. An intravenous infusion of L-noradrenaline was started immediately (16 mg. per 1,000 ml. of 5% dextrose and water), and the hypotension was effectively controlled. L-Noradrenaline infusion in progressively decreasing amounts was continued for 12 hours post-operatively. The post-operative course was otherwise uneventful.

Discussion

Although there is ample experience to which one may refer for information concerning the management of the usual patient with phaeochromocytoma, there are few (Wilkins *et al.*, 1950; Rothermich, 1952; Gjøl *et al.*, 1957) which discuss the management of the patient in whom periods of alarming hypertension alternate with periods of profound shock. These wild swings in the systemic blood pressure are best explained if we assume that the rate of liberation of pressor substances from the tumour is inconstant. The truth of this assumption is supported by the observation that manipulation of the tumour through the abdominal wall would produce a dramatic hypertensive episode; we need not infer, however, that secretion ceases during the hypotensive episodes. Freeman *et al.* (1941) produced shock in unanaesthetized dogs by the continuous infusion of adrenaline, and the reports of Green *et al.* (1948) and Blacket *et al.* (1950) demonstrated that prolonged infusion of pressor amines was followed both in the experimental animal and in man by a period of hypotension. It is logical to assume that the infusion of pressor amines

invokes compensatory mechanisms which favour hypotension if the infusion is terminated or if the rate of infusion is abruptly diminished.

In this instance, since intermittent intramuscular phentolamine failed to control the fluctuating blood pressure, we decided to administer the drug by continuous infusion. Not only were the hypertensive episodes immediately and completely controlled, and further hypotensive crises prevented, but the patient's general clinical condition was rapidly and markedly improved. We believe that the dramatic response of the patient is a reflection of the efficacy of this approach. Many patients with phaeochromocytoma are poor surgical risks. Our results in this case suggest that the prolonged pre-operative intravenous infusion of phentolamine may be of value in the preparation of these doubtful-risk patients, whether hypertensive-hypotensive crises are present or not.

Summary

A patient with a phaeochromocytoma, in whom the classic symptomatology was complicated by wildly fluctuating blood pressure, was managed by a continuous pre-operative intravenous infusion of phentolamine over a period of two and a half days with dramatic results. The tumour was removed by surgical excision and the patient's recovery was uneventful.

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The Wellcome Trustees have made a grant to the Medical Research Council of up to £26,000 for the provision of a vessel which could serve as a floating laboratory and means of transport for use by the Council's laboratories in the Gambia. On September 26 the *Lady Dale*, as the launch is named, was inspected at the boat yard of Aldous Successors Ltd., Brightlingsea, by a party from the Medical Research Council and the Wellcome Trustees. The *Lady Dale* will be based on Bathurst, at the mouth of the River Gambia, and will sail from there not only to the subsidiary field laboratories at Keneba, some 70 miles up-river, but also to other parts of the territory along the river where laboratory facilities would not otherwise be available. The research programme of the M.R.C. laboratories is concerned mainly with parasitic diseases, primarily malaria; in addition, the facilities of the laboratories, including accommodation, can be made available to visiting scientists. Formed originally after the second world war as a subsidiary of the council's human nutrition research unit in London, the laboratories are now an independent unit under the direction of Dr. I. A. MCGREGOR.

PUERPERAL MENTAL ILLNESS A FOLLOW-UP STUDY OF 75 CASES

BY

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Mental illness occurring after childbirth is a common condition. The incidence in all confinements has been variously estimated as 1 in 400 (Boyd, 1942) to 1 in 1,200 (Morton, 1934). It is the cause of 2 to 8% of female admissions to mental hospitals all over the world (Small-admissions to mental hospitals all over the world (Small-don, 1940; Boyd, 1942; Brew and Seidenberg, 1950). What is the prognosis for recovery in the individual case? What is the likelihood of recurrence should the patient become pregnant again? Can recurrence be prevented by social, medical, or psychiatric prophylactic measures? Is termination of pregnancy indicated in any cases, and should sterilization ever be considered? This study is an attempt to answer these and other questions in the light of experience at St. Patrick's Hospital.

Material and Methods

This investigation is a study of 75 patients suffering from puerperal mental illness who were admitted to St. Patrick's Hospital, a private psychiatric hospital, between January, 1947, and June, 1957. During the 10½-year period 80 cases were admitted (2% of 4,006 female admissions) of which five could not be traced. The age of the patients ranged from 21 to 45, with an average of 31.5 years. Patients, or their relatives, were required to fill in a questionnaire giving details about their present state of health, information about all pregnancies, and the occurrence of nervous symptoms, whether associated with childbirth or not. Further correspondence and telephone calls were made in over three-quarters of the cases to elicit details from the patient and family to gain objective information from the husband or family doctor. All patients were invited to attend hospital for interview, but, as they came from all over Ireland and the follow-up period was long, a good response could not be expected. The sources of information are shown in Table I.

TABLE I.—Sources of Information

Patient	Questionnaire alone	plus letter	Total
	22	19	41
Husband	Personal interview	11	29
	Questionnaire alone	18	3
Family doctor	Personal interview	..	41
	..	..	4
Sole information from patient's questionnaire	..	..	55
Information from personal interview or family doctor	..	..	14
Information from husband	..	..	73*
Total	..	..	73*

* 2 patients had died.

In only four instances (three cases of depression and one of schizophrenia) was there no objective information about the patient's present state of health. The patients interviewed were not selected in any way, but tended to come from the Dublin area (13 of 18).

Time of Onset

In this survey all illnesses which began within six months of childbirth were included as puerperal. Some investigators in the past have taken the obstetrical puerperium of six weeks as their standard, later illnesses being termed lacic weeks. There seems to be no advantage in this. The time of onset of symptoms is shown in Table II. In 14.7% of

TABLE II.—Distribution of 75 Cases According to Time of Onset of Symptoms

	During pregnancy	0-14 days after birth	14-28 days after birth	28 days-6 months after birth
	11 (14.7%)	33 (44.0%)	12 (16.0%)	19 (25.3%)

cases the earliest symptoms were noticed during pregnancy, but there was a clear-cut exacerbation of symptoms after

confinement, necessitating admission to hospital. It must be noted that in some cases the onset of symptoms was gradual and difficult to date accurately. In many, however, it was dramatically sudden. In 60% of the cases the first symptoms were noticed within one month of delivery.

These figures correspond closely to an average of several series reviewed by Boyd. Mental illness precipitated by abortion has been excluded from this series.

Type of Illness

The cases fell into five diagnostic groups, as follows:

1. *Affective Psychosis*.—This was defined as an illness in which there is a greatly exaggerated emotional response, either depression or elation. Delusions may be present, but they are in keeping with the emotional change—for example, self-accusation or ideas of unworthiness in association with depression. Early waking and morning exacerbation of depression are often present.

2. *Schizophrenia*.—There is distorted thinking on personal topics, which are often projected as delusions or hallucinations without a corresponding emotional display (Skottowe, 1942). The affect may be one of apathy or fear, or there is incongruity of affect.

3. *Schizoaffective Psychosis*.—There is definite evidence of distorted thinking, delusions, and hallucinations characteristic of schizophrenia. In addition, there is a well-marked affective element, usually depressive with ideas of guilt, but sometimes manic. This corresponds to a group called "mixed schizophrenia" by Hemphill (1952).

4. *Toxic Confusional State*.—This was diagnosed only when two conditions were fulfilled: firstly, there was definite evidence of physical illness, such as infection of the genital tract, or breast; secondly, there was confusion, disorientation in time and place, faulty perception, amnesia, and often vivid auditory or visual hallucinations.

5. Hysteria.

The distribution of cases is shown in Table III.

TABLE III.—Distribution of 75 Cases According to Diagnosis

Diagnostic Group	Total
Affective psychosis:	
Depression	27
Mania	1
Schizophrenia	15 (20.0%)
Schizoaffective psychosis:	
Depression	24
Elation	5
Toxic confusional psychosis	2 (2.6%)
Hysteria	1 (1.3%)

The lack of standardization of psychiatric terminology, and the fact that many authors do not define their diagnostic criteria, make comparison with other series very difficult. For instance, the incidence of schizophrenia varies from 20 to 58% in reported series. The incidence of toxic confusional states has fallen over the years, owing partly to improved obstetrics and the advent of antibiotics, and partly to altered diagnosis. Cases previously called "non-toxic delirium," as described by Boyd, would now be classified as schizophrenia. Foundeur *et al.* (1957) found no cases of toxic confusional state in their series of 100 patients, though, unlike other observers, they had a high incidence (21%) of psychoneuroses. The experience in this country is that neurotic reactions, though common, rarely necessitate admission to hospital.

Treatment, Results, and Follow-up

The time interval between discharge and follow-up is shown in Table IV.

TABLE IV.—Time Interval Between Discharge and Follow-up

Diagnostic Group	4 Months-2 Years	2-4 Years	4-6 Years	6-11 Years	Total
Affective	11	8	3	6	28
Schizoaffective	3	9	5	10	27
Schizophrenic	4	3	3	5	15
Toxic confusional	1	0	1	0	2
Hysteria	0	0	0	1	1
Total	19	20	12	22	73*

* 2 patients died.

Affective Group

In this group (27 with depression and 1 with mania) electroplexy was the standard treatment. The immediate response was good in all cases. The average number of treatments given was 7.4, and the average stay in hospital was 5.5 weeks. Of the 28 patients 13 recovered with one course of electroplexy (four to nine treatments)—that is, they had lost all psychotic symptoms and their pre-psychotic personality was restored. Ten cases (including the patient with mania) relapsed within 17 days of ending the first course, but recovered after a second course. Four patients required maintenance treatments, but had all recovered within 4½ months of admission to hospital. One patient who relapsed four weeks after a satisfactory response to a course of treatment refused to return to hospital, and was still depressed five months after the onset of her illness.

Follow-up (average 2½ years after discharge) showed that 24 of the 27 were in normal health, although one had had a further puerperal depressive illness and three had had further non-puerperal illnesses, all of which responded well to electroplexy. Two patients complained of minor neurotic symptoms and one was undergoing treatment for a non-puerperal depression.

The immediate prognosis of affective disorders in the puerperium is therefore excellent and full recovery can be expected with electroplexy.

Schizoaffective Group

Of the 29 patients 28 were treated with electroplexy, and 15 of these had in addition insulin coma therapy (Sargent and Slater, 1954). The average stay in hospital was 12.8 weeks. One patient, who had severe diarrhoea, died suddenly on the fifth day after admission, probably from pulmonary embolism, but necropsy was not carried out. She had been treated with antibiotics and sedatives only. Of the 28, 18 were discharged as recovered and 10 as much improved. The latter had some residual symptoms and had not completely regained their pre-psychotic personality. However, they were considered fit to live at home and look after their family and house.

Follow-up (average 4½ years later) showed that 24 of the 28 patients were in normal health, although two had had further puerperal illnesses and one a non-puerperal psychosis, all of which again responded satisfactorily to treatment. Two patients complained of minor neurotic symptoms and one had died of pulmonary tuberculosis a year after discharge, no details of her mental state being obtainable. The remaining patient had never been completely well since the initial puerperal psychosis and had required admission to hospital for a further puerperal and non-puerperal illness. She was able, however, to live at home and look after her household.

In this group the standard initial treatment was electroplexy. If relapses occurred or if the schizophrenic element persisted when the affect was restored to normal, insulin coma therapy was given.

Schizophrenic Group

Of the 15 patients, 13 were treated with electroplexy, combined in nine cases with insulin coma therapy, in two with intensive reserpine therapy (Moore and Martin, 1957), and in one with chlorpromazine therapy. Of the remaining two patients, one was treated with reserpine therapy but later developed depression, which responded satisfactorily to electroplexy. The other had a spontaneous remission. The average stay in hospital was 12.4 weeks.

Six of the 15 patients were discharged as recovered and nine as much improved. Follow-up (average 4½ years later) showed that all 15 patients were in normal health. One patient had had a further puerperal psychosis, and one had had two further non-puerperal illnesses, all of which again responded to treatment.

These findings suggest that insulin coma therapy combined with electroplexy is a satisfactory treatment of

puerperal schizophrenia. There is insufficient experience from this study to decide whether it can be replaced by tranquillizing drugs.

Toxic Confusional Group

Both the toxic patients were febrile and obviously ill—one with a septic parotitis, the other without clear cause—and both were markedly anaemic. They were treated with antibiotics, parenteral iron, vitamins, and sedatives. One recovered uneventfully and was discharged within six weeks. The other developed depressive symptoms when all signs of toxicity had cleared up; these responded to electroplexy and she was discharged as recovered 11½ weeks after admission. Follow-up showed that both these patients were in normal health.

Hysteria: Untraced Cases

The one case of hysteria had various treatments, including psychotherapy, carbon dioxide inhalations, modified insulin, and electroplexy. She was discharged as improved after 12 weeks. Follow-up showed that she remained as previously, a very neurotic personality, but had never required further treatment in hospital.

Of the untraced cases, two had affective disorders, two schizoaffective psychoses, and one schizophrenia. All five were discharged as recovered or much improved.

In all cases, irrespective of the diagnostic grouping, simple psychotherapy in the form of encouragement, explanation, and reassurance was given in addition to the physical methods of treatment. It was considered important, too, that all patients should join in the active occupational and social therapy routine of the hospital. In some cases iron and vitamin supplements were given. The sedatives used were mostly barbiturates.

Findings at Follow-up

The psychiatric state of the whole series at the time of writing (average follow-up period, four years) is shown in Table V.

Of the 75 patients 65 are now in normal health and two have died. Two patients only have residual psychotic symptoms and it is felt that the patient who is depressed should respond well to another course of electroplexy, if she would agree to come to hospital. Five patients have residual neurotic symptoms, three of these having always had neurotic personalities. One patient is having out-patient treatment for a mild non-puerperal depressive illness. The overall picture, therefore, is very good. It is worth noting that practically all the patients who were only thought to be much improved on discharge are now considered to be recovered. Not one of 75 patients has become a chronic mental invalid.

TABLE V.—*Psychiatric State of the Whole Series*

Type of Illness	Died	In Normal Health	Residual Psychotic Symptoms	Residual Neurotic Symptoms	Under-going Non-puerperal Psychosis	Total
Affective	—	24	1	2	1	28
Schizoaffective	2	24	1	2	—	29
Schizophrenic	—	15	—	—	—	15
Toxic confusional	—	2	—	—	—	2
Hysteria	—	—	—	1	—	1
Total	2	65	2	5	1	75

It has been stated that electroplexy should be avoided for one month after confinement because of the danger of embolism from the pelvic veins during the convulsion (Jacobs, 1943; Feldman *et al.*, 1946; Brew and Seidenberg, 1950; Hemphill, 1952). Feldman *et al.* reported a death eight hours after an E.C.T. in a woman, two months after delivery, who had thrombophlebitis of one leg. She probably had had a pulmonary embolus, but a necropsy was not carried out. This is the only case of embolism following E.C.T. given during the puerperium traced in the literature. In the present study 72 patients were given electroplexy, and 12 of these started a course within four

weeks of delivery. In one patient the course was started on the third post-partum day, in six patients on the 12th to 16th days, and in five on the 19th to 24th days. There was no case of pulmonary embolism. In all cases the convulsion was well controlled with the thiopentone and suxamethonium premedication. Impastato and Gabriel (1957) describe a series of 14 patients given controlled E.C.T. uneventfully within one month of confinement.

Incidence of Puerperal Psychoses in Other Pregnancies

The details of these psychoses are shown in Table VI and VII.

TABLE VI.—*Analysis of Other Puerperal Psychoses Related to Previous or Subsequent Pregnancies*

Type of Illness	No. of Patients who had other Pregnancies	No. of other Pregnancies	No. of other Puerperal Psychoses
Affective	22	71	9*
Schizoaffective	28	87	4
Schizophrenic	12	34	2
Toxic confusional	1	3	—
Hysteria	—	—	—
Total	63	195	15

* This figure includes 2 previous illnesses in one patient—the only one in the series who had more than 2 puerperal psychoses.

TABLE VII.—*Analysis of Pregnancies Subsequent to that Associated with the First Puerperal Psychosis*

	Patients	Puerperal Illness
1st puerperal illness	75	75
1st subsequent pregnancy	44	9 (20.5%)
2nd "	23	3 (13.0%)
3rd "	9	2 (22.2%)
4th "	2	1
5th "	1	—
6th "	1	—
		15 (18.7%*)

* Calculated as a percentage of 80 total subsequent pregnancies.

It will be seen that 75 women had a total of 270 pregnancies with 90 associated puerperal psychoses—that is, for every pregnancy associated with a puerperal illness there were two normal pregnancies. After the first puerperal psychosis 1 in 5 (20.5%) of the patients had a recurrence with their next pregnancy. The overall relapse rate in all subsequent pregnancies was 18.7%.

Only six of the 11 patients who had had a non-puerperal psychosis prior to their first puerperal illness became pregnant again. They had a total of 12 subsequent pregnancies. These three again becoming ill—one on two occasions. These three all fell into the affective group. The non-relapsers comprised two schizophrenics and one schizoaffective. These numbers are too small to conclude that having had a non-puerperal psychosis in addition to a puerperal one necessarily increases the risk in subsequent pregnancies.

It has been stated that it is wise for women who have had a puerperal psychosis to avoid becoming pregnant again for two or three years (Boyd, 1942; Parfitt, 1952). Our experience does not confirm this. 37 patients had another pregnancy after their illness in St. Patrick's Hospital, and 19 of them had their baby within two years, with two associated puerperal illnesses (10.5%). The remaining 18 had babies after the two-year period, with three associated puerperal illnesses (16.6%).

Some Aetiological Factors

Personality.—Information on this subject was not sufficient for the drawing of any definite conclusions. Neurotic features were much more frequently present in the schizoaffective and affective groups than in the schizophrenic. It was noteworthy, too, that 14 of the 15 schizophrenic patients showed no clear pre-psychotic schizoid features such as unusual shyness, extreme sensitivity, or emotional coldness. This may have contributed to the excellent response to treatment in this group, for it is generally agreed that in any

psychiatric illness the chances of recovery are higher if the personality is good.

Previous Mental Illness.—In 17 patients (22.6%) there was a past history of mental illness. The corresponding figure given by Hemphill (1952) was 13% and by Foundeur *et al.* (1957) 30%. The latter found that a matched control group of patients with non-puerperal psychoses had exactly the same incidence of previous mental illness.

Family History.—There was a 32% incidence of mental illness in near relatives (grandparents, parents, siblings, uncles, aunts, first cousins). This figure is of the same order as that obtained in patients with non-puerperal psychoses, but it is much higher than that for the general population. This strongly suggests that there is a genetic element in puerperal as in non-puerperal psychoses.

Physical Illness.—13 patients (17.3%) had some form of infection during the puerperium (breast abscess, 3; infection of the genital tract, 1; abscess of buttocks, 1; urinary infection, 1; septic parotitis, 1; phthisis, 1; pyrexia of unknown origin, 5). This cannot be compared directly with the published figures from maternity hospitals, as these are assessed on the basis of a rise in temperature to 100.4° F. (38° C.) or more within 14 days of childbirth. The morbidity figures from the Dublin Maternity Hospitals in the years 1953 to 1955 vary from 0.9% to 5.6%. The considerable disparity between these figures and 17.3% suggests that infection may have played some part in the causation or aggravation of puerperal psychoses. Twelve patients (16.0%) of this series had some degree of anaemia (haemoglobin less than 11.2 g. per 100 ml.). Gatenby and Lillie (1955) found that practically 24% of antenatal patients at the Rotunda Hospital, Dublin, had a haemoglobin of less than 10 g. per 100 ml. This would suggest that anaemia was of no aetiological importance in this series. Blood W.R. was positive in 2 of the 75 patients, without evidence of involvement of the central nervous system. There were two sets of twins in the series and four stillbirths. Eight patients (10.7%) had a prolonged labour or difficult birth. Seven had a caesarean section, at least three being performed on account of nervous symptoms.

Discussion

The findings in this study may be summarized as follows. Puerperal mental illness is not a psychiatric entity, the patterns of illness being the same as those in the non-puerperal state. The prognosis in puerperal illnesses—treated as outlined—is excellent, irrespective of the diagnostic classification. It is not dangerous to give electroplexy controlled by thiopentone and suxamethonium in the first month after confinement, provided there is no evidence of thrombophlebitis. In any subsequent pregnancy there is a one-in-five chance of recurrence. There is no psychiatric basis for advising a patient to avoid having another pregnancy for at least two years after her illness. Subsequent puerperal or non-puerperal illnesses tend to be of the same diagnostic type as the original puerperal illness, and the response to treatment similar. The only definite aetiological factor is the genetic make-up, but infection may be of some importance.

Some of these conclusions are in direct contradiction to statements in other surveys, the major disagreement being on the question of prognosis in those patients showing schizophrenic symptoms. Hemphill wrote that puerperal schizophrenia was a particularly malignant illness, only one of his 19 patients recovering sufficiently to live outside hospital: "Puerperal schizophrenia, in spite of favourable prognostic criteria, is rarely curable." Skottowe stated: "In schizophrenia the prognosis is grave, few patients recovering. The most that can reasonably be expected is stabilization at a level of invalidism necessitating some special care at home; but nearly half of the patients in this group become more or less permanent mental-hospital patients, notwithstanding shock therapy." Boyd stated: "The diagnosis of schizophrenia implies a very serious

prognosis, and the majority of these patients progress to a severe mental deterioration." He felt, however, that the prognosis was slightly better than in schizophrenia occurring apart from childbirth. Brew and Seidenberg wrote: "The prognosis is somewhat poorer in the post-partum schizophrenic reactions than in these reactions in general." This pessimistic outlook is not shared by everyone, however. Mayer-Gross *et al.* (1954) wrote: "The prognosis for the first attack is relatively favourable as in other schizophrenias precipitated by physical illness." Foundeur *et al.*, from their experience with 50 post-partum schizophrenics, state: "It cannot be said that post-partum patients who were diagnosed as schizophrenic do less well than those with other diagnoses." Three out of four of their total group of 100 patients had a reasonable level of recovery four years after their hospitalization.

In view of these conflicting opinions, it is necessary to look critically at this series and at those previously published. The St. Patrick's schizophrenic group possibly comes from a better-off social class than other series. All the patients were married, and marital disharmony and home stresses, such as financial difficulties, were not much in evidence. Physical illness lending itself to correction was relatively frequent. The pre-morbid personality of the schizophrenic group was good. These factors all lend themselves to a good prognosis. In a group with a higher number of illegitimate pregnancies one would expect to find a higher incidence of unstable personalities in whom the prognosis would possibly be less good. Assessment by methods other than personal interview is open to fallacy. As the patients came from all over Ireland, and as the follow-up period was so long, personal interview with the patient was possible in only six of the 15 schizophrenic cases. In seven further cases there was information from the family doctor, and in one of the remaining two cases there was objective evidence from the husband.

Further evidence supporting the view that puerperal schizophrenia has an excellent prognosis is the fact that among the chronic female patients in St. Patrick's, the majority of whom are schizophrenics, there is no case in which the illness started during the puerperium. Moreover, it is the practice in the hospital to consider leucotomy in any illness in which a good remission cannot be obtained with other treatments, and when symptoms are persisting after two years. The records show that this has never been considered or performed in any case of puerperal psychosis. Undoubtedly before the era of active psychiatric treatment puerperal schizophrenia had a bad prognosis. This is amply documented by writers such as McIlroy (1928), James (1935), and Karnosh and Hope (1937). In those days, tuberculosis, pernicious anaemia, and many other diseases also had a bad prognosis, but the outlook has been completely changed by improvements in treatments. Modern psychiatric therapy such as electroplexy, insulin coma therapy, and the tranquillizing drugs, combined with an active social rehabilitation programme, undoubtedly does influence psychoses. Prognosis, therefore, can be assessed only in the light of the treatment given, and many authors, including Hemphill and Skottowe, give no details of intensity and duration of treatment.

There is general agreement that the great majority of patients with depressive illnesses recover, and that electroplexy is a very effective method of treatment. Hemphill, however, wrote: "There is a psychiatric entity—puerperal depression—which differs from the manic-depressive psychosis, and in many ways resembles involuntal melancholia." He believes that both puerperal depression and typical manic-depressive cases respond poorly to E.C.T., although eventual recovery is to be expected. There is no evidence from this study to support the view that puerperal depression is a psychiatric entity. Moreover, the response to electroplexy was uniformly good, although some cases pursued a relapsing course.

The only follow-up study of the prognosis in subsequent pregnancies that I have been able to trace is that of White

et al. (1957). Of their 100 patients 22 had a total of 27 additional pregnancies, but only three had a recurrence of their mental illness. They wrote: "From this small sample one might infer that the chances are that one in seven patients will experience mental illness associated with a subsequent pregnancy." Other authors give grave warnings of the dangers of subsequent pregnancies, but quote no supporting figures. Hemphill states: "It seems to be extremely dangerous for a patient who has recovered from puerperal schizophrenia to become pregnant again." Boyd concurs in a very similar phrase. The evidence from this study is that the risk of recurrence in any subsequent pregnancy is one in five. No particular diagnostic group seems more susceptible. Eight of the 15 schizophrenic patients had 13 subsequent pregnancies with only one associated puerperal psychosis. Unfortunately, no criterion by which recurrence may be forecast has been determined. Any recurrence is likely to follow the same pattern as the previous illness, and the response to treatment is likely to be similar. In the light of this knowledge no dogmatic statement can be made about the advisability or otherwise of avoiding further pregnancies. Each case must be decided on its own merits, taking into account the personality of the patient, the degree of desire for another child, and the pattern of the previous illness.

A past history of puerperal psychosis is, in the opinion of some authors, an indication for consideration of therapeutic abortion early in any subsequent pregnancy. Religious and ethical considerations forbid such a practice in Ireland. A recent discussion at the Royal Society of Medicine, London, revealed wide disagreement among psychiatrists about the value of and indications for termination of pregnancy (Pearce, 1957). The findings of this study lend no support to advocates of therapeutic abortion or sterilization. Moreover, termination of pregnancy does not seem to be without psychiatric risk. In 1955, in Sweden, where it is widely practised, Ekblad followed up a series of 479 women in whom abortion had been induced on psychiatric grounds. He found that 25% developed subsequent guilt reactions of varying severity. Siegfried (1951) is quoted as having found 59% of such reactions. Polonio and Figueiredo (1955), in a study of 244 puerperal psychoses in Lisbon, found spontaneous abortion responsible for 20% of the cases.

It would seem wise, in the individual case presenting early in a subsequent pregnancy, to inquire about marital stresses and home difficulties which might be alterable. Efficient antenatal care should be ensured, to minimize infection and anaemia. Encouragement and reassurance will often be necessary. Four patients in this series developed anxiety symptoms during ensuing pregnancies. These responded well to simple psychotherapy and mild sedation.

The conflicting views about psychoses associated with childbirth can be resolved finally only when large-scale studies with careful and personal follow-ups are undertaken. It would seem to be an eminently suitable and worth while subject for a Medical Research Council investigation co-ordinating the facts from a number of centres.

Summary

75 patients who had suffered from puerperal mental illness were followed up for periods varying from 4 months to 10½ years. Diagnosis, treatment, and results are analysed.

65 of the patients are now in normal health and only 2 have residual psychotic symptoms. None have become chronic hospital invalids. All 15 schizophrenic patients are fully recovered. The diverse views on the prognosis in puerperal schizophrenia are reviewed and discussed.

Electroplexy controlled by relaxants was given uneventfully to 12 patients within one month of confinement. It is considered to be safe, provided there is no evidence of thrombophlebitis.

The recurrence rate of puerperal mental illness in subsequent pregnancies in this series was 1 in 5 (18.7%). Relapse was not more frequent when the next birth occurred within two years of the illness.

Therapeutic abortion is discussed.

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ACUTE LARYNGOTRACHEOBRONCHITIS TREATED WITH 0.125% SUPERINONE

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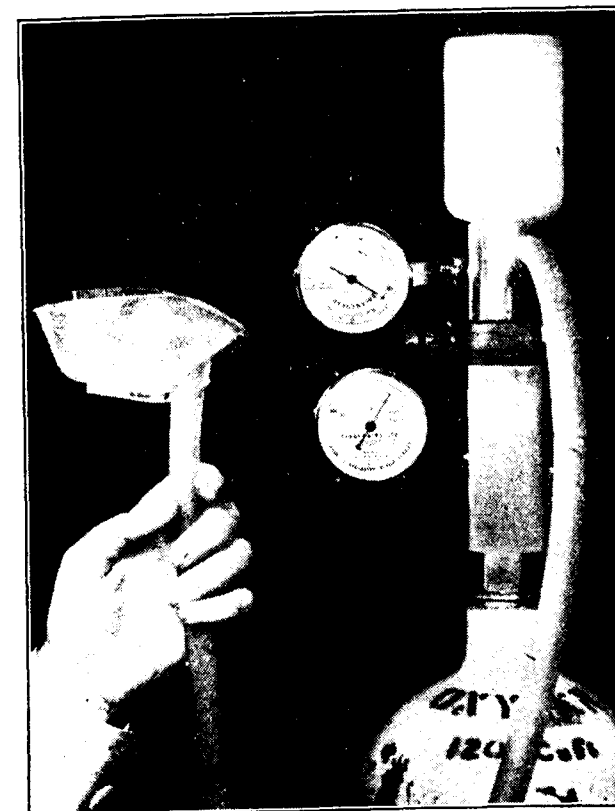
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0.125% superinone is a surface-active agent which acts by lowering surface tension, causing liquefaction of thick mucoid and purulent exudations in the upper respiratory tract and bronchial tree. Thickening of the sputum and dryness of the respiratory membranes are minimized, permitting better ciliary action and thus facilitating expectoration. Superinone is made up in a sterile alkaline medium ("alevaire"), which is administered as an inhalation in the form of a fine mist produced by a nebulizer usually activated by oxygen. It may be given intermittently or continuously (see illustration).

Acute laryngotracheobronchitis is usually of sudden onset and often follows a mild upper respiratory infection. It may be rapidly fatal, death being due either to asphyxia caused by laryngeal obstruction with thick viscid mucus or to toxæmia. The infection is probably of virus origin (Rabe, 1948). Cytopathogenic agents have been isolated from the secretion of several patients (Beale *et al.*, 1957), and in a recent paper Beale *et al.* (1958) demonstrated that the presence of these bodies in cases of acute laryngotracheobronchitis is associated with a rise in antibodies during convalescence. Clinically the appearances are reminiscent of laryngeal diptheria (Garson, 1950), and before the name laryngotracheobronchitis was coined many cases were thought

to be due to this cause, though this diagnosis was never confirmed at post-mortem examinations.

The advent of chloramphenicol was of great value in dealing with the infection and toxæmia (Moncrieff and Weller, 1949), thus reducing the mortality; but the treatment of the asphyxia proved more difficult. Mild cases may be treated by steam inhalation if there is no evidence of bronchopneumonia, but as the patients are anoxic oxygen must be given as well. These patients



Apparatus for administering alevaire in a fine mist.

were therefore nursed in an oxygen tent, being transferred to a steam tent for 10 minutes every hour. Pharyngeal suction was carried out every 15–20 minutes. For cases with asphyxia bronchoscopic suction seemed rational, but this was not always possible and the manipulations involved could easily prove fatal. Tracheotomy then was the only means of trying to prevent death from asphyxia, but, although this successfully bypassed the obstructed larynx, one still had to deal with the viscid exudate in the trachea and bronchial tree. It was felt, therefore, that 0.125% superinone might be of use in dealing with this exudate, and the following is a report of five cases so treated.

Case Reports

Case 1.—A female infant aged 6 weeks was admitted to hospital on February 6, 1958, with a 24-hour history of a cough and cold. She had become very pale and short of breath in a few hours. The birth, personal, and family history revealed nothing relevant. On examination she was afebrile, but grey, cyanosed, and distressed, with rapid breathing and some subcostal recession. Air entry was good, with crepitations at the right base. Post-nasal mucus in small quantity was present. Penicillin was prescribed and the infant nursed in an oxygen tent. She became very much worse some 12 hours later, with marked respiratory embarrassment, collapse, and cyanosis. Air entry over the

lungs was then very poor and there was much white viscid mucus in the fauces arising from the larynx. A diagnosis of acute laryngotracheobronchitis was made. It was decided to give alevaïre by facemask for 10 minutes every two hours, followed by pharyngeal suction. Penicillin was discontinued and chloramphenicol 125 mg. six-hourly substituted. After 12 hours there was no dyspnoea or cyanosis, and mucus was much reduced and less viscid. Air entry was then good, with no subcostal recession. The alevaïre was finally discontinued after 48 hours and the oxygen tent removed. Chloramphenicol was stopped after five days. On admission the W.B.C. was 16,300. The chest x-ray picture on February 20 was clear. The baby was discharged quite well after 18 days.

Case 2.—A female infant aged 3 months was admitted to hospital on February 11, 1958, with a history of croupy cough for 24 hours. She became worse suddenly two hours before admission, with marked dyspnoea and cyanosis. The birth, personal, and family history revealed nothing relevant. On examination she was afebrile, collapsed, and limp, with moderate generalized cyanosis, much dyspnoea, and moderate subcostal recession. Faucial examination revealed much viscid white mucus arising from the larynx. Air entry was poor and few crepitations were heard. There were no other significant signs. Acute laryngotracheobronchitis was diagnosed and she was admitted to hospital at once. The infant was nursed in an oxygen tent and was given alevaïre by facemask for 10 minutes every 90 minutes, followed by pharyngeal suction and chloramphenicol 125 mg. six-hourly. After 12 hours there was no dyspnoea or cyanosis, and the fauces were clear; the air entry over the lungs was good, with no subcostal recession. Her general condition was very good. Alevaïre and the oxygen tent were discontinued after 48 hours and chloramphenicol after five days. The W.B.C. on admission was 8,400. The chest x-ray picture on February 19 was clear. The infant was discharged after 19 days in excellent general condition.

Case 3.—A male infant aged 3 weeks was admitted to hospital on February 17, 1958, with a three-day history of cough and 12-hour history of cough with vomiting and cyanosis. Birth, personal, and family history showed nothing relevant. On examination he was afebrile and slightly cyanosed, with rapid respiration and marked subcostal recession. Air entry over the lungs was poor, and there was inspiratory stridor. A moderate amount of white viscid mucus was present in the throat. The infant was nursed in an oxygen tent and was given alevaïre by facemask for five minutes every two hours, followed by pharyngeal suction and chloramphenicol 125 mg. six-hourly. The patient showed marked improvement in about eight hours. There was no dyspnoea or cyanosis, the fauces were clear, and air entry was good. The oxygen was discontinued after 24 hours, but chloramphenicol was continued for five days, by which time all abnormal signs had cleared. The W.B.C. on admission was 7,600. The baby was discharged after 11 days.

Case 4.—A male infant aged 4½ months was admitted to hospital on March 1, 1958, with a history of cough and snuffles for two weeks and pallor and cyanotic attacks for two days. A dyspnoeic attack occurred before admission. Birth, personal, and family history revealed nothing relevant. On admission the child was febrile, with only slight cyanosis and normal respiration, and did not appear to be seriously ill. Air entry over the lungs was good, with a few crepitations at the left base. A short time after admission, however, he became very distressed, pale, cyanosed, and limp. On examination there was very poor air entry with marked respiratory embarrassment. Faucial examination revealed a large quantity of viscid white mucus. Treatment consisted of immediate pharyngeal suction. Alevaïre was given by facemask five minutes every two hours followed by pharyngeal suction, and chloramphenicol 125 mg. six-hourly was prescribed. There was marked improvement after about 12 hours: no dyspnoea or cyanosis, air entry good, and fauces free of exudate. The alevaïre was discontinued after 36 hours, but the oxygen tent was needed for three days.

Chloramphenicol was stopped after five days. Progress was complicated by a secondary bronchopneumonia, which, however, responded to tetracycline. Chest x-ray films showed a patch of consolidation at the right base which suggested abscess formation, but further films showed that this was resolving satisfactorily. This, of course, has prolonged the baby's stay in hospital. The W.B.C. on admission was 7,300.

Case 5.—A male infant aged 5 weeks was admitted to hospital on March 1, 1958, with a three-day history of cough and cyanotic and dyspnoeic attacks for the previous few hours. Birth, personal, and family history revealed nothing relevant. On examination he was cyanosed and dyspnoeic, with marked subcostal recession. Air entry over the lungs was very poor; there were no added sounds. A moderate amount of viscid white mucus was present in the pharynx. He was nursed in an oxygen tent and given alevaïre by facemask for five minutes every two hours followed by pharyngeal suction and chloramphenicol 125 mg. six-hourly. Marked improvement occurred after a few hours: improved air entry, no dyspnoea or cyanosis, and fauces free of exudate. Alevaïre was discontinued after 36 hours; oxygen was maintained for three days. Chloramphenicol was discontinued after five days, by which time all abnormal signs had disappeared. The W.B.C. on March 4 was 17,800. Chest x-ray examination on March 12 showed clear lung fields with some interlobar pleural thickening on the right side. He was discharged quite well after three weeks.

Comment

Cases 1, 2, and 4, would have qualified for tracheotomy, but it was decided to try the effect of alevaïre before actually resorting to this. Previous attempts at diffusing alevaïre into the oxygen tent continuously had not been successful, so it was thought advisable to administer it in Case 1 by means of a facemask placed directly over the patient's nose and mouth. The resulting liquefaction of the thick viscid mucus after only a few minutes, with rapid improvement of the asphyxia and cyanosis, was quite impressive, and so this method of administering alevaïre intermittently was continued. Although the laryngotracheal secretion ceased to form after 8 to 12 hours, the intermittent administration of alevaïre was continued for a longer period as described in the case reports.

Summary

Five cases of acute laryngotracheobronchitis are reported in which the asphyxial aspect was successfully treated with alevaïre. Three of these (Cases 1, 2, and 4) would have needed tracheotomy otherwise. The alevaïre resulted in rapid liquefaction of the viscid laryngeal exudate, with immediate improvement of the dyspnoea and cyanosis. All the patients recovered.

We thank the sisters and nursing staff for the excellent nursing management of these cases.

ADDENDUM.—Since the above was written Case 4 developed a recurrence of bronchopneumonia during his convalescence. His stools were then noticed to be frequent and very offensive. Examination of the stools showed no tryptic activity. No tryptic activity was detected in the duodenal juice, and his sweat test showed an increase in the chlorides to 840 mg./100 ml. There seemed no doubt, therefore, that he was suffering from mucoviscidosis. His condition continued to deteriorate, with increase in the physical signs over the lungs and reticular shadows in the chest x-ray films. Death occurred on April 25, 1958. Post-mortem examination revealed purulent bronchopneumonia and a tough fibrotic pancreas.

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POISONING BY ACONITINE

REPORT OF TWO CASES

BY

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The history of poisoning by aconite is a long one, going far back into ancient times. This is not surprising, since the plant species from which the poison is derived, notably *Aconitum napellus* (monk's-hood) and *Aconitum ferox*, are common and widely distributed. Within modern times, however, aconite poisoning has been relatively uncommon, certainly within the United Kingdom; and poisoning with the pure alkaloid itself, aconitine, is still more rare. For this reason the symptoms are worth recording, as they occurred in two recent non-fatal cases.

Two medical students, engaged in "spring-cleaning" a privately owned collection of materia medica, found in one of the cupboards a number of small glass phials labelled as containing various vitamin preparations. These they decided to throw out, but before doing so they each took a "pinch" from certain of the phials, including one from which a detached label, inscribed "vitamin C" appeared to have fallen. Subsequent investigation showed that the white crystalline powder in this phial was in fact aconitine, in a total quantity of about 250 mg. (4 gr.), but failed to reveal how the aconitine came to be in the collection or how long it had been there.

In an attempted assessment of the amount they had had, the students demonstrated exactly how they had taken a pinch of powder between finger and thumb, put it on the palm of the other hand and then transferred it to the tongue. Although an estimate arrived at in such a manner cannot be regarded as exact, it is based on more direct evidence than is available in many cases of poisoning, and the students' statements and demonstrations were consistent and convincing. From these it appears reasonably certain that each student had a dose of between 5 and 10 mg. (1/12–1/6 gr.) of aconitine, and more nearly the latter than the former. Both agreed that there was no great difference in the quantity of powder taken, but that Mr. B. (Case 1) probably had slightly more than Mr. T. (Case 2).

The aconitine was taken at 1.20 p.m., and the following is a description of the subsequent symptoms in each case.

Case 1

Mr. B. experienced a "sharp," slightly bitter taste, and a rapidly developing sensation of warmth and tingling in his tongue, which increased in intensity and extent until his whole mouth was affected. Within 10 minutes his tongue, cheeks, and lips felt numb and "drawn," his throat felt constricted, and he had a feeling of nausea. He gargled with water and took a large drink of water to make himself vomit. In this he was successful, and vomiting recurred at intervals during the next four hours without any further efforts on his part. Within half an hour of taking the dose, tingling and numbness had appeared in his fingers, and gradually spread "all over," but became particularly noticeable and distressing in his jaws and face. The vomiting, tingling, and numbness increased to a maximum about 4 p.m.—that is, some two and a half hours after taking the poison, and at this time he was conscious also of great tiredness and actual muscular weakness, so marked that he could only lie on his bed. In spite of his tiredness, however,

he felt restless, the restlessness being attributable at least in part to a feeling that the sensory disturbances in the face and elsewhere were more distressing if he stayed still. From 4 p.m. onwards his symptoms abated gradually, and by the later part of the evening he felt quite fit and well again.

Case 2

Mr. T. experienced almost immediately a slightly bitter taste and a tingling, burning sensation in the tongue, mouth, and throat, which developed into a condition of numbness, tightness, and constriction, lasting till 2 p.m. At 2 p.m. he felt slight nausea and was salivating freely but did not vomit. Indeed, during the next hour his symptoms regressed and he felt fairly well. At 3.15 p.m., however, he began to experience a tingling sensation, which gradually pervaded all parts of the body, becoming especially marked in the face. By 5 p.m. this tingling and numbness in the face were very distressing; he had had three bouts of retching and vomiting; he felt very sick and salivated freely; he felt faint and very cold, especially in the limbs, and his voice seemed far away. His skin was cold and moist.

He had to lie down because he was so weak, and he could scarcely move his limbs. Voluntary effort to seek or call for assistance was impossible. Yet he felt restless, and again the restlessness was dictated in part at least by the feeling of apprehension induced by the numbness in his face, and elsewhere, which seemed to be worse when he lay still. Any attempt to get up, however, brought him near to fainting. He remained in this state for more than two hours, the symptoms of tingling and numbness, salivation, and sickness, coldness, and faintness, weakness, restlessness, and a feeling of dread all persisting and becoming even worse. During this period he repeatedly tried to feel his pulse, but it was undetectable. His illness reached its climax between 7 and 8 p.m., and from 8 p.m. onwards he improved gradually. About 11.30 he fell asleep. He slept soundly throughout the night and felt quite recovered the following day.

Comment

It will be recalled that Mr. B. had, if anything, a larger dose than Mr. T. From the relative severity of their illness it would appear probable that Mr. B. succeeded in getting rid of a proportion of the poison by means of his self-induced vomiting 10 minutes after the dose was taken and by the further attacks of vomiting soon afterwards. Mr. T. did not take the same precautions, nor did he have any vomiting for the first two and a half hours or so. Indeed, he was lulled into a false sense of security by the almost complete absence of symptoms between 2 and 3 p.m.

Neither student received any treatment, although they reported to the out-patient department of a hospital about 2 p.m. They were told to go home, lie down, keep warm, and return if they felt worse—sound enough advice so far as it goes, and perhaps reasonable in the circumstances at that time, although in the light of events it might well have been supplemented or replaced by more active measures and a period of observation. The students went from the hospital to their respective lodgings, where, as it happened on that particular day, they were obliged to endure in solitude what was, particularly in the case of Mr. T., a most unpleasant and alarming experience.

Identification.—The powder in the phial was submitted for chemical investigation. It was reported as being purely alkaloidal in character, and giving reactions which were consistent with its being aconitine. With the usual range of chemical tests for alkaloids it is not possible as a rule to be more specific than this when seeking to identify aconitine, and confirmation must be sought by means of physiological tests. The substance was personally sampled, perhaps slightly to excess, for not only was there a rapid development of warmth and tingling in the tongue and mouth, but this went on to numbness and tightness of the mouth and throat and tingling in the fingers, which persisted for some time. Finally a dose of 0.5 mg. (1/128 gr.) was injected

subcutaneously into a rat. After a delay of about a minute, the animal showed signs of restlessness and agitation, and started to run. Salivation, retching, and respiratory distress developed, followed by paralysis, affecting first the hind limbs and then the forelimbs. There were terminal convulsions before the animal died three minutes after being given the injection. These were the results on which the opinion was based that the material in the phial was in fact aconitine.

Discussion

The fatal dose of aconitine is variously stated as being anything from 1/60 to 1/10 gr. (1 to 6.5 mg.) or slightly more. The uncertainty on what constitutes a fatal dose is no doubt related to the infrequency of poisoning with the pure alkaloid and also to its unstable nature. Furthermore, there are several varieties of aconitine, and they are not all equally poisonous. Factors of this kind presumably explain why the results were not even more serious in the cases described, although in each case the dose was certainly in excess of that which is commonly regarded as fatal or potentially so.

Aconite (aconitine) has both a local or peripheral and a systemic or central action, and both have served as a basis for its use as a therapeutic agent. The local or peripheral effect is the more striking and characteristic—namely, tingling and numbness, experienced either on local application or in the mouth when ingested, and in the extremities after absorption. The drug was formerly used, usually in the form of the tincture, for the relief of neuralgic or rheumatic pain. The central effect of value was believed to be a slowing of the heart and a reduction in blood pressure, hence its former use in certain cases of heart disease and in various febrile conditions.

To-day aconite is very little used therapeutically, and never internally, except perhaps in homoeopathic practice. Aconite poisoning is therefore uncommon, and the occasional cases which do occur are usually due to the suicidal or accidental ingestion of a liniment containing aconite mixed with other noxious substances. Accidental death through mistaking monk's-hood root for horse-radish is less frequent to-day than it appears to have been some years ago.

Because of its rapid and rather striking local effects, aconite is not an ideal homicidal poison, and it has rarely been used as such in this country. It has been suggested, however, that because of the effects on the heart, coupled with peripheral effects experienced in the arms and hands, sickness, and upper abdominal discomfort, and an early fatal outcome, cases of homicidal aconite poisoning might well be overlooked and regarded as deaths due to coronary artery disease.

In an Irish case in the first half of last century (*Regina v. McConkey*, 1841), powdered aconite root (monk's-hood) was mixed with pepper and sprinkled over the greens which formed part of the victim's dinner. Dr. Pritchard (1864-5) gave tincture of aconite mixed with Battley's solution to at least one of his two victims, but essentially the deaths were due to antimony poisoning. The outstanding homicidal case is undoubtedly that of Lamson (1881-2), also a medical man of sorts, who administered the alkaloid aconitine in a capsule (or a cake) to his invalid brother-in-law.

In the Lamson case aconitine was detected in the vomit, in the urine, and in an extract from the stomach, stomach contents, liver, spleen, and one kidney. Identification was by means of alkaloidal reactions, by the local effects produced on the tongue, and by the rapidly fatal effects on mice. Since then various colour and crystal tests have been described in attempts to render the chemical identification of aconitine more positive, but there is no general agreement on the specificity of any such tests. It has been suggested that most reliance can be placed on the effects of aconitine on the frog's heart, which appear in a characteristic sequence—namely, initial slowing followed by sudden acceleration, then incoordination, and a final slowing and arrest.

Greater certainty may be possible with the more modern methods of chromatography and spectrophotometry. Curry and Powell (1954) have described a method for the detection of alkaloids on a micro-chemical scale by means of paper chromatography which would appear to be applicable in the case of aconitine. Similarly, Kaye (1954) has described a characteristic spectrophotometric absorption curve for aconitine. Since these methods are applicable to very small quantities of material they would, if proved to be sufficiently specific, provide an extremely valuable means of identification, and might indeed relegate the older forms of testing to a role which was largely confirmatory. It is certain, however, that the characteristic and striking local effects of aconite will always retain their highly diagnostic significance.

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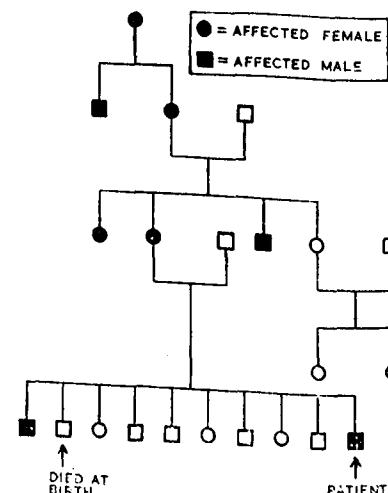
A Case of Nephrogenic Diabetes Insipidus

Nephrogenic diabetes insipidus is a heredo-familial disease characterized by polydipsia and polyuria from infancy. It is a sex-linked condition affecting males usually and transmitted by females, who act as heterozygous carriers. The condition is resistant to treatment with "pitressin," and appears to be due to an inherent kidney defect which results in failure of tubular reabsorption of water. Renal function in all other respects is unaffected. The following is a report on a case occurring in a youth of 18. This case is of interest because some of the female members of his family, besides acting as carriers, appear to have suffered from the full-blown clinical syndrome.

CASE REPORT

The patient complained that he had had to drink large quantities of water and passed large amounts of "white urine" for as long as he could remember. He found it necessary to carry supplies of water with him on train journeys or when he visited the cinema. Failure to relieve his thirst resulted in drowsiness, headache, and general malaise. He passed urine every half to one hour during the day and four to six times during the night. His daily intake and output was between 12 and 16 litres of water.

He was one of 10 children who were all alive except one brother who died at birth. He had five living brothers and three sisters. His mother, eldest brother, a maternal aunt, a maternal uncle, a female cousin, maternal grandmother, a maternal great-uncle, and maternal great-grandmother all suffered from this syndrome from birth. The family tree showing the incidence of the disease in the two sexes was compiled from information given by the patient and his mother. The latter stated that she found it necessary to take 6 pints (3.4 litres) of water to bed with her at night and drank much more during the day. The general appearance of the patient was normal and there were no abnormal physical signs in any system.



Special Investigations.—The specific gravity of the urine varied from 1000 to, on one occasion, 1012. More usually it was between 1004 and 1008. It was not possible to carry out a urine concentration test, as the patient could not be deprived of water for a sufficient length of time. M.S.U.: reaction acid; protein nil; reducing substances nil; deposit N.A.D.; cultures sterile. The blood urea was 32 mg./100 ml. Serum electrolytes were within normal limits. X-ray films of the chest and skull were normal. The Wassermann, Kahn, and Price precipitation reaction were negative.

At first twice-weekly injections of 5 units of pitressin in oil were given intramuscularly. This, however, had a negligible effect in reducing the polyuria. The patient did feel that pitressin snuff administered four or five times daily reduced his frequency slightly, but this was not enough to render its continued use worth while. It can be concluded, in this case, that pitressin by the intramuscular or nasal route had no appreciable effect in reducing diuresis.

COMMENT

This case is of interest in that females appear to have exhibited the fully developed clinical syndrome. This feature is unusual. Recent published work has shown that symptomless female carriers of the disease show an impairment of urine-concentrating power and a lowered response to pitressin (Garrod, 1956). Carter and Simpkins (1956) investigated four families and showed that the female carriers were unable to concentrate urine beyond 1018. They suggested that this test be used as a means of "carrier state" detection.

My thanks are due to Lieutenant-Colonel R. M. Johnstone, R.A.M.C., for his kind permission to publish this case.

L. H. GLASER, M.B., B.S.

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Duplication of the Stomach Simulating Pyloric Stenosis

Duplication of the stomach is an uncommon condition. Gross (1953) reports two cases in a series of 68 duplications of the alimentary tract studied by Dr. Sidney Farber at the Boston Children's Hospital. One, in a child of 7 years, gave a palpable mass in the epigastrium, but did not produce obstruction. The cyst was as large as the stomach, and lined by necrotic mucosa. Treatment by partial excision and by marsupialization was successful. His second patient, aged 3 days, had a cyst 4 cm. in diameter, lined by gastric mucosa, on the greater curvature of the stomach. Excision of the cyst and gastrostomy were performed, but the baby died. Galloway, Sutherland, and Williams (1956) report a case, first seen at the age of 4 weeks, with symptoms of vomiting, green slimy stools, and failure to gain weight. A swelling was visible in the left hypochondrium moving downwards when the baby was fed. Peristalsis was not seen. The vomiting was not severe, and operation was postponed until the baby was 4 months old. The cyst measured 5 by 3 by 3 cm., and was attached midway along the greater curvature. It was lined with gastric mucosa. Complete excision of the cyst was carried out and the baby made a good recovery.

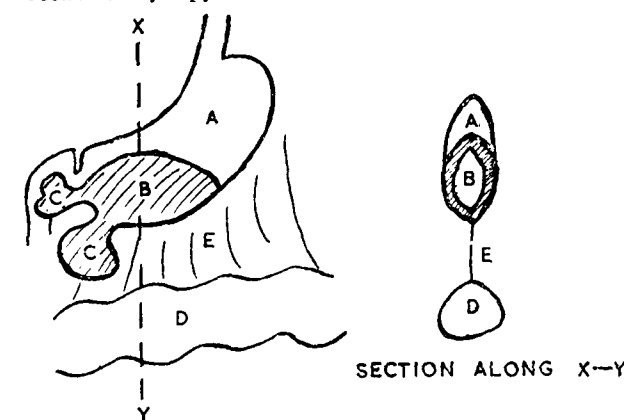
The following case presented with symptoms and signs suggesting pyloric stenosis.

CASE REPORT

A male child, the second baby of healthy parents, was born on September 22, 1956, by caesarean section, and weighed 10 lb. 3 oz. (4.6 kg.) at birth. He was breast-fed for the first month and did not vomit during this time. At the age of 4 weeks he was put on to feeds of full-cream National dried milk, and a week later he started to vomit about half of every feed. The vomits were projectile in character, and he became constipated. On admission to hospital on November 17, at the age of 8 weeks, he weighed only 8 lb. 13 oz. (4 kg.).

On examination he was thin and slightly dehydrated. His stomach contained 1 oz. (28 ml.) of residue immediately before a feed. During feeding visible gastric peristalsis was seen, and a large firm mobile tumour was felt in the right hypochondrium. He was given small frequent feeds of half-strength Hartmann's solution, which he retained. His dehydration was corrected, and he was fit for operation on November 19.

Operation was performed by Mr. A. C. Gairdner. The pylorus was found to be normal. The pyloric antrum was obstructed by a pyriform swelling which formed part of the



Operative findings. A=Stomach. B=Duplication. C=Pulsion diverticulum. D=Transverse colon. E=Gastrocolic omentum.

greater curvature of the stomach. This swelling had a common muscular wall with the greater curvature of the stomach, and was a blind gastric duplication consisting of secreting gastric mucosa and muscular tissue which was grossly hypertrophied. The wall common to the stomach and the swelling was also grossly hypertrophied, and it was this which caused the obstruction. In two places the mucosa had become herniated through the muscular wall, forming pulsion diverticula (see Diagram). The wall of the subsidiary stomach was excised with the diverticula, leaving the common wall, from which the mucosa was completely removed. The remaining hypertrophied stomach wall was then found to be still partly obstructing the pyloric antrum, so a posterior gastro-enterostomy was performed.

The specimen consisted of five pieces of cyst wall, the largest measuring 3.5 by 1 cm. and 0.5 cm. thick. The walls consisted of thick muscle, lined by gastric mucosa. The fluid contained in the cysts was colourless and slightly opalescent, containing 6 g. of protein per 100 ml. Unfortunately tests for acid and pepsin were not performed.

Post-operative Progress.—Fluid requirements were given by scalp-vein infusion for the first four days, together with a transfusion of 100 ml. of blood. Feeds of half-strength Hartmann's solution were begun 48 hours after operation, expressed breast milk being substituted on the fourth day. His recovery was uneventful, although he was slow in gaining weight. His birth weight was not regained until the age of 3 months (4½ weeks after operation), but he then gained a further 13 oz. (370 g.) in the next 10 days.

A barium-meal examination on February 18, 1957, three months after operation, showed that the meal passed into the small intestine both via the pylorus and via the gastro-jejunostomy.

When seen on June 27, seven months after operation, he was very well, with no vomiting, his weight at the age of 9 months being 20 lb. 12 oz. (9.4 kg.).

I am grateful to Dr. F. S. W. Brimblecombe and Mr. A. C. Gairdner for permission to record this case, and to the nursing staff of the Royal Devon and Exeter Hospital for their care of the patient.

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Reviews

AORTOGRAPHY IN RENAL DISEASE

Aortography. Its Application in Urological and Some Other Conditions. By W. Barr Stirling, Ch.M., F.R.C.S.(Ed.), F.R.F.P.S.G. (Pp. 292+vii; illustrated. 50s.) Edinburgh and London: E. and S. Livingstone Ltd. 1957.

This monograph of about 290 pages relates the author's experiences of some 500 aortograms performed mainly for renal disease. Some vascular and other conditions are considered in a relatively short terminal section. The early chapters contain an account of the history, applied anatomy, and technique of the examination performed by the trans-lumbar route. There is an interesting chapter on pressure factors in the aorta. In a lucid account of the hazards and possible complications of the procedure, anuria following repeated injections, without extravasation of the contrast medium, has been omitted. The congenital variations of the renal tract and the importance of the blood supply are well illustrated and described and their surgical aspects are stressed. While the application of the investigation to polycystic disease is limited, not everyone would agree that the appearances are not specific. It is also refreshing to find that, in the author's opinion, the differentiation of simple cyst from cortical neoplasm is reliable, when the opposite view has recently been stated in the literature. I entirely endorse the author's opinion. The importance of the examination in the assessment of function and distribution of blood supply in hydronephrosis, renal calculus, and other conditions requiring reparative or conservative surgery is stressed and beautifully illustrated. In suspected renal hypertension, especially if the excretory pyelogram is normal, the examination may nevertheless reveal arterial insufficiency to the whole of part of one kidney. The book is well endowed with short case reports. As the author states in the preface, this monograph is not a textbook; nevertheless it is sufficiently comprehensive to form a basis for those interested in the examination and its possibilities.

C. G. WHITESIDE.

CHROMATOGRAPHY TECHNIQUES

Chromatographic Techniques: Clinical and Biochemical Applications. Edited by Ivor Smith, B.Sc., Ph.D., F.R.I.C. (Pp. 309+ix; illustrated. 45s.) London: William Heinemann Medical Books, Ltd. 1958.

Paper chromatography represents one of the most important advances in biochemical technique, and it has justly been given pride of place in the exhibition of British inventions at the Brussels World Fair. In medicine it has the particular advantage of using small quantities of material. It can be carried out without elaborate equipment and can be performed even by those who have not been highly trained. The widespread application of the technique has resulted in numerous papers distributed amongst a great variety of journals. It is often not possible to employ these methods without doing some additional research of one's own. Their reliability will have to be verified, and technical details more often than not have to be modified. A laboratory bench-book on chromatography techniques is, therefore, a most useful addition to the armamentarium of the medical laboratory worker. The title of the book is a misnomer. Chromatographic methods include adsorption chromatography in columns made of silica gel, alumina, and ion-exchange resins. These techniques are either not described or only mentioned in passing. The editor, Dr. Ivor Smith, is a postgraduate lecturer in chromatographic methods at the Technical College, Acton, London; he is also associated with the Courtauld Institute of Middlesex Hospital, London, and he is joined by J. P. Jepson, R. W. H. Edwards, A. H. Snaith, and H. G. Stevens from the Middlesex Hospital. Other contributors are J. V. Jackson from New Scotland Yard, T. Wood from Bovril Ltd., H. G. Horwell from

May and Baker Ltd., E. Kawerau from St. Mary's Hospital, and M. Birchenough from the Norwood Technical College, London. Amino-acids and amines, imidazoles, purines, sugars, the acids of the citric acid cycle, barbiturates, and steroids are amongst the compounds which are considered in detail. A most valuable contribution is that dealing with the indoles, including hydroxyindolylacetic acid and tryptamine. It is perhaps surprising, but presumably owing to the book's restriction to paper chromatography, that the useful work by Huisman and his colleagues on resin chromatography of haemoglobin variants is not mentioned. There are also chapters on chromatographic apparatus and techniques and two indexes—one general, dealing with more than 500 items, and the other of some 600 compounds named in the tables.

Considering the number of tables, diagrams, and illustrations, and the quality of the paper, the book is not expensive. It will undoubtedly become a standard laboratory bench book, and the authors and publishers are to be congratulated for having made a substantial contribution to laboratory practice.

H. LEHMANN.

ANATOMY AND HUMANISM

Anatomist at Large: An Autobiography and Selected Essays. By G. W. Corner. (Pp. 213. \$4.00.) New York: Basic Books. 1958.

Professor George Corner's eminence is well recognized in both anatomical and physiological circles. Distinction between the two departments, on the level on which he works, has indeed now almost vanished, but he is specially known for his discoveries on the sexual cycle of apes, which closely resembles that of the human subject. Thus much of his work is, or will be in the near future, of direct medical application. He was born at Baltimore in 1889, and has spent there most of his active life as student, investigator, and teacher. After a sound basic education he entered Johns Hopkins University, first "majoring" in classics and afterwards changing to science, especially biology, finally passing to a medical course. He was a pupil of the anatomists F. P. Mall and Florence Sabin, to whom he gives special acknowledgment. His clinical years were in the latter period of first blossoming of that great school, where William H. Welch, William S. Halsted, Howard A. Kelly, and Whitridge Williams were among his teachers. After several crowded years, which included a time spent in Germany and two seasons with the Grenfell Medical Mission in Labrador, where he met his accomplished wife, he spent a year in Great Britain with Starling, Bayliss, and Elliot Smith, finding time somehow to produce a distinguished piece of historical research, a line of work in which he always showed, and still shows, much interest. After acting as assistant to Herbert M. Evans in California he became professor of anatomy at Rochester, N.Y. There he remained until his return to his native city to occupy a research chair provided by the Carnegie Fund. In 1952 he was Eastman Visiting Professor at Oxford, when he was elected into the Royal Society. Soon after he became president of the American Philosophical Society. On retiring from his chair at Baltimore he undertook to write the history of the Rockefeller Foundation, on which work he is still engaged.

In addition to the autobiography, this volume includes a "type research" in substantially its original form. It is a happy idea to republish such a work, for, better than any other, it gives the reader a view of the investigator's real preoccupations. For this purpose he has selected his classical paper in which, with one of his students, he showed experimentally that the corpora lutea contain a specific hormone, a function of which is to induce pregestational proliferation of the endometrium in preparation for reception of embryos. He calls it "Search for a Hormone," and its results have elucidated the human menstrual cycle.

The lives of experimentalists are notoriously uneventful outside the laboratory, but Dr. Corner is exceptional in having had a richly varied career which has always been

coloured by humane purposefulness. In reading his essays one feels that the man is best reflected in his several addresses to students. They are the work of a scientist who, in his labours, has never lost sight of their possible application to medical practice. Here is none of the remoteness of the traditional professor. These student addresses especially maintain the dignity of a fine literary tradition. They reveal much of the personality of the author, who, in his turn, must surely have felt their delivery as a call and a charge. They show Professor Corner as a wise and experienced physician in the true Hippocratic mood, for "where the love of Man is, there also is love of the Art."

CHARLES SINGER.

PATHOLOGY IN THE U.S.A.

Pathology. Edited by W. A. D. Anderson, M.A., M.D., F.A.C.P., F.C.A.P. Third edition. (Pp. 1,402+xv; illustrated. £6.) London: Henry Kimpton. 1957.

The third edition of this standard textbook follows the general plan of its predecessors. Some parts have been completely rewritten, others revised, and a few shortened. The references have been brought up to date and the number of illustrations increased, and the binding appears to be more sturdy. As there are now 35 contributors, representing 17 of the 48 stars on the Union flag, "Anderson" can be regarded as fairly representative of the healthy state of the pathology in the United States. Great Britain and the London Hospital are represented by one author, Professor Dorothy S. Russell, who contributes an article on the pituitary gland. In the words of the editor, "a thorough coverage of the subject has been attempted within the limitations of a single volume." The reader will agree that this attempt has been singularly successful and the editor's purpose achieved by the exceptionally liberal use of small print. Few, if any, single-volume modern textbooks contain so much accurate and relevant pathological information. Dr. Anderson suggests that the large-print sections can be used by the junior student, and that he will increasingly need the "small print" as he progresses. There is no doubt that the book will continue to serve as a reliable reference book for advanced students, clinicians, and pathologists. While "morbid physiology" is by no means neglected, the background of this book is the accurate correlation of descriptive morbid anatomy and histology with clinical signs and symptoms. This interpretation of the word "pathology" in the United States is very probably related to the firmly established and highly commendable practice of holding clinico-pathological discussions on the majority of patients who die in their teaching hospitals. It is not improbable that we are tending to neglect this approach in Great Britain.

GEOFFREY HADFIELD.

WHITLA'S DICTIONARY OF TREATMENT

Whitla's Dictionary of Medical Treatment. Ninth edition. By R. S. Allison, V.R.D., M.D., F.R.C.P., D.P.M., and T. H. Crozier, M.D., B.Sc., F.R.C.P., and twenty-six contributors. (Pp. 854+xiii. 52s. 6d.) London: Baillière, Tindall and Cox. 1957.

This is the ninth edition of a book which first appeared in 1891, and the authorship has grown from a single man to 26 contributors. It is now the product of the Belfast school as a whole. While the authorship has increased, the territory covered has diminished; surgical topics have been omitted and the material is confined to medical therapeutics. The arrangement is alphabetical, and in general the items can be classified in four groups—the names of recognized diseases or syndromes, common presenting symptoms and signs, therapeutic procedures, and finally therapeutic principles underlying medical treatment. There are a detailed list of contents and a good index, so that the book is easy to read. The book is addressed to the senior student and practitioner, and does what it sets out to do extremely well. The instructions are modern and practical, and there are none of those relics of a bygone day which so often intrude

in texts of this age. Common diseases like coronary thrombosis are well handled. There is an excellent section on the painful lesions of the neck, arm, and shoulder, which are apologetically classified under the heading "brachial neuritis." Prescriptions are given in both the English and the metric system, but figures for the latter have been so literally translated that they would be extremely annoying to the chemist. For example, 15 minims becomes 0.9 ml. instead of 1 ml., and the equivalent of a dose of $\frac{1}{2}$ oz. is given as 14.2 ml. instead of 15 ml.

L. J. WITTS.

INTRACTABLE HEADACHE

Management of the Patient with Headache. By Perry S. MacNeal, M.D., F.A.C.P., Bernard J. Alpers, M.D., Sc.D.(Med.), F.A.C.P., and William R. O'Brien, M.D., F.A.P.A. (Pp. 145. 26s.) London: Henry Kimpton. 1957.

Intractable headache or frequently occurring headache is not an uncommon problem in most types of medical practice. To those concerned with questions of differential diagnosis and of treatment this little book may be of some interest, and even perhaps of limited value. The attainment is uneven, as might be expected when such a wide subject is tackled by multiple authorship. The sections dealing with psychopathology and with the personality traits of the migrainous sufferer are frankly unconvincing, naive, and unacceptable. One feels at times tempted to protest, like Oscar Wilde: "You must not find symbols in everything you see. It makes life impossible." With much of what the authors have to say about the medicinal treatment of migraine—both in and between attacks—no one can quarrel, and many medical men will indeed appreciate the clear exposition of the present position of drug therapy. Some of the *obiter dicta* are shrewd: "... History is far and away the most important part of the study of a patient with headache. The physical examination helps some [sic] and laboratory studies least of all. The skull x-ray, ordered so frequently, is almost uniformly a waste of time and money. We have seldom seen a simple x-ray study of the skull reveal anything of importance in the study of the patient with the chief complaint of headache." None the less the wise physician will continue to utilize routine radiology, not only of the skull but also of the chest, in the investigation of his patients with intractable headache.

MACDONALD CRITCHLEY.

THE ADRENALS IN DIABETES

Cortico-surrénale et Diabète Humain: Relations entre le Diabète Stéroïdien et le Diabète Ordinaire. By P. Bastenier with eight contributors. (Pp. 506; illustrated. 4,000 frs.) Paris: Masson et Cie. 1956.

This is a comprehensive review of the role of the adrenals in human diabetes. Virtually the whole range of human diabetes is discussed, from the rarer syndromes of the Cushing and Achard-Thiers type to the more commonly occurring disease encountered in everyday clinical practice. The earlier part of the book has chapters devoted to the basic physiology and biochemistry of diabetes, and these are exhaustively dealt with. Succeeding chapters are concerned with methods used in investigating the metabolism of glucose and steroids and the fate of steroids in man. After chapters dealing separately with acromegaly and Cushing's syndrome, space is devoted to the classification of human diabetes. Some interesting analogies are drawn between the obese type of human diabetes (the Continental *diabète gras*) and Cushing's syndrome on both clinical and experimental grounds. The possible part played by the adrenal cortex in the genesis of diabetic vascular complications is discussed at length, as is both the surgical and medical therapy used in this condition. The volume is well produced, with some good diagrams and clear photographs. Even though at times it is provocative, this book, with its wealth of references, will be very valuable to clinicians and research workers alike in this highly controversial field.

K. W. TAYLOR.

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IMMUNOLOGICAL SPECULATIONS

The skin is a well-recognized mirror of systemic diseases. Initial observations on lupus erythematosus and sarcoidosis stemmed from dermatologists; but, later, specialists in other disciplines were to contribute to the evolution of knowledge. The first step forward was the recognition that they were not primarily dermatological curiosities, but instead disorders frequently affecting tissue systems throughout the body. Once this was established, the terms disseminated, systemic, and generalized were bestowed to include manifestations remote from the original skin disease. Thus far, study of the diseases had been a meeting-point for the dermatologist, general physician, and pathologist. But it became evident that the diagnosis could be made with some confidence in the absence of skin lesions. Although the field of interest of the physician had now eclipsed that of the dermatologist, he still relied on the morbid anatomist for corroborative histological evidence of the "onion-skin" and "wire loop" vascular lesions found respectively in the spleen and renal glomeruli in lupus erythematosus.

Emphasis is once again shifting, this time from the histological to a more dynamic immunological approach to these and other disorders. Acute lupus erythematosus gives clinical, histological, and haematological evidence suggesting a hypersensitivity mechanism. E. G. L. Bywaters¹ and W. Dameshek² have suggested that this may be of the auto-immunization variety. The severe constitutional upset with fever, polyarthralgia, serositis, nodules, lymphadenopathy and also the peculiar vasculitis observed histologically have for long suggested an allergic response, similar in some respects to serum sickness and drug allergy. To this picture may be added a set of associated haematological disturbances—haemolytic anaemia, leucopenia, thrombocytopenia, and coagulation defects. That these are linked with a positive Coombs test, the L.E. cell factor, platelet agglutinins, false-positive serological tests for syphilis, isoagglutinins after blood transfusion, and raised serum gammaglobulin levels all support the thesis that an immunological disturbance is responsible.

¹ Bywaters, E. G. L., *Proc. roy. Soc. Med.*, 1956, **49**, 287.

² Dameshek, W., *Ann. intern. med.*, 1958, **48**, 707.

³ Teilmann, G., *Amer. J. Path.*, 1948, **24**, 389.

⁴ ———, *Acta path. microbiol. scand.*, 1951, **28**, 294.

Dameshek considers that these clinical, histological, and haematological features of systemic lupus erythematosus portray the end-result of a series of reactions directed against the endothelium of blood vessels and against red corpuscles, white cells, platelets, and blood-coagulation factors. In our present degree of ignorance of these reactions the speculation is a reasonable one and it is certainly fashionable to confer the term "auto-immune" on a set of reactions which apparently arise within the host's own body and attack various constituents of his own tissues. It remains to be seen whether a responsible antigenic substance is uncovered. Hydrallazine is known to produce a syndrome resembling lupus erythematosus, and the L.E. cell has also been detected in the serum of patients with hypersensitivity reactions to penicillin. It is possible that these or similar chemicals may so alter the cell surface as to render it antigenic.

Another factor which might be usefully entertained in discussing the pathogenesis of disseminated lupus erythematosus is its conspicuous predilection for women of the child-bearing years of life. In fact, Dameshek² states that he has observed it only in three males, two of whom had received hydrallazine and the third penicillin, all for prolonged periods. He suggests that the active endometrium is an ideal milieu for the production of antigenic substances from altered blood cells and blood vessels, associated as it is with large pools of stagnant blood. He also suggests that the periodic character of the catamenia might play a significant part, corresponding to "booster" injections in an immunization procedure or sensitization process. Although this stimulating concept cannot at present be verified, it does not preclude us from attempting to analyse our data of other ill-defined conditions in a similar light. Sarcoidosis has been mentioned as a dermatological curiosity which was extended to become a disorder of general medical interest. Radiology and tissue biopsy provided means of establishing the diagnosis in the absence of skin lesions. The occurrence of fever, polyarthralgia, erythema nodosum, and acute iritis at its onset, the depression of delayed-type (tuberculin-type) skin-test reactions, the abnormal serum globulins, and the Kveim test phenomenon could all be construed as evidence of hypersensitivity or of reticulo-endothelial imbalance. G. Teilmann³ brackets both disseminated lupus erythematosus and sarcoidosis as examples of allergic hyperglobulinosis. Moreover, erythema nodosum due to sarcoidosis also predominantly affects women during the reproductive years of life. For the present these may appear to be a series of unlinked observations, but an immunological approach holds the exciting promise of a connecting thread.

SYMPTOMLESS JAUNDICE

If the serum of apparently normal blood donors is analysed for bilirubin content, a proportion will be found above the normal upper limit of 1 mg. per 100 ml. A few of these subjects will be suffering from congenital spherocytosis (acholuric jaundice), which is readily diagnosed by examination of the peripheral blood film, reticulocyte count, and erythrocyte fragility tests. An even smaller number will be shown to suffer from a well-compensated Laennec's cirrhosis, and other stigmata of liver disease such as vascular spiders on the skin, hepatomegaly, or splenomegaly will often be found. Sero-flocculation tests such as thymol turbidity may be positive, and injected bromsulphalein is usually retained abnormally. There remains the group of congenital hyperbilirubinaemias which are now attracting much general interest. The most frequent is Gilbert's disease,^{1,2} which is inherited as a dominant characteristic. Mild jaundice with tiredness and languor are noted intermittently. There are no other abnormal physical signs. Histological examination of liver-biopsy material shows normal appearances.³ Bile pigment is not present in the urine. J. F. Crigler and V. A. Najjar⁴ have described what is probably a more severe form of Gilbert's disease in which jaundice is deeper. The circulating serum bilirubin is unconjugated with glucuronide ("indirect" type) and has an affinity for nervous tissue, so that the features of kernicterus are present. A biochemical defect in the conjugation of bilirubin with glucuronic acid in the liver has been demonstrated in deeply jaundiced patients with the Crigler-Najjar type.⁵ The specific defect seems to be in glucuronyl transferase, an enzyme which is present in hepatic microsomes and which transfers glucuronic acid from uridine diphosphate glucuronic acid to various receptors, including bilirubin.⁶ The liver in Gunn's strain of congenitally jaundiced Wistar rats has been shown to have a similar defect.⁷ Diminution of conjugation of other substances with glucuronic acid has also been shown: these include menthol, salicylates, and metabolites of cortisone.^{8,9} The patients and the rats were much more icteric than the usual sufferer from Gilbert's disease. Difficulty has arisen in confirming these results in the mildly icteric, and more recently it has been shown that patients

with Gilbert's disease conjugate administered salicylamide¹⁰ and also menthol¹¹ with glucuronic acid normally. Nevertheless the demonstration of a specific hepatic enzymatic defect in the severe forms of the disease represents an important advance, and results of the wider application of these methods to other forms of jaundice will be awaited with interest.

The third, rarer, form of congenital hyperbilirubinaemia was first described in 1954 by I. N. Dubin and F. B. Johnson¹² as "chronic idiopathic jaundice with unidentified pigment in liver cells" and by H. Sprinz and R. S. Nelson¹³ as "persistent non-haemolytic hyperbilirubinaemia associated with lipochrome-like pigment in liver cells." Dubin has recently reviewed 50 cases of the disease.¹⁴ The disorder differs from the Gilbert type in that the circulating bilirubin is conjugated with glucuronide ("direct" type) and is water-soluble and so appears in the urine. The essential defect is not in the conjugation of bilirubin but in its excretion into the bile. The main point of distinction is in the liver, which, macroscopically, is greenish-black. Dubin¹⁴ has even suggested that the disease might be termed "macro-hepatic icterus" or "black-liver jaundice." The pigment is found in liver cells and belongs to the family of lipofuscins, the so-called "wear and tear" pigments. It has not been chemically identified.

Both Gilbert's and the Dubin-Johnson type of congenital hyperbilirubinaemia carry an excellent prognosis. Their distinction one from the other remains of theoretical rather than clinical interest. The differentiation from the more serious types of chronic intermittent jaundice is, however, of great practical importance and merits the fullest biochemical and haematological investigation, perhaps necessitating aspiration liver biopsy.

TISSUE BUILDING AND PROTEIN ANABOLIZERS

The metabolic pool is a useful concept, allowing us to make a mental image of the circulating fluid to which nutrients, hormones, vitamins, and degradation products each add their quota and from which at any hour of the day or night, in each deviation from health and in all the seven ages of man, the body seeks to supply its varying demands. Even if we narrow our field of vision to the best understood of the products of metabolism, glucose,¹ we soon find that ignorance outweighs understanding, and if we press our inquiry as far as the uptake and utilization of glucose by the cell mystery enwraps us. As to the metabolism of proteins, the situation is even less accurately defined: we know that growth requires an increased amount of protein, and we can measure

¹ Gilbert, A., and Lereboullet, P., *Sem. méd. (Paris)*, 1901, **21**, 241.

² Meulengracht, E., *Quart. J. Med.*, 1947, **16**, 83.

³ Krarup, N. B., and Roholm, K., *Klin. Wschr.*, 1941, **20**, 193.

⁴ Crigler, J. F., Jr., and Najjar, V. A., *Pediatrics*, 1952, **10**, 169.

⁵ Schmid, R., et al., *J. clin. Invest.*, 1957, **36**, 927.

⁶ Arias, I. M., and London, I. M., *Science*, 1957, **126**, 563.

⁷ Arias, I. M., and London, I. M., *Biochem. J.*, 1957, **67**, 9.

⁸ Lathé, G. H., and Walker, M., *Biochem. J.*, 1957, **17**, 1485.

⁹ Peterson, R. E., and Schmid, R., *J. clin. Endocr.*, 1957, **17**, 1485.

¹⁰ Axelrod, J., Schmid, R., and Hammaker, L., *Nature (Lond.)*, 1957, **180**, 1426.

¹¹ Barniville, H. T., and Misk, R., 1958, in preparation.

¹² Isselbacher, K. J., 1958, personal communication.

¹³ Dubin, I. N., and Johnson, F. B., *Medicine (Baltimore)*, 1954, **33**, 155.

¹⁴ Sprinz, H., and Nelson, R. S., *Ann. intern. Med.*, 1954, **41**, 952.

¹⁵ Dubin, I. N., *Amer. J. Med.*, 1958, **24**, 268.

this by the amount of nitrogen retained in the body. We know, too, that in certain catabolic states—accident, operation, inflammation, and neoplasm—an increased amount of protein is broken down and utilized in unusual ways, by gluconeogenesis, for example, and we can in these conditions measure the increased loss of nitrogen from the body. When the body enters the stage of protein repair, then nitrogen is retained in excess until complete restitution occurs. Hormonal agencies such as the protein anabolizers, growth hormone, and the androgens control the build-up of protein. Cortisol is recognized as the main protein katabolizer, and in his Burns lecture D. Hubble² attempted the construction of a hormonal formula for the metabolism of protein. Although the balance may be tipped in either direction in disease states, yet we have to assume that the body each hour in each day maintains its predestined balance between protein building and protein breakdown, and no one would wish lightly to interfere with it.

In many disease states, however, there is great protein loss, and the need for increased protein anabolism is often seen. In recovery from acute illness,³ from operations,⁴ from accidents,⁵ and from severe burns⁶ it is rational therapy to encourage as rapid a protein build-up as can be obtained. Since the growth hormone is not available for protein anabolism in man, testosterone in some form can be employed for this purpose. This has the disadvantage, when used in women and children, of a strongly virilizing action, and effective alternative preparations with a much weaker androgenic action than testosterone have been long awaited. The synthesis of the 19-nortestosterone group ("nilevar" and "durabolin") is a step towards meeting this need, for the protein-anabolizing effect of these compounds is equal to that of testosterone and the virilizing effect is said to be slight. It has, however, been stated recently that these new compounds definitely cause virilism,^{7,8} though they are markedly less androgenic than testosterone. When, therefore, they are used for long periods in women and children such undesirable consequences must be carefully looked for. Methyl testosterone has for many years been available for use as a stimulus to protein anabolism in men, and it is salutary to remember, while welcoming the new and

expensive remedies, how little it has in fact been used in supportive therapy.

Fuller Albright⁹ first described the anti-anabolic action of the glucocorticoids on protein metabolism—an action which produces some of the most characteristic of the symptoms of Cushing's syndrome—and suggested the use of testosterone in therapy. There are to-day much more effective treatments for this disease, but if for any reason surgery is contra-indicated and x-ray therapy fails then the new protein anabolizers should be used. With long-continued therapy by cortisol or any of its associated compounds in moderate or high dosage it is rational—particularly in children to assist growth and in post-menopausal women to prevent osteoporosis—to use the 19-nor-testosterone derivatives. There are other indications for the use of the protein-anabolizers. Since we have no growth hormone for therapeutic use, these new remedies should be valuable in hypopituitary dwarfism and might also be tested in other forms of dwarfism.¹⁰ Stimulation of growth by testosterone has to be undertaken with great care because of its androgenic effect, but this hormone has been used with some success in the treatment of carcinoma of the breast with dissemination to bones. This good effect has been attributed to a consequent change in the hormonal environment of the cancer, possibly resulting in some depression of oestrogen action by testosterone. If this is so, no good result would be expected from the use of 19-nor-testosterone in this disease, and the manufacturers of Nilevar, while recommending its use in carcinomatosis as a stimulant to protein metabolism, expressly disclaim for it any specific action on bone metastases. In another common disorder, osteoporosis in women, oestrogens have been shown to be effective in treatment¹¹; methyl testosterone has also been used as an additional therapy in small doses and in interrupted courses. If, for any reason, it is necessary to supplement the action of oestrogens, then 19-nor-testosterone should be used.

The therapeutic indications for these new protein anabolizers are, then, in stimulation of growth in the dwarfed of both sexes, in aiding the recovery of women and children from any illness in which there has been severe protein loss, whether acute or chronic, and in protecting the skeleton against the harmful action of the glucocorticoids. The cost of one week's treatment by Nilevar may be from £3 to £5 (more than seven times as expensive as the equivalent treatment by methyl testosterone), and an expenditure of this sort, especially if long continued, may be thought justifiable only when an express need for the treatment is apparent.

THE NATURE OF PENICILLIN SENSITIVITY

Reactions to penicillin may be of two kinds. In one, skin manifestations predominate, whether the reaction is due to contact or to parenteral injection: they are of urticarial type and, if extensive, are accompanied by fever. The second and more dangerous kind of reaction is immediate shock, which if not immediately treated may be fatal within a few minutes. The fact that sensitivity can manifest itself in two quite different ways requires explanation, and emphasizes the importance of understanding the basis of these states. A test for sensitivity may sometimes be desirable, and various methods have been used. S. Swift¹ suggests a scratch test, followed by intradermal injection if the former is negative. He describes two kinds of reaction, an immediate one denoting the anaphylactic type of sensitivity, and a delayed reaction seen in patients with sensitivity of the urticarial or "serum sickness" type. Not every one has had such consistent results, and several authors complain that patients who have exhibited sensitivity fail to react to such tests. O. Idsøe and P.-N. Wang,² reporting on reactions to penicillin in Taiwan (Formosa), give the results of skin tests for sensitivity performed on 48 of 106 patients in whom reactions occurred to the subsequent injection: these tests had been negative in all patients developing severe or even fatal shock, and positive only in a proportion of those with milder shock or urticaria. On the other hand, there is the opposite difficulty of an unduly violent reaction to a test. P. S. Mayer and his colleagues³ caused shock with a test dose of only 10 units.

According to Swift, sensitivity is passively transferable, which would signify the formation of an antibody, and, since penicillin while in the blood stream is to some extent bound to plasma albumin, it has been supposed to function as a haptene. If indeed antibody formation is the basis of sensitivity, the antibody should be demonstrable. Two recent papers make the claim that this has been achieved. R. J. Muelling and colleagues⁴ have carried out an investigation on 100 patients who had exhibited sensitivity either to penicillin or to one of several other antibiotics. They tested for antibodies in the serum of these patients by the method of diffusion in a gel, the serum being incorporated in agar at the bottom of a tube and covered with a layer of agar separating it from a solution of the antibiotic: lines of precipitation appearing in the intervening layer indicate the presence of antibody. Of 71 sera from patients suspected of penicillin sensitivity, 34 gave positive results. A few positive results were also obtained with several other antibiotics, including even tetracyclines, to which sensitivity is reputed to be very rare. There are some strange features in these findings, notably the long delay which seems sometimes to have occurred before a precipitate appeared (it is said to be advisable to continue the test for 21 days) and the occurrence of double bands when in fact the antigen is a single one.

Nevertheless other workers will doubtless wish to explore this method of detecting antibody.

The other observation, reported by Allyn B. Ley and her colleagues,⁵ of New York, is more positive and immediately significant. It arose from a chance finding. The serum of a patient requiring transfusion was found to agglutinate every suspension of red cells to which it was added. These had been preserved with penicillin. Fresh cells from the same individuals were unaffected, and, on the other hand, cells of any blood group to which penicillin had been added became agglutinable by this serum. The examination of about 2,000 further sera revealed 25 more possessing this property. All the people from whom they were obtained had at some time been treated with penicillin, but "only a minority" had exhibited penicillin sensitivity. To sensitize cells to the antibody in these sera they had to be suspended in rather high concentrations of penicillin: a 25% cell suspension required 3,000 units per ml. for 24 hours or higher concentrations for a shorter period. Admixture with concentrations of the same order deprived serum of the capacity to agglutinate sensitized cells, presumably owing to binding of the antibody. It was also found possible to elute the antibody from agglutinated cell suspensions by heating to 54° C. The clinical significance of this antibody remains to be determined, but its discovery provides another test which should certainly be applied in cases of clinical sensitivity, and may well stimulate a search for other methods of detecting the changes on which sensitivity depends.

PEPTIC ULCER AND SECRETOR STATUS

That the occurrence of peptic ulcer is associated with blood group O is now well established. Results obtained from over 12,000 patients with peptic ulcer indicate that the risk of duodenal ulcer is about 38% more and the risk of gastric ulcer about 19% more for subjects with blood group O than for other subjects.¹ While the increased risk is, thus, not great, it has been observed in eight countries, and it is difficult to believe that the association could be an artifact due to the existence of strains within each national population who were both high in group O and particularly susceptible to peptic ulceration. In fact, the blood group antigens (group substances A, B, and H in persons of blood groups A, B, and O respectively) are mucopolysaccharides and form an important proportion of the mucins normally secreted in the gastro-intestinal tract, so that it would be reasonable to suppose that the association between blood group and disease was a direct result of a difference in the local physiological effects of the different substances. Not all persons, however, secrete the ABH substances, and if this hypothesis were true it might be supposed that non-secretors would be more susceptible to the disease than secretors. Moreover, in these circumstances, it would be expected that a

¹ Long, C. N. H., *Lancet*, 1952, 1, 325.

² Hubble, D., *ibid.*, 1957, 2, 301.

³ Best, C. H., and Taylor, N. B., *The Physiological Basis of Medical Practice*, 1955, London.

⁴ Beal, J. M., Cornell, G. N., and Gilder, H., *Surgery*, 1954, 36, 468.

⁵ Cuthbertson, D. P., *Brit. med. Bull.*, 1954, 10, 33.

⁶ Howard, J. M., *Amer. J. clin. Nutr.*, 1955, 3, 456.

⁷ Prunty, F. T. G., Brooks, R. V., Clayton, B. E., and McSwiney, R. R., *Proc. roy. Soc. Med.*, 1958, 51, 557.

⁸ Martin, M. M., and Wilkins, L., *J. clin. Endocr.*, 1958, 18, 679.

⁹ Albright, F., *Harvey Lect.*, 1942-43, 38, 123.

¹⁰ *Brit. med. J.*, 1957, 2, 870.

¹¹ Henneman, P. H., and Wallach, S., *Arch. Int. Med.*, 1957, 100, 715.

¹ Swift, S., *Lancet*, 1954, 2, 602.

² Idsøe, O., and Wang, P.-N., *Bull. Wld Hlth Org.*, 1958, 18, 323.

³ Mayer, P. S., et al., *J. Amer. med. Ass.*, 1953, 151, 351.

⁴ Muelling, R. J., et al., *Amer. J. clin. Path.*, 1958, 20, 503.

⁵ Ley, A. B., et al., *Science*, 1958, 127, 1118.

¹ Roberts, J. A. F., *Brit. J. prev. soc. Med.*, 1957, 11, 107.

² Clarke, C. A., Edwards, J. W., Haddock, D. R. W., Howell-Evans, A. W., McConnell, R. B., and Sheppard, P. M., *Brit. med. J.*, 1956, 2, 725.

³ McConnell, R. B., and Sheppard, P. M., *Acta genet. (Basel)*, 1956, 6, 574.

⁴ Wallace, J., Brown, D. A. P., Cook, I. A., and Melrose, A. G., *Scot. med. J.*, 1958, 3, 105.

difference in the susceptibility of persons of different groups would be found only among those whose gastro-intestinal mucus contained some of the relevant group substance. These possibilities were first investigated by Clarke and his co-workers at Liverpool,^{2,3} and, as was expected, the proportion of non-secretors among duodenal ulcer patients was found to be greater than among a control group of healthy subjects (35.0% against 24.2%). But, contrary to expectation, the proportion of group O subjects was found to be just as great among the non-secretors with ulcer as among the secretors. This result has now been confirmed by J. Wallace and colleagues.⁴ Among 181 subjects with duodenal ulcer belonging to blood groups A, B, and AB the proportion of non-secretors was 37.0%, against 23.5% among a control group of patients with non-gastro-intestinal disease, whereas among group O subjects the proportions were 39.5% and 28.7%. It seems, therefore, that the greater susceptibility of group O subjects is independent of the presence of the H antigen in the mucous secretions, and the association between blood group and disease can hardly be regarded as due to a direct local effect. Further evidence that this is not the explanation is provided by the data on the distribution of blood groups within ulcer families. C. A. Clarke and R. B. McConnell's most recent data were reported at the symposium on medical research, Wisconsin University, on April 7-10 last. They have now studied nearly 400 duodenal ulcer sibships, and, though these show some slight predominance of group O subjects and of non-secretors among the ulcer patients in comparison with their healthy sibs, the excesses are very slight. These workers have therefore felt obliged to suggest that a maternal factor might be involved, and that mothers who are group O may be more likely to produce children who will develop a duodenal ulcer than mothers belonging to any one of the other groups.

Obscure though the explanation now is, the recent data on secretor status provide the most encouraging clue to the aetiology of peptic ulcer that has been obtained for many years. Taken in conjunction with the data on distribution of blood groups, they point to a factor of considerable importance. For it can be shown that the risk of developing the disease among non-secretors who belong to group O is nearly 2.5 times as great as among men whose mucous secretions contain the A or B antigens, and, according to Wallace and his co-workers, the relative risk of developing an ulcer severe enough to warrant operation may be even higher.

THE JOHN CURTIN SCHOOL

In March the permanent building of the John Curtin School of Medical Research was officially opened. The school, situated in Canberra, is the fourth of the Australian National University's research schools, the others being those for the physical sciences, the social sciences, and for Pacific studies.¹ Founded in 1946, the National University is Australia's answer to the old

complaint that so many of her ablest scientists are lost to universities and research centres abroad, a complaint that was perhaps particularly justified in the case of medical scientists. Other Australian scientists had the many fine laboratories of the Commonwealth Scientific and Industrial Research Organization, whereas the only native medical research centre with an assured international reputation was in those days the relatively small Walter and Eliza Hall Institute in Melbourne. The opportunities for the new school, under its dean, Professor A. H. Ennor, are thus great.

Appropriately it was Sir Howard Florey who performed the opening ceremony, in the presence of a distinguished company which included the Prime Minister of Australia, for it was Sir Howard's recommendations to the Government of the day that supplied the critical stimulus for the school's birth. In 1944, in a report to the Commonwealth Government, he recommended the setting up on Australian soil of a national institute for advanced medical sciences, and the John Curtin School is the direct result of this suggestion. Later, when his proposal had become accepted policy, Sir Howard Florey guided the school's development. In 1948, when the first professor was appointed, it had no laboratories of its own and its various departments therefore began by being housed in accommodation generously lent by other institutions—the department of biochemistry at the Commonwealth Serum Laboratories, Melbourne; the department of medical chemistry at the Wellcome Research Institution in London; the department of microbiology at the Walter and Eliza Hall Institute; the department of experimental pathology in Sir Howard Florey's laboratories in Oxford; and the department of physiology at Otago University. By 1951 temporary laboratories were ready in Canberra, and the departments were set up there until their move last year to their permanent home. At present the total research staff is about 40 and there are some 20 Ph.D. students, but the school is still in the process of growth, both in the sense that over the next few years several new departments are projected and in the sense that each department has yet to reach its own maturity. The new building provides first-rate facilities for research in a wide range of the medical sciences, and already the John Curtin School has earned itself a name known throughout the world.

BLACK PATCH DELIRIUM

Mental illness occasionally follows a surgical operation, just as it may follow childbirth, often after a short interval, and the symptoms may be those of mania, depression, or a schizophrenic state.¹ More rarely the mental symptoms are those of a confusional state, and may come on immediately, particularly in the elderly and arteriosclerotic. Since operations for cataract are performed predominantly on elderly patients, it is not surprising that "cataract delirium" or "black patch

¹ Stengel, E., Zeitlyn, B. B., and Rayner, E. H., *J. ment. Sci.*, 1958, 104, 389.
² Solomon, P., Leiderman, P. M., Mendelson, J., and Wexler, D., *Amer. J. Psychiat.*, 1957, 114, 357.
³ Weisman, A. D., and Hackett, T. P., *New Engl. J. Med.*, 1958, 258, 1284.

delirium" should be well known to ophthalmologists. It appears to be due to the fact that both eyes are bandaged after operation. The temporary total blindness leads to disorientation, with restlessness, suspicion, and anxiety as its commonest signs. This is reminiscent of the temporary mental disorders that have been induced in volunteers by keeping them in darkened, sound-proofed rooms, their limbs completely covered, so that sensory stimulation was minimal.² But in the patients submitted to surgical treatment of the eyes the confusional state is more easily produced, perhaps because of a degree of concomitant deafness or dementia. A. D. Weisman and T. P. Hackett³ have reported cases in which the risk of a confusional state was averted by brief psychotherapy before operation. The psychiatrist endeavoured with each patient to establish himself as a recognizable individual in a recognized place, and used not only talk, but the scent of flowers, touch, and taste, to get into a warm relationship with the patient. He reappeared after the operation to remind the patient of orientation in space and time, and to reassure him on the successful outcome of treatment.

CONTRACTUAL VALIDITY OF SPENS

The Secretary of State for Scotland has refused to join with the B.M.A. in testing the contractual validity of Spens under Scottish law. The legal procedure in which the Minister had been asked to join with the B.M.A. was that of presenting a special case to the Court of Session. A special case is a device, peculiar to Scottish law, which enables parties amicably to agree to put their differences of opinion to the Court for an objective decision. The procedure was one which appeared particularly apt for settling, so far as doctors in Scotland were concerned, in an atmosphere of good will far removed from that of the usual type of contentious litigation, the divergence of views between the profession and the Government on the proper interpretation of the Spens Committee's recommendations. And the Chairman of Council's announcement¹ to the Representative Meeting at Birmingham that the Minister had been asked to participate was received with enthusiasm. The Secretary of State's refusal, as reported in this week's *Supplement*, can be only interpreted as another example of the Government's distaste for any calm and objective discussion of the Spens Reports.

IN NEED OF HELP

The generosity of individual doctors has enabled the Royal Medical Benevolent Fund to grow over the years, but, as its latest report says, "the necessity has also but, as its latest report says, 'the necessity has also grown appallingly.'" Expenditure last year is witness to this: it was £51,194, leaving a surplus of only £132. Many cases of desperate need among doctors and their families are beyond the reach of State or other aid, and here the R.M.B.F. is indispensable to relieve their distress. A new venture is the purchase of a house in Putney for conversion to five self-contained flats to accommodate indigent doctors.

¹ *Brit. med. J., Supplement*, 1958, 2, 80.

All doctors are urged to contribute what they can to help their unfortunate colleagues through this charity. By signing a seven-year covenant the Fund's income can be substantially increased without further cost to the subscriber, and there are also other ways in which the Fund and its ally, the Ladies' Guild, can be helped; full details of them can be obtained from the Secretary of the Fund at 1, Balliol House, Manor Fields, Putney, London, S.W.15.

ANNUAL CLINICAL MEETING AT SOUTHAMPTON

In the *Supplement* this week we print the programme of the Clinical Meeting which is being held in Southampton from December 4 to 7. This will be the first Annual Clinical Meeting to be held following the approval by Council of the Organization Committee's proposal¹ that a second scientific meeting should be held each year in addition to the Annual Meeting. The variety of the subjects chosen for the panel discussions and general sessions can be seen from the programme, and anyone who attends all the meetings and some of the clinical demonstrations will have had a concentrated refresher course presented in the most agreeable way possible. Not only will there be easy ways to learning through colour television and film shows, but during the afternoon of Friday, December 5, the American Medical Association's winter meeting in Minneapolis will be linked by telephone with the B.M.A.'s meeting in Southampton for the purpose of a transatlantic clinical conference: this novel event will no doubt have its entertaining as well as instructional aspects. Perhaps before Southampton welcomes an Annual Clinical Meeting for the second time transatlantic conferences may be linked by vision as well as sound. The local organizers of the meeting under the chairmanship of Dr. R. S. Russell-Smith have arranged what should prove to be an excellent clinical meeting, and on the social side too there will be much to enjoy in a short time. In every way it seems that Southampton is setting an admirable example to other towns which may be the venue of future Annual Clinical Meetings.

Members of the British and Canadian Medical Associations will receive with regret the news in this week's *Supplement* that their President-Elect, the Duke of Edinburgh, will be unable to be present at the Joint Annual Meeting of the two Associations in Edinburgh in July, 1959, since he will be with the Queen in Canada for the whole of that month.

Sir Arthur Porritt has agreed to act as chairman of the committee to review the medical services which is being set up under the joint sponsorship of the Royal Colleges, the Scottish Royal Medical Corporations, the British Medical Association, the College of General Practitioners, and the Society of Medical Officers of Health.

¹ *Brit. med. J.*, 1958, 1, 1171.

¹ *Med. J. Aust.*, 1958, 1, 677.

A SURVEY OF 100 CONSECUTIVE CHILDREN AWAITING ADMISSION TO A MENTAL DEFICIENCY HOSPITAL

BY

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Owing to the acute shortage of beds in mental deficiency hospitals, the problems connected with long waiting-lists are becoming more serious. Parents may have to wait several years before they are offered a place for their child. The Fountain Hospital, of 600 beds, usually admits children under 5 years; in theory they should be transferred in early adolescence to other mental deficiency hospitals, but, owing to the limited provision for adult low-grade defectives, the number of transfers is small. A few children improve enough to be accepted for educationally subnormal schools or schools for the handicapped, etc. (Kirman, 1958; Craib and Woodward, 1958). Vacancies also occur when children go home on licence, die, or move to other branches of this hospital. The area covered by this survey included south-east London, south-west London, and Surrey, thus presenting the problems of both town and country.

The aim of the survey was to assess the social and psychological problems associated with young defectives awaiting admission. Statutory supervision is carried out by the local authority while the defective child remains at home, and the present practice is generally for the home to be visited by the hospital social worker when a vacancy is being considered. Out-patient appointments are made when the parents particularly request this.

Method

The Fountain Hospital is situated within the London area, and in 1948 the administration was taken over by the South-West Metropolitan Regional Hospital Board. Owing to the need for these children to be visited regularly and the demand for beds for young defective children, arrangements were made to admit children from the London administrative areas outside the jurisdiction of the regional board. Vacancies are allocated between the areas, and additional vacancies are credited to the individual regional hospital boards which arrange transfers to adult hospitals for patients becoming too old to remain in this hospital. Of those still awaiting a vacancy there are over three times as many from one area as from the others. In our visiting, therefore, it was not surprising that many of the most urgent cases were found in this one area.

The survey deals with 100 consecutive names on the hospital waiting-list. The period covered was from September, 1955, to May, 1957. A combined visit was paid to the home by the social worker and psychologist, after making a written appointment. In the present inquiry this visit was made much earlier than usual. The ordinary hospital pre-admission form was completed by the social worker with the mother. This form is designed to obtain medico-social information about the child's early history together with his physical development, any previous hospital treatment, and the family circumstances. The precipitating factors which led the parents to ask for admission were noted and the psychologist tested the child and discussed his early development and present abilities with the mother.

Material

At the time of writing 50 of the 100 children no longer required a vacancy at this hospital: 12 had died, 21 had

been admitted to other M.D. hospitals, 8 were no longer considered mentally deficient, 5 were able to stay at home, and in 4 cases the parents had moved from the catchment area. Of the remaining 50, 39 were still waiting admission and 11 had been admitted or offered a vacancy.

In 64 cases the reasons the child needed hospital care were discussed with the parent or guardian. These 64 cases included the 50 still on the waiting-list or admitted, plus 14 who later had their names withdrawn for reasons such as death or admission to other hospitals. In each case the main precipitating factor was assessed as well as any additional factors; these are given in Table I. Some of these factors need further amplification.

Factors Precipitating Request for Admission

	Main	Additional
(1) Physical care of the defective had become too much for the mother	18	7
(2) Parents wanted the defective's name retained on the waiting-list for the future	13	0
(3) Defective in the care of the children's officer	7	0
(4) Parents concern over the adverse effect on their other children	6	13
(5) Hospital care considered necessary for defective or the child removed at birth	5	10
(6) Parents abroad	4	0
(7) Family illness or birth of a further child	3	6
(8) Defective's behaviour was disturbed or destructive	3	1
(9) Marital disharmony	3	1
(10) Housing difficulties	1	8
(11) Parents considered that the defective needed hospital training	1	0

(1) In most cases it appears that it is the physical strain of looking after the child that precipitates a request for admission. Some of these children are heavy and helpless, and the strain on the mother becomes too much. When temporary care can be arranged (up to a maximum of eight weeks), this sometimes enables the mother to keep the child at home. For many mothers in this group there is the added emotional strain of having a severely handicapped child; the extent of this could not be assessed in a single interview.

(2) A number of parents realized that they would not always be able to care for the defective at home, and some felt the security of having the child's name retained on the waiting-list in case an emergency arose.

(3) Seven of the children have no home, are illegitimate, or have been abandoned. Whilst awaiting admission these children are placed in a nursery or foster home by a children's officer.

(4) For many normal children a defective sibling is an embarrassment and a tie, and the mothers cannot give them as much time and attention as they need. Although the main precipitating factor is rarely the welfare of other children, nearly a third of the parents were considering their needs when asking for admission.

(5) Some of the most tragic families are those where the parents, having been told soon after birth that the child is mentally deficient, are then strongly advised to apply for immediate hospital care. In three cases the child was separated from the parents when 2 weeks old and was then transferred to a private nursery while waiting for a hospital vacancy. The hydrocephalic child and the mongol child are particularly prone to such circumstances. The hydrocephalic child may need more medical and nursing care than can be given at home, but the baby mongol presents no nursing problem in normal circumstances. In the families in this group where the mongol baby has been separated at 2 weeks, serious emotional difficulties in the parents have arisen. Some parents who were unable to afford a private nursery have later expressed their thankfulness at having given their child a period of home care during his early life. Only a small proportion of parents felt it was "right" for their child to be away from them. From the point of view of the child's emotional needs, a hospital for mental defectives is no adequate substitute for the individual care given by a mother.

The remaining precipitating factors are self-explanatory; it will be noted that housing difficulties hold a relatively low position, although they appear to be an important subsidiary factor.

Psychological Tests

This survey was planned so that the children could be tested by a psychologist before they were admitted to a mental deficiency hospital, enabling them to be seen in their homes with their mother present. This was found to be helpful, as the mother was often able to describe the young child's achievements very accurately. However, directly speech was used to any considerable degree in testing, mothers found it difficult not to encourage the child, rephrase the question, or give the answers. From the mother's point of view, she could discuss the child's abilities on a developmental type of test with interest and very little guilt, but directly the child was asked to do specific items or to name objects, several mothers made remarks such as, "I haven't been able to teach him that yet," or, "Should I have done that with him?" or a more defensive and aggressive reaction was given such as, "Well, he couldn't do that because he's never played with things like that before." This last was said referring to test material which is usually new to a child.

Some of the mothers of mongols and gross idiots were very pleased to have their child tested; mothers of these children with rather obvious defects sometimes felt that in children with rather obvious defects sometimes felt that insufficient time had been spent examining the child's abilities. Before this survey was carried out it was not appreciated how helpful a test can be to a mother in recognizing for herself the approximate level her child has reached and in realizing that, although his development is slow, it is progressing along the same lines as that of other children.

In spite of the advantages of testing in the home, it seems preferable that the parents should visit the hospital, bringing the child as an out-patient, and that testing should be carried out by a psychologist then, leaving the social worker to visit the home alone. With a small group of children who show disturbed behaviour, however, it might be very valuable to see them in their own homes, as their behaviour sometimes appears to change markedly on admission.

The testing was carried out to find the I.Q. scatter in 100 children awaiting admission and to investigate any who might later be considered educable. But, for the reasons already given, testing of the whole 100 was found to be impossible, so that the children described are the 50 remaining on the waiting-list or already admitted.

The children were tested with the Griffiths mental development scale and/or the Vineland social maturity scale, except for one mongol of 7 who was given a Terman - Merrill revision of the Stanford-Binet test, Form L. Where two tests were given the scores were averaged. This is of course not standard practice, but was suitable for the purpose of this survey. The results are given in the Chart.

The average I.Q. of this group was 25, with a range from 2 to 84. All the children with I.Q.s over 50 were mongols. The average age of all the children on June 30, 1957, was 2.9, with a range from 3 months to 7 years. It was found that these children divided naturally into four groups—mongols, other imbeciles, idiots, and a group of children who showed severe behaviour disturb-

ances and were consequently very difficult to assess accurately. In the whole group there were over three times as many boys as girls, the numbers being 38 boys and 12 girls. The ratio between boys and girls in each group was two to one for mongols and imbeciles, four to one for idiots, and eight to one for disturbed children. With such small numbers the high ratio for disturbed children can only be suggestive; the other ratios are similar to those usually found. The I.Q.s, I.Q. range, average ages, and age ranges of the various groups are given in Table II.

TABLE II.—I.Q. and Age of Four Groups of Children Awaiting Admission

Group	No.	I.Q.		Age in Years	
		Average	Range	Average	Range
Disturbed	9	31	17-49	4.25	2.42-5.67
Idiots	20	7	2-16	2.75	1-5.08
Imbeciles	9	30	25-40	2.83	1.75-4.5
Mongols	12	45	13-84	2.33	0.25-7
Total	50	25	2-84	2.92	0.25-7

Of the 50 children tested in this group 12 were mongols, 20 were low-grade idiots, and 9 were imbeciles. These groups showed no marked behaviour problems; however, the nine remaining children showed severe emotional symptoms. The behaviour of these disturbed children might be due to brain damage, psychosis, emotional disturbance, or deafness, or any combination of these. They appeared to be physically fairly normal, although a little undersized. Their behaviour was characterized by restlessness, mannerisms, screaming attacks, perseveration, and avoidance of contact with people, although they sometimes made contact with their parents. The histories of these nine children were investigated, and in three cases there had been a disturbed background, early separation, or neglect, but in the other six there was no obvious explanation; the child had been at home with apparently well-adjusted parents and had normal siblings. It was decided to assess the backgrounds of the remaining children. Each child was considered in alphabetical order and put into one of two groups: those who had been separated from their mother for over three months, who had been abandoned, or whose parents showed signs of neurosis were described as having an abnormal background, while those who had spent all their lives in a stable home were described as having a normal background. The results are given in Table III. It will be seen that the homes of the disturbed children are no less stable than the others.

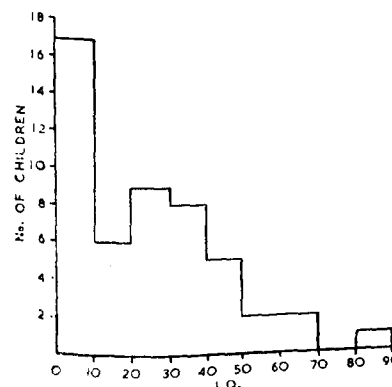
TABLE III.—Number of Children Coming from Normal and Abnormal Homes in Each Group

Group	No.	Normal Home	Abnormal Home
Disturbed	9	6	3
Idiots	20	13	7
Imbeciles	9	4	5
Mongols	12	6	6
Total	50	29	21

Discussion

It is realized that this division into "normal" and "abnormal" is rather arbitrary, that there may be hidden factors which have been overlooked, and that in some cases the child's original deficiency may have caused the abandonment, long hospitalization, etc.; however, nearly half the children in this group have had enough in their upbringing to justify disturbance, and the disturbed children's background does not appear to differ from the others. This was contrary to what was expected, and might be due to the smallness of the numbers, or the disturbed behaviour being caused by other than environmental factors. This does not detract from the possibility of individual children functioning on a defective level for no other reasons than emotional ones.

The high incidence of children with disturbed backgrounds is due to this group being selected because, for the various



I.Q. scatter of children awaiting admission to a mental deficiency hospital.

reasons given above, their parents felt it best for them to come into hospital care. However, nearly all the parents seen wished strongly that they could have managed to keep their child at home.

The further study of differences between behaviour at home and behaviour in a new environment such as a hospital may prove of use in distinguishing the components of this probably mixed group who show disturbed behaviour.

The earlier home visit was found to be useful for several reasons. Firstly, to give the parents the opportunity of discussing their individual anxieties about the hospital with the hospital social worker. These anxieties are very varied, and include advice on allowance, delays in admission, emergency provisions, visiting arrangements, sick-notice procedure, availability of medical advice, legal implications, clothing, and provision of toys, as well as the child's future placement. In some cases the parents are not sure whether they want a vacancy, and wish to discuss this with the hospital social worker in order to clarify their ideas on hospital care.

Secondly, the visit was useful to correct any serious misunderstanding regarding the child and his hospital treatment. As patients naturally wish their child to be "cured" and some hope for curative treatment, it is necessary to explain to them that, although research is being carried out, as yet it is unwise to expect any cure. It is important to correct misconceptions such as that mongols usually die at 5 years of age and that the children are kept permanently in bed. Before visiting the hospital the parents may not realize the essential differences between this hospital and one for general medical treatment. With increasing awareness of mental deficiency in society, it is now rare for the parents to confuse mental illness with mental deficiency, but when this occurs it is important to clarify the position before the child is admitted.

Thirdly, at this home visit an out-patient appointment can be suggested, and this provides an opportunity for the parents to consult a specialist and see the hospital, and for the child to have a pre-admission assessment by a psychologist. This psychological test is useful as an early record and for research purposes. It also affords an opportunity for eliminating educable children from the waiting-list; it has been found that they are more likely to succeed if they go straight to school instead of having to adjust to an initial period of hospital care.

Lastly, an earlier visit is useful in making known the specialized services and experience of the hospital. These include arranging friendly contact between parents of waiting-list children and parents of those already admitted, and giving general advice on training and feeding when requested. Some of the parents felt that their normal home care for the child might be inadequate; one parent was very worried because, despite the fact that her child had a good set of teeth, she could not teach him to chew, not realizing that this was quite usual. Most of the parents were aware of the provision of temporary care, but wanted to know exact details from someone working in the hospital.

There was a discrepancy from area to area in the ways in which parents had been helped. Where statutory supervision is carried out by trained social workers the parents appeared to be more adequately informed of the implications of hospital care. Nevertheless there was still a need for a direct personal contact between the hospital and the parents. This would almost certainly lead to closer co-operation in future years.

In spite of the advantages of an earlier visit a difficulty is presented by the fact that out of the 100 consecutive cases 50 were withdrawn for various reasons. Nevertheless it is considered that the earlier visit would help the parents to adjust to the various problems relating to having a defective child. Likewise, the pre-admission testing by a psychologist would be found most valuable, not only in assessing the child's abilities but also in observing his behaviour in relation to his parents.

Summary

One hundred consecutive cases awaiting admission to a mental deficiency hospital for children were investigated. Joint home visits by a social worker and psychologist were paid to find the factors precipitating the request for admission, to test the child's intelligence, and to assess the usefulness of an earlier home visit by the social worker. In spite of the extra time involved, the value of an earlier visit was thought to be considerable. The children were found to divide into four categories, their I.Q.'s and age ranges are given, and a review was made of their home background. Out-patient visits to the hospital for examination and psychological testing are recommended, with home testing only in special circumstances.

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ISRAEL MEDICAL ASSOCIATION

FOURTH WORLD ASSEMBLY

[FROM A SPECIAL CORRESPONDENT]

The Israel Medical Association held its fourth world assembly at Tel Aviv from August 12 to 24, under the chairmanship of Dr. J. BICKELS. Great Britain was represented by Dr. E. E. LIEBER. The inaugural ceremony was attended by both the Prime Minister of Israel and the Minister of Health. Dr. S. WAND, Chairman of Council of the B.M.A., attended the last two days of the meeting, and was made an honorary member of the Assembly.

Professor Zondek's Address

Welcoming the overseas delegates, Professor HERMAN ZONDEK said that, though they might see in Israel problems and disease entities bearing the stamp of local climatic, nutritional, and social conditions, it would be absurd to speak of a national or specifically Jewish medicine. There was, however, an intimate connexion between the teaching of Judaism and the ethical aspects of medicine. The *Old Testament* message, Man is made in the image of God, imposed for the first time the moral obligation to respect the sanctity of life, a postulate that formed the ethical foundation of their profession. In the spirit of this tradition Jews had always shown a marked affinity to medicine, and for centuries this attitude had been instrumental in leading a disproportionately great number of Jews to the study of the natural sciences and to the medical profession.

Professor Zondek then turned to the scientific aspects of medicine. What had been their contribution to the philosophy underlying the profession of medicine? Not so long ago scientific thought had been largely dominated by the mechanistic doctrine of causality, reflected in such trends as rationalism, materialism, Darwinism, naturalism, and so on, until the human organism had been converted into a soulless machine. However, deeper insight into the workings of Nature had given a new direction to natural philosophical thought. In their lifetimes they had been privileged to witness the enormous strides made by the physical sciences, and not least by medicine; and yet they had not come a single step nearer to solving the essential riddle of life. Some examples from his own field of research would illustrate what he meant. "When I was a young assistant at the Charité in Berlin, nearly fifty years ago," said Professor Zondek, "the question cropped up whether the ganglia of the heart were responsible for the movement of the heart muscle or whether the latter possessed an inherent capacity for its activity as advocated by Ludwig and my teacher His. I still remember the crucial experiment which, at the time, roused much comment. A small piece of embryonic chicken

part, certainly devoid of nerve substance, was put into a test-tube and suspended in Carrel's solution. After a while it began to contract in the rhythm of the normal heart beat." The cause of the alternating contraction and relaxation which the heart relentlessly keeps up for decades was thus inherent in the heart muscle. Yet the eternal question stood, Why does a piece of tissue spontaneously start functioning at a given moment to stop without apparent cause?

The physician of our time, no matter to which school of thought he might adhere, was called upon to take a greater part in public life than hitherto. Humanity in our time was sick, suffering from numerous endogenous ailments—moral, political, and economic threats to its very existence—the most dangerous of which was the unchaining of atomic power. Humanity would no more get rid of that great threat. It seemed easy to die with the atomic bomb, but how should one live with it? Medicine was at a loss to devise a remedy, but doctors could contribute by an educational effort to increase respect and reverence for the miracle and sanctity of organic life.

Selected Scientific Papers

The second day was devoted to various papers on health progress in Israel. Despite the immense difficulties, during the 10 years of its existence the State of Israel has achieved remarkable results in the various fields of health, which are reflected in the country's vital statistics. The birth rate is high (28) but the death rate low (6.3); infant mortality at 32 is only a fraction of that in most countries in the Middle East; life expectancy (68) is comparable with that in the U.S.A. (72), and the mortality rate from tuberculosis (7.1) is the second lowest in the world.

There was a symposium on blood diseases. Dr. Y. MATOTH said a high incidence of thalassaemia had been found among Jews from Kurdistan. Over a five-year period 80 new cases of thalassaemia had been diagnosed among Kurdish children and adults in the Jerusalem area, including 11 new cases of thalassaemia major, the homozygous state. The frequency of thalassaemia in this Kurdish population had been calculated as 0.0663 for the homozygous state and 0.123 for the heterozygous state. Rare instances of thalassaemia had been encountered among Jews from other Middle Eastern regions, but an extensive search for abnormal haemoglobins by paper electrophoresis among members of various other Jewish communities had yielded negative results. It seemed, therefore, that thalassaemia was the result of only haemoglobinopathy affecting Jews in Israel, and that it was virtually limited to those from Kurdistan. Dr. C. SHEBA said that haemolytic reactions to sulpha drugs and other noxious agents occurred only among the non-European Jews. The erythrocytes of those who had suffered from such reactions showed a low glutathione concentration, glutathione instability, defective glucose-6-phosphate-dihydrogenase activity, and a low rate of incorporation of radioactive glycine into glutathione. In a survey of 2,000 control subjects, no such abnormalities were found among European Jews, while 10% of the non-European Jews were affected. The abnormality was most frequent among those originating from Iraq (about 20%); in other groups studied (Yemenites or immigrants from North Africa) the frequency was about 5%. In Italy this trait is found only in subjects of Sardinian and Sicilian origin. Genetic evaluation showed the abnormal trait to be sex-linked, incompletely dominant, with sex-conditioned variable expressivity.

Dr. D. BRUNER spoke on myocardial infarction in Yemenite Jews. Conditions in Israel presented an excellent opportunity for studying the aetiology of atherosclerotic heart disease and the relationship between lipid patterns and the incidence of coronary disease. The very large immigrant population of European Jews had a high incidence of coronary disease as in the Western world, while the Yemenite Jews were practically free from atherosclerotic heart disease and angina pectoris in middle age. An analysis of the various lipid fractions in 74 patients with myocardial

infarction showed that in only 10.8% of them was the β -cholesterol level less than 180 mg./100 ml. On the other hand none of 32 Yemenite farmers had a β -cholesterol level over 180. Despite a low total cholesterol among the Yemenites, α -cholesterol levels were very similar in both the European (healthy and affected) and the Yemenite groups studied.

Dr. E. E. LIEBER (Great Britain) described an inquiry into whether certain industrial dusts and vapours in a factory could cause chest disease. The dusts contained glass monofilaments, beryllium-copper alloy, epoxy resins, and polyesters. He regarded the occasional case of emphysema as the result of the action of polyester and epoxy resin dusts on the pulmonary neurovascular tissue. Lung markings caused by polyester dust were due purely to its mechanical irritant effect, not to any chemical toxic reaction. The prognosis in all cases was excellent, and the patient's condition did not continue to deteriorate after removal from exposure. Normal dust extraction equipment plus the usual additional prophylactic measures were adequate to protect workers engaged in handling glass fibres or epoxy resins in any form.

Professor A. DE VRIES gave the results of an epidemiological investigation of urolithiasis in Israel. In 12 settlements, selected because of different climate and ethnic composition, the incidence was high. In males the incidence was 14.4% and in females 8.8%. The incidence was highest in the hottest and lowest in the coolest regions, higher in immigrants from Europe than in those from the Middle East and North Africa, low in those born in Israel and in immigrants below the age of 18, though in the latter it rose sharply after that age. In the large majority of the patients the urolithiasis developed within the first five years of arrival in Israel. Inadequate fluid intake was the most satisfactory explanation of these findings. Ethnic differences could be explained by differences in drinking habits.

PROMOTION OF THE SALE OF DRUGS AMERICAN CODE

The two main associations of drug manufacturers in the U.S.A.—the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers' Association—have recently merged. The newly formed organization is called the Pharmaceutical Manufacturers' Association, and one of its first actions was to issue the following statement of principles¹ applying to the promotion of pharmaceutical products sold only to the medical and allied professions:

"We, members of the Pharmaceutical Manufacturers' Association, recognizing our responsibilities and obligations to promote the public welfare and to maintain honourable, fair and friendly relations with the medical profession, with associated sciences, and with the public, do pledge ourselves to the following statement of principles:

"(1) Prompt, complete, conservative and accurate information concerning therapeutic agents shall be made available to the medical profession.

"(2) Any statement involved in product promotional communications must be supported by adequate and acceptable scientific evidence. Claims must not be stronger than such evidence warrants. Every effort must be made to avoid ambiguity and implied endorsement. Whenever market, statistical, or background information or references to unpublished literature or observations are used in promotional literature, the source must be available to the physician upon request.

"(3) Quotations from the medical literature or from the personal communications of clinical investigators in promotional communications must not change or distort the true meaning of the author.

"(4) If it is necessary to include comparisons of drugs in promotional communications, such comparisons must be

¹ *Drug Trade News*, June 2, 1958.

used only when they are constructive to the physician and made on a sound, professional and factual basis. Trade-marks are private property that can be used legally only by or with the consent of owners of trademarks.

"(5) The release to the lay public of information on the clinical use of a new drug or to a new use of an established drug prior to adequate acceptance and presentation to the medical profession is not in the best interests of the medical profession or the layman.

"(6) All medical claims and assertions contained in promotional communications should have medical review prior to their release.

"(7) Any violation of these principles brought to the attention of the president of the Pharmaceutical Manufacturers' Association shall be referred by him to the Board of Directors."

MEDICAL DEFENCE UNION

The 73rd annual meeting of the Medical Defence Union was held this year at the Royal Victoria Infirmary, Newcastle upon Tyne. It took place on September 16, under the chairmanship of Dr. S. COCHRANE SHANKS, president of the Union, who presented the annual report. The total membership at July 15 was 45,374, of whom 8,182 were women and 3,258 life members. During 1957 the Union handled 2,492 cases, compared with 2,379 the year before. The accounts, which were presented by Dr. HENRY ROBINSON, showed an adverse balance of £19,241, owing to generally rising costs and the rise in indemnity claims (over £33,000). The subscription had had to be raised on May 1 from £2 to £3 per annum, but this sum was eligible for tax relief under the Finance Act, 1958, as a necessary expense, making the net amount now no more than 34s. 6d.

Hazards of Practice

Mr. A. HEDLEY WHYTE, senior surgeon to the Royal Victoria Infirmary, gave the customary address, choosing as his subject for his largely student audience "The Hazards of Practice." After relating a number of the commoner disasters and one unusual one in which recently a pathologist was asked to examine a specimen of duodenum obtained by sigmoidoscopy, Mr. Hedley Whyte described some of the precautions currently in force at the Infirmary. In particular he described the rigorous safeguards adopted routinely against any chance of the surgeon operating on the wrong patient, or a wrong part of him, of swabs or other objects being left behind in body cavities, of incompatible blood transfusion, and against tetanus.

In the theatre three kinds of swab were used—packs, mops, and stamp gauzes. Stamp gauzes were always on holders and never loose. Packs and mops were of the "raytex" variety, marked with a thin radio-opaque line. These swabs were counted, before sterilization, into bundles tied in fives, counted out again before operation, and the number in use chalked on a board for all to see. Before the beginning of wound closure the swab count, clip and needle counts, must all be correct, and similarly a second correct count must be agreed before the patient left the theatre. They thought this the best method, and had no use for tapes or similar contraptions tied to swabs.

The problem of tetanus was not so satisfactory, although the outcome was less gloomy than heretofore. Cases still occurred, however, at the rate of two or three a year. At the Royal Victoria Infirmary all patients were given some sort of prophylactic treatment, irrespective of the site of the wound, whether or not it was penetrating, or the likelihood of its being contaminated. No case was missed, so vigilant was this service. Usually the patient was given a divided dose of 1,500 units of A.T.S. in 1 ml. First the patient was questioned about his susceptibility to various foods and about asthma or hay-fever, and then given 0.2 ml. of A.T.S., and after 20 minutes the remaining 0.8 ml. If there was any possibility of sensitivity, then a minute intradermal dose was tried, and if there was no untoward reaction then the

(Continued at foot of next column)

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Uniplex (Weddel Pharmaceuticals, Division of the Union International Co. Ltd.). Each tablet contains 125 mg. of granulated whole liver extract, 1 mg. aneurine hydrochloride, 1 mg. riboflavine, and 5 mg. nicotinamide. Uniplex is intended for treating such conditions as pyrexia, debility, neuritis, glossitis, diabetes, pregnancy, lactation, or impaired function of kidney or liver in which the intake of vitamin B may be below normal.

Deficiency symptoms of vitamin-B complex vary considerably, since it is concerned with general metabolism, and all types of tissue may be affected. When symptoms are due to a deficiency of it, a satisfactory response may be expected on administration of this preparation. Patients who have to live on a restricted diet may also be helped by this product.

N.H.S. basic price: 50 tabs., 2s. 8d.

Ferronicum (Sandoz Products Ltd.).—Each sugar-coated tablet contains ferrous gluconate 300 mg., equivalent to 35 mg. bivalent elemental iron. This preparation is intended for the treatment of iron-deficiency anaemia in doses of 2 tablets three times daily in post-haemorrhagic anaemia, 3-4 tablets three times daily in essential hypochromic anaemia, and for anaemia after gastric resection 4 tablets five times daily; for children up to 12 months 1-2 tablets daily crushed in water, and for older children 3-9 tablets daily. A normal response should be obtained with 3-6 tablets daily. While this is an effective preparation in the treatment of iron-deficiency anaemia, it costs more than ferrous gluconate tablets N.F., which have the same clinical effects.

N.H.S. basic price: 100 tabs., 3s.

Distivit Vitamin B₁₂ Peptide Complex (The Distillers Co. (Biochemicals) Ltd.).—A tablet contains cyanocobalamin (vitamin B₁₂) combined with a peptide to form what is called vitamin B₁₂ peptide complex. Supplied in tablets containing 20 or 100 µg. vitamin B₁₂. This is intended for the oral treatment of pernicious anaemia and similar megaloblastic anaemias as well as subacute combined degeneration of the cord. The treatment recommended is 100 µg. of B₁₂ in the form of this complex three times daily for ten days, followed by 100 µg. daily until the blood count reaches normal levels. Maintenance dose thereafter is adjusted according to the response obtained in the patient.

This is a new preparation, and the follow-up of patients treated with it for pernicious anaemia is not yet adequate to judge its effects fully. A few cases have been reported and have been treated over short periods of time with good results, but other patients have not responded so well. Long-term observations are needed before a full assessment can be made of the value of this treatment in pernicious anaemia, and it would be worth making these.

N.H.S. basic price: 20-µg. tabs., 100 for 8s. 8d.; 100-µg. tabs., 100 for 21s. 10d.

(Continued from preceding column)

remainder was given in 20 minutes. Should a reaction be feared, then toxoid was administered, a second dose being given in two weeks' time. Where it could be ascertained that triple vaccine against diphtheria, whooping-cough, and tetanus had been given in childhood, as was increasingly the case, then a 1 ml. dose of toxoid only was given. During the last five years they had had 14 cases of tetanus, of which seven recovered, although the last two cases had died. It was disturbing that both these last two cases had been treated prophylactically before admission, one at home and the other at another hospital, and both with apparently adequate dosage.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Medical Education

SIR, I very much welcomed the article of Dr. Richard Scott (*Journal*, September 6, p. 577) and the report of the College of General Practitioners on psychological medicine (p. 585) in your educational number. I ask myself whether the recommendations made therein are good, and also what response the medical schools should make. Progress in medical education occurs slowly because it is generally envisaged in a fixed framework; the effort to find more room for more subjects is frustrated by the difficulties of omitting or contracting others. There would soon be no progress at all were it not that a less rigid curriculum has increased teaching freedom, and were it not that the faint possibility of change in examination method gives some hope that the mutual neurosis of students and teachers (comparable to the situation of 11-plus) might be eased.

The demands made in these two articles are, firstly from Dr. Scott, that students should see general practice for two weeks at a late date in their training, and after his analysis of the defects of medical teaching in hospitals the conclusion is to me *ridiculus mus*. The College of General Practitioners' report requires greater emphasis on normal psychology and psychological medicine, a compulsory question on these subjects in the final examination (I view with deep fear and depression: "What are the indications for E.C.T.?"), but, fearing the inadequacy of these suggestions, a demand also for more postgraduate education. I am full of sympathy, but think that these demands should be much more radical and courageous. If, as Dr. Scott says, the diagnostic method of the general practitioner involves a synthesis of all factors, whereas the hospital method is analytical and exclusive of data, then if the former is right the latter should be brought into line. If, as the College suggests, 30% of all morbidity seen by practitioners is due to mental stress, etc., then too we must adapt our teaching to meet this.

We will fail to correct our teaching until we recognize that medicine must be a study of all aspects of man as he lives in society. Social medicine, psychological medicine, or organic medicine are all useful but misleading isolates from the whole complex, and each tends by itself to give a distorted view. Six complex, and each tends by itself to give a distorted view. Six years are spent in undergraduate medical education; for two and a half to three years man is cut into pieces in studies of anatomy, physiology, and biochemistry, and towards the end of the period there may be some lectures on man's behaviour. These isolates are never integrated, and man (*Homo sapiens*—such is our conceit) has been dissected with a scalpel, microscope, a chemical balance, etc. The student, thinking that when he enters his clinical years he will meet people, comes up against an introductory course which should tell him that all these dull things he has learnt and is trying so hard to forget are his basic sciences, and the process of integration which should commence is progressively swamped by fact-cramming—but of course he is considered to be too immature for psychological medicine. The eclectic psychiatrists sometimes pooh-pooh the Id and the Ego and the Freudian heresy, and belabour the student with taxonomy, fear of transference situations (our old friend the doctor-patient relationship). Why can't the student be taught about his own mental maturation, his own adjustment to society from birth onward, so that he himself can mature more rapidly and become a real doctor?

It is a pity that the term "psychosomatic" is so useful for a limited group of disorders, for indeed all medicine is psychosomatic and each individual's psyche develops in his ever-changing social setting. Can we not begin our clinical studies with this in mind? Many physicians have found insufficient help from their psychiatric colleagues in their everyday work; they envy their American colleagues who have fully staffed psychotherapy departments available. So they are now forced, perhaps fortunately, to learn about this large aspect of their patients. Can we not now teach our students from the commencement of their clinical work that a case history is not a record of symptoms, plus a few

isolated data about family and social setting, but a history of a person and how it is to be understood? Let the student find out why Mr. A. visits the pub and puts off his evening return to his termagant wife, find out why Mrs. A. is a termagant wife; and to understand why Mrs. B. is ill, she being a rejected but still matriarchal mother-in-law; why Mr. C., middle-aged, is unmarried, hypertensive, and still living with his parents. If such is the setting of so much illness (*vide* H. G. Wolff, *Lancet*, 1958, 2, 206) much of the teaching should be done by the physician, who will need help, but the important thing is to keep the student in this human atmosphere for eighteen months in medical, surgical, paediatric, and gynaecological departments only: the surgeon too must teach him about people, their fears of pain and surgery, the loss of employment, the full meaning of rehabilitation; the paediatrician must teach about mothers and fathers, affection, security, and the lack of these; the gynaecologist must teach about women, and that if menstrual upsets are caused by stress psychological methods should be used, teach too what a womb means to a woman and what threatened womblessness portends. Of course the student must learn too that estimations of electrolytes, surgical procedures, isotopes, etc., are also instruments for the investigation of or treatment of a sick human being. Quite early he must learn to talk to patients—learn what to say and ask, learn how to listen with every faculty alert, and to interpret the verbal and other communications with patients, understand too what people feel like when distended with barium enemas in dark rooms, or sigmoidoscoped with bottoms exposed. What shocking examples so many of us set in our rounds, how little we know what a frantic hour ward sisters spend soothing patients, answering their questions—What did HE say? What did HE mean? The busy teaching physician must educate his staff because the eager registrar is often cynical behind his back; perhaps they should not be promoted until they have had a dose of Dr. Balint or a near equivalent from some of his enthusiastic pupils who have been so actively spreading the light.

I have only sketched an approach. I have said nothing new, there is much agreement, but the working out is very urgent before the distended curriculum bursts.—I am, etc.,

London, W.1.

HUGH GAINSBOROUGH.

SIR,—The educational number of the *Journal* (September 6) and the report of the College of General Practitioners' working party on psychological medicine in general practice (*Journal*, September 6, p. 585) raise important issues.

Pre-registration Training.—I believe that this is unnecessarily protracted by one year by virtue of an over-academic preclinical course. To give but one example, 18 months are spent learning anatomy in fine detail, soon to be forgotten. The acquisition of such knowledge is the concern of the postgraduate budding anatomist or surgeon, etc. The fundamentals, which can be learnt in half the time, are adequate for the general practitioner. During clinical training, emphasis is still centred on disease *per se*. The revelation now to me is that what matters more is the patient's mental manipulation of his disease and environment—including his medical advisers—and the varying degree of ego breakdown, with its concomitant somatic effects, in different persons affected by a similar aetiological agent. In addition to teaching normal and abnormal psychology as such, their participation in every branch of medicine must be impressed upon students, so that from the outset they have a deeper insight into their patients' problems. Now that at least a third of disease has been assigned to the realm of psychopathology, the suggested inclusion of one compulsory psychiatric question in finals (marked, we hope, by the "interested" examiner) is conservatively timid. There should of course be both a written and an oral examination. The introduction of the pre-registration year, to be served in hospital, is an impertinence to the qualified doctor. It serves no intrinsic value and should be abolished.

Post-registration Study.—The plea for improved training facilities for the general practitioner is well founded. Part-time courses with adequate instruction for higher qualifications in all branches are also necessary. Lack of available time and lack of pecuniary reward for doing specialized work in the N.H.S. are difficulties which could be met by a reduction in list size with commensurate financial compensation.

I disagree with the working party's opinion that the use of hypnosis is, "at present, outside the normal province of general practice." I find it of real value. For example, when symptom-removal by direct suggestion is employed, say in so-called psychogenic rheumatism, it compares favourably with the hospital physiotherapy department as a faith-healing agent, and time, expense, and manpower are saved. Although much is unknown about hypnosis, the fact remains that its lay use is increasing. Rather than dismiss it arbitrarily, the wise course would be to establish a university department for its scientific study and appraisal.

In the National Health Service of the future the role of the general practitioner will increasingly become that of an intermediary whose duties could be largely performed by a civil servant, unless the doctor is given the opportunity to establish his legitimate position as a person of education and authority in that particular branch of general practice in which he has special interest.—I am, etc.,

Edmonton, N.9.

HAROLD FOX.

Contraception by Inhibition of Ovulation

SIR,—Dr. B. H. Kirman (*Journal*, August 30, p. 565) criticizes my annotation (*Journal*, August 2, p. 297) on the use of "enavid" as an oral contraceptive. His criticisms are based on several misconceptions. Firstly, he compares the toxicity of progesterone, a naturally occurring hormone, with that of aminopterin, a known tissue poison, whose effect upon fertility may well include an abortifacient action mediated by its toxic effect upon the foetus. It is quite misleading to compare the toxic action of aminopterin with the very occasional report of foetal abnormalities following progesterone and other progestational agents. In any case his fears are, I believe, groundless, as the design of the Puerto Rican study is such that any patient becoming pregnant would automatically discontinue taking the tablets, and not therefore be exposed to the hypothetical risk to the foetus which might result from continued hormone administration during the early months of pregnancy. Quite apart from this consideration, I would like to point out that foetal malformation has not so far been reported following administration of enavid in pregnancy. (There is a growing experience of such administration in the treatment of recurrent abortion, for which the use of a progestational agent has been suggested by Goldzieher and Benigno.¹) The intrinsic oestrogenic activity of enavid encourages the hope that this drug may prove safer for administration during pregnancy than other progestational agents, many of which, including progesterone itself, show slight androgenic activity in some situations.

Secondly, Dr. Kirman comments that "it is surely unwise to permit the marketing and widespread use of such potent compounds for this purpose" (contraception). If Dr. Kirman is under the impression that enavid is marketed for this purpose, he is under a misapprehension, as this is not the case. The makers have at no time made such a recommendation for its use. In due course the field trial in Puerto Rico will show whether or not long-term use of this method of contraception is safe. Thirdly, Dr. Kirman criticizes the choice of Puerto Rico for the site of the trial. The choice was in fact a good one for several reasons. The population problem in Puerto Rico is such that there is a strongly felt need for a reliable method of contraception. There was already a useful background knowledge of the fertility of the population to be studied. The fact that the previous pregnancy rate was a high one rendered the population particularly suitable for this type of field trial.

I would agree entirely with your annotation that even at this early stage (third year) of a long-term scientific study "a remarkable step forward" has been made.—I am, etc.,

High Wycombe, Bucks.

G. R. VENNING,
Medical Director,
G. D. Searle & Co. Ltd.

REFERENCE

¹ Goldzieher, J. W., and Benigno, B. B., *Amer. J. Obstet. Gynec.*, 1958, 75, 1202.

Anaesthetic Hazards

SIR,—The occupational hazards of an anaesthetist include those of drug addiction, unhappily more common, I believe, than generally recognized. Adopting the methods recommended by Dr. Victor Goldman (*Journal*, August 2, p. 327) of not only smelling, not only sniffing, but testing by the administrator everything it is intended to use on the patient, would seem to add greatly to the risks referred to above. Addition to nitrous oxide/oxygen, nitrous oxide/air, not to mention the more potent inhalational agents, would seem to be encouraged by this. Surely safety is ensured by careful checking of cylinders, connexions, and bottle contents. I am, etc.,

Plymouth.

R. E. ANGEL.

Antenatal Irradiation and Childhood Malignancies

SIR,—The fact that the authors of the investigation into childhood malignancies¹ have now stated that antenatal x-rays cannot account for the apparent rise in infantile cancer will be welcomed by all x-ray workers. This conclusion does not, however, go far enough in dispelling the impression created and spread by the lay press that diagnostic x-ray examinations are dangerous and harmful. The investigators themselves are convinced that they proved beyond all reasonable doubt that there exists a causal relationship between antenatal diagnostic irradiation and malignancy, and in this they seem to be supported by an irrefutable set of figures. If their results were accepted it would mean that one child of every 3,000 mothers who had a pregnancy x-ray would develop cancer and that between 20 and 30 cases of childhood cancer out of a total of 500 cases a year might be directly attributable to antenatal irradiation.

The publication of their preliminary report² has resulted in antenatal x-ray examinations being severely curtailed by obstetricians and radiologists. It can only be a guess that the lack of x-ray confirmation of various maternal or foetal conditions may maintain the high maternal death rate (399 in 1956), the stillbirth rate (16,505), and the neonatal death rate (11,779). If one assumes that with adequate x-ray surveys of the pregnant population only as little as 1% of these mothers and babies could be saved, this would give us over 10 times as many live births as dead babies from a possible malignancy in childhood, not to mention fewer feeble-minded and spastic children following birth injuries. In spite of the apparent smallness of the risk attached to such examinations, I still feel it necessary to remove the stigma which has been attached to such x-ray procedures for the past two years since the publication of the preliminary report.

I analysed the figures of my own x-ray examinations on pregnant women during the past 15 years and found among 4,000 cases x-rayed in one hospital in Hertfordshire no case of childhood leukaemia, but there were six cases of leukaemia in children of non-irradiated mothers. A rough check on a further 3,000 cases from a London maternity hospital did not reveal a post-radiation leukaemia either. I am fully aware that my own figures are not statistically important, but they still suggest that the problem should be critically re-examined in case there is a flaw in the investigations which in itself would account for the unusual and unexpected result of their survey.

In my opinion the authors¹ have not paid enough attention to the various groups of maternal characteristics which differ widely in their respective numbers in the case and control groups and which may constitute an increased indication for the taking of radiographs. The authors set out to prove that a certain factor had been induced in the foetus during intrauterine life which would eventually develop into a malignant condition. Therefore not only the children but also the maternal state before and during pregnancy should have been closely matched in the two groups. The total differences in numbers of irradiated women between the case and control groups (their Table VII) amounts to 60 for a three-year period. If it can be proved that these 60 cases can be accounted for by differences in the two

groups of mothers, then the results of this survey would become very questionable.

(1) Primigravidae in the survey amounted to 510 in the case group, against only 427 controls with 8.4% of the latter x-rayed. The rate of multiparae (with at least two previous births) x-rayed is given as 6.8%. But such a percentage difference cannot occur in a normal control group, as every x-ray department will examine at least twice as many primigravidae as multiparae. (My own figures: 1957, 2.6 : 1; 1958, so far, as 2.5 : 1). The only explanation for the authors' ratio (8.4% : 6.8% = 1.2 : 1) can lie in considerable under-reporting of the controls—i.e., one mother in 40 failed to record an antenatal x-ray. If we assume that the percentage of primigravidae x-rayed was twice that of multiparae, then we arrive at 13.6% for 510 primigravidae = 69 cases. This would give 33 more cases than those recorded, and it would reduce the differential between the case and control group to less than 30.

(2) Elderly mothers are much more frequently x-rayed than a young mother. I believe that there were a total of 67 women over 40 years in the case group, and, in the absence of figures supplied, I assume that over 30 of these were surplus over the control group.

(3) Mothers' illnesses during pregnancy fall into two groups: (a) *Infectious diseases*, of which an excess of 12 was found in the neoplastic group, and (b) *diseases specifically associated with pregnancy*: toxæmias, genito-urinary infections, and threatened abortions, which showed a surplus of 36 on the case side. It is obvious that if 48 extra cases of similar illnesses were included on the control side then the number of x-ray cases would go up considerably in this group.

(4) Mothers' past histories disclose an excess of 37 case mothers with a total of 48 abortions and a further seven case mothers with a history of at least one stillborn child. Here again the clinician will order more x-ray examinations than in a group of normal patients.

Altogether the last three groups show an excess of 122 anomalous mothers in the case group, each one of whom is a more likely subject for an x-ray examination than a normal pregnancy case. If a corresponding number of 122 abnormal women were included on the control side with the object of making both groups reasonably equal then we could expect that at least one in four of these anomalous types would be referred for an x-ray examination. This would reduce the difference between the two groups to zero and would have the following results: (1) The whole argument that antenatal x-rays in small doses can be responsible for childhood malignancies becomes null and void. (2) It would throw doubt upon the widely held belief that human foetal cells are more susceptible to x-radiation than adult cells. (3) It would confirm the view that a fairly high threshold dose exists below which x-rays are harmless.—I am, etc.,

J. RABINOWITCH.

London, W.1.

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- , Giles, D., and Hewitt, D., *Lancet*, 1956, 2, 447.

Sweet Tooth and Decay

SIR, In your issue of September 6 (p. 638) is printed a letter by Mr. F. T. Ranson that calls for early reply. He argues that sugar does not seem likely to be the cause of dental decay, since the chewing of sugar-cane in Jamaica appears to be a powerful preventer of decay. After three years in Trinidad during the war I would accept the latter fact without hesitation, but the reason is that sugar-cane is a natural material. Not only is the fibre in the sugar-cane addition any cane cells left lying around the teeth afterwards are still alive and so the antibodies in these cells prevent bacteria attacking them, just as our own do as long as we are alive. In both these respects the unnatural sweetmeats and other contents of confectionery shops present a most striking and tragic contrast.—I am, etc.,

Gosport, Hants.

T. L. CLEAVE.

SIR,—Having read your article "Sweet Tooth and Decay" (*Journal*, August 2, p. 293) and the interesting point raised later by Mr. F. T. Ranson (*Journal*, September 6, p. 638) that "chewing sugar-cane and good teeth go together," may

I say that there is some truth in that statement? The fact is that it is not only due to sugar-cane that the West Indians have such excellent teeth—not forgetting the sunshine for a moment—it is the chewing of hard food that gives exercise to the muscles of the jaw, thereby promoting better circulation, consequently denser calcification and dentition and glossy enamelling. We must not forget that Asiatics and African races not only avoid soft sloppy feeding but clean their teeth with religious scruple, not leaving any bacteria to flourish and cause havoc. Medical men and especially dental surgeons hope that the habit of oral hygiene will be inculcated in schoolchildren all over the world.—I am, etc.,

Abbots Langley, Herts.

A. K. K. NYAZAI.

Fishbone Furunculosis

SIR,—During the late summer months at Lowestoft and Llandudno I have seen a number of cases of a skin eruption which occurs amongst fishermen. Following a fishbone scratch (apparently irrespective of the type of fish) small furuncles crop up on the fingers. They resemble normal furuncles but are not so painful and there is no lymphadenopathy. *Staphylococcus aureus* has been grown from the yellow discharge. The condition rapidly responds to intramuscular penicillin. The local fishermen say the condition is common amongst them, but only during the months of August and September. I would be interested to hear of any further cases.—I am, etc.,

Llandudno.

PETER COOK.

Premonition of Death

SIR,—On paying my usual routine visit one Tuesday afternoon to a male patient of mine dying from cancer of the lung, the patient took hold of my hands, thanked me for all my attention, and then proceeded to tell me that I would not need to call and see him after Thursday, as he was going to die at 2.30 that afternoon. Needless to say, I comforted him the best way I could, told him to exclude such thoughts from his mind, and promised to look in again.

On late Thursday afternoon I received a message from a member of his family that their father had passed away peacefully. A few days later two daughters of the deceased came to consult me, and in the course of our conversation told me that the day before their father died he had summoned all the members of the family together and repeated to them what he had told me—namely, that he would die the following day at 2.30. On the predicted day, all the members of his family were with him in his bedroom except his wife. As 2.30 was approaching he urgently called for his wife to come in, saying, "Hurry, hurry, before it is too late." She came running into the room, and on the stroke of 2.30, according to the two daughters, "He sighed, raised both hands behind his head, smiled, and passed away." I wonder if any of my colleagues have had a similar experience.—I am, etc.,

Glasgow, S.W.3.

ARNOLD B. COWAN.

Human Factor in Diagnosis

SIR,—I found the article by Dr. C. P. E. Elliott-Binns on the human factor as a cause of delay in diagnosis in general practice (*Journal*, August 2, p. 271) very interesting. I am sure every general practitioner who has been in practice for some time will say to himself after reading it, "Well, I am not the only one who has missed a diagnosis." I think the following type of case is common enough and comes within the third criterion that Dr. Elliott-Binns mentions. In this particular type of case the doctor, after a thorough examination, knows there is something wrong but cannot find the cause. He refers the patient to hospital, where he is investigated as an in- or out-patient, a diagnosis is made, treatment suggested or carried out, and the patient is sent home. Somehow the general practitioner is not happy about the patient's progress, and there are further admissions or attendances at the hospital. The

doctor is none the wiser and begins to think that the patient is either a hypochondriac or a hysteric. Then something turns up and to his horror the doctor finds his patient is suffering from an inoperable condition which is going to prove fatal.

In my view these types of case are here to stay, no matter what one does. But the moral of them surely is that reference of a patient to hospital does not entirely absolve the general practitioner from diagnostic responsibility nor does it relieve his mind from worry when he views the case in retrospect.—I am, etc.,

Liverpool, 18.

H. J. PRATAP.

SIR,—I have been very interested by the article by Dr. C. P. E. Elliott-Binns (*Journal*, August 2, p. 271) and the letter from Dr. M. H. S. Bound (*Journal*, August 23, p. 512) on the human factor in diagnosis. Any doctor of experience can bear out how unpleasant, not to say sometimes fatal, results are due to this factor. They are the recognized penalties of snap diagnosis, and such events, as pointed out, may well inculcate a spirit of humility. While we bewail our insufficiency, however, may we not take comfort from the fact that the number of such accidents and fatalities fades into insignificance when compared with those originating from the same factor in industry and on the roads. On the credit side, also, must be placed the many happy hits of snap diagnosis. Most of us can recall moments when a sort of second sight came to our aid. This, too, may surely be regarded as a human factor, and one which contributes not seldom to important scientific discovery as well as helping to lighten and brighten the multifarious perplexities of our profession.—I am, etc.,

Bristol.

P. T. MACDONALD.

Cord Round the Neck

SIR,—The cases from the literature of multiple loops of umbilical cord around the neck quoted by Dr. H. E. Reiss (*Journal*, June 14, p. 1394) recalled to my mind a case I attended in 1955. As there appears to be no comparable case among those he has quoted, I considered that this information is worth recording. The patient was a primigravida who came into labour at term. A male child weighing 6 lb. 8 oz. (3 kg.) presented with six loops of cord around the neck. The loops were easily removed over the head without cutting, and at no stage was there any evidence of foetal distress. The length of the cord was not measured, but it was, of course, extremely long.—I am, etc.,

Hamilton, New Zealand.

R. E. WRIGHT-ST. CLAIR.

Cancer Education

SIR,—I was interested and slightly amused to see that your correspondent Dr. J. Kenworthy Ogden (*Journal*, August 9, p. 389) has resurrected that old controversy concerning the definition of cure in malignant disease. Everybody will agree with him that in order to produce scientific proof of cure a post-mortem examination must be carried out, but not only is it necessary to find evidence of a different cause of death but it is essential to cut and scrutinize serial sections one cell thick from the scalp to the soles of the feet, a somewhat lengthy undertaking. The same is true for tuberculosis to discover a live tubercle bacillus, and many other diseases. In practice the yardstick of five years' survival without signs or symptoms is very useful.

Dr. Ogden then says it is unwise to instil in the minds of the public that some cancers are "curable" if treated in an early stage, but it is true from the patients' point of view if they get rid of the symptoms and signs and possibly live another twenty years. They are unlikely to worry if a few malignant cells are found post mortem.

Space does not permit me to discuss cancer statistics on which your correspondent touches. He goes on to say he does not object to the public receiving cancer education provided it is based on truth. Truth depends on two people, the person who utters the words, and the person who hears

them. There is no easier way of telling a lie than by telling the exact scientific truth to a lay person who has no scientific training. I wonder what your correspondent would like us to say to the public. Possibly we should say, "If you get cancer you are bound to die even if it is only discovered post mortem many years later." What value would this be to the lay person? The objects of cancer education are to relieve the minds of thousands of people from fear of the disease, and to obtain some more early stage diagnosis, by putting before them a true picture of what can happen if certain cancers (particularly the accessible cancers) are treated in an "early stage." Everybody realizes that the prognosis depends largely on the degree of malignancy of the particular tumour, but unless we revise our ideas about cancer being a progressive disease nobody will deny that the earlier the stage of the disease when the patient is treated the better the prospect of saving life.—I am, etc.,

Oxford.

MALCOLM DONALDSON.

Adrenalectomy and Hypertension

SIR,—Your admirable annotation on "adrenalectomy and hypertension" (*Journal*, August 30, p. 555) could only be criticized as being a little too discouraging about the operation of total adrenalectomy for the malignant phase. If the cardiologists refer such cases for surgery after renal failure has become established the mortality will be prohibitive. However, there are many cases of malignant hypertension which are not yet in renal failure, and if such cases were operated upon as soon as the blood urea, etc., commences to rise the results could be most satisfactory. The blood pressure *per se* is unlikely to be reduced to any marked degree, but the eye changes and the congestive heart changes will be relieved, while the patient's general comfort will be greatly increased.¹ If we exclude the 5 cases of failing renal function from our own series of 13 operations² we are left with 8 patients, all of whom are alive, 1 at six years,³ 3 at four years, 2 at three years, and 2 at over two years. It is interesting that no further deaths have occurred after the second year.—I am, etc.,

London, W.1.

HOWARD G. HANLEY.

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Aetiology of Coronary Disease

SIR,—I read with great interest the article by Professor R. P. Malhotra and Dr. N. S. Pathania on coronary heart disease in their part of India (*Journal*, August 30, p. 528). It is a valuable contribution to our understanding of the disease and I hope may encourage others in India to carry out similar surveys on the differential incidence of disease according to geography and racial habits in that country.

That there is a profound difference in the incidence of the common "Western" diseases of stress, so-called, in different parts of the Indo-Pakistan subcontinent has been very evident for some time. My own field of work has been in East Pakistan and North-east India over 10 years, and I have been intrigued by the difference in incidence, between the north-east and north-west areas of the subcontinent, of the two large disease groups, hypertension and peptic ulcer. Amongst Bengalis, hypertension, and in particular malignant hypertension, seems to be relatively common, though the incidence of the arteriosclerotic conditions fairly rare. Valvular heart disease caused by either rheumatic fever or syphilis is common, but coronary heart disease extremely rare. I cannot recall seeing a single patient complaining of angina of effort, but do remember two cases of coronary thrombosis, both in Muslims of the upper income group, both West Pakistanis, native of an area adjacent to Professor Malhotra's. On the other hand, obliterative arterial disease of the Buerger type is fairly common. It would have been helpful if Professor Malhotra had subdivided his cases in religious groups, as the Sikhs and Hindus have, as he states, differing customs regarding smoking and alcohol, and some difference may have been detected.

I wonder, from his findings and in the light of my own experience, what are the varying influences of diet and mental stress in coronary disease. The Punjabi and Bengali diets differ mainly in the Bengali being a rice-eater while the Punjabi is a wheat-eater.

Apart from that, diet varies according to income and religion. Muslims tend to be meat-eaters to a greater extent than Hindus, many of whom are vegetarians, but a greater amount of fish is eaten than in the West. The main oil used for cooking is mustard oil. Obesity is probably just as common as in the Punjab, but appears to have no relation to causation in our area. I doubt very much if the differences in types of oils used in the two areas can have an influence, but it would perhaps be wise to eliminate this by an analytical study of the various Indian oils before we dismiss the cholesterol content as being irrelevant.

The occupation of the person and his social status may play a very important part. My work was mainly amongst the poorer groups of the population, and it is possible that there may be a higher incidence in Bengali upper-class groups than I have been aware of. However, I do not think that that factor alone is sufficient to account for such a great difference in incidence in the two areas.

Comparisons with colleagues in other parts of Bengal and Assam seem to indicate that the incidence of coronary disease in that area is indeed much lower than in Professor Malhotra's area. What is the answer? I think that the badly neglected study of the epidemiology of diseases such as coronary disease and peptic ulcer in India and Pakistan may throw a great deal of fresh light on these two still very enigmatic "stress" diseases. Diet, customs, and ways of life need to be studied in mass surveys such as have been carried out here in relation to lung carcinoma. Everyone who has lived in India and Pakistan for any length of time knows that the Bengali is by no means a less emotional man than the Punjabi. Why should he not be subject to coronary disease yet be plagued by peptic ulcer?

—I am, etc.,

Eastbourne.

I. T. PATRICK.

Halothane Concentration

SIR.—We have followed with great interest the correspondence in your columns on halothane concentration and hope that a view in perspective on this important problem might not be amiss. Our use of the Rowbotham's bottle in a circle absorber was part of a phased plan to demonstrate the safety and economy of vaporizing halothane in a circle system; this particular phase is now over,^{1,2} and it was never denied that the use of the bottle or indeed any vaporizer for this purpose offered some slight resistance to inspiration. Dr. H. C. Newman's statement (*Journal*, June 14, p. 1417) succinctly and authoritatively puts it: "Whereas I agree that the vaporizer might be modified to possess bigger ports and pathways, the matter is not quite as alarming as has been made out." We accept this appraisal as being based on accurate measurement, and at realistic flow rates. Even if flow rates of 80 litres a minute or more do occur, they can only be momentarily sustained.

Dr. John Bullough in his latest letter (*Journal*, August 23, p. 510) has not only attempted to restate his case but has ingeniously inserted a number of red herrings which may confuse the issue further and possibly trap the unwary. Coughing and straining (which in our practice with halothane is practically nonexistent) are largely a matter of forced expiration, and therefore as such are mainly a concern of the expiratory valve and not the Rowbotham's bottle, which is situated on the inspiratory side of the circuit.

The experiment mentioned of endeavouring to reproduce conditions involving low minute volumes, quoted by one of us (F. R. G.) (*Journal*, June 7, p. 1356) was unsound if only for the reason that a Coxeter-Mushin Mark I unit was used. This machine, as is well known, has been superseded by the Boyle Circle II (used by both of us) because of the former's relatively large areas of dead space, and we are only surprised that the large areas of dead space, and we are only surprised that the figure given of 2% carbon dioxide was not greater. Work is in progress which will demonstrate clearly, by means of rapid infra-red analysis, that, in a true circle system with halothane, carbon dioxide build-up with low minute volumes is very slight and is of no clinical significance.

We are perturbed at the suggestion that an anaesthetist might be content these days to use an unknown concentration of halothane; surely we have reached a stage in the evolution of this anaesthetic agent that it is imperative to know that we are delivering continuously a safe concentration to the patient? The tendency for halothane to ruin the ether vaporizer of a B.O.C.

circle unit has now been shown to be a certainty,³ and in addition the method carries the great danger of sudden increases in concentration.

Finally, lest it be said that we are unable to see the wood for the trees, a near to resistance-free vaporizer, capable of delivering safe concentrations of halothane in a circle system at theatre temperatures for up to two hours, will be available in a short time.—We are, etc.,

P. J. C. BURTON.

F. R. GUSTERSON.

Worthing.

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Buzzers for Bed-wetters

SIR.—Surely the electrical buzzer is the most expensive and troublesome way of curing bed-wetting (*Journal*, August 23, p. 499). There is another and simpler way which does not seem sufficiently well known. At the Dreadnought Seamen's Hospital I see a large number of young men who wish to go to sea but who are prevented by bed-wetting. They are easily cured by pituitary snuff and strong suggestion. Pituitary snuff inhibits the secretion of urine so that if the patient empties his bladder before going to bed and takes a sniff of snuff he cannot wet the bed because he has no urine left to do so. He is told that bed-wetting is merely a childish habit he has never grown out of, but if he takes the snuff for a few months he will. It is surprising how many cases are successful with this simple routine. No doubt not so dramatic as bells ringing and rising at night to pass water, but much cheaper, simpler, and comfortable. —I am, etc.,

London, W.1.

CLIFFORD ALLEN.

Mass Casualties from Nuclear War

SIR.—In the concluding remarks of his presidential address to the Bath, Bristol, and West Somerset Branch of the B.M.A., "Nuclear Warfare and the Treatment of Mass Casualties" (*Journal*, August 9, p. 379), Dr. G. D. Kersley suggests that information must be given to the public to reduce panic about the unknown effects of a nuclear explosion; that people must understand the "stay put" policy; and that the population as a whole must learn some first-aid, home nursing, and self-help. It may not be sufficiently well known that the Women's Voluntary Service is giving information now on these lines to one in five of the women in the country under the W.V.S. "One-in-Five" scheme. Specially schooled W.V.S. speakers give the first two short talks, based on information contained in the Civil Defence manual, and drawn up in full consultation with the Home Office: "How to Protect Your Home and Family," explaining simply and clearly about the after-effects of a nuclear explosion and how they could be lessened by simple precautions; and "How You Would be Cared for—How to Try to be Independent," explaining the extent of the help which the Civil Defence Corps could give, and how by applying their own practical knowledge women could provide much of this help for themselves. It also impresses upon them the importance of "staying put" in their homes, if asked to do so, however damaged those homes might be.

The third talk, "How to Care for a Sick Person at Home," is given by trained nurses and specially nominated members of the St. John Ambulance Brigade, or St. Andrew's Ambulance Association, and the British Red Cross Society. It was drawn up by W.V.S. with the help of St. John Ambulance Brigade, the British Red Cross Society, Queen's Institute of District Nursing, and the Ministry of Health, and explains very simply how it is possible to care for someone sick in a badly damaged home, how to improvise where necessary, and how to do the best under any circumstances until skilled help arrives.

The talks are primarily designed for the ordinary housewife who does not belong to any special organization. It

is hoped that the practical knowledge which is contained in them would give her some measure of assurance in a nuclear disaster. Small groups of women are meeting in their own homes, at their work, in village halls, and other convenient places to hear the talks, which each lasts about half an hour and which are followed by time for questions. There is nothing to pay, and women are not asked to join any organization, although those wishing for more information are advised to join the Civil Defence Corps.—I am, etc.,

London, S.W.1.

MARGUERITE M. HAMMOND,
Joint Head, "One-in-Five" Department,
Women's Voluntary Service for Civil Defence.

SIR,—Dr. G. D. Kersley's paper on this subject (*Journal*, August 9, p. 379) is illuminating, but I suspect it will not produce the effect he apparently desires. The author claims that, with proper preparation, much could be done to alleviate the effects of nuclear warfare on Britain. However, careful examination of his proposals forces one to the following conclusions:

(1) *The schemes proposed are based on impossible estimates of what can be done by one doctor in 24 hours.*—Ahern¹ is quoted as authority for the statement that a filter unit with 10 doctors can sort 6,000 patients and perform urgent surgery on 1,200 of these in 24 hours, allowing 2 minutes per examination and 9 minutes per operation. Now $2 \times 6,000 + 9 \times 1,200$ minutes adds up to 380 hours; that is, each doctor will have to work 38 hours in the 24, which is nonsense. In the same paper Ahern says that one surgeon can categorize 3-4,000 patients in 36 hours. This can only mean that this surgeon examines patients at the rate of one every 30-40 seconds for 36 hours, without pause.

(2) *Our medical services will be disrupted if these schemes are put into effect fully.*—A 10-megaton bomb is stated to produce 110,000 untrapped casualties in a city of a million inhabitants. Of these, 50,000 are serious and two-thirds of them will need hospitalization. Let us accept Ahern's claim that a unit with 10 doctors can "filter" 6,000 casualties in 24 hours and Drummond's statement² that three doctors can cope with 100 serious surgical cases in hospital. A simple calculation shows that, to deal with the effects of one H-bomb on such a city, 1,183 doctors will be required. Suppose we follow this estimate to its logical conclusion. We may regard as a potential target any town with a population of over 100,000, and there are 20 million people living in such towns in this country. Since the blow delivered is likely to be adapted to the size of the target, we can assume that the number of casualties in each town will be roughly proportional to the population and that the medical services required will be similarly proportional. We therefore need $20 \times 1,183$, or 23,660, doctors to be ready to deal with the initial onslaught. Since there will be no time to locate and evacuate 23,000 doctors to their action stations in the brief hour or so left to us after we are warned that the missiles are on their way (and this is the first we shall hear of hostilities), it follows that half the medical profession must leave our large towns in the near future, and the sooner the better, and wait indefinitely at sites 20-30 miles (32-48 km.) away. Since, as we have seen, Ahern's estimate is hardly reliable, we shall need a correspondingly larger proportion of the medical profession to be so evacuated. The effect on our medical services can be imagined.

(3) *Even if they could be put into effect, these schemes would do little good.*—We are not told how many dead to expect, but there will be 150,000 serious casualties per million of population attacked. Of these, 100,000 will be trapped and presumably abandoned. Of the 50,000 untrapped, a third will be abandoned because under these conditions there will be no facilities to treat their injuries. Two-thirds will be sent to hospital requiring surgery. Now from Whitney's estimates³ it is seen that 50,000 serious casualties will need over 10,000 pints (5,700 litres) of blood in the first three days, so we can assume that any surgery undertaken will be effectively without the aid of blood. Anaesthesia will necessarily be of the sort which can be undertaken by medical personnel without special training or by nurses. Asepsis will be of the most primitive kind. It would not be pessimistic to expect a 30% death rate in these circumstances. The net survival, then, of the 150,000 serious casualties will be about 22,000, or one in seven. This is hardly reassuring and does not justify Kersley's optimistic outlook.

(4) *The schemes ignore major factors almost inevitable in a nuclear war and which will prevent them from being carried out.*—No allowance has been made for further waves of assault with nuclear weapons. No allowance has been made for devastation

by extensive fall-out, and that this is likely is suggested by the American admission⁴ that nuclear weapons have been altered in a way that would increase local fall-out. No allowance is made for breakdown of transport, communication, electricity, or water supply, and none for epidemics or panic. Even the possibility that the rescue services might be unexpectedly efficacious is not envisaged, since the medical services would then be overwhelmed with some of the two-thirds of the casualties who would otherwise have remained trapped.

Many of us are put in a dilemma by such schemes. If we reject them as so much nonsense, we may be accused of refusing to plan to help the victims of an approaching disaster. On the other hand, if they are accepted by any large section of the medical profession and there was extensive participation by the profession in Civil Defence organization, this would certainly revive the illusion now held by few that an effective answer exists to nuclear weapons, that such a war would not be so terrible after all, and that the individual citizen has a good chance of surviving. Such beliefs are false, and to help to spread them is irresponsible, to say the least. Widespread appreciation of the realities of nuclear warfare is the surest safeguard against such a war. We must be on our guard, therefore, against being led by humanitarian considerations to approve of schemes which will blunt this appreciation and thereby bring about the very thing we most wish to avoid. If there is an answer to this threat, it cannot lie in plans which bear no relation to reality. If, for reasons of their own, statesmen wish to foster this illusion, let them take the responsibility for it and let them do it without help from us.—I am, etc.,

Harrow.

M. C. BERENBAUM.

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Hypno-anaesthesia

SIR,—We have read with great interest the leading article in the *Journal* of September 13 (p. 682) which reviews the role of hypnosis in medicine and surgery and recommends a more extended employment. The point that we noted with particular attention was the suggestion that clinics could be formed in the larger hospitals to use and study hypnotic techniques in suitable cases.

The two hypnosis societies which we have the honour to represent were founded about six years ago, and together now have a membership of over a thousand medical and dental practitioners, the great majority of whom have attended specially organized courses of instruction in hypnotic techniques. Regular meetings have been held by both bodies at which papers have been read on hypnosis by authorities in various branches of medicine and surgery. Recently we have felt that further progress could best be advanced by the organization of a clinic specializing in hypnotic techniques, and a joint committee of both societies has been exploring the possibilities. Contact has been made with public bodies, the representatives of which have received us with sympathetic interest. The ideal is, as your leading article suggests, to work under the aegis of a large hospital, but a great practical difficulty has been to secure the necessary accommodation. If any such hospital can give us the necessary accommodation we are prepared to furnish the appropriate medical and dental staff from our members, who would be prepared to work on a voluntary basis, at least in the early stages until the value of hypnotic techniques had been amply demonstrated. In this connexion it is important for the practitioner to recognize the limitations as well as the possibilities of hypnosis. An alternative method would be to open a clinic in a central area of London, and, although this presents some financial problems, they are not incapable of solution: nevertheless direct attachment to a hospital represents the method of choice.

There is no doubt at all that a knowledge of hypnotic techniques is essential to a properly equipped doctor or

dentist. Probably for practical reasons (e.g., the congested curriculum) postgraduate instruction in the pre-registration period would be most suitable for the medical practitioner, and some similar method could be devised for the dental surgeon.—We are, etc.,

WILLIAM MOODIE,
President, The Hypnotherapy Group.
E. E. WOOKEY,
President, Dental and Medical Society
for the Study of Hypnosis.

"Sytron"

SIR,—In the note on sytron under the heading "To-day's Drugs" (*Journal*, August 30, p. 562) it is stated, "This substance produces diarrhoea in about 25% of patients treated with it." If this is based on Dr. C. F. Herridge's comparative study of ferric chelate and other iron preparations (*Journal*, July 19, p. 140) I should like to point out that he used a preparation of sodium ironedetate containing 71 mg. elemental iron per 8 ml. (2 teaspoonfuls) and administered this dose b.d. or t.d.s. to 10 children. He reported diarrhoea in 3 of these patients—2 transitory and 1 possibly not entirely due to the drug—but expressed the opinion that his dosage could probably be reduced and still give adequate haematological response, with fewer side-effects. The preparation which has been made generally available (sytron) contains sodium ironedetate equivalent to 55 mg. iron in 8 ml. and the dosage recommended for children is $\frac{1}{2}$ –1 teaspoonful t.d.s.; experience has shown that this dosage produces adequate response and is better tolerated than the much larger one used by Dr. Herridge.—I am, etc.,

C. BEAVEN.

Medical Service Department,
Parke, Davis & Co. Ltd.

Hounslow.

Deluge of Advertisements

SIR,—Dr. B. J. Maxwell's figure of seven and two-thirds pieces of pharmaceutical literature per practitioner in one day is far from being a record (*Journal*, August 2, p. 329). Were it a matter for pride, I should boast of the 30 delivered one day to my home in Sussex. Many had to be redirected for the second time, having been sent to the wrong address in Malaya, some for the third time. Since one hospital complained that my "correspondents" had not been notified of my change of address, I sent out 37 circulars of my own requesting pharmaceutical firms not to bother me with preparations which had no use in anaesthesia. I received five replies, expressing all degrees of concern at my annoyance, and one Swiss firm was frank enough to explain they worked on the "all-or-none" principle. When I firmly declined to receive their advertisements, they discovered it was after all possible to oblige a potential customer.

I have no figures to show accurately the result of my campaign, but I should say the "flow rate" has decreased about 50%. One or two firms appeared to attack me with renewed vigour when they learned my latest address, and I should be delighted to co-operate with other members of the profession in compiling a black list of these people. On the other hand, it gives me pleasure to record the outstanding courtesy of Messrs. May and Baker, both here and in England.—I am, etc.,

Malaya.

A. S. GARDINER.

"Flying Ambulance"

SIR,—The portrayal of medical practice on television will remain, no doubt, a controversial subject. Let us give the B.B.C. full marks, however, for a really commendable production, "Flying Ambulance," which portrayed with tact and accuracy some of the problems of general practice in an isolated community off the West Coast of Scotland. It was a most moving tribute to all our colleagues—medical and non-medical—who undertake such service. I hope there will be an early repeat of this programme, because, in common with many others, a "call" prevented my seeing part of it.—I am, etc.,

London, N.18.

S. A. HALL.

Electrified

SIR,—Dr. Robert McCurdy's letter (*Journal*, September 13, p. 691) is a reminder that electrification is no new phenomenon. We have in the R.A.M.C. Historical Museum a massive manuscript autobiography of one Surgeon-General William Cattell (1829–1919). In the 1880's he was serving in Canada and writes as follows:

"The air here and in the States is thought to be more electrical than in Europe, and the dry winter is especially attended by evidences of such, as by sliding the feet on the carpet to charge the body, so you can light a gas jet by the spark from one's finger. Blanche can do this at any time by taking off her shoes and gliding along the carpet for frictional excitement, and she thinks there is nothing uncommon in the power."

Blanche certainly cannot have been wearing nylons in those days!—I am, etc.,

Crookham, Hants.

R. E. BARNSEY.

SIR,—We in Canada are acquainted with Mr. L. H. Pimm's startling electrical experience (*Journal*, August 9, p. 390), though we are not afflicted during the summer months. In winter, when the temperature on a crispish January morning may be to 10 to 20° F. below zero and the humidity low, nylon snow-suited infants in their fur-clad mother's arms present the human equivalent of cat's fur and ebony rod, so that paediatricians develop a Pavlovian reluctance to pat them affectionately on the head. I suppose the answer would be to earth all babies as soon as they entered the waiting-room, but, so far, guile in persuading someone else to touch the loaded baby first has been my most effective prophylactic.

Incidentally, I have no idea why Mr. Pimm should have been afflicted during an English midsummer.—I am, etc.,

Fort William, Ontario.

PATRICK C. MACGILLIVRAY.

Gray's Anatomy

SIR,—I have read your recent references to *Gray's Anatomy* and its centenary (*Journal*, September 6, pp. 598 and 610) and I have wondered if the following will be of interest to you. Although it has nothing to do with the book it does refer to two of its former editors. My father was the originator of the anatomical tip, "Timothy doth vex all very nervous pupils," and he once told me that Timothy Holmes was not pleased. It does seem remarkable to me that a phrase of no literary merit should have survived for so long (it must be more than 80 years since it was first coined) and have become so widely known; I understand that it is still in use by students of the present day.—I am, etc.,

Sherborne, Dorset.

B. PICKERING PICK.

POINTS FROM LETTERS

Orthopaedic Medicine

Dr. R. T. D. FITZGERALD (Brampton) writes: Dr. T. Logan's comments (*Journal*, August 9, p. 390) on Professor J. H. Kellgren's review of Dr. J. H. Cyriax's *Textbook of Orthopaedic Medicine* are most appropriate. I would remind Professor Kellgren that in his own admirable researches into pain he made most of his deductions following injections. Dr. Cyriax has done exactly the same, and I am sure that his total of more than 20,000 epidural anaesthetics given both diagnostically and therapeutically gives him at least some claim to know what he is talking about. I am not aware that Dr. Cyriax anywhere ignores morbid anatomical studies. On the subject of disk lesions in particular Dr. Cyriax has been in advance of many of the morbid anatomists and surgeons, both in the medical and veterinary world. . . . The method of manipulation advocated by Dr. Cyriax for cervical and lumbar spines is completely foolproof, and is performed by all St. Thomas's Hospital physiotherapists with no harm to any patient (myself included), the reason being that no anaesthetic is used for this painless procedure. The danger of spinal cord lesions arises only in the work of ignorant osteopaths or in the hands of orthopaedic surgeons who manipulate under anaesthesia. . . . Dr. Cyriax's book is of great value to all general practitioners and students particularly in that it teaches diagnosis with a precision and nicety not elsewhere to be found.

Obituary

W. J. A. WEBSTER, M.B., Ch.B., F.R.C.S.Ed.

Dr. William Webster, who had practised in the village and environs of Cradley, in Herefordshire, until his retirement in 1952, died on August 10 in his 83rd year.

William John Alexander Webster received his medical education at Glasgow University, graduating M.B., Ch.B. in 1898. After holding a resident post at the Western Infirmary and a period of general practice in the Lake District, he went to New Zealand to study conditions existing there in the treatment of mental disorder. On his return he decided to take up surgery and was admitted to the F.R.C.S.Ed. in 1910. He became house-surgeon at the West Norfolk and Lynn Hospital and later was appointed honorary surgeon in charge of out-patients at the North Staffordshire Royal Infirmary, Stoke-on-Trent. During this time he was actively associated with Freemasonry in the town and was a justice of the peace and a town councillor at Newcastle under Lyme. It was a surprise and disappointment to his colleagues on the staff at the Infirmary when he announced that he was leaving surgery for a post in the Ministry of Health of an administrative character. At the Infirmary at that time he was regarded as the best diagnostician, medical or surgical, in the hospital. His erudition was very exceptional, and there was no branch of medicine on which he was not well informed. In 1933, after spending some years in retirement at Milverton, in Somerset, he decided to resume the practice of medicine as a general practitioner. He took over a small practice at Cradley, on the borders of Herefordshire and Worcestershire, and for the next twenty years he worked with vigour and enthusiasm to build up a thriving practice.

Dr. C. S. GLASS writes : In the passing of Dr. William Webster we have lost the last of the all-round, first-class doctors. Trained with Sir William Macewen, he was the complete doctor, unknown in these days of specialization. When he was on the staff of the North Staffordshire Infirmary he used to do all his own pathology and bacteriology. The mantelpiece of his room was festooned with culture tubes, and the long table held his two first-class microscopes and all the necessary requisites. He performed all his own surgery either in the patient's home or in his own house, assisted by his wife, and very occasionally in a nursing-home. Many times I have gone over to Newcastle and given an anaesthetic for him while he did mastectomies, gangrenous appendices, prostates, and what have you. He was rather a slow operator, but a very careful and thorough one. He always said that he had seen more patients killed by speed than by being slow and careful. He was indeed an all-rounder. He did the pathology for the North Staffs Royal Infirmary for a time and the eye work at another time when the only eye surgeon was ill during the first world war. He never used the infirmary dressings and instruments, preferring always to prepare his own. I remember on one occasion I got him far out into the country to see a woman with a suspected meningitis. A lumbar puncture was done by candle-light, and we went back and hunted bugs till 3 a.m. As a diagnostician he was splendid : he often spent twenty minutes in getting a history, and if anyone at the North Staffordshire Royal Infirmary was stumped Webster was always asked to see the case and usually had some very useful suggestion to make. I think of the days when we did hernias, appendices, and hysterectomies in the kitchen on a portable operating table and the anaesthetic was by rag and bottle. To the young surgeon he was ever kindly and helpful. He always said that you must operate under supervision, and was always willing to let a houseman have a go while he stood by. To me, as a young doctor, he was an inspiration, guide, philosopher, and friend. I took all my difficulties to him and never in vain. To his colleagues he was very loyal, and he certainly maintained the highest traditions of the medical profession.

G. E. R. B. writes: I was privileged to be associated with Dr. Webster only in the last decade of his life. As a young man entering general practice I considered myself most fortunate to be working with a man of such vast experience and wide knowledge and one who still preserved his truly remarkable flair for diagnosis. He had a prodigious memory, and I have listened on many occasions to him reciting case histories in minute detail dating back to the beginning of the century. His singleness of purpose in pursuing a problem was an inspiration to me, as was also the faith and confidence that he inspired in his patients. When he had his surgery built at Cradley just before the second world war, he incorporated into it what was virtually a one-man pathological department, and spent many hours at the microscope and the bench. He still practised surgery when he could, and on a number of occasions since 1948 I have not only given anaesthetics in patients' homes but helped him to load up his car with all the equipment and instruments, including a portable operating table. He and his wife, who predeceased him in 1956, were held in great esteem throughout the surrounding countryside. To the end, through many months of suffering, he maintained his interest not only in the many medical problems that I could take him but also in the stocking and cultivation of his garden, which he loved so much.

J. W. BROWN, M.D., F.R.C.P.

Dr. J. W. Brown, who was a regional cardiologist with headquarters at the City General Hospital, Sheffield, died at Mount Vernon Hospital, Middlesex, on September 16. He was 61 years of age.

James William Brown was born at Gloucester on January 23, 1897. After serving with the French Red Cross from 1915 to 1918 during the first world war he enrolled as a medical student at the Middlesex Hospital, and qualified M.R.C.S., L.R.C.P. in 1923. He obtained the London degrees of M.B., B.S. in 1924 and proceeded to the M.D. four years later. In 1930 he was elected a Member of the Royal College of Physicians of London, becoming a Fellow of the College in 1942. After qualification he held the appointment of casualty medical officer at the Middlesex Hospital. He was in general practice at Cleethorpes from 1924 to 1931 and at Grimsby from 1931 to 1938, when he became a consultant physician with a particular interest in congenital heart disease. Physician for many years to the Grimsby and Scunthorpe hospitals, he subsequently became cardiologist to both hospitals and to the Lincoln County Hospital. In 1952 he was appointed a part-time lecturer and clinical teacher in medicine in Sheffield University. A member of the British Medical Association for 35 years, he was chairman of the Grimsby Division in 1932-3 and he represented his Division at the Annual Representative Meetings in 1928, 1929, and 1931. He also served on the Consultants and Specialist Committee from 1946 to 1948. He was the author of *Congenital Heart Disease*, a book first published in 1939 and of which a second edition appeared in 1950.

F. M. writes: Dr. J. W. Brown, "Jim" to many of us, died at a comparatively early age, but few have lived a life with more activity and a wider range of interests. His boyhood in Gloucestershire gave him a knowledge of and an interest in all aspects of rural life. Had he not from an early age always been attracted by medicine he would surely have become a great naturalist. This interest in bird, animal, and plant life persisted, and it was always a joy to be with him on a country walk or to show him around one's garden. His zest in these aspects of life was apparent in his photographic work and in his engravings on wood and lino. He had a great appreciation of graphic and decorative arts, and keen critical faculties with books, cinema, and stage. But there was little time for these aspects of life, since medicine always had first call. With himself he was merciless when medical work was concerned. The highest standard was all that he would consider, and he expected others in his profession to be similarly minded.

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The fact that he was forthright, outspoken, and confident of his own knowledge did, on occasion, lead to pronouncements that could hurt and were sometimes unforgiven. But to most he will be remembered as a delightful, lovable man, free from any form of affectation and with little time for the outward pomp of this life, cherishing his profession and an active supporter of the B.M.A. In the sphere within which he worked he has left his mark, one that will persist. In the wider sphere of medicine his pioneer work on congenital heart disease culminating in the publication of his book, *Congenital Heart Disease*, brought him an international reputation and will assure him a place among those who lived and worked in the highest traditions of the medical profession.

H. MURTAGH, M.B., B.Ch.

Dr. Harold Murtagh, who had been in practice in Ripponden, Yorkshire, for nearly thirty years, died suddenly on August 29 while on holiday in Cornwall. He was 58.

Harold Murtagh was born on August 20, 1900, and studied medicine at Queen's University, Belfast, graduating M.B., B.Ch., B.A.O. in 1927. Through a family friendship with the late Mr. John Hodgson, who was a surgeon on the staff of the Royal Halifax Infirmary, Harold Murtagh joined the resident staff of that hospital, where he was successively house-physician, house-surgeon, and resident surgical officer. When he had completed these appointments in 1929 he joined the late Dr. J. M. Wingham in practice in the village of Ripponden in the rural Ryburn valley, where he remained for the rest of his life. Keenly interested in his work as a general practitioner, he held the posts of police surgeon and appointed factory doctor for the valley and was medical officer to Rishworth School. His leisure was devoted largely to fly-fishing and gardening.

N. H. writes: Harold Murtagh was a true rural general practitioner, beloved by all in the wide area he served, where his equable temperament made allowances for the oddities of human nature, and his cheerfulness played no small part in his successful therapy. A patient recently declared that to visit him was in itself a tonic. He was a man of great energy, and his arrival was invariably announced by a cheery whistle, but he wasted no time in the completion of his duties. No wonder that his loss is most keenly felt by all his patients and by his partner. He leaves a widow and a daughter, who is a medical student, and in their loss they will have the sympathy of all his friends and colleagues.

D. JUSTIN DAVIES, M.B., B.S., F.F.A. R.C.S.

Dr. D. Justin Davies, consultant anaesthetist in Leicester, died with tragic suddenness on September 7, when he collapsed during a game at the Leicestershire Golf Club. He was 61 years of age.

David Justin Davies was born on July 26, 1897, the son of the Rev. D. C. Davies. Educated at the University Colleges of Aberystwyth and Cardiff, he completed his clinical training at the Middlesex Hospital, qualifying in 1920. After holding resident posts at the Middlesex, he became an assistant medical officer at one of the Metropolitan Asylums Board hospitals in London. Having graduated M.B., B.S. at London University in 1924, he came to Leicester Royal Infirmary as house-surgeon in that year. Later he married Dr. Lucy Simpson, a daughter of the late Councillor Herbert Simpson, a former Lord Mayor of Leicester, and they set up in joint practice in that city. Becoming interested in anaesthetics, he decided to make that his specialty, and was appointed visiting anaesthetist to Leicester Royal Infirmary in 1933. He gained his D.A. in 1935 and was elected F.F.A. R.C.S. in 1953. He soon became recognized as an anaesthetist of outstanding ability and enjoyed an extensive hospital and private practice. Maintaining a keen interest in clinical matters, he was a most regular attendee at meetings of the Leicester Medical Society, of which he had been

OBITUARY

a vice-president. He was an ex-president of the Sheffield and East Midland Society of Anaesthetists. A keen Territorial, he held the rank of lieutenant-colonel in the R.A.M.C., commanding the No. 9 C.C.S., which went to France in 1939, but he was invalided out of the Service after Dunkirk.

R. McD. C. writes : Dr. D. Justin Davies was a most likable man and extremely popular with all with whom he came in contact ; in consequence he had a very wide circle of friends, all of whom will miss very much his genial and engaging personality. The loss of his wife in 1947 was a very great blow, but he was devoted to his daughter, who is now in her final year in medicine, and his interest in her career and well-being came to be the outstanding object in his life. To her is extended the sincere sympathy of his many friends and colleagues in the loss of a loving father. Recently Dr. Davies had been in failing health, but fully realized the import of his physical handicaps. Himself a son of the manse, he took a deep interest in the affairs of the Presbyterian Church in Leicester, of which he was an elder. He developed a most admirable philosophical attitude to life, and was determined to carry on with his work. Nothing gave him more pleasure than a quiet game of golf with his friends, and one cannot help feeling that the end, coming as it did, might well have been the one he himself would have chosen.

J. CATHCART, M.B., Ch.B., D.P.H.

Dr. John Cathcart, who was formerly in practice in Bootle, died suddenly at his home at Chorley, in Lancashire, on August 26. He was 72.

John Cathcart was born on March 29, 1886, in Kells, in Northern Ireland, and studied medicine at Edinburgh, where he graduated M.B., Ch.B. in 1910, taking the D.P.H. in the following year. After holding resident appointments at Stockport Infirmary, the Royal Victoria Hospital, Belfast, and the Barnes Convalescent Home of Manchester Royal Infirmary, he decided to specialize in tuberculosis and became a medical officer at Whiteabbey Sanatorium in Co. Antrim. During the first world war he served in France in the R.A.M.C., being attached for much of the time to the Black Watch. On return to civilian life he held a resident post at Lord Mayor Treloar Cripples' Hospital, Alton, and then joined the staff of the Lancashire County Council as assistant tuberculosis officer, remaining in that employment for twelve years. After further sanatorium appointments he decided to go into general practice and eventually settled at Bootle, where he took part in establishing a group practice. During the second world war his house was destroyed by a bomb, but he continued to practise until three years ago. He leaves a widow.

C. H. BURGESS, M.B., Ch.B.

Dr. C. H. Burgess, who practised for many years in Hoylake, died there on September 1 at the age of 75 years.

Charles Herbert Burgess was born on August 26, 1883, the third son of Dr. Robert Burgess, of Coagh, Co. Tyrone. Educated at the Royal School, Dungannon, and at the University of Edinburgh, he graduated M.B., Ch.B. in 1906. After a period of practice in Doncaster he moved to Hoylake in 1911. During the first world war he served in the R.A.M.C. from 1914 to 1918, mainly in Egypt and Palestine. Returning to Hoylake, he remained in practice there until he retired last March.

In 1908 Dr. Burgess married Meta Jeanette Leitch, who died not long ago. He is survived by a daughter and by a son, who is surgeon on the staff of the Southport General Infirmary.

We are indebted to Dr. J. A. ELLIOT for the following appreciation: Charles Burgess was a perfect example of the

best type of family practitioner—wise, calm, patient, and inspiring. He was a retiring person, and I knew him for years before I knew him well. Thereafter I was privileged to enjoy his friendship and to share work with him. He was a wise and far-seeing person and occasionally gave me remarkably valuable advice, ranging in subject from the value of tinned hams in the summer of 1939 to that of a new car in the following year—just before such a thing disappeared off the market. I learned much from him and found the process entertaining as well as educative. It would be impossible for his friends to forget what he was like. His last illness was borne with stoical and matter-of-fact calm which was not only characteristic but deeply impressive.

T. I. ROWLAND, M.B., B.S.

The death of Dr. Trevor I. Rowland at the age of 31 has been reported from the Solomon Islands. A medical officer of the South Pacific Health Service, he was travelling, accompanied by his wife, on board the Government ship R.C.S. *Melanesian* to pay a routine visit to the isolated Polynesian atoll of Sikiana, when the ship was lost, on or about July 10, with all 60 or so souls on board. So far the body of only one crew member has been recovered.

Trevor Ingman Rowland was born on August 15, 1926, and studied medicine at Guy's Hospital, graduating M.B., B.S. in 1950. After holding the posts of house-physician at the Southern Hospital, Dartford, and to the radiological department at Charing Cross Hospital, he served for two years in the R.A.M.C. Entering the Oversea Civil Service in 1956, he worked for a year in Fiji and was then transferred to the British Solomon Islands Protectorate, being stationed as medical officer on the island of Malaita.

J.D.M. writes: Although his short service in the Solomons was fated to be terminated so abruptly, Dr. Rowland's pleasing personality, his professional competence, and the unstinted hospitality of a home managed more than capably by his charming wife endeared him to his colleagues and friends, and not least to the Solomon Islanders in whose service he lost his life.

R. R. MACNICOL, M.B., Ch.B.

Dr. Roderick R. Macnicol, who died at his home in Edinburgh on September 4 at the age of 87, practised at Taynuilt for fifty years and was well known in the West Highlands.

Roderick Reid Macnicol was born on March 15, 1871, and received his early education at the village school at Dalmally, where his father was in practice, having moved some years before from North Uist. Going on from Glasgow High School to the University, he graduated M.A., M.B., Ch.B. in 1898. After working as an assistant in Oban and then in Blantyre, he was appointed parish medical officer in Taynuilt, and for fifty years he practised in this widely scattered district, which extended from his home far beyond the head of Loch Etive on the one side to the shores of Crevan in the north and over difficult roads to Kilchrenan and Dalavich on Loch Awe.

J.A.C.G. writes: During all his years in Taynuilt Dr. Macnicol looked after his patients both far and near with zeal and skill. Many a time he had to travel for miles in an open boat or on foot and often on horseback. These journeys had to be undertaken in summer and winter, by day and by night, often in wind and rain. He always seemed to enjoy the walking, which he said contributed to his good health. He came to Taynuilt at a time when there were no telephones and the motor-car was unheard of in the Western Highlands. He was a man of even temperament, never perturbed by anything. A fluent Gaelic speaker, he was a great upholder of the language and was a life

member of An Comunn Gaidhealach. A good pianist he was always ready to help, and his talent was much appreciated by everyone.

He never seemed to grow old, and remained young-looking and active to the day of his retirement. Some years after he retired, when he was over 80 years of age, he attended a meeting of the Argyll Division of the B.M.A., of which he was a former chairman, and his colleagues were amazed to find that he had not changed in any way, and was still the same quiet, knowledgeable colleague we had all liked so much when he was in practice in Taynuilt. During the first world war he served for four years in the R.A.M.C. After the war he acquired his first motor-car, to use, as he said, "when there were roads available."

Dr. Macnicol was a real Highland gentleman, with an individuality and a charming personality all his own. He enjoyed his work to the full and never spared himself in fulfilling his arduous duties in the scattered West Highland district which he liked so much. He will long be remembered by his colleagues and his patients and by everyone in the community he served so well.

His wife died many years ago, and he is survived by his daughter, to whom our sympathy is extended in her sad bereavement.

Medico-Legal

CHIVERS CANCER ASSOCIATION IN LOTTERY TROUBLE

[FROM OUR LEGAL CORRESPONDENT]

With certain statutory exceptions lotteries are illegal in England. A lottery is any scheme for the distribution of prizes by the operation of chance, and a raffle is a typical example. The statutory exceptions are not designed to make the path of the lottery promoter smooth.

The Betting and Lotteries Act, 1956, created a new exception in favour of lotteries promoted on behalf of registered societies established for charitable and certain other purposes to allow them to raise money for the purposes of the society. The principal thorn on this rose is that the total value of the tickets sold must not exceed £750, but a branch of a society for the purposes of the Act counts as a separate society.

On September 16 Harold Chivers and the Chivers Cancer Association Ltd., of Southchurch Road, Southend, pleaded guilty at Southend Quarter Sessions to five charges of promoting lotteries on behalf of the Chivers Cancer Association Ltd., with, in each lottery, tickets on sale exceeding £750 (*Manchester Guardian*, September 17). For the prosecution it was said that the association, a company limited by guarantee with the object of raising funds by any lawful means for cancer research and treatment, had registered a number of non-existent branches from which to run lotteries simultaneously. The Act required, however, that to be treated as a separate society the branch must be a bona-fide one, and not just attached to the name of someone who as in this case had only to sign two documents. It was stressed by the prosecution that Mr. Chivers had an excellent character. There was no question of fraud. For the defence it was said that Mr. Chivers had collected £10,000 between 1952 and 1956 for cancer research. Neither he nor Mrs. Chivers had benefited in any way from the lotteries, the prizes for which had been Premium Bonds.

Fines of £50 each were imposed on Mr. Chivers and the company and each was ordered to pay £25 costs, two months being allowed for payment. This case should serve as a warning that, however excellent the object, the promotion of lotteries for the purpose of raising money is beset by very stringent restrictions, the infringement of which carries heavy penalties. It is dangerous to attempt to run a raffle without legal advice.

Vital Statistics

Week Ending September 13

The largest fluctuations in the number of notifications of infectious diseases in England and Wales during the week ending September 13 were decreases of 374 for measles, from 1,977 to 1,603, and 45 for whooping-cough, from 791 to 746, and an increase of 27 for food-poisoning, from 275 to 302.

A further decline in the incidence of measles was recorded throughout the country; the largest falls in the number of notifications were 89 in Lancashire, from 315 to 226, and 66 in Sussex, from 112 to 46. The number of notifications of scarlet fever, 296, were 8 fewer than in the preceding week, and there were no large fluctuations in the local returns. The trends of whooping-cough showed very little change, with the exception of a fall of 50 in the number of notifications in Lancashire, from 119 to 69. 3 cases of diphtheria, the same number as in the preceding week, were notified, and 2 of these cases were notified in Plymouth C.B., where 2 cases were also notified in the preceding week.

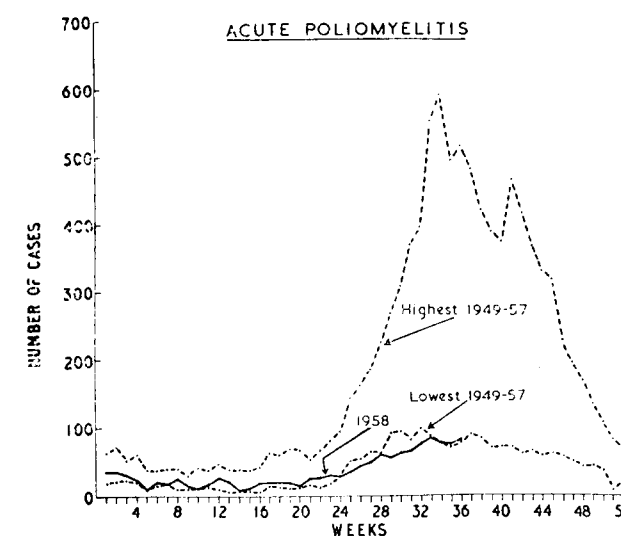
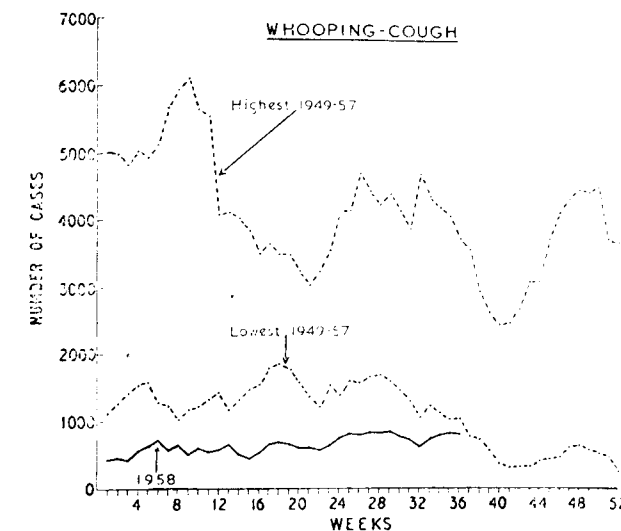
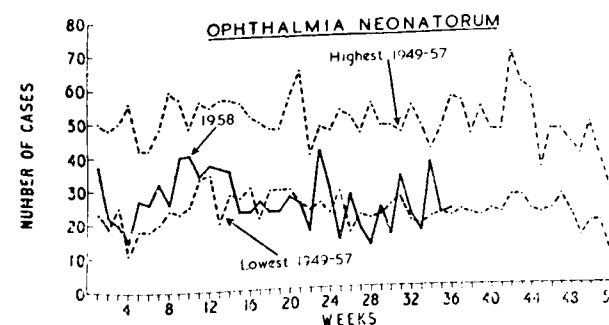
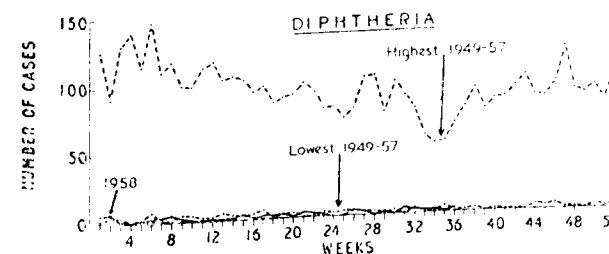
The number of notifications of acute poliomyelitis numbered 62, and these cases were 20 fewer for paralytic and 2 more for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 13 (Leeds C.B. 4, Bradford C.B. 2), Lancashire 12 (Manchester C.B. 5, Liverpool C.B. 3), and Yorkshire North Riding 5 (Middlesbrough C.B. 2).

The number of notifications of dysentery, 329, was 13 more than in the preceding week. The largest centres of infection were Yorkshire West Riding 55 (Leeds C.B. 21), London 54 (Bermondsey 13), Lancashire 44 (Liverpool C.B. 18), Nottinghamshire 19 (Basford R.D. 10), and Warwickshire 19 (Birmingham C.B. 10).

The largest outbreak of food-poisoning was 20 cases in the metropolitan borough of St. Pancras.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus ----, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



X-rays in industry

At the end of 1957 about 400 factories in Britain were using radioactive isotopes, and over 100 were operating x-ray apparatus, according to the Annual Report of the Chief Inspector of Factories for the year.¹ The chief hazard to health at present is thought to be when sealed sources such as strontium-90 and thallium-204 are used to emit beta rays. The hazard occurs mainly when the machine is being dismantled for maintenance or to remove the source. Isotopes used for radiography are thought to be a greater hazard than x rays. In most cases when x-ray operators have received an overdose it has been an accidental and isolated occurrence. Luminizing factories pose special problems. One is that the luminizer may often be a young woman who has had no scientific education, and therefore "it is difficult for her to grasp the real nature of the hazard." The following example is recorded of how badly a luminizing shop can become contaminated:

"The linoleum top of the desk was found to have surface contamination 60 times greater than the recommended maximum; the facing edge of the luminizer's bench 150 times; the lampshade 80 times; the seat of the luminizer's chair 60 times; the back of the seat 40 times; and the cover of the log book 60 times."

At most establishments the employees are highly skilled technicians aware of the hazards, "although even among these workers dangerous practices sometimes occur."

¹ Annual Report of the Chief Inspector of Factories for the Year 1957, cmd. 521. H.M.S.O., 5s.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending September 6 (No. 36) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957					
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	
Diphtheria ..	3	0	1	0		1	0	7	0		
Dysentery ..	316	36	135	11	11	220	28	136	10	8	
Encephalitis, acute	1	0		0		2	1		0		
Enteric fever:											
Typhoid ..	5	0	1	0	1	6	1	0	1	1	
Paratyphoid ..	9	1	0	1	1 (B)	12	0	2	0		
Food-poisoning ..	275	30	17	1		223	20	31	1		
infective enteritis or diarrhoea under 2 years ..					16	32				6	28
Measles* ..	1,977	118	17	20	21	2,073	53	28	26	8	
Meningococcal infection ..	10	0	13	0		31	7	6	1	1	
Ophthalmia neonatorum ..	22	3	3	0		20	2	1	0		
Pneumonia† ..	144	9	105	1		206	11	139	3		
Poliomyelitis, acute:											
Paralytic ..	60	1	20	1	3	{ 158	12	6 }	12	13	4
Non-paralytic ..	20	1									
Puerperal fever‡ ..	188	19	12	0	1	218	41	6	1		
Scarlet fever ..	304	19	55	7	8	272	18	51	14	14	
Tuberculosis:											
Respiratory ..	412	44	91	13		502	45	118	22		
Non-respiratory ..	73	4	12	3		69	2	11	4		
Whooping-cough ..	791	45	100	61	6	1,013	75	97	2	25	

DEATHS	1958					1957				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0			
Encephalitis, acute		0			0	0				0
Enteric fever ..	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years ..	6	0	1	0	0	0	3	0	1	
Influenza ..	4	0	1	0	0	0	0	0	0	0
Measles ..		0	0	0	0	0	0	0	0	0
Meningococcal infection ..		0	0			0	3			
Pneumonia ..	340	26	12	8	3	12	11	10	4	
Poliomyelitis, acute	4	0		0	0	2	0	0	0	0
Scarlet fever ..		0	0	0	0	0	0	0	0	0
Tuberculosis:										
Respiratory ..	70	7	8	1	1	6	6	1	2	
Non-respiratory ..	0	0	0	0	0	0	0	0	0	0
Whooping-cough ..	0	0	0	0	0	0	0	0	0	0
Deaths 0-1 year ..	284	19	23	4	8	22	35	4	15	
Deaths (excluding stillbirths) ..	7,878	622	477	79	141	668	529	94	154	
LIVE BIRTHS ..	13,658	1,116	961	191	361	11,24	894	204	383	
STILLBIRTHS ..	323	26	19			21	26			

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

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

Travelling Fellowships.—The Medical Research Council invites applications for travelling fellowships in medicine and medical science, to be awarded for the academic year 1959-60. These fellowships are intended for graduates resident in Britain who have had some training in research work in clinical medicine or surgery, or in some other branch of medical science, and who are likely to profit by a period of work at a centre in the United States or elsewhere abroad before taking up appointments for higher teaching or research in the United Kingdom. Fellowships held in the United States will provide maintenance allowances at rates varying from \$3,000 to \$5,000 per annum, according to individual circumstances, and travelling expenses will also be supplied. Further particulars of these fellowships and forms of application may be obtained from the secretary, Medical Research Council, 38, Old Queen Street, Westminster, S.W.1, to whom the completed form should be returned not later than October 31.

Parkes Weber Collection.—Dr. F. PARKES WEBER has presented to the Wellcome Historical Medical Library, London, the remarkable collection of manuscript notes, reprints, and case reports of rare diseases which he has brought together in the course of his long and distinguished career as a physician and medical writer. Dr. Parkes Weber was born in 1863, and his books, *Rare Diseases and Some Debatable Subjects* (2nd ed., 1947) and *Further Rare Diseases* (1949), were based on a selection of this material. A general index to the "Parkes Weber Collection," as it is to be known, will be prepared by the Wellcome Library, where in due course it may be consulted, together with the original records and reports.

"Gray's Anatomy."—On September 18 at the Stationers' Hall, London, the directors of Messrs. Longmans, Green, and Company, the publishers of *Gray's Anatomy*, gave a dinner to celebrate the centenary of this famous textbook's first appearance. The guest of honour was Professor T. B. JOHNSTON, senior editor of the centenary edition. The company which assembled in the finely restored Stationers' Hall was a judicious mixture of anatomists and other medical folk, and of those concerned with the book's production. Mr. WILLIAM LONGMAN, who proposed the toast to *Gray's Anatomy* and its editors, said the occasion was not so much the centenary of a book as the centenary of the birth of an idea of a book. Longmans had always been interested in medical books; in their 1725 book list 44 of the 520 titles were medical, three of them works on anatomy, including Cheselden's, which saw 13 editions between 1713 and 1792. Professor JOHNSTON, replying on behalf of himself and his fellow editors, Professor D. V. DAVIES, of St. Thomas's, and Professor F. DAVIES, of Sheffield, sketched the origins and later progress of *Gray's Anatomy*. It was a wonder it had survived, he said. It had to weather a damaging first review; its first publishers went out of business after the second edition; and Gray himself died of smallpox in 1861 at the early age of 34. Credit for its survival was due to Timothy Holmes, who edited the next seven editions between 1863 and 1880. Professor JOHNSTON ended by thanking all those who had contributed to the present centenary edition.

Guy's Hospital.—On September 19 LORD NUFFIELD, president of Guy's Hospital, laid the foundation stone of the hospital's new surgical block (see *Journal*, September 28, 1957, p. 773). The block is an eleven-story building, designed by Mr. A. S. GRAY, F.R.I.B.A., with the help of Mr. PAUL G. BURT, of Chicago. Its cost is put at about £2.25m., and it is expected to be finished in two years' time. Speaking at the foundation ceremony, the MINISTER OF HEALTH, Mr. Derck Walker-Smith, paid tribute to Lord Nuffield's great generosity to Guy's. The new building, he went on, was a striking manifestation of the steady

growth and acceleration of the Government's hospital building programme. These projects represented in terms of money £10m. in 1955, £13m. in 1956, £18m. last year, £20m. this year, and £22m. next year.

Medical Society of London.—Sir CECIL WAKELEY, president of the Medical Society of London, appeals on behalf of the society for the loan of portraits of former presidents so that they may be photographed for permanent record. The society has an almost complete list of its presidents since its foundation in 1773, and would be glad to hear of portraits of any of the following:

John Millar, M.D., 1773	Theophilus Thompson, M.D., F.R.S., 1844
George Edwards, M.D., 1779	Walter Cooper Dendy, 1846
George Pinckard, M.D., 1811	Edward Headland, 1854
Thomas Walshman, M.D., 1817	Francis Hird, 1857
David Unwins, M.D., 1821	William Hughes Willshire, M.D., 1858
William Shearman, M.D., 1823	Francis Sibson, M.D., F.R.S., 1862
John Burne, M.D., 1831	Peter Marshall, 1869
John Whiting, M.D., 1835	John Cockle, M.D., 1879
Thomas Egerton Bryant, 1837	
Leonard Stewart, M.D., 1839	
George Pilcher, 1842	

Information about portraits of these past presidents should be sent to Sir Cecil Wakeley at the Medical Society of London, 11, Chandos Street, Cavendish Square, London, W.1.

Medical Photography.—The ninth annual conference of the Medical Group of the Institute of British Photographers was held at the Royal College of Surgeons, Lincoln's Inn Fields, from September 18 to 21. Sir JAMES PATERSON ROSS, P.R.C.S., opened the conference, which then proceeded to discuss such topics as the routine production of colour prints, the design of hospital photographic departments, the relationship between the medical photographer and his medical colleagues, and the presentation of demonstration panels. During the conference the Group held its annual meeting, under the chairmanship of Mr. NORMAN K. HARRISON. On the last day there were demonstrations of the Land polaroid camera and of the photography of dermatological and orthopaedic conditions.

Changes at the Ministry.—Dr. G. A. CLARK, one of the two deputy chief medical officers at the Ministry of Health, is retiring on September 30. He will be succeeded by Dr. DANIEL THOMSON.

COMING EVENTS

Institute of Dermatology.—Semi-permanent exhibition, October 1-28, on "The Sweat-retention Syndrome."

Casualties Union Day.—Casualties Union is holding a civil rescue contest (starting 11 a.m.) and the finals of its annual open competition in first aid and diagnosis (starting at 2 p.m.) on October 5 at the George Cohen 600 Group Depot, Wood Lane, London, W.12. Tickets (2s. 6d.) are obtainable from Miss E. E. JOHNSON, 8, Woodcote Park Avenue, Purley, Surrey.

London Hospital.—Old Students' dinner, October 9, at the Trocadero. Tickets 37s. 6d. (27s. 6d. for those qualified less than five years) from Dr. R. R. BOMFORD, London Hospital, E.1.

Glasgow Graduates in Yorkshire.—Annual dinner, October 17, in the senior common room, Leeds University. Details from Mr. JAMES WISHART, 33, Manor Row, Bradford, 1.

Leeds School of Medicine.—Annual dinner of past and present students, October 31, at the Griffin Hotel, Leeds. Details from the hon. secretary to the medical dinner, Leeds Medical School, Leeds, 2.

Hand Clubs.—The Hand Club of Great Britain and the Second Hand Club are holding a meeting on November 22, from 10 a.m. to 4 p.m., at the Royal College of Surgeons. Any surgeon interested who would like to speak or attend should write to Mr. GRAHAM STACK, 150, Harley Street, London, W.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, September 29

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. H. J. B. Atkins: Fibroadenosis of the Breast; 6.30 p.m., Mr. R. F. Guymer: Surgeon and the Injured Worker.

Tuesday, September 30

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor C. J. Kaplan: An Appraisal of Conservative Therapy in Skeletal Tuberculosis.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—6.30 p.m., Mr. R. Belsey: Carcinoma of the Oesophagus.

ROYAL STATISTICAL SOCIETY.—At New Small Lecture Theatre, London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. J. Tizard: Prevalence of Mental Defect.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. G. F. Swann: Vertebral Arteriography.

Wednesday, October 1

FOUNTAIN HOSPITAL.—5.30 p.m., subject: Care of the Mentally Retarded Child. Dr. S. Yudkin: Paediatric Aspects of the Care of Mentally Retarded Children; Miss Jacqueline Grad: Home Care of the Mentally Retarded Child.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Fungi as Saprophytes and Parasites.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Sir Russell Brock: Surgical Treatment of Pulmonary Stenosis.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—5.30 p.m., Dr. I. Friedmann, Dr. D. A. Osborn, and Dr. A. Jeanes: clinico-pathological conference.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Dr. W. N. Mascall: Gonococcal Urethritis.

MANCHESTER MEDICAL SOCIETY: SECTION OF MEDICINE.—At Large Anatomy Theatre, Medical School, Manchester University, 4.30 for 5 p.m., "Hashimoto's Disease." Dr. R. W. Luxton: Clinical Aspects. Dr. Deborah Doniach: Immunological Aspects.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Dr. Wilfrid Oakley: Surgery in Relation to Diabetes; 6.30 p.m., Mr. D. J. Waterston: Surgery in the Newborn.

YORKSHIRE SOCIETY OF ANAESTHETISTS.—At General Infirmary at Leeds, 8.30 p.m., Dr. Michael Johnstone: Respiratory Function During Halothane Anaesthesia.

Thursday, October 2

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. H. R. S. Harley: Subphrenic Abscess.

ROYAL SOCIETY OF HEALTH.—At Town Hall, Colchester, 10 a.m., Dr. J. D. Kershaw: Practical Integration of Health Services; Mr. W. A. Rapier: New Houses for Old: An Experiment in the Modernization of Ancient Houses.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. R. B. Welbourn: Surgery of the Adrenal Glands.

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., Dr. George Somerville: Changes in Psychiatric Disorders During the Past 25 Years.

Friday, October 3

● INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. G. B. Dowling: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. E. H. Hudson: clinical demonstration.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., clinical discussion for general practitioners by Dr. Norman Hulbert: Blood Disorders in Association with Ear, Nose, and Throat Diseases.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. R. B. Welbourn: Surgery of the Adrenal Glands.

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., Dr. George Somerville: Changes in Psychiatric Disorders During the Past 25 Years.

Saturday, October 4

ASSOCIATION OF CLINICAL BIOCHEMISTS.—At Royal College of Surgeons of England, 9.30 a.m. and 2 p.m., scientific meeting (with Association of Clinical Pathologists) including symposium on quantitative paper chromatography; 5 p.m., annual general meeting.

NORTH OF ENGLAND OTOLARYNGOLOGICAL SOCIETY.—At Preston, 2 p.m., annual general meeting.

Sunday, October 5

UNIVERSITY COLLEGE HOSPITAL.—10.15 a.m., meet in Front Hall of main hospital building, lecture-demonstration for general practitioners. Clinical demonstration by Professor C. E. Dent: Dwarfism. An Obvious Feature Sometimes of Diagnostic Importance.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Armitt.—On September 11, 1958, at Farley House, Farnborough, Hants, to Dr. Marion (formerly Jenkins) and Dr. J. M. Armitt, a sister for Gillian—Rosemary Ann.

Clements.—On September 15, 1958, at Poole, Dorset, to Sheila Mayer, wife of Dr. P. W. Clements, a brother for Gillian and Stephen—Christopher.

DEATHS

Ker.—On September 3, 1958, at Halstead, Essex, William Perceval Ker, M.R.C.S., L.R.C.P., aged 83.

Laslett.—On September 6, 1958, at 1, Albert Road, Farnworth, Bolton, Lancs, William Henry Laslett, M.C., M.B., Ch.B.

Mackenzie.—On September 8, 1958, at the Royal Infirmary, Edinburgh, John Cosserat Mackenzie, M.B., Ch.B., of 67, Mountcastle Drive South, Portobello, Midlothian.

Macnicol.—On September 4, 1958, at 97, Greenbank Road, Edinburgh, Roderick Reid Macnicol, M.B., Ch.B., late of Tynmilt, Argyllshire, aged 87.

Rutherford.—On September 2, 1958, Henry Ireland Gascoyne Rutherford, M.B., B.Ch., of 100, Widdicombe Way, Moulsecoomb, Brighton, Sussex, aged 73.

Schonberger.—On August 12, 1958, Elisabeth Schonberger, M.D., of Greenbanks, Springwell Road, Durham.

Webster.—On August 10, 1958, in a nursing-home, William John Alexander Webster, M.B., F.R.C.S.Ed., of Redbrook Gate, Cradley, near Malvern, Worcs, aged 82.

Wilson.—On August 27, 1958, Fergus Falconer Wilson, M.B., Ch.B.

Any Questions ?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Toxic Effects of Mersalyl

Q.—What are the toxic effects of mersalyl therapy, and how should they be treated ?

A.—The most serious toxic effect of mersalyl therapy is heart failure. Mersalyl is a compound of mercury, and mercury has long been known to combine with sulphhydryl groups. Compounds containing sulphhydryl groups indeed are known as mercaptans because they capture mercury. Mersalyl can combine with sulphhydryl groups in the heart and cause arrest. Mersalyl is given by intravenous injection or by intramuscular injection. The risk of causing cardiac arrest is much greater when the intravenous route is used, and for this reason mersalyl should always be given intramuscularly. Dimercaprol is of value in treating the toxic action on the heart, but it must be given immediately there are signs of failure. For example, in the heart-lung preparation of the dog it is possible to cause cardiac arrest by injecting mersalyl and then to restore the beat by injecting dimercaprol. Dimercaprol contains sulphhydryl groups which dislodge the mercury from its attachment to the heart. To-day, however, the newer diuretics, particularly chlorothiazide, should be used in preference to mersalyl, for they are much less toxic.

E.C.G. in Angina of Effort

Q.—What further information may be gained from an E.C.G. in a patient who gives a clear-cut history of angina of effort ?

A.—The electrocardiogram varies in the presence of a clear-cut history of angina of effort. Sometimes definite evidence of myocardial infarction with deep muscle damage is seen, while in other cases the electrocardiogram shows the damage to the muscle to be less serious. Another group of patients shows slight or no evidence of cardiac damage in the resting electrocardiogram, and an electrocardiogram with exercise is necessary to demonstrate the lesion. If the electrocardiogram is normal, both at rest and on effort also, the diagnosis should be questioned. In general, therefore, the electrocardiogram confirms the clinical diagnosis and amplifies it by indicating the degree of muscle damage and also its anatomical site.

The crux of the question, however, lies in the interpretation of the words "clear-cut." Angina of effort is perhaps the most pathognomonic of all cardiac symptoms ; it is certainly more so than the isolated pain of cardiac infarction, which may be simulated by pulmonary embolus, dissection of the aorta, and other conditions. In the anxious patient, however, it may sometimes be difficult to disentangle the organic from the functional symptoms suggesting angina of effort, and it is here that the electrocardiogram is of special value.

Inadequate Personality

Q.—What is the definition of an inadequate or immature personality ? Is this a permanent disability, or is it possible to help an adult affected by this handicap ?

A.—An inadequate or immature personality characterizes the individual who is unable (or unwilling) to adapt himself to the everyday demands of his setting in life. The disability is usually due to a mixture of constitutional and environmental influences. Nevertheless, it is seldom easy to lay down the precise responsibility of nature or nurture. It is possible to help the condition and often to help substantially. Much depends upon the patient's age, his capacity for co-operation, his circumstances and general

health, and also upon the opportunities for obtaining the requisite professional advice and treatment.

The first step is to find out the nature of the disability. There may be intellectual inadequacy and consequent difficulties in education, or social maladaptation because of personal anxieties and complexes. The immature person is prone to develop neurosis ; he compares the achievements of his contemporaries with his own efforts and becomes discouraged. Psychological treatment can relieve this situation and at any rate prevent the spread of the trouble by the accumulation of new symptoms. The patient should be seen by a psychiatrist. He will make a tentative diagnosis, probably using one of the many personality tests, and assess the situation. If he succeeds in establishing a good contact with the patient on a human and personal level, the outlook for later treatment will be much improved.

Glucose Tolerance in Pregnancy

Q.—(1) Does pregnancy affect the glucose tolerance test ; and (2) does the E.S.R. rise in pregnancy ?

A.—(1) Pregnancy does not affect the glucose tolerance test. The finding of reducing substances in the urine in the presence of a normal glucose tolerance test is due either to a lowered renal threshold for glucose or to lactose. (2) The E.S.R. may rise markedly in pregnancy, presumably owing to a decrease in the viscosity of the plasma.

NOTES AND COMMENTS

Tennis Elbow.—Mr. A. H. G. MURLEY (London, W.1) writes : Your expert in the answer to the question on tennis elbow ("Any Questions ?" August 16, p. 461) mentions the efficacy of injection of hydrocortisone acetate in this condition. He says that it is useless to expect a satisfactory result unless the injection causes agony. This agony, I feel, is quite unnecessary, as equally satisfactory results can be obtained after local analgesic infiltration of the tender area, provided the hydrocortisone is injected into the area which is tender. Because of the comparatively superficial situation of this area, this is technically quite easy, and by this method the patient is saved a good deal of pain.

OUR EXPERT replies : My experience does not lead me to support Mr. Murley's view. In my hands the preliminary infiltration of a local analgesic makes the subsequent injection of hydrocortisone a less accurate method of giving the patient relief, but, as I stated in my previous answer to the original question, very many different varieties of treatment and of techniques are credited with success in this condition.

Correction.—In the report of Dr. J. Joseph's address at the B.M.A.'s Annual Meeting (July 26, p. 231) the subjects on whom he performed electromyographic studies were described as having "the hands clasped tightly behind the back." This should have read "lightly."

Collected Articles from the "British Medical Journal"

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Refresher Course for General Practitioners, Volumes 2 and 3 (26s. 9d.).

Clinical Pathology in General Practice (22s. 3d.).

Any Questions?, Volumes 2 and 3 (8s. 3d. each).

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THE EPIDEMIOLOGY OF Q FEVER IN GREAT BRITAIN

AN ANALYSIS OF THE FINDINGS AND SOME CONCLUSIONS*

BY

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Perhaps the most lasting impression left by a survey of the literature of Q fever is of the remarkable diversity of the ecology of *Rickettsia burneti*. Its pattern of maintenance in animal or insect hosts differs strikingly from one part of the world to another, and the particular local variant which has evolved may have much significance for the infection of man. Thus, for example, the infection of sheep in the central valley of California or in southern Europe is accompanied by an appreciable morbidity among the human beings in contact, whereas the presence of the organism in the rabbits and ticks (Hyalomma excavatum) of the Nefik forest, Casa-blanca, is an inapparent infection of seemingly little consequence to the visitors to this popular holiday resort (Blanc and Bruneau, 1956).

The extensive information about Q fever has been reviewed in detail many times (Derrick, 1953 ; Berge and Lennette, 1953 ; Kaplan and Bertagna, 1955 ; Stoker and Marmion, 1955a) and attempts have been made to form a unified view of the ecology of the rickettsia from a unified view of the ecology of the rickettsia (Derrick, 1944 ; Marmion, 1954). These have not, perhaps, been particularly successful, but they do serve at least to indicate those ecological problems which need further exploration—for example, that of the relation between the cycle of maintenance of the rickettsia in ticks and small animals in various parts of the world and in the larger domestic animals, such as cattle, sheep, and goats.

Sporadic cases or outbreaks of the human disease have often been found in areas of intensive cattle or sheep farming, and the work of the Californian investigators (Huebner and Bell, 1951 ; Lennette and Clark, 1951) in particular has done much to unravel the way in which infection spreads from these animals to man. However, methods of animal husbandry in California have some unusual features, and the experience there cannot necessarily be used as a model for other countries. Q fever appears to be rare or entirely absent in certain agricultural countries such as Denmark, Finland, Norway, the Netherlands, and New Zealand. This may possibly be related to the infrequent importation of cattle and sheep into these countries (Kaplan and Bertagna, 1955), but the factors responsible may be more

complex, as the prevalence of the disease in cattle has been found to vary quite strikingly within the boundaries of a single county in England.

The work of Giroud and his colleagues in the Belgian Congo and French Equatorial Africa suggests that the ecology of the rickettsia and the epidemiology of the human disease may differ both qualitatively and quantitatively in tropical as compared with the temperate areas of the world.

Italian workers (Babudieri and Moscovici, 1952) found that pigeons and geese may be naturally infected with *R. burneti*, and Czechoslovakian workers (Brezina and Táborská, 1956 ; Raska *et al.*, 1956 ; Syruček and Raska, 1956) have extended our knowledge in this field by demonstrating natural infection in certain wild and domestic birds as well as in various rodents. The former finding is of some interest in view of a Russian report (Zhmaeva *et al.*, 1955) that *R. burneti* has been isolated from nestling field sparrows and two species of bird mites in an endemic focus of infection in Central Asia. The mites, it appears, were of a variety which sometimes attacks man and were collected from some of the numerous sparrows nesting near a village where human cases of Q fever had occurred.

These examples of the more unusual geographical variants of the ecology of the organism have been chosen deliberately to give point to Derrick's (1953) statement that "the history of 'Q' fever is full of paradoxes and surprises and changes of emphasis" and to make it clear that our understanding of the ecology of *R. burneti* is still incomplete.

There are therefore good general grounds for investigating Q fever in each country where it has been detected—quite apart from the need for public health workers to know about the local reservoirs of infection for man.

The investigation of the disease in England started in 1949, when Stoker found serological evidence of infection in two patients with pneumonia. Later in the same year the organism was isolated from patients in a small outbreak of Q fever at a hospital in London (Harman, 1949 ; MacCallum *et al.*, 1949). The epidemiological investigation of this outbreak (Marmion and Stoker, 1950) established that cattle in this country were infected and that the human cases were not the result of isolated importations of the disease.

*Based on a report to the Medical Research Council.

†Now at the Public Health Laboratory, Bridle Path, Leeds, 15.

Subsequent epidemiological investigations fell into two stages. In the first, conducted from Colindale and Cambridge, patients with Q fever in many parts of the country were followed up to find out how they had been infected. This approach to the problem yielded some information, summarized in the paper by Marmion *et al.* (1953). However, the retrospective investigation of sporadic cases or outbreaks has limitations—due principally to the absence of epidemiological information about control groups of uninfected human beings or animals. In the second stage, therefore, certain areas and groups of the population were studied in a controlled way so as to assess the significance of various possible sources or modes of spread of infection to man which had been uncovered in the earlier investigation. This work was carried out from Cambridge as a joint responsibility of the authors and with support from the Medical Research Council and Cambridge University. Attention was concentrated on Kent and East Anglia—areas of high and low prevalence of the disease. Systematic surveys of possible animal reservoirs of Q fever in these two areas were undertaken and three main epidemiological investigations were carried out. For the sake of brevity the latter will subsequently be called the “survey of healthy adults,” the “rural area investigation,” and the “urban area investigation.”

In the first of these the epidemiological histories of blood donors with Q fever antibody who were living in Kent or East Anglia were compared with the histories of randomly selected and negative donors living in the same areas (Marmion *et al.*, 1956). In the second a comparison was made of the prevalence of Q fever in a sheep-raising area, the Romney Marsh, and in a geographically similar area of Fenland—Chatteris-Witchford R.D.—with few sheep (Marmion and Stoker, 1956). In the third, the residents of two towns in north-east Kent were studied to determine the part played by cows' milk as a vehicle of Q fever infection (Marmion and Harvey, 1956).

In other parts of the country and about the same time, surveys of Q fever infection in cattle and cows' milk were undertaken by Dr. Slavin, of the Weybridge laboratory of the Ministry of Agriculture and Fisheries (Slavin, 1952). The disease in human beings and animals was also investigated by Drs. A. D. Evans, W. F. Lane, and J. C. Walker at the Public Health Laboratories in, respectively, Cardiff, Bedford, and Luton, and also by Dr. N. R. Grist at the Virus Laboratory, Ruchill Hospital, Glasgow.

It is the purpose of this paper to assemble the results of all these studies and to present them, together with some fresh information, in an effort to provide a composite picture of our national epidemiology.

The reservoirs of infection in this country and their possible interrelationships are described first of all, then the ways in which infection spreads from them to man.

1. NATURAL HOSTS OF *R. BURNETI* IN GREAT BRITAIN AND MAINTENANCE OF THE ORGANISM

Cattle

R. burneti has been isolated on numerous occasions from the pooled milk of herds of cattle kept in many parts of England, Wales, and Scotland (Marmion and Stoker, 1950; Slavin, 1952; Marmion *et al.*, 1953; Evans, 1956; Grist, 1956). The survey by Slavin was the most comprehensive, and covered 3,374 herds, of which 6.9% in England, 2%,

in Wales, and 0.8% in Scotland were infected as judged by the isolation of the rickettsia from the herd milk. The intensity of infection appeared to vary from county to county, doubtless owing mainly to uneven sampling, but nevertheless it was probably a valid observation that herds in East Anglia were much less often infected than those, for example, in Kent, Devon, Stafford, or Cheshire.

Few observations have been made on the distribution and progress of infection within herds of cattle in this country. The scanty information available suggests that the number of cows in a herd which are excreting rickettsiae in the milk may be small and that the infection may smoulder in the herd in an undramatic way. Thus in six infected herds in Kent and East Anglia 12 (10%) of 116 cows were shedding the rickettsia in the milk, and 24 (21%) of 114 cows had serological evidence of infection. Infection was found to persist for at least as long as two years in some Kentish herds which were sampled repeatedly.

Serological surveys of cattle at large—carried out mainly by testing sera submitted to veterinary laboratories for other diagnostic purposes—suggested low rates of infection; only 2 of 446 cattle in Kent and none of 609 cattle in East Anglia had Q fever antibody. Slavin found rather higher rates—12 (2.3%) of reactors among 509 sera collected from cattle in the country as a whole. When it is remembered that *R. burneti* was isolated from 8 to 12% of herd milks in Kent it is clear that surveys of bovine sera are an insensitive method of detecting or excluding the presence of Q fever in countries with a prevalence of infection at levels such as ours.

The rates of infection found by Huebner and his colleagues in Californian cattle were much higher than those just described—the milk from two-thirds of 63 dairies in Los Angeles contained the rickettsia (Huebner and Bell, 1951) and over 15% of 120,000 dairy cattle at large had serological evidence of infection (Luoto *et al.*, 1952). Such frequencies of infection seem to be of a different order of magnitude to those in British cattle. This might be due either to the less intensive methods of dairy farming in this country or it might represent a fundamental difference in the modes of spread of infection among the cattle. Presumably *R. burneti* is excreted in the placenta of English cattle as in Californian (Luoto and Huebner, 1950), but in a small series of tests we failed to isolate the organism from 32 placentas collected from cattle in herds with evidence of infection.

Sheep

Serological evidence of infection with *R. burneti* has been found in sheep in several parts of Great Britain. Fifteen (1.6%) of 906 sera from sheep killed in Kent slaughterhouses were found to have antibody, and higher rates of infection were found in certain flocks associated with cases of Q fever in the Romney Marsh area of the county (Marmion *et al.*, 1954). Eleven (3.5%) of 317 sheep in a rural area of Cardiganshire about 12 miles from Aberystwyth were found to have Q fever antibodies (Report to the P.H.L.S., 1956). Further south in Wales it was found that 2.7% of nearly 2,000 sera from sheep in 13 sanitary districts had Q fever antibody (Evans, 1956). Grist (1956) found a few positives among sheep coming to the Glasgow abattoir.

The significance of these serological observations was confirmed and enhanced by the isolation of *R. burneti* from 2 of 96 placentas collected from ewes in a flock with serological evidence of infection and kept in the Romney Marsh (Stoker *et al.*, 1955). The rickettsia was also isolated from pieces of wool collected from around the vulva of some ewes in the same flock. The frequency of serological positives and of the isolation of the organism from the placenta suggests a less intense infection than that found for example in North Californian or Italian sheep (Lennette and Clark, 1951; Davoli and Signorini, 1951).

We do not know how infection commonly spreads among sheep in this country—whether it is by the respiratory tract

after inhalation of infected aerosols, or by the digestive tract after the ingestion of water or pasture contaminated with the rickettsia, or even by arthropod vectors. Although *R. burneti* was found in the ticks (*Haemaphysalis punctata*) which heavily parasitized one infected flock in the Romney Marsh, infection was also found in another flock which was virtually free from ticks.

Spread of Infection from Sheep to Cattle

Early in the investigation of Q fever in Kent it was noted that the herd milks from cattle in the sheep-rearing areas of the county were more often infected than those elsewhere. A detailed survey of herds in two parts of the county was undertaken, therefore, to explore this lead. The parts chosen were agricultural census areas 8, 9, and 10 on the one hand and area 2 on the other. (See Fig. 1 (a).) Samples of the herd milks from the cattle in these areas were inoculated into guinea-pigs by Dr. E. R. Jones, of the County Pathological Laboratory, Maidstone, and the sera from the guinea-pigs, collected some six weeks after inoculation, were tested for Q fever antibody in our laboratory. In addition, samples of milk were obtained for us by medical officers of health in the two areas and tested in guinea-pigs at Cambridge. It will be seen from Table I that

TABLE I. Isolation of *Rickettsia burneti* from Herd Milks of Cattle in Various Areas of Kent with Differing Populations of Sheep

Agricultural Census Area	Animals per 100 Acres of Crops or Grass			Cattle: herds with		Total
	Cattle	Sheep	Pigs	Positive Milk	Negative Milk	
2	26.8	14.9	16.8	0	82	82
8, 9, 10	21.3	57.3	22.2	12	91	103

the two test areas were roughly similar in their numbers of cattle and pigs but differed strikingly in their number of sheep. It is clear that the proportion of herd milks which contained *R. burneti* was much higher in agricultural census areas 8, 9, and 10 than in area 2.

This difference in the rates of infection in the herds of cattle in the two areas could, of course, be due to other factors unrelated to exposure to sheep. Consequently an attempt was also made to find out whether the herds in the two areas differed in their size, methods of maintenance and replacement, exposure to sheep, infestation with ticks, and so on. This was done by sending a questionnaire to the farmers whose herds had been sampled. An analysis of the results is shown in Table II. The herds in the two areas were similar in respect of size, methods of maintenance, and grazing practice, but those in areas 8, 9, and 10 were more

TABLE II.—Analysis of the Answers to a Questionnaire Sent to 35 Farms in Area 2 and 63 Farms in Areas 8, 9, and 10

	Agricultural Census Areas			
	2		8, 9, and 10	
	No.	%	No.	%
No. of cattle in herd:				
< 10	20	57	28	44
10-30	7	20	12	19
31-50	6	17	8	13
51-70	1	3	9	14
> 70				
Herds maintained from:	34	97	58	92
(a) Calves born in herd	1	3	6	10
(b) Calves from outside herd	10	29	17	27
(c) Adult cattle from outside herd				
Grazing practice:	8	23	18	29
(a) Cattle graze with sheep	7	20	17	27
(b) Cattle graze on pasture used by sheep				
Flock of breeding ewes on same farm:	4	11	22	35
(a) At present time	9	26	39	62
(b) In the past	6	17	6	10
Flock of "fat" sheep on same farm				
Ticks:	4	11	5	8
(a) On farm dogs	2	6	20	32
(b) On cattle or sheep				
Total farms	35	100	63	100

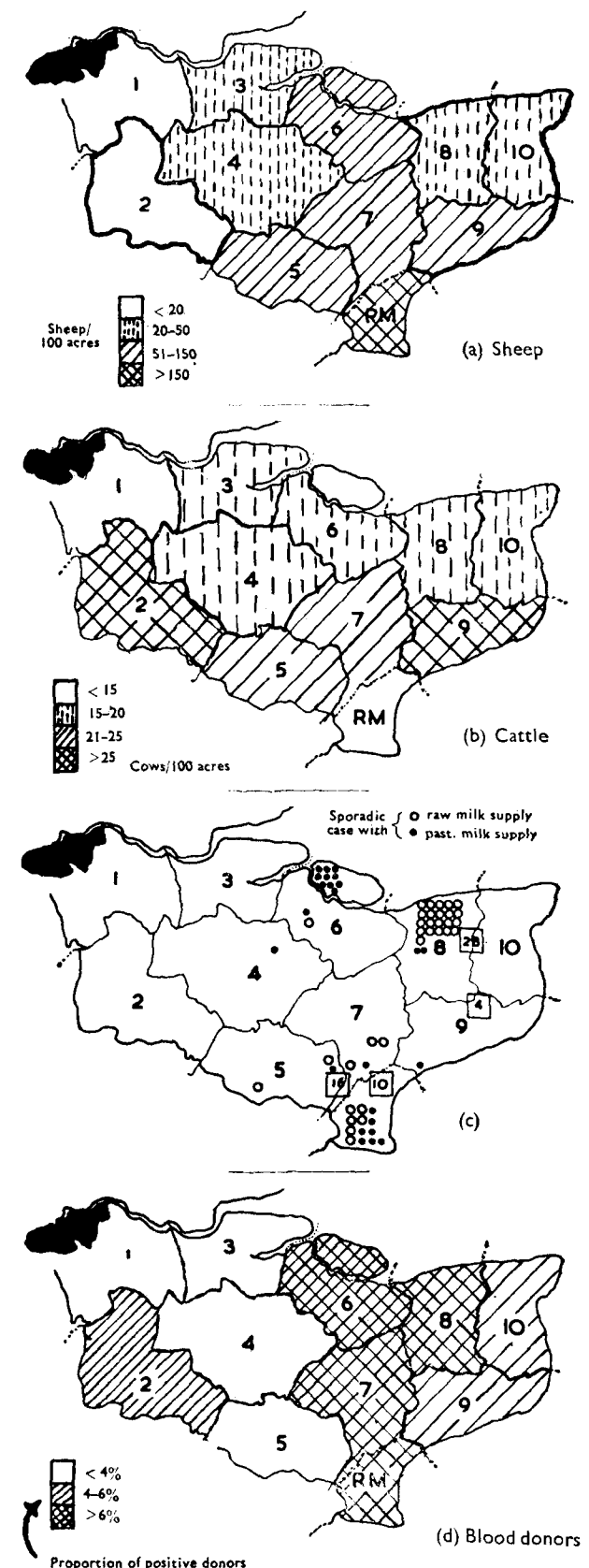


FIG. 1.—Sketch maps of Kent, divided into agricultural census areas (1 to 9 and the Romney Marsh) and showing (a) the number of sheep per 100 acres of crops and grass in the various areas of the county, (b) the number of cattle per 100 acres of crops and grass, (c) the distribution of sporadic cases, and outbreaks of Q fever (the numbers in the squares), and (d) the proportion of blood donors with Q fever antibody in the various areas.

commonly found on farms where there was a flock of breeding ewes—either at the time of replying to the questionnaire or in the past—and the farmers also reported that ticks were more often found on the cattle or sheep.

There is thus some evidence for an association between the infection of cattle and the presence of sheep or sheep ticks, or both, in this region of Kent. This conclusion is also supported by the findings in East Anglia, where the sheep population is low and the cattle are infrequently infected (Marmion *et al.*, 1953; Marmion and Stoker, 1956).

Goats and Pigs

Slavin (1952) isolated *Rickettsia burneti* from the pooled milk of a herd of goats in Devon. More recently we have failed to isolate the organism from the milk of five of the larger herds of goats in Kent.

So far as we are aware, there is no substantial evidence that pigs can act as a source of Q fever, although some workers (Giroud and Jadin, 1951; Giroud and Goulon, 1952; Davoli and Signorini, 1951; Monaci and Nuvolone, 1953) have found antibody in their sera. The epidemiology of an outbreak of Q fever on a farm in Kent (Stoker and Thompson, 1953) suggested that farrowing sows might be a source of infection for man. This conclusion stimulated a search for more certain evidence of infection among pigs in this country. As a preliminary some pigs were inoculated artificially to determine the nature of their serological response to infection with *R. burneti*. Both complement-fixing and agglutinating antibody were formed, but the rickettsia was not excreted in the placenta of a sow inoculated during pregnancy (Stoker and Betts, 1953). Tests for these two types of antibody were then carried out on the sera from 106 bacon pigs and 401 sows slaughtered in bacon factories and abattoirs serving a wide area of the country, but the results were negative. In addition placentas were collected from 101 sows, mostly on dairy farms in Kent, but *R. burneti* was not isolated by guinea-pig inoculation. Other material which was tested and proved to be negative included post-mortem specimens from four sows coming from farms where infection was known to be present either in human beings or in dairy cattle.

Rabbits

Bengtson (1941) and Fiset (1957) have shown that rabbits artificially inoculated with *R. burneti* form agglutinating and complement-fixing antibodies, and other workers have shown that infection sometimes occurs in Nature (Davoli and Signorini, 1951; Blanc and Bruneau, 1956).

The organs from 229 rabbits, mostly trapped in the Romney Marsh, were examined by guinea-pig inoculation, but *R. burneti* was not isolated. Professor C. P. Beattie, of the Department of Bacteriology, University of Sheffield, kindly provided 172 rabbit sera which had been collected during a survey of the distribution of *Toxoplasma*. These showed neither agglutinating nor complement-fixing antibody to *R. burneti*.

Birds

Chickens

Our colleagues Drs. Fiset and Barber have examined sera from domestic hens which were obtained through the courtesy of Miss M. J. B. Wheatley and Mr. John Edwardson, of the Veterinary Inspection Service in Kent and of the Director of the Houghton Poultry Research Station in East Anglia. The method of indirect complement-fixation (Rice, 1948) was used to test for Q fever antibody and with an antigen made from the Nine Mile strain of *R. burneti*.

Sera from 390 birds were tested and 46 (11.8%) gave a positive inhibition test at titres of 1/10 or more. A comparison of sera collected from Kent, where Q fever is endemic, and East Anglia, where infection is rare, showed that 46 (13.5%) of 341 Kentish fowl sera were positive (some with titres of 1/80) but none of 49 sera from East Anglian fowls. There was also an indication that the

proportion of positives in Kent was the highest in flocks of hens running on pastures used by sheep.

The serological infection rate in Kentish fowls was of the same order as that—15%—found by Syruček and Raska (1956), who, however, used the direct complement-fixation test on fowl sera from Czechoslovakian farms where Q fever had occurred in man and domestic animals. These authors, and Sobeslavsky, also studied the excretion of the rickettsia and antibody formation in experimentally infected fowls. *R. burneti* was recovered from the droppings of one bird during the period from the 7th to the 40th day after inoculation. Complement-fixing antibody formation as measured by the direct test was rather irregular: only 3 out of 12 hens developed antibody, and even then not until six weeks after infection.

Wild Birds

The organs of 166 wild birds of various species taken in the Romney Marsh were examined, but *R. burneti* was not isolated.

Ticks

R. burneti was isolated from two batches of *Haemaphysalis punctata* collected from the flock of sheep in the Romney Marsh which had provided the infected placentas and wool clippings (Stoker and Marmion, 1955b). Ticks collected at the same time from other flocks in the Romney Marsh were negative, but an equivocal isolation was made some years before from *H. punctata* collected on the northern Kent marshes. Large batches of *Ixodes ricinus* from Cumberland and Scotland and a small number of *Dermacentor reticulatus* from Devon were negative (Marmion *et al.*, 1953).

Miscellaneous Animals and Ectoparasites

The organs from 30 assorted small animals—mice, rats, shrews, moles—and several pools of rabbit fleas, mostly collected in the Romney Marsh, were examined by guinea-pig inoculation with negative results.

2. TRANSMISSION OF INFECTION TO MAN

General Epidemiology of Human Q Fever

Geographical Distribution of Cases

Patients with Q fever have been detected in most parts of the Midlands and southern England. Relatively few cases have been reported in the north, and they appear to be especially rare in Lancashire, Westmorland, Cumberland, and the North and East Ridings of Yorkshire (Stoker, 1949; Manderson, 1949; Crofton *et al.*, 1951; Cameron, 1951; Marmion *et al.*, 1953, and unpublished data; Erooga and Shaw, 1956). The absence of Q fever in these northern counties, which are agricultural areas with large numbers of sheep, is most probably due to the fact that a systematic search has not been made. On the other hand, there are certain areas in East Anglia where, despite a rigorous search for patients with Q fever, only one or two have been found. This fact and the relatively infrequent finding of Q fever antibody in healthy members of the local population make it certain that the disease is genuinely absent and not merely undetected (Marmion *et al.*, 1953, 1956; Marmion and Stoker, 1956). In fact, the disease may have a patchy distribution even within the boundaries of a single county. Thus in Kent most of the patients with Q fever were found in the eastern half of the county, although admittedly the distribution is weighted by the inclusion of patients in the "urban" and Romney Marsh areas, which were the subject of special study. Despite this, the results of a serological survey of healthy adults (blood donors) throughout the county does support the idea of an irregular distribution of infection which more or less coincides with the case distribution. (See Fig. 1 (c) and (d).)

Sporadic cases or outbreaks of Q fever have also been found in many parts of Wales (Forbes, 1950; Evans, 1956; Report to the P.H.L.S., 1956). Little evidence of human

infection has yet been obtained in Scotland in spite of finding infected cattle in Dumfries, Clydebank, and Aberdeen (Grist, 1956; Slavin, 1952).

Age and Sex Distribution of Sporadic Cases

An analysis of the first 69 patients with Q fever showed that 58 were males and only 11 females. Of the patients, 92% were between 20 and 60 years old—that is, of working age (Marmion *et al.*, 1953). An analysis of cases since 1953 shows similar trends. The youngest patient in our records was aged 6.

Seasonal Prevalence of Cases

Fig. 2 shows the distribution of 104 patients with Q fever in England and Wales by their month of onset of illness. Over half of these had been found in Kent—an area of intensive study. It will be seen that cases occurred all the year round, but that there was a sharp increase in the spring (April and May) and another peak in September and October. Fig. 3 (a, b, c) gives the results of a detailed analysis of the 57 patients in Kent. Fig. 3 (a), "all cases," shows once again the prevalence of infection in the spring. Three out of the four outbreaks in the county occurred at this time of the year. Fig. 3 (b) shows that the vernal increase

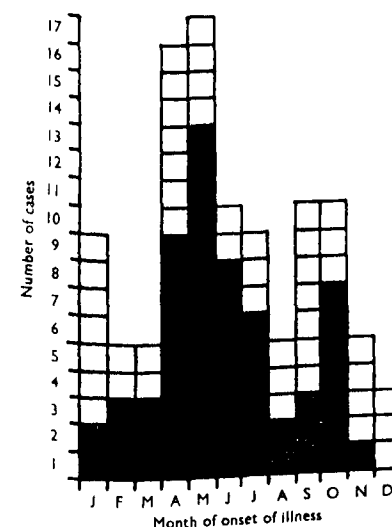


FIG. 2.—Seasonal distribution of 104 sporadic cases of Q fever in England and Wales. Those in Kent are represented by black squares and those elsewhere by open squares.

was predominantly among those supplied with pasteurized milk at home, so that infection from a source other than raw milk must be postulated. Lastly, Fig. 3 (c) shows that the vernal prevalence of infection was most striking in the Romney Marsh area of Kent, where sheep were almost certainly the source of infection. On the other hand, cases in the urban area in the north-east of Kent, where milk was the most probable source of infection (see below), occurred all the year round.

Modes of Spread of Infection from Animals to Man

Occupational Q Fever

Classically, Q fever is a disease of those working with the domestic ruminants, but in fact only 8 (11.6%) out of the original series of 69 sporadic cases of Q fever in this country had such exposure. Nevertheless, in accord with the pattern of the disease elsewhere, patients with Q fever have been found among farmers and farm workers, shepherds, slaughterhouse workers, and veterinary surgeons. The herds, slaughterhouse workers, and veterinary surgeons. The serological survey of healthy adults in Kent and East Anglia showed that antibody was almost twice as common in persons who were occupationally exposed to cattle and sheep (or materials from them) as in those who were not. The low incidence of the clinical disease among those most closely exposed was probably due to pre-existing immunity—a point more fully explored in the discussion.

Residence Near Sources of Infection

Elsewhere in the world, in Los Angeles or Italy for example, it has been found that people living near certain sources of infection (cattle, sheep, or goats, particularly when giving birth to their young) have an increased risk of

getting Q fever. In England, however, there is little evidence from the investigation of Q fever patients in general that such "residential" contact plays a significant part in the epidemiology of the disease. This conclusion is supported by the finding that healthy adults in Kent and East Anglia who had lived within 200 yards (183 m.) of farm stock did not have Q fever antibody any more frequently than those not so exposed. This divergence from the experience in Los Angeles and elsewhere is probably accounted for by our wetter and less dusty atmosphere, the generally low incidence of Q fever in English cattle and sheep, and the less intensive and concentrated dairy farming.

There was, however, one group of 10 patients with Q fever in a small town in north Kent (Fig. 1 (c), area 6) where a form of "residential" exposure probably did play a part. Investigation of these patients showed that they had probably not been infected from milk or the local cattle and sheep, and the only remaining source seemed to be a large glue and fertilizer factory, around which most of the cases of Q fever either lived or worked. The factory received, among other materials, the offal from animals slaughtered in abattoirs in various parts of Kent and Sussex—bones, horns and hooves, intestines, and parts of the genital and urinary tracts. Some of this material—namely, the udder, the uterus with placenta and birth fluids, and the intestines—may have contained *R. burneti* from time to time, or indeed any of it may have been contaminated with the excreta of the rats which were inevitably to be found in the area.

If the factory was the source of infection then it is far from clear how infection was disseminated to the local inhabitants. Simple wind-borne carriage of infected dust from the factory during the processing of various tissues seems hardly credible, as some of the patients lived or worked more than half a mile (0.8 km.) away. Some interesting conclusions about the distance which infected aerosols can

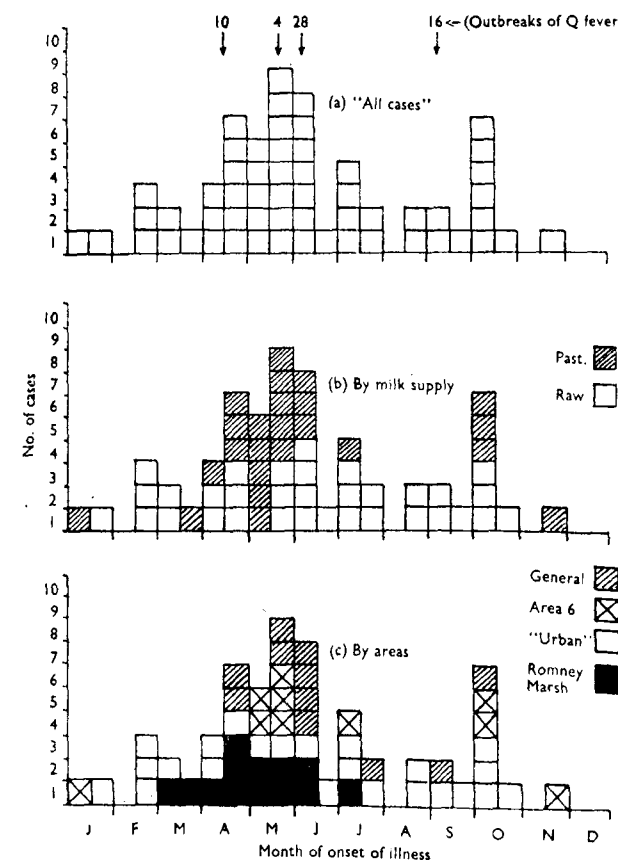


FIG. 3.—Seasonal distribution of sporadic cases and outbreaks of Q fever in Kent: (a) all cases, (b) showing the household milk supply at the time of illness, and (c) showing the area of the county from which the cases were drawn.

spread from a rendering and fertilizer factory have recently been given by Spendlove (1957). After an outbreak of psittacosis had occurred at a factory which processed infected turkeys it was found that "tracer" bacteria placed on the material being macerated could be recovered in small numbers in an air sampler placed on a road skirting the factory and some 100 feet (30 m.) down-wind from the factory chimney. A more credible if quite unproved explanation would suggest that infected dust was carried out of the factory on the floors of transport vehicles or on the clothing or hair of the factory workers and subsequently liberated into the air of places at a distance—for example, the packing bays of adjoining factories, or in local shops, public houses, or cafés, and so on. Presumably the intensity of such infection would be greatest in the vicinity of the factory but would diminish much more slowly with the distance from the source than would simple wind-borne carriage of infected dust.

Direct Contact with Infected Cattle and the Use of Infected Raw Milk

Although there have been one or two episodes in which bystanders other than the herdsman or veterinary surgeon have been infected at the birth of a calf, the main vehicle by which Q fever comes from cattle to man in England appears to be the milk. The part played by milk in causing Q fever was shown in two towns in area 8 of Kent. (See Fig. 1 (c).) In these towns it was found that there was a preponderance of users of raw milk among Q fever patients when compared with a control group of patients suffering from other forms of fever or pneumonia. The majority of the cases of Q fever, and also the highest proportion of healthy adults with serological evidence of infection, were found among the customers of five particular retail dairies out of a total of 16 or 17 selling milk in the two towns. The rickettsia was demonstrated in the milk supplied to two of the five dairies.

Infection from sources other than milk seemed improbable in these two towns because a history of occupational or any other form of contact with animals or animal products, or of regular contact with persons working in trades with animals, was no commoner among the Q fever patients than among the controls.

The results of the survey of healthy adults in all parts of Kent and several counties of East Anglia provided an independent confirmation of the importance of milk-borne infection. In both areas it was found that after due allowance had been made for exposure in other ways the proportion of healthy adults with Q fever antibody was significantly higher among those who had used raw milk at home for all or part of the period 1942–53 than among those who had used only pasteurized milk.

Sheep as a Source of Infection for Man

The part played by sheep in the epidemiology of human Q fever in England was explored in the Romney Marsh area of Kent, which has a very large sheep population. As already mentioned, several flocks with serological evidence of infection were found in this area and the rickettsia was isolated from placental and wool samples collected from the sheep in one such flock. A serological survey of patients in the Romney Marsh who had suffered from pneumonia or undiagnosed fever during the period 1949–54 showed that some 14% of them had probably had Q fever. The majority of the patients with Q fever became ill in April, May, and June—that is, at a time when lambing, shearing, and other work with the sheep is at its height. (See Fig. 3 (c).) Several of the patients with Q fever were farm labourers or shepherds in close contact with sheep, and in at least three episodes it seemed very probable that the patients had been infected from the lambing ewes. The other Q fever patients in the area were not working with sheep, but some were in contact with shepherds or other persons handling sheep or materials from them. An investigation of the milk supplies of the cases of Q fever showed that some were using

pasteurized milk, while others were using supplies of raw milk and that one of these was infected with *R. burneti*. This last supply may have been the source of infection for a few of the cases (Marmion *et al.*, 1954; Marmion and Stoker, 1956).

The investigation of a small outbreak of 15 cases of Q fever in a sheep-rearing area of Cardiganshire (Report to the P.H.L.S., 1956) provided additional evidence that sheep may be responsible for human infection in Great Britain. As with the series of Q fever patients in the Romney Marsh only a proportion, 10 of the 15 patients, had obvious occupational exposure to animals. The remaining patients—a salesman in a mobile clothing-shop, a physician, a newspaper reporter, a carpenter, and a domestic worker—had either visited farms or had some contact in their spare time with persons who were engaged in sheep farming. It seems probable that they were exposed to infection in some undefined way during these activities.

The epidemiological pattern of the Welsh outbreak and that of some of the Romney Marsh cases resembles that found in the outbreak at Colusa, North California, by Clark *et al.* (1951). These workers considered that some persons who were not directly exposed to sheep may have been infected by the inhalation of dust containing *R. burneti* which was carried into town on the clothing of sheep farmers or other fomites. We have recovered *R. burneti* from the dust taken from the clothing of a Romney Marsh shepherd in charge of an infected flock (Marmion and Stoker, 1956), and it is easy to imagine how such persons dressed in their working clothes could carry infection into local shops, cafés, hairdressers, or public houses, or to any other place at some distance from the infected sheep.

Possibility of Infection from Other Domestic Animals, Birds, and Arthropods

Goats.—These animals are known to play a part in the epidemiology of Q fever in some parts of the world. Although infection has been demonstrated in goats in England (Slavin, 1952) their small number probably makes them of little importance as a cause of human Q fever in this country. Reliable statistics of the goat population are difficult to obtain, as many goats are kept on holdings of less than an acre, which are not included in the agricultural returns. In the 1951 census 995 goats were recorded in Kent—a trifling number compared with some 120,000 cattle and 400,000 sheep. Goats are sometimes kept instead of cows to provide milk for farm households in the Fenland areas of Cambridgeshire, and are probably commoner there than in Kent. It is significant, therefore, that the Fens are largely free from Q fever. The survey of healthy adults in Kent and East Anglia revealed that only 5% of the sample of nearly 400 persons who were interviewed had bought or consumed goat's milk during the period from 1942 to 1953. Those who had done so did not have Q fever antibody more frequently than the remainder of the sample.

Pigs.—The survey of healthy adults in Kent and East Anglia did not show any increased frequency of Q fever antibody in human beings in contact with pigs. In fact, those persons living in areas of Kent and East Anglia with the largest populations of pigs showed the lowest rates of serological infection. These findings, together with the failure to demonstrate infection in pigs (see above), indicate that the pig is at best a very infrequent source of infection for man in this country.

Miscellaneous Animals, Birds, and Insects.—There was no increased frequency of Q fever antibody among the healthy adults in Kent or East Anglia who had kept dogs, cats, rabbits, chickens, or various psittacine birds at or near their homes during the survey period from 1942 to 1953. Similarly infestation (generally slight) of the house or outbuildings with mice, rats, or mosquitoes was without significance. A history of tickbite was very uncommon among both the healthy adults and the patients with Q fever, and there is no good evidence of the infection of man by this means. There were a few reports of the presence of ticks on dogs,

cats, or ferrets, and it is possible that an occasional patient might be infected while removing them—as in the incident with dogs and *Ixodes ricinus* described by Hengel *et al.* (1950).

DISCUSSION

It is difficult to make an accurate estimate of the prevalence of clinical Q fever and the size of the problem it presents in this country. This is partly because of the indefinite clinical picture and partly because there is considerable variation in the frequency of the disease from area to area (for example, in Kent and East Anglia) and also between town and country. It is not altogether surprising, therefore, that figures derived from the central examination of the sera from patients with pneumonia or unexplained fever (mostly from urban areas) show low rates of infection (MacCallum, 1954). In some well-studied areas such as the Romney Marsh, or the small urban area in Kent, some 14% of patients with pneumonia probably had Q fever, and it is significant that the local medical practitioners at first did not distinguish the sporadic cases of Q fever from the bulk of those with pneumonia or fever due to other causes. Evans (1956) draws attention to the discrepancy between, on the one hand, the evidence of infection in cattle and sheep in South Wales and the frequency of antibody in the healthy residents of the area, and, on the other hand, the infrequent detection of clinical Q fever (15 (0.6%) of 2,482 cases of non-bacterial pneumonia). These findings might mean either that human infection was occurring at the time of the survey but was almost entirely subclinical in nature, or, as antibody may persist for six or more years after infection, that the antibody in the healthy population was from past infection and that the rickettsia was no longer spreading from cattle (or sheep) to man in this area. A recent change to the use of pasteurized milk could, for example, bring about such a dissociation between serological and clinical evidence of infection.

In general terms the finding of antibody in a population with no clinical Q fever might indicate a past acquisition of immunity and resistance to present exposure to infection. Relatively few of the Kentish cases of Q fever occurred among persons occupationally exposed to animals, although antibody was commonly found among such workers. In both the urban area and the Romney Marsh investigations it was noted that the newcomer to the area bore the brunt of the clinical Q fever—an observation most easily explained by postulating an immunity in residents of longer standing. Such an immunity might be the result of childhood exposure and acquired from infected milk—which appears to produce a high ratio of subclinical to clinical infections. An analogous situation appears to exist in South Africa, where most of the adult population are apparently immune and patients with Q fever are seen mostly among newly arrived immigrants from overseas or in South-African-born children (Report, 1954; cited by Kaplan and Bertagna, 1955).

The main conclusion from the investigations in Great Britain is that human beings in the areas studied were infected primarily from cattle and to a less extent from sheep. Although a few persons may have been directly or indirectly infected at the birth of a calf, the chief way in which the rickettsia spread from cattle to man appeared to be in the milk—at least in the sporadic cases of Q fever. No epidemiological evidence was obtained that goats, pigs, dogs, cats, rats, mice, domestic fowl, psittacine or other birds, ticks or other insects were a significant source of infection.

Although there is convincing evidence that Q fever can be contracted from the use or consumption of infected raw milk from cows—not only from the pioneer observations of Huebner and his colleagues in Los Angeles (Huebner *et al.*, 1948; Beck *et al.*, 1949; Bell *et al.*, 1950), but also from our own experience with the survey of healthy adults and the urban area investigation—the situation has nevertheless some puzzling features.

Infected milk may contain large numbers of rickettsiae—5 to 500 guinea-pig-infective doses per ml., and sometimes even more. Superficially it might be thought that drinking infected milk would be more dangerous, in terms of concentrations of organisms in contact with the oropharynx, than inhaling an infected aerosol. Yet the consumption of infected milk appears to be responsible for sporadic cases of Q fever at most. It is often assumed, possibly correctly, that this low incidence of clinical Q fever in drinkers of raw milk is due in some way to the greater resistance to infection of the oropharynx or intestinal tract as compared with the lower reaches of the respiratory tract. The recent demonstration (Abinanti and Marmion, 1957) of the protective or neutralizing properties of whey antibody in infected milk offers another possible explanation—namely, that contact with the antibody-coated rickettsiae leads to subclinical rather than clinical infection as with the guinea-pig inoculated with a mixture of rickettsiae and immune serum.

The ratio of subclinical (antibody-forming) to clinical infections among the users of an infected milk supply is a matter of some interest. In the absence of much-needed and accurate data from an institutional population supplied with infected milk we can only make a very rough estimate of the proportion of clinical cases of Q fever to persons with antibody for the customers of dairies A and B of the urban-area investigation. Probably about 7,000 to 8,000 people were getting milk from these two dairies. It can be estimated that during the period 1948–54 there were some 94 cases of pneumonia in this group and that of these about 30 were probably due to Q fever. From the results of antibody tests on the samples of healthy adults using milk from dairies A and B it can be calculated that some 1,070 persons among the customers had antibody—a proportion of one patient with Q fever for every 35 persons with antibody.

There have been several experimental investigations of the effects of pasteurization on infected raw milk (Huebner *et al.*, 1949; Marmion *et al.*, 1951). Essentially these have shown that treatment of the milk at 161° F. (71.7° C.) for 15 seconds in the high-temperature-short-time (H.T.S.T.) process and 145° F. (62.8° C.) for 30 minutes in the vat-holding process is generally sufficient to destroy the rickettsiae in naturally infected milk. A recent reinvestigation of the problem (Enright *et al.*, 1957) has confirmed these findings. Examination of milk purchased in the open market and pasteurized by the H.T.S.T. or vat-holding process has revealed a few samples in which the rickettsia has survived (Huebner *et al.*, 1949; Lennette *et al.*, 1952; Evans, 1956). This is probably of little practical significance, for the results of our investigations show clearly that persons using pasteurized milk have a lower probability of contracting Q fever or of exhibiting antibody than those in the same area who use raw milk. The great increase in the pasteurization of milk which has taken place during the last ten years in this country should substantially reduce the number of sporadic cases of Q fever in urban dwellers who are not otherwise exposed, although unpasteurized tuberculin-tested milk will presumably still remain as a potential source of infection.

Although the sporadic cases of Q fever may be brought under control the outbreaks of the disease may well continue, as they appear to be part of a different epidemiological problem. The source and occasion of infection has only been determined with certainty in one of the seven British outbreaks investigated—that at the Royal Cancer Hospital in London. Four of the outbreaks occurred in the spring and at the time of lambing and shearing, but the remaining two were at quite different times of year. Perhaps the most puzzling of all was that among the students at the College of Arts, Canterbury, where no obvious contact with domestic animals, rodents, or birds could be demonstrated (Harvey *et al.*, 1951).

A number of the students at this college came from the farming community and a few from sheep farms on the edge of the Romney Marsh. In view of the recovery of

R. burneti from air-borne dust by the Northern Californian workers (DeLay *et al.*, 1950) and their suggestions about fomites-borne infection (see Welsh, 1951), and also of our own isolation of *R. burneti* from dust collected from the clothing of a Romney Marsh shepherd, it is tempting to look back at this outbreak and speculate on the possibility that infected dust may have been brought to and disseminated in the college by a student rather than on the exterior or the contents of a packing-case, as tentatively suggested at the time.

The recent discovery that certain rodents and chickens can be infected and excrete the rickettsia points to another possibility which should be explored in future outbreaks where cattle, sheep, or goats are not obviously involved. Even if *R. burneti* is not regularly maintained in rats or chickens it may well be that these creatures can act as "short-term" or "secondary" hosts to the rickettsia and carry it into domestic or other environments well away from domestic ruminants, their products, or fomites directly contaminated by them. To mention this possibility is only to return to the theme of the variability of the ecology of *R. burneti* which has been stated in the introduction. Our information about the epidemiology of the disease in Great Britain as a whole is still quite limited. The indications from the most closely studied county, Kent, are of localized and complex endemic focus in which ticks and sheep are infected, with spread of infection from the latter to cattle and possibly to other creatures in contact, such as chickens. The distribution of sporadic cases and outbreaks of Q fever in man corresponds to the intensity of stocking with sheep in Kent, but it is clear that infection does not always spread from them to man by the most direct route. Studies elsewhere in Great Britain might well show different combinations of hosts and different routes of spread of infection.

Summary

Investigations of the epidemiology of Q fever in Great Britain since 1949 have shown that the disease is widespread in the country.

Rickettsia burneti has been isolated from the milk of cows and goats and from the placenta and wool of sheep. It has also been isolated from the sheep tick, *Haemaphysalis punctata*, but not from *Ixodes ricinus* or *Dermacentor reticulatus*.

There was some evidence of an increased frequency of infection in cattle in areas of Kent with large numbers of sheep and in some sheep ticks.

Limited attempts to find a reservoir of infection in small wild animals or wild birds were unsuccessful. Serological evidence of infection was found in chickens, but there are, at present, no grounds for assuming that these birds are an important reservoir of infection in Great Britain.

Infection in man has not been limited to those persons working with animals, but has been found in all sections of the community. Sporadic cases and outbreaks of Q fever occurred at any time of the year, but, in the areas studied, were commonest in the months from April to July.

Studies of the transmission of *R. burneti* to man have shown that sheep or cows were directly or indirectly the main sources of infection. Good evidence was obtained of the importance of unpasteurized cows' milk as a vehicle of infection.

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"The control of dark smoke can be achieved if the representatives of local authorities accept the responsibilities that the full implementation of the Clean Air Act, 1956, involves. The common practice of waiting for smoke nuisance complaints from the public before action is taken is over. All areas should be subject to constant inspection and contraventions should not be allowed to persist. In many cases the co-operation of the owners or occupiers of the premises is readily available once their attention is drawn to such contraventions, and persuasion rather than compulsion is the answer; on the other hand there is sometimes a hard core of resistance to be overcome, and in such cases the local authority should ensure that the enforcement of legal proceedings can be carried out. If the representatives of local authorities who are in fact the policy makers do not accept the responsibilities placed upon them by the Clean Air Act, 1956, then I suggest that one of the ideas of this Society, 'To encourage the adoption of methods to reduce and prevent atmospheric pollution,' will be of no avail."—Mr. G. W. FARQUHARSON, chief smoke inspector for Birmingham, speaking on October 1 at the annual conference of the National Society for Clean Air.

OESOPHAGEAL STRICTURES AFTER GASTRIC SURGERY AND NASO-GASTRIC INTUBATION

BY

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The occasional development of an oesophageal stricture without apparent cause following the use of an indwelling naso-gastric tube and, usually, some type of gastric surgery has been recognized for many years. Less often, this condition has followed naso-gastric intubation and either some other abdominal operation or a severe illness not treated by operation. Douglas (1956), when reporting five of these cases, referred to 23 reported in the literature since 1915.

The mechanism of production of these oesophageal strictures and the part played by various factors have previously been discussed by several authors, without any generally agreed or very convincing conclusion having been reached.

A personal experience of four of these cases is recorded below. Study of them throws, I believe, some light on the aetiology of the condition.

Case 1

A man aged 41 was operated on in the Mid-Ulster Hospital for a perforated duodenal ulcer on May 24, 1950, and the perforation closed. Gastric aspiration by means of an indwelling Ryle tube was maintained for 48 hours. During this time the patient was lying flat. Troublesome heartburn started 10 days post-operatively. Otherwise his progress was quite satisfactory until three or four weeks after the operation, when, shortly after he had returned home, he began to experience a little dysphagia. The dysphagia rapidly increased, and he was readmitted on July 7 able to swallow even fluids only with difficulty. Barium-swallow examination showed a narrow stricture involving apparently the lowest few inches of the oesophagus and slight dilatation of the oesophagus above. He was transferred to the Royal Victoria Hospital, Belfast, on July 19, in an advanced stage of starvation, with a slow pulse, hypotension, and extreme prostration and general weakness. A life-saving measure before any investigation of his dysphagia was undertaken. His condition rapidly improved.

At oesophagoscopy on August 7 I found that the mucosa in the lower oesophagus was reddened, oedematous, easily traumatized, and showed superficial ulceration just above a narrow stricture. Gum-elastic bougies were readily passed. It was noted at the time that the appearance suggested peptic oesophagitis.

Following the dilatation, improvement in swallowing lasted for only a few days, and after two further oesophagoscopy dilatations regular self-bougienage by the patient was begun, starting with the smallest sizes and gradually increased. He was able to swallow reasonably well, though having to be careful that solids were cut up fine or minced. He was discharged on September 10 to continue with self-bougienage, and found that by passing his bougie, at first daily, later at weekly intervals, and eventually at intervals of several weeks, he was able to swallow satisfactorily.

He continued, though, to be troubled repeatedly with ulcer dyspepsia, including one episode of haematemesis and melaena, and on June 8, 1955, a gastro-enterostomy and vagotomy was carried out by Mr. E. Morrison. Recovery was uneventful, and the patient returned home to continue with self-bougienage.

For a period of some weeks after this operation he again required to pass his bougie as often as two or three times a week, but, apart from this, the operation has proved most satisfactory in every way. Not only has the patient been free from ulcer dyspepsia, but he no longer suffers from heartburn, which had been very troublesome ever since his perforation in 1950, and he has been able gradually to lengthen the intervals between dilatations until these have virtually been discontinued. When last seen he had not required to pass his bougie for eight months, and, provided solids are cut up fine, he has no trouble with swallowing.

When he was first seen it was thought the radiographs showed the oesophageal stricture to extend to the oesophageal hiatus, but after Case 4 of this series had been seen the radiographs were reviewed, and it was then realized that the appearances were consistent with the presence of a hiatus hernia. Further radiographs, taken recently with this in mind, confirmed that a hiatus hernia was indeed present, and that gastro-oesophageal reflux could be produced.

Case 2

A man aged 68, who had had ulcer-type dyspepsia for many years, was operated on in Coleraine Hospital on January 4, 1954, and a perforated duodenal ulcer sutured. Two days after operation a Ryle tube was passed because of vomiting, and aspiration was carried out for at least 48 hours, with the patient lying flat during this time. He was discharged on January 28, but was readmitted on March 5 because of projectile vomiting. A gastro-enterostomy was performed and he was discharged on April 8. On June 15 he was again readmitted because of gradually increasing vomiting immediately after every meal. Barium-swallow examination showed a stricture with hold-up of barium in the lower third of the oesophagus. The gastro-enterostomy was functioning satisfactorily.

At oesophagoscopy on July 4 I found a stricture at 37 cm. Oesophageal mucosa for a short distance proximal to this was reddened, inflamed, and ulcerated, the appearance being that of reflux oesophagitis. A biopsy specimen showed granulation tissue infiltrated by acute inflammatory cells.

The patient learnt to pass oesophageal bougies himself and was discharged on July 30 to continue bougienage at home. At first daily bougienage was carried out, but it proved possible gradually to decrease the frequency of dilatations, and three and a half years later he required to pass a bougie only at intervals of several weeks, was keeping well, had no dysphagia, except occasionally for meat, and had put on over a stone (6.4 kg.) in weight.

This patient has recently been reviewed and further radiographic examination carried out. The presence of quite a large hiatus hernia with reflux was demonstrated, and above this a slightly strictured lower segment of oesophagus.

Case 3

A man aged 61 had a gastro-enterostomy and vagotomy performed for pyloric stenosis in the Royal Victoria Hospital, Belfast, on June 13, 1957. Gastric aspiration was carried out for 48 hours. He was transferred to a convalescent hospital 12 days later. Shortly after arriving there he began to have dysphagia. Barium-swallow examination on July 5 showed what seemed to be an unusually long, narrow stricture apparently involving the lower half of the oesophagus (Fig. 1).

At oesophagoscopy (by Mr. H. M. Stevenson on July 15) the appearance was of an area of gross oesophagitis, at the lower end of which was a tight, simple stricture. This was dilated easily.

The dysphagia soon became as bad as before, and further oesophagoscopy dilatations were carried out on July 26 and August 15. Any benefit from these dilatations lasted for only very brief periods, and when I saw him on September 19 he was able to swallow scarcely anything but water, and sometimes milk, and was in a state of extreme weakness and debility.

At oesophagoscopy on September 20 I found the condition apparently unchanged, the mucosa at mid-oesophagus being red and oedematous and ending in a stricture. This was dilated.

Thereafter self-bougienage was carried out by the patient, at first three times daily, and when he could pass a size 17 English bougie he was discharged from hospital. Since then daily bougienage has been continued. His condition has improved steadily. He has to cut his food up fine, and there is occasionally a transient hold-up with solids.

The earlier radiographs were regarded at the time as showing the oesophageal stricture extending to the oesophageal hiatus, and a hiatus hernia was not specially looked for. A recent barium examination, carried out with the possibility of a hiatus hernia in mind, demonstrated that below the stricture there was indeed a large hiatus hernia with free reflux, and that the stricture was not nearly as long as had been thought (Fig. 2).

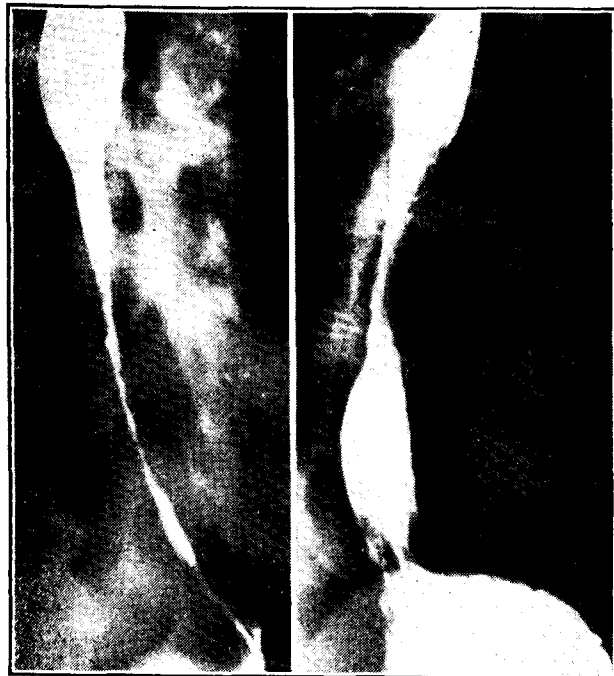


FIG. 1

FIG. 2

FIG. 1.—Case 3. Barium-swallow radiograph (July 5, 1957) showing what seemed an unusually long oesophageal stricture. A hiatus hernia was not specially looked for. FIG. 2.—Case 3. Barium study of oesophagus and cardia (February 27, 1958) revealed a large hiatus hernia.

Case 4

A man aged 39 had a rather harrowing story of peptic ulcer trouble. It can be summarized as follows: 1935, perforated duodenal ulcer sutured. 1942, gastro-enterostomy (Professor P. T. Crymble). 1955, gastro-enterostomy undone and Polya-type gastrectomy performed because of an anastomotic ulcer (Mr. M. Lavery). 1956, perforation of anastomotic ulcer sutured. May 14, 1957, Polya-type gastrectomy converted into Billroth I gastrectomy, a portion of jejunum involved in an anastomotic ulcer being excised (Mr. I. Fraser).

The patient was extremely ill for some days after this last operation, and gastric aspiration was carried out for five days, with the patient lying flat. A few days later he began to be troubled with hiccup and severe heartburn. As soon as he went home, a little over three weeks after operation, he experienced some dysphagia for the first time. This continued and became progressively worse. When I saw him on January 9, 1958, he was unable to swallow solids at all. Barium radiographs, shortly before this, had shown a hiatus hernia with readily produced reflux, and above this a stricture at the lower end of the oesophagus. (It was after seeing this case that the earlier cases were re-examined

and were also found to have hiatus hernias.) It is worth noting that barium-meal examination three months before his last gastric operation had not shown any sign of an oesophageal stricture. A hiatus hernia was not looked for at that time.

At oesophagoscopy (January 12) the appearance was that of a reflux oesophageal stricture, the mucosa just proximal to the stricture being reddened, oedematous, and slightly ulcerated, and bled easily on trauma. The stricture was dilated. A biopsy specimen showed smooth muscle with a marked chronic inflammatory infiltrate.

The patient began self-bougienage and was able to swallow a reasonable diet. However, he continued to have heartburn, and in view of his age and the chances of his reflux stricture becoming progressively worse, I decided that, instead of treating his condition purely by dilatation, I would carry out Collis's operation of gastropasty (Collis, 1957). I have recently been using this operation with most gratifying results in some cases of hiatus hernia with reflux oesophagitis, stricture formation, and shortening of the oesophagus. The operation was performed on January 28.

Up to the time of writing, two and a half months later, the patient has done well. Since the operation he has had no more heartburn, has required no further dilatations, and his swallowing has improved steadily, though he still has to be a little careful with solids. On recent radiographic examination reflux through the hiatus from the portion of stomach below the diaphragm could not be produced.

Discussion

Possible reasons for the development of oesophageal strictures in this type of case have been discussed by others. Straus (1950), for example, suggested that they may be the result of trauma from the tube, but this view has usually been discounted. Certainly the finding of acute inflammatory changes, with redness, oedema, and ulceration of the mucosa, weeks and even months after the removal of the indwelling tube, as in the present cases, clearly is against this view. Douglas (1956), in reporting five cases similar to those described in this paper, suggested that the most important factor in the production of these strictures was probably the patients' vomiting. This, however, is not very convincing, for some of these patients did not have a great deal of vomiting, and the effect of gastric aspiration with an indwelling tube is to prevent vomiting post-operatively.

Once it was recognized that the four cases described above all had hiatus hernias these difficulties disappeared. As already mentioned, the oesophagoscopic appearances in these cases were identical with those found in the reflux oesophagitis and reflux oesophageal stricture so often complicating hiatus hernia. The association in each case of a hiatus hernia and these oesophagoscopic findings makes it appear certain, therefore, that the oesophageal strictures in these cases were due to the hiatus hernias and the result of gastro-oesophageal reflux. This is not to say, though, that the operations and indwelling gastric tubes did not play a part. Reflux oesophagitis certainly often develops in association with hiatus hernia without any prolonged period of recumbency and without an indwelling tube. But reflux occurs more readily in the recumbent position, and almost certainly more readily still if an indwelling tube is present at the same time. Therefore this combination of recumbency and an indwelling tube in a patient with an unrecognized hiatus hernia could well start off reflux oesophagitis where none had been present before or markedly exacerbate a pre-existing mild oesophagitis. The temporary increase in dysphagia in Case 1 following gastro-enterostomy and vagotomy, when the patient was again confined to bed and an indwelling gastric tube was again employed, provides support for the view that such a regime may exacerbate reflux oesophagitis in a patient with a hiatus hernia.

It cannot, of course, be stated with certainty that similar cases described by others have had unrecognized hiatus hernias. But as in the first three cases described here the hernias were at first unrecognized, and as a hiatus hernia

can be present and yet be extremely difficult to demonstrate radiologically, the possibility must exist that in many such cases, and perhaps in all, the essential factor is the presence of a hiatus hernia.

If any lesson is to be drawn from these cases it is that when a patient requires gastric aspiration with an indwelling tube he should, if possible, even if there is no reason to suspect the presence of a hiatus hernia, be kept in an upright position and not lying flat.

Summary

Four cases of oesophageal stricture following gastric surgery and naso-gastric intubation are recorded.

The oesophagoscopic appearances in these cases were those of reflux oesophagitis, and in each case careful radiological examination demonstrated that a hiatus hernia was present.

Reasons are given for believing that, while the recumbent position and an indwelling gastric tube play a part in producing oesophageal strictures in such cases by initiating or exacerbating reflux oesophagitis, the essential factor is the presence of a hiatus hernia.

In all four cases treatment started with regular self-bougienage. This has become unnecessary or virtually unnecessary in two cases. In Case 1 this improvement gradually developed after gastro-enterostomy and vagotomy performed for persistent duodenal symptoms, and in Case 4 immediately following Collis's operation of gastropasty. In the other two cases self-bougienage is being continued.

It is suggested that when gastric aspiration with an indwelling tube is required in any patient the recumbent position should, if possible, be avoided.

I thank Mr. W. M. Brennan, Mr. H. W. C. Bailie, Mr. H. M. Stevenson, and Mr. I. Fraser for referring these cases to me. I am grateful to Dr. F. McDowell for the radiographic demonstration of hiatus hernias in the first three cases when they were reviewed. I am also indebted to Mr. R. D. Wood for help with the illustrations.

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OESOPHAGEAL STENOSIS AFTER PARTIAL GASTRECTOMY

BY

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Benign stricture of the oesophagus consequent on reflux oesophagitis is now a well-recognized condition. Allison (1948), in a review of 74 cases of oesophageal stenosis treated at the General Infirmary at Leeds, emphasized the role of peptic oesophagitis as a cause of stricture formation.

The frequency with which oesophageal stenosis occurs after oesophago-gastric operations has been pointed out by Barrett and Franklin (1949), and by Ripley, Olsen, and Kirklin (1952). In all the cases reviewed by them the operative procedures had interfered with the cardiac sphincter, the cardiac valve, or the "diaphragmatic pinchcock." Since the continence of the cardiac mechanism had thereby been interfered with, and acid and pepsin were able to regurgitate into the lower oesophagus, it is not surprising that reflux oesophagitis followed by stenosis had occurred.

The cases described here are of particular interest in that stenosis of the lower end of the oesophagus followed partial gastrectomy. This is doubly surprising, since the cardiac mechanism apparently had not been grossly disturbed, so there was no special reason for oesophageal reflux to take place. In addition, complete absence of free hydrochloric acid had been attained in both cases after operation; it was therefore unlikely that acid pepsin should cause ulceration of the oesophagus.

It is interesting to note that oesophageal stenosis after various types of operations for peptic ulcer has escaped mention in textbooks of surgery, for review of the literature indicates that this complication does in fact occur following various purely gastric procedures.

Oesophageal stenosis after uncomplicated gastro-enterostomy for duodenal ulcer has been recorded by Larson, Layne, and Howard (1942), and by Allison (1948). A further case of oesophageal stenosis after gastro-enterostomy has been reported by Bergqvist (1946), but this case was complicated by regurgitant vomiting, and duodenostomy had to be performed.

Review of the literature indicates that oesophageal stenosis is rare after partial gastrectomy. Craighead (1954) recorded two cases; in one of these emergency Polya-Hofmeister gastrectomy had been carried out for bleeding duodenal ulcer; the other patient had had a long-standing duodenal ulcer with evidence of early pyloric obstruction. Both patients, however, had had serious post-operative complications. The first of these still had a high level of free hydrochloric acid after operation and had developed stomal ulceration with stenosis, for which jejunostomy and further gastric resection had to be effected; the second patient suffered complete bursting of the wound on the third post-operative day. A somewhat similar case to the former is recorded by Benedict and Daland (1938) in which, after partial gastrectomy, the patient developed efferent-loop obstruction and subsequently oesophageal stenosis.

It is interesting at this stage to note how frequently, in patients who subsequently develop oesophageal stenosis, the previous gastro-enterostomy or partial gastrectomy has been followed by post-operative regurgitation or obstruction.

The only case of uncomplicated partial gastrectomy followed by oesophageal stenosis that we have been able to find is that recorded by Straus (1950). From personal communications with many surgeons, however, it would appear that this complication follows subtotal gastrectomy much more often than the literature indicates. For this reason it is felt desirable to record the following cases.

Case 1

A housewife aged 72 had suffered from vague dyspepsia and attacks of vomiting at intervals for 20 years. The condition was fully investigated in 1939, the symptoms being attributed to pylorospasm. Response to medical treatment was satisfactory, and no further serious symptoms occurred until she suffered a relapse in 1953, when the former symptoms of pyloric obstruction recurred. A barium-meal examination at this time showed a low distended stomach, but no ulcer crater. After a further period of peptic ulcer diet the symptoms again cleared up, but vomiting recurred in the spring of 1955, and persisted until the patient was seen on August 11 of that year. At this time her general condition was poor, and her weight had fallen from 8 st. 4 lb. to 6 st. (52.6 to 38.1 kg.). The clinical picture was that of

complete pyloric obstruction, and this was confirmed by barium-meal examination.

After careful restoration of fluid and electrolyte balance, operation was performed on September 2. The stomach was grossly hypertrophied and dilated, and there was an extreme degree of pyloric obstruction. The pyloric narrowing was attributed to the healing of a peptic ulcer. No other abnormality was detected in the abdomen. Partial gastrectomy was carried out, the lesser curve of the stomach being reconstructed so that the gastric remnant formed a smoothly tapering tube which was joined by anastomosis with the jejunum in front of the colon, and with the afferent loop to the lesser curvature. The patient's immediate post-operative progress was entirely uneventful and uncomplicated. After operation a Ryle tube was left in the stomach for 72 hours.

On the twentieth day after operation, when the patient was awaiting discharge, she developed a burning pain behind the sternum which radiated through to the back just below the shoulder-blades, and was associated with hiccup. Swallowing food brought on the pain, and there was some sensation of obstruction at the lower end of the sternum. The pain and oesophageal obstruction were intermittent

and were attributed to spasm. Barium-swallow examination at this time showed a fixed smooth narrowing of the lower end of the oesophagus, which was attributed to spasm. Oesophagoscopy showed inflammatory changes in the lower end of the oesophagus with some narrowing. Dilatation of the oesophagus was carried out and the patient discharged.

After discharge from hospital the patient's general condition improved, and within three months her weight had increased by 21 lb. (9.5 kg.). She still, however, complained at intervals of attacks of the same retrosternal pain, with dysphagia. Further dilatation of the oesophagus produced a very temporary benefit, and, though her general condition improved and there was further increase in weight, the attacks of pain became more persistent and the difficulty in swallowing more constant.

Barium-swallow examination on

June 11, 1956, showed narrowing of the distal 2 in. (5 cm.) of the oesophagus with dilatation above the narrowed segment (Fig. 1). There was increased peristalsis, and the narrow portion showed a beaded appearance when the bolus was actually passing. There was no filling defect to suggest new growth (Fig. 2), and on placing the patient in the Trendelenburg position no reflux of barium occurred. The gastric remnant showed no abnormality and the meal passed through the stoma quite normally.

Because symptoms persisted the patient was admitted on June 20 for reinvestigation. The x-ray appearances were unchanged, and oesophagoscopy showed inflammatory changes in the lower end of the oesophagus with narrowing of the lumen and small superficial longitudinal ulcers on the crests of the mucosal folds. After dilatation of the oesophagus, specimens of gastric juice were obtained. These showed no free acid; the total acid was 10 clinical units, and the pH 6.5.

It was decided to explore the lower end of the oesophagus, and this was done on June 26 through an oblique

thoraco-abdominal approach along the line of the eighth left rib. The gastric remnant was found to be lying neatly below the spleen, and there was no evidence of obstruction of the efferent or afferent loop. The gastro-jejunostomy stoma was entirely free and normal in every respect and there was no evidence of either stomal ulceration or of jejunitis. The oesophageal hiatus was rather loose and admitted two fingers into the sac of a small sliding hernia. The lower end of the oesophagus was swollen and oedematous, though perioesophageal adhesions were not extensive.

It was decided that the oesophagitis was possibly due to the reflux of alkaline jejunal secretion in view of the pH of the specimen of gastric juice previously obtained. To confirm this, a further gastric specimen was obtained and the pH was found to be 7. In view of these findings and for reasons discussed below, it was decided to convert the Polya-Hofmeister gas-

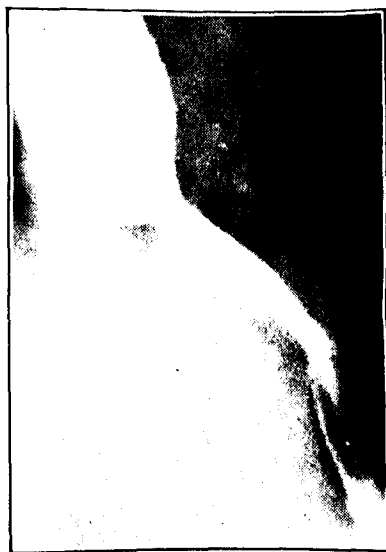


FIG. 3.—Case 1. Barium-swallow radiograph, after dilatation and conversion of Polya gastrectomy to one of Billroth I type, showing a greatly increased lumen at site of former narrowing in lower third of oesophagus.

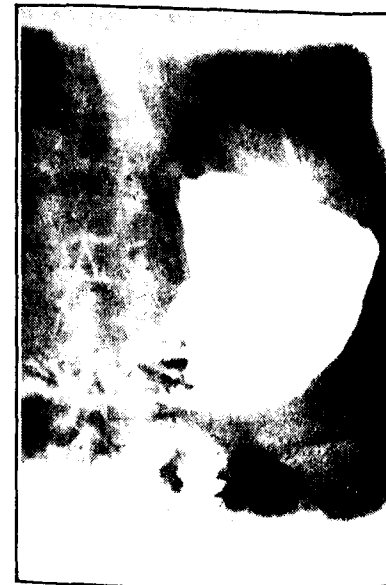


FIG. 4.—Case 1. Barium-meal radiograph showing normally functioning Billroth I gastrectomy.

trectomy into one of the Billroth I type. The gastro-jejunostomy stoma was excised, retrograde dilatation of the oesophagus was carried out, and an anastomosis was performed between the re-formed stomach remnant and the duodenal stump. The gastro-jejunostomy stoma, excised *in toto*, was sent for section. This showed no evidence of stomal ulceration.

Post-operatively, a naso-gastric tube was kept in for five days, and the patient made a completely uninterrupted recovery. The retrosternal pain cleared up at once and she was able to swallow with ease. Barium-swallow examination on November 9, 1956, showed no evidence of obstruction at the lower end of the oesophagus (Fig. 3), and the gastrectomy was working normally (Fig. 4).

The patient has been reviewed at intervals for the past two years and has been entirely symptom-free; she is still gaining weight. Examination by barium swallow has been done on several occasions and no recurrence of the oesophagitis or of oesophageal narrowing has occurred.

Case 2

A schoolmaster aged 64 had had occasional attacks of heartburn for some years, but no serious trouble until two months before his admission to hospital. As a result of serious domestic and personal worries he had been smoking and drinking to excess. He developed epigastric pain, which came on after food and was not relieved by food, with occasional night pain. Vomiting started some days before his admission to hospital; it was persistent and severe, and on several occasions he vomited blood.

On admission on October 31, 1954, his condition was very poor; he was dehydrated, and the haemoglobin estimation was 79% (11.9 g. per 100 ml.). The stomach was distended and there was visible gastric peristalsis and a succussion splash. Blood was frequently present in the vomit, and occult blood tests of the stools were constantly positive. Fractional test meal showed hyperacidity. Barium meal examination on November 9 showed a distended stomach with increased peristalsis. No barium was passing through the pylorus, and there was tenderness and deformity in the region of the duodenal cap, with gastric residue at 24 hours.

After four weeks' medical treatment the patient's condition improved. At operation on December 1 gross pyloric obstruction was confirmed. The narrowing had occurred round an ulcer exactly on the pylorus, which penetrated deeply into the pancreas and was surrounded by oedema and fibrosis. A partial gastrectomy was carried out with removal of three-quarters of the stomach, and after re-fashioning part of the lesser curvature an anastomosis of the afferent loop to the lesser curve was carried out, using exactly the same technique as in Case 1. Post-operative progress was entirely uneventful and uncomplicated. After operation a test meal showed complete achlorhydria. Section of the ulcer confirmed that it was a pre-pyloric ulcer with no evidence of malignancy.

On the day of discharge from hospital, three weeks after operation, the patient found that he could not take normal meals because of difficulty in swallowing. Solid food appeared to stick at the lower end of the sternum and there was a sensation of heaviness in the upper part of the epigastrium. On occasion a mouthful or two of undigested food was regurgitated.

These symptoms persisted, and after five months his weight had fallen from over 12 st. to 8 st. 10 lb. (76 to 55.3 kg.). During this period the patient had failed to report to hospital or to his own doctor, but on June 4, 1955, he was readmitted in emergency in an emaciated condition. He was unable to swallow anything except fluids, and bed-sores were developing.

It was thought that the patient had developed a carcinoma of the oesophagus, and after intense medical treatment he became fit enough for barium-swallow examination to be carried out on July 20. This showed a stricture in the lower third of the oesophagus (Fig. 5). Oesophago-

scopy showed an inflammatory narrowing at the lower end of the oesophagus but no evidence of growth. After dilatation had been carried out, specimens of gastric juice were taken, and these showed complete absence of free hydrochloric acid. After dilatation there was no improvement in the dysphagia, and the oesophagus was re-explored on July 22. A thoraco-abdominal incision was made along the line of the seventh rib from the mid-axillary line on the left side, over the costal margin to the midline on the anterior abdominal wall, and the chest cavity and abdomen were widely opened. No growth was found, but there was thickening and oedema of the oesophagus, suggestive of oesophagitis. There was no evidence of diaphragmatic hernia. For reasons discussed further below, it was decided to convert the Polya-Hofmeister into a Billroth I gastrectomy. The gastric remnant was re-formed and joined by anastomosis with the duodenal stump, and the jejunal stoma carefully repaired. After this operation a Ryle tube was kept in the stomach for five days, and the only other point of special notice was that a further oesophageal dilatation was carried out.

After operation the patient's condition improved steadily. The total proteins on September 12 had risen to 6.2 g. per 100 ml. (albumin 3.5 g., and globulin 2.7 g.). X-ray examination on February 17, 1956, showed very slight narrowing of the lower end of the oesophagus with a normally functioning gastrectomy (Fig. 6). There was no evidence of any hold-up, and the patient said he had no difficulty with swallowing. He has been seen from time to time since this operation, and his good progress has been maintained.

Discussion

A review of the histories of these two cases reveals some quite remarkable similarities.

Both patients were in advancing years, one being 64 and the other 72 years of age. They were both in a very debilitated condition in which vomiting and loss of weight had been marked features.

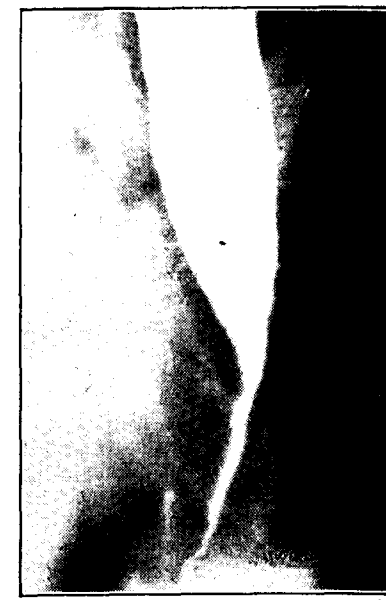


FIG. 5.—Case 2. Barium-swallow radiograph seven months after partial gastrectomy, showing simple stricture of lower end of oesophagus, with considerable dilatation above the narrowed segment.



FIG. 6.—Case 2. Barium-swallow radiograph after the Polya gastrectomy had been converted to one of Billroth I type. The oesophagus had not been dilated post-operatively.



FIG. 1.—Case 1. Barium-swallow radiograph taken nine months after partial gastrectomy, showing an elongated narrowing of lower end of oesophagus, with dilatation above the narrowed segment.

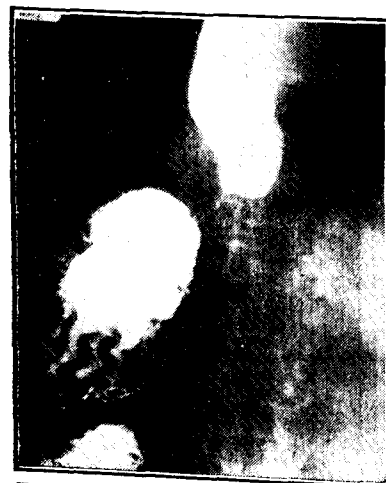


FIG. 2.—Case 1. Oblique (anterior-posterior) view of oesophageal stricture, showing no evidence of new growth.

Pyloric stenosis was present in each instance. In Case 1 there had been intermittent pyloric obstruction for many years, attributable to pylorospasm, but in the year prior to operation the obstruction was constant and almost complete, and the patient's weight had fallen to 6 st. (38.1 kg.). In Case 2 the symptoms of pyloric obstruction did not begin until two months before admission to hospital, but the rapid deterioration in his condition was aggravated by serious domestic worries and over-indulgence in alcohol and tobacco.

The original operative technique of partial gastrectomy was the same in both instances. It may be of significance to emphasize that the left gastric artery was ligated near its origin, but in such a way as to leave undisturbed the left inferior phrenic (and oesophageal) branches. The lesser curve of the stomach was reconstructed quite extensively to allow anastomosis of the afferent loop to the lesser curve to lie easily in the left paracolic position below the spleen.

Both cases were managed after operation in exactly the same manner. An indwelling Ryle tube was present for 72 hours in each case, and in neither were there any post-operative complications until the oesophageal symptoms developed. Both patients developed symptoms on the 20th day after operation. In view of the time of onset of the symptoms and of the domestic background in each case, a psychological basis for the onset of the symptoms was at first suspected.

In each case after gastrectomy complete absence of free hydrochloric acid was found, in response both to test meal and to histamine injection. In view of the fact that the hydrogen-ion concentration of the gastric juice varied between 6.5 and 7, it was thought that recurrent peptic ulceration was not likely to have occurred.

There were two points of difference in the histories which should be mentioned by way of contrast. The patient in Case 1 was shown at the second operation to have a small sliding hernia at the diaphragmatic hiatus which would admit two fingers, though reflux had not been demonstrated by x-ray examination. The patient in Case 2 had complained of some heartburn at intervals, but vomiting was more prominent than discomfort.

It is worth noting that the two cases here described are members of a large series at present under review, in which the pre-operative preparation, operative technique, and post-operative management have been standardized. It would thus appear that the incidence of two in a series of 1,000 cases gives an accurate view of the frequency of this complication, the incidence of which is therefore 0.2%.

Aetiology

The aetiology of this condition is not understood, though various theories have been advanced to explain its occurrence. Straus (1950) has suggested the possibility of a thrombophlebitis extending from the coronary vein upwards along its oesophageal tributaries and causing inflammatory changes in the oesophageal wall. Another possibility is that the left gastric artery may have been ligated at too high a level and that as a result the oesophageal branches were obstructed and the blood supply to the lower end of the oesophagus thereby impaired, producing an area where stenosis might well occur. As previously mentioned, great care had been taken in all the cases in the series to avoid ligating the left gastric artery at too high a level, so that this, though a possibility, is unlikely.

Mosher (1945), in discussing oesophageal stenosis in cases of cardiospasm, regarded oesophageal and perioesophageal infection as the cause of the organic narrowing. In the cases here described there was no evidence of subphrenic infection, and, at the second operation, changes in the region of the cardiac hiatus were in no way prominent.

The trauma of the indwelling Ryle tube must be considered as a possibility. The frequency of urethral stenosis following the indwelling urethral catheter provides an interesting clinical parallel. Following a review of 82 cases of

oesophageal stenosis studied at necropsy, Bartels (1935) felt that the naso-gastric tube was not an aetiological factor, but stated that it might act as an aggravating factor. Olsen (1948), Benedict and Sweet (1948), and Mason and Ausband (1952) all emphasized the significance of naso-gastric tubes in contributing to oesophagitis and stenosis. In the cases here described, however, it will be remembered that while the naso-gastric tube was left *in situ* for 72 hours after the Polya operation, on the other hand the tube was left in for five days when the operation was converted to a Billroth I gastrectomy. As oesophageal stenosis followed the first operation but not the second, it must be deduced that the presence of the tube does not play a fundamental part in the production of stenosis.

The final aetiological factor to be considered is that of reflux. The occurrence of peptic ulcer of the lower end of the oesophagus associated with either gastric or duodenal ulcer has been recorded on so many occasions that the vulnerability of the oesophagus to acid-pepsin is accepted without question.

In the cases here described the possibility that minor degrees of reflux might have occurred is accepted, in that one case had a sliding hernia and the other had pre-operative symptoms suggestive of reflux. What cannot be accepted is that acid-pepsin played a part as the causative factor. After partial gastrectomy both cases had complete achlorhydria, and estimation of the

hydrogen-ion concentration showed that this varied between 6.5 and 7. It would appear, therefore, that if reflux did take place the reaction of the fluid being so near neutrality could not of itself harm the oesophageal mucosa. Since the activity of pepsin at the pH's under review would be negligible (Fig. 7), a different explanation is required. Since trypsin is a most powerful proteolytic enzyme and acts in an alkaline, neutral, or slightly acid medium, it seems quite possible that tryptic activity could severely damage the lower end of an oesophagus, causing oesophagitis and stenosis. In the cases under discussion the hydrogen-ion concentration of the fluid obtained from the stomach and lower end of the oesophagus provided a very suitable medium for tryptic activity. It may well be, therefore, that in these cases a combination of factors has been involved and that tryptic activity, rather than acid-pepsin activity, was the primary factor in causing reflux oesophagitis followed by stenosis.

Treatment

It is not possible to be in any way dogmatic in regard to the treatment of this unusual condition. It is apparent, however, that after simple dilatation of the oesophagus recurrence takes place with great rapidity. In Case 2 dilatation was carried out under direct vision, but the oesophagus was oedematous and congested, so that no benefit could have been expected or anticipated, and no benefit in fact occurred. In Case 1 repeated dilatations were carried out in the first instance, but recurrence of stenosis took place with such rapidity that they were abandoned.

The failure of dilatation was presumably due to the fact that the conditions giving rise to the oesophagitis were still operative, so that the inflammatory condition persisted and stenosis recurred.

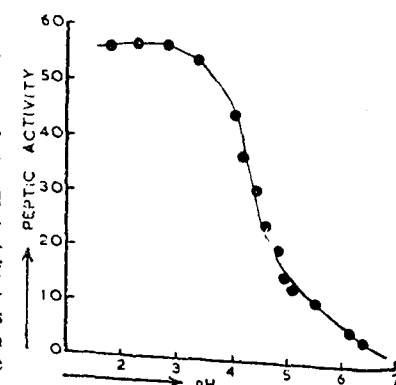


FIG. 7.—Graph showing the peptic activity of gastric juice at various hydrogen-ion concentrations. Note that peptic activity declines from a maximum at pH 2.1 to negligible activity at pH 6.0.

It was felt that reflux was the most likely cause of oesophagitis in the cases here described. Since both cases showed a complete achlorhydria, it was thought that acid or peptic digestion was unlikely to be the operative factor. On the other hand, the conditions for tryptic activity were ideal. It was therefore felt necessary to prevent jejunal contents from reaching the lower end of the oesophagus. The obvious means of attaining this end was to convert the Polya gastrectomy into a Billroth type. If reflux did thereafter occur, the contents would be gastric, achlorhydric, and free of jejunal content.

In both cases this manoeuvre was successful. The oesophagitis and dysphagia cleared up rapidly, and though reflux has taken place at frequent intervals for the past two years, no evidence of recurrence of stricture has occurred. This seems to confirm that reflux of jejunal content, and probably tryptic activity, were the cause of the oesophagitis which led to stenosis.

Summary

Two cases of an unusual complication of subtotal gastrectomy are described.

The possible causes of this complication are discussed. It is suggested, on theoretical grounds and as a result of the line of treatment adopted in these cases, that the reflux of the jejunal contents, and possibly tryptic activity, may be the operative factors in causing the oesophagitis which led to stenosis.

I thank Dr. P. N. Coleman, consultant pathologist, for the section reports and also for his work in association with Mr. S. Taylor, F.I.M.L.T., our chief technician, in preparing the photographs. I also thank Professor Ian Aird for his kind interest and help, and Dr. W. Irvin and Dr. A. K. Lamballe, who have taken the radiographs of these cases.

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ADRENALINE IN HYPERTHYROIDISM AND INSULIN HYPOGLYCAEMIA

BY

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There are many similarities between the features of acute insulin hypoglycaemia and of hyperthyroidism. Tachycardia, weakness, finger tremor, sweating, and flushing can occur to a similar extent in both conditions. Furthermore, the similarity between the features of hyperthyroidism and those of phaeochromocytoma is striking; indeed, these disorders are not infrequently confused. All three conditions are known or thought to be related to an increase of secretion of adrenaline from the adrenal medulla. Cannon *et al.* (1924) reported an increase of adrenaline secretion in cats in response to insulin hypoglycaemia and showed that this was a mechanism for raising the lowered blood sugar.

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It has been suggested that adrenaline is responsible for many of the symptoms of hypoglycaemic reactions (Bell *et al.*, 1956). Similarly, in man, von Euler and Luft (1952) and French and Kilpatrick (1955) demonstrated a considerable increase in urinary adrenaline excretion following hypoglycaemia.

An association between hyperthyroidism and changes in adrenaline metabolism has long been suspected. Hyperthyroid subjects have a striking increase in sensitivity to adrenaline and noradrenaline (Rosenblum *et al.*, 1933; Peltola, 1951; Schneekloth *et al.*, 1953; Brewster *et al.*, 1956). Many observers have noted changes in adrenaline content of adrenal glands in animals in which hyperthyroidism was produced by giving thyroxine (Goodall, 1951; Hökfelt, 1951; Pekkarinen *et al.*, 1951; Durlach *et al.*, 1955). Accordingly, urinary catechol excretion has been measured in a number of patients with hyperthyroidism and the results are compared with those found in insulin hypoglycaemia and in normal subjects.

Methods

The urinary catechol excretion was measured in 12 euthyroid subjects, in 17 patients with hyperthyroidism of varying degree, and in two patients with hypothyroidism. The estimation was repeated in two patients previously hyperthyroid who had become euthyroid following treatment with radioiodine.

In all but one of the patients with hyperthyroidism the estimation was performed while they were in-patients and thus at rest in bed. The normal subjects, who were mainly hospital and university staff, were performing their usual duties. Urine was collected for 24 hours into a dark bottle containing hydrochloric acid.

Two methods of extraction were used, either aluminium hydroxide (von Euler and Hellner, 1951) or aluminium oxide (von Euler and Orwen, 1955). The latter method required modification as our assay was done on the rat-uterus preparation (Diller, 1958). Recovery by both methods varied between 65 and 90%. No correction was made for this.

Adrenaline assays were performed, using the oestrous rat uterus stimulated by carbachol (Gaddum and Lembeck, 1949). Values are given as L-adrenaline. The assay was checked in two ways. Firstly it was shown that all adrenaline-like activity was destroyed by boiling an aliquot of the extract at alkaline pH. Secondly, addition of known amounts of adrenaline to the extract after measurement produced only additive effects and no potentiation or masking was found. If either of these requirements was not met another extract was prepared from a further urine collection.

Total catechols were measured in the same extract on the cat's blood pressure, and the noradrenaline content was found by using the adrenaline value from the uterus assay (Burn *et al.*, 1950). Values are given as DL-noradrenaline.

Attempts were also made to measure adrenaline and noradrenaline by a fluorimetric method (von Euler and Floding, 1955), so that the number of estimations could be increased. However, it was found that there was much non-specific fluorescence in all the urines that were studied. This produced more inaccuracy when the level of catechols was in the physiological range. Similar results with fluorimetric methods are described by Pitkänen (1956).

Radioiodine tracer studies were performed in all of the patients with thyroid disorders. They were given 25 μ c. of 131 I and the thyroid uptake was measured after 4 and 48 hours. Protein-bound 131 I was measured at 48 hours, using trichloroacetic acid as protein precipitant (Goodwin *et al.*, 1951).

Results

The clinical diagnosis of hyperthyroidism was confirmed by radioiodine studies; in all of them the four-hour uptake was more than 40% of the dose and the 48-hour protein-

bound ^{131}I more than 0.4% of the dose per litre of plasma (Wayne, 1954).

The values for adrenaline and noradrenaline in normal subjects and patients with thyroid disease are shown in the Table. In normal subjects the mean daily adrenaline excretion

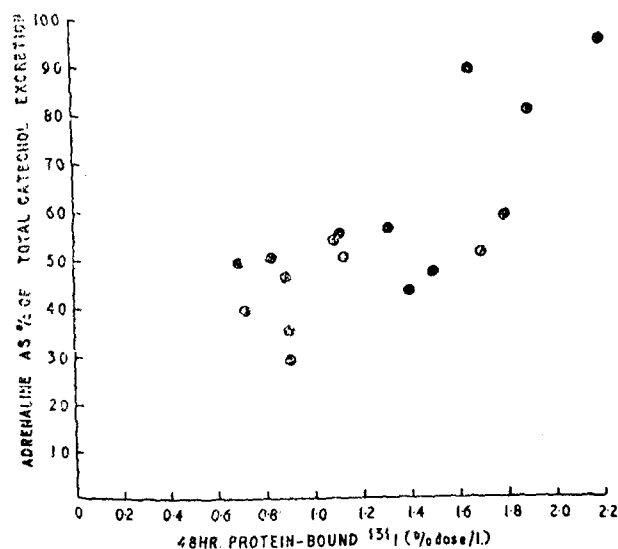
Urinary Catechols in Hyperthyroidism and Hypothyroidism

	No.	No. of Estimations	Mean Daily Output of		
			Adrenaline ($\mu\text{g.} \pm \text{S.E.}$)	Nor-adrenaline ($\mu\text{g.} \pm \text{S.E.}$)	Adrenaline (Percentage of Total Catechols $\pm \text{S.E.}$)
Normal	12	16	2.8 $\pm$ 0.5	22.6 $\pm$ 3.1	12 $\pm$ 1
Hyperthyroid	17	20	25.0 $\pm$ 6.8	15.8 $\pm$ 2.3	55 $\pm$ 4
Hypothyroid	2	3	0.8	14.3	5

tion was 2.8 $\mu\text{g.}$ (range 1–7 $\mu\text{g.}$) and the mean daily noradrenaline excretion 22.6 $\mu\text{g.}$ (range 9.4–50 $\mu\text{g.}$). No significant difference was found between the two methods of extraction.

A striking difference is apparent when the mean daily adrenaline excretion in the patients with hyperthyroidism is considered. This is 25 $\mu\text{g.}$ (range 7.5–130 $\mu\text{g.}$) and is significantly greater than the mean in normal subjects ($P < 0.05$). The mean excretion of noradrenaline is lower, but this difference is not significant. The high adrenaline excretion in hyperthyroidism is emphasized when this is expressed as a percentage of the total catechol excretion. In hyperthyroidism this is more than four times that found in normal subjects.

The protein-bound ^{131}I values reflect the rate of turnover of iodine by the thyroid and probably give an indication of the severity of hyperthyroidism, provided that the thyroid gland has not been disturbed by previous treatment. In this series all the patients with hyperthyroidism were studied before any treatment had been given. The 48-hour protein-bound ^{131}I values have been plotted against the daily adrenaline excretion, expressed as a percentage of the total catechol excretion (see Chart). The excretion of adrenaline apparently rises with an increased concentration of labelled hormone.



Urine adrenaline excretion in patients with hyperthyroidism, and the protein-bound radioactivity of serum at 48 hours.

In two patients with hyperthyroidism, who had become euthyroid some months after treatment with radioiodine, the daily adrenaline excretion had fallen from 30 and 20 $\mu\text{g.}$ to 5 and 7 $\mu\text{g.}$ respectively. These latter results are within the range of normal.

Only two patients with hypothyroidism were studied; both had low values for adrenaline excretion (see Table).

These results of adrenaline excretion in hyperthyroidism may be compared with those found in insulin hypo-

glycaemia. French and Kilpatrick (1955) found that the mean adrenaline excretion in three patients during the three hours preceding the injection of insulin intravenously was 5.1 $\mu\text{g.}$, and 46.1 $\mu\text{g.}$ during the three hours following it. As hypoglycaemia occurs acutely, it is difficult to compare with the daily adrenaline output in hyperthyroidism. However, the rise in output during the three hours following the induction of hypoglycaemia and for 24 hours in hyperthyroidism is approximately tenfold compared with the control results.

Discussion

The results for adrenaline and noradrenaline excretion in normal subjects agree with those of von Euler and Floding (1955) and of Bischoff and Gray (1956), using biological assay.

It seems that adrenaline excretion in urine is much increased when hyperthyroidism is present, and the correlation of adrenaline excretion with the amount of labelled thyroid hormone is suggestive evidence that this excretion is related to the degree of thyroid hyperactivity. It has been shown (von Euler and Hellner, 1952) that activity increases adrenaline excretion, and thus the adrenaline values in hyperthyroidism are even more striking, as these patients were in bed, whereas the normal subjects had no restriction on activity. If it is assumed that renal clearance of catechols remains unaltered, this suggests that the blood adrenaline level is also raised in hyperthyroidism. This may be due either to increased production or to decreased destruction. There is no direct evidence for or against the first, though many observers have noted changes in histology and adrenaline content of adrenal glands in experimental hyperthyroidism in animals (Herring, 1917; Goodall, 1951; Hökfelt, 1951; Pekkarinen *et al.*, 1951; Durlach *et al.*, 1955).

There is some evidence that there may be decreased destruction of adrenaline in hyperthyroidism. Spinks and Burn (1952) and Trendelenburg (1953) found a fall in liver amine oxidase content in rabbits when thyroid extract was given and a rise in the content of the enzyme following thyroidectomy in rabbits and rats. Kawamoto *et al.* (1952) noted a fall in adrenaline dehydrogenating enzyme in hyperthyroidism. Burn and Marks (1925) revealed this decreased destruction by showing that following thyroid feeding there was an increase in the hyperglycaemia produced by adrenaline and a decrease following thyroidectomy. They also showed that there was an inverse relationship between hyperglycaemia produced by adrenaline and hypoglycaemia produced by insulin. Thyroidectomy increased the fall in blood sugar following insulin, and thyroid feeding decreased it.

The insulin-tolerance test may show prolonged hypoglycaemia after insulin in patients with hypothyroidism (Fraser and Smith, 1941). These results are in accordance with the evidence that adrenaline is released in response to insulin hypoglycaemia (von Euler and Luft, 1952), even though this release appears to cause very few of the symptoms of hypoglycaemia (French and Kilpatrick, 1955). Adrenaline and insulin can be regarded as physiological antagonists for many of their actions, and thus the secretion of adrenaline in response to hypoglycaemia may be regarded as compensatory. However, this is not so with thyroxine and adrenaline. It is surprising, therefore, that the blood level of adrenaline appears to increase when hyperthyroidism is present. Direct measurement of circulating adrenaline, and if possible in adrenal vein blood, is required for final confirmation.

Summary

The daily urinary excretion of adrenaline and noradrenaline has been measured in patients with hyperthyroidism and in normal subjects.

A large increase in adrenaline excretion was found in hyperthyroidism, but no change in noradrenaline excretion.

There was a correlation between adrenaline excretion and severity of hyperthyroidism, as measured by output of labelled hormone following a tracer dose of ^{131}I .

Possible mechanisms for these changes and relationship to insulin hypoglycaemia are discussed.

We gratefully acknowledge the advice and encouragement of Professor G. M. Wilson, and the co-operation of our patients and normal subjects. This work was done while W. F. D. held a German Council Scholarship, and R. K. a B.M.A. Research Scholarship.

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AETIOLOGICAL FACTORS IN PRIMARY RAYNAUD'S DISEASE

BY

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The term "idiopathic," or "primary," Raynaud's disease is currently applied to those patients who present with intermittent attacks of digital pallor or cyanosis in whom careful examination fails to reveal either a local contributory cause or an associated systemic disease in which the digital symptoms might be considered to represent a single feature of a more generalized disease process.

The use of the term primary is in many ways open to individual interpretation by the clinician. This is not only due to the gradually increasing number of diseases with which the digital syndrome is now associated, but is also dependent on the care and accuracy taken to exclude systemic disease and to establish aetiological factors on which such a diagnosis may be accepted or rejected.

Apart from the influence of heredity and the frequent appearance of symptoms during childhood or at puberty (Lewis and Pickering, 1934), little is known about endogenous influences which may affect either the appearance of symptoms or the severity of the disease, and the purpose of this paper is to draw attention to certain features in the histories of a group of patients with this

disease which suggest that they should be regarded as aetiological factors in the evolution of the vascular abnormality of primary Raynaud's disease.

Clinical Material

The 21 cases recorded form part of a group of 42 patients diagnosed as having primary Raynaud's disease. Their symptoms were intermittent attacks of digital pallor or cyanosis of the upper extremities of such severity as to constitute a serious disability in their normal way of life. All were females, aged 23 to 52 years, who had been referred either for upper-limb sympathectomies or because of recurrence of symptoms following previous operations. All fulfilled both the criteria laid down by Allen and Brown (1932a) of a diagnosis of primary Raynaud's disease and those suggested by Hunt (1936) for primary Raynaud's phenomenon. They were otherwise in good general health, and with the exception of one case (No. 10) were non-smokers.

Clinical examination failed to reveal either a local cause for their symptoms or any associated systemic disease. All peripheral pulses were normal and the blood pressure ranged from 110 to 140 mm. Hg systolic and 65 to 80 mm. Hg diastolic. A careful investigation of the E.S.R., serum proteins, and blood excluded the presence of the collagen disease group.

Clinical Histories

Analysis of the clinical histories of the patients obtained by careful questioning of the patients themselves and their close relatives indicated that symptoms either arose for the first time, or pre-existing mild symptoms became greatly exacerbated, following three main events in the patient's life: (1) childbirth; (2) the onset of the menopause; and (3) a period of severe mental stress.

Aetiological Factors in Primary Raynaud's Disease

Case No.	Hereditary History	Age of Onset of Digital Symptoms	Age of Onset of Disability	Aetiological Factor	Progression to Nutritional Lesions
1	+	32	32	Parturition	Yes
2	+	15	29	"	"
3	—	Child	36	"	No
4	+	26	26	"	"
5	+	Child	18	"	"
6	+	35	35	"	"
7	Not known	17	33	"	"
8	+	15	23	"	"
9	+	Child	45	Menopause	"
10	+	47	47	"	"
11	+	Teens	35	Hysterectomy and unilateral oophorectomy	"
12	+	33	34	Hysterectomy	"
13	—	33	33	"	"
14	—	42	42	"	"
15	+	40	40	Mental stress	"
16	+	28	28	"	"
17	+	42	42	"	"
18	—	30	30	"	"
19	+	35	35	"	Yes
20	—	Teens	37	"	No
21	—	25	25	"	"

Childbirth.—In eight patients symptoms severe enough to make them seek medical treatment arose within six months of the birth of a child, the time period between parturition and the onset of symptoms being related to the interval between parturition and the onset of cold weather. In three cases it was following the birth of the first child, in four the second, and in one the third. Two of these cases progressed within a period of five years to nutritional lesions of the digits and sclerodactyly. In three patients the symptoms arose *de novo* and there was no evidence to suggest that previous mild attacks had occurred. In five cases occasional digital pallor had been present for many years, and it was the severity of the attacks that had been modified. These had been converted from occasional and mild to severe and prolonged, with marked pain and disability.

Menopause.—In four of the six patients in this group the digital symptoms followed within a few months of subtotal hysterectomy for fibroids. In only one case (No. 11) was

an associated unilateral oophorectomy performed. In two others the symptoms arose at a time when irregular menstruation was already present which culminated within 18 months in a complete menopause. Although pain and prolonged cyanosis were dominant symptoms in all cases, only one progressed to digital ulceration within the next five years and in only two cases of these did the symptoms arise *de novo*. In four it was established that mild attacks of pallor or cyanosis had been previously present for many years, and the effect of the menopause in these was to exacerbate a pre-existing mild form of the disease rather than to initiate it.

Mental Stress.—In seven cases the digital symptoms followed a period of prolonged and severe mental stress. In four cases symptoms appeared immediately before or after the death of a mother or husband whom the patients had been nursing, whilst in the three remaining cases they arose during a period of unhappy married life leading to separation or divorce from their husbands. In six of these cases the symptoms arose for the first time within a period of one to four months of either the death of the relative or the date of separation, and in only one case (No. 20) was there any evidence that pre-existing mild attacks of pallor or cyanosis had been present, so that the stress was predominantly an initiating rather than an exacerbating factor in this group of patients.

Discussion

The influence of heredity in Raynaud's disease has previously been commented upon, and it could be seen that in 16 of the 20 cases in which a complete family history was available a history of similar attacks was present in one or both of the parents. It would be reasonable to assume, therefore, that there did exist an inherited predisposition to such attacks in the majority of these patients, although the nature of the inherited defect remains unknown. In the first two groups of 14 cases nine had had symptoms before the event which precipitated the disability, but these had been minimal and had given rise to no disability. In only one of the group associated with mental stress were pre-existing symptoms present. In 10 of the 21 cases, therefore, the effect was to exacerbate a pre-existing mild form of the disease, and in all of these cases (with the exception of Case 7, in which the family history was incomplete) a hereditary history of similar attacks was present. In the remaining 11 cases the symptoms were initiated for the first time by the event, and in seven of these a family history of similar attacks was obtained.

Childbirth and mental stress seem to have been largely disregarded as possible aetiological factors in Raynaud's disease, as, apart from the 137 patients recorded by Allen and Brown (1932b), no large series of cases of this disease have been analysed. It is noteworthy, however, that these authors commented that "in a considerable number of cases the disease appears to be initiated by an operation, childbirth, infection, or the death or illness of a loved one, and these factors could doubtless be elicited in a larger percentage of cases if the patients were questioned specifically regarding this."

In this respect Case 5 in Raynaud's (1862) original thesis was a patient in whom symptoms occurred within a month of the death of the mother, and this was recorded by Hunt (1936) as being the only true example of primary Raynaud's disease in Raynaud's series. Hunt's following case (Mrs. H. G.) was also a patient in whom anxiety of the type described above was present, as she was an individual who was separated from her husband.

The menopause has been stated by Jepson (1951) to have occurred often in the condition he described as "the middle-aged female syndrome." I believe, however, that the use of such a term is not entirely satisfactory, as it is non-specific in character and, according to Jepson's description, covers a number of cases in the age group 35-55 years, in which symptoms were initiated in some instances by the menopause and in others by factors which were not discovered. If all cases of primary Raynaud's disease in this

age group are so classified it is quite probable that a number of cases will be included in which other factors in the aetiology would be disregarded. It should be noted also that, although the menopause is often the cause of symptoms severe enough to give rise to a disability and act as an initiating factor, careful questioning may well reveal that mild attacks had in fact occurred before this but were regarded by the patient as being so mild as to be of no importance.

Whether this latter group should be classified as primary Raynaud's disease or included in secondary Raynaud's disease may be regarded as controversial. Such cases do not exhibit any other signs of disease, and clinical examination fails to reveal any evidence of systemic disease—they therefore fulfil the criteria for a diagnosis of primary Raynaud's disease. To regard these cases as secondary in origin owing to their association with the menopause is no more justifiable than to regard the hereditary group, or those which occur at puberty, as falling into this category. It is believed that these cases should therefore still be included in primary Raynaud's disease.

Summary

Twenty-one cases of primary Raynaud's disease are recorded in which the digital symptoms were initiated, or pre-existing mild attacks were converted into a more severe form, at a time so closely related to childbirth, the menopause, or a period of mental stress as to indicate that these three events should be regarded as aetiological factors in primary Raynaud's disease.

These cases represent 50% of a larger series of 42 cases, in the remainder of which no such aetiological factors could be detected.

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A CONTRIBUTION TO THE MYCOLOGY OF THE MOUTH

BY

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The published records of fungi obtained from the human mouth demonstrate that fungi of many types can be isolated both from apparently normal mouths and from mouths showing various disorders; in some of these diseases fungi have often been regarded as the causal agents. During recent years particular attention has been paid to mycotic infections of the oral cavity as a complication of antibiotic therapy (Cross, 1949; Tomaszewski, 1951a, 1951b, and numerous others).

The literature on the mycology of the mouth, which is both extensive and confused, will be reviewed elsewhere. Here it is only necessary to note that many of the earlier records are unsatisfactory owing to deficiencies in the clinical and mycological evidence, and that only a few attempts have been made to study the mycology of the mouth in relation to a number of fairly common oral pathological conditions.

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In an effort to supply additional data in this field, isolations of fungi were made from a series of selected cases at Birmingham Dental Hospital during 1952-5 to ascertain whether there were any relationships between fungi and certain well-known pathological conditions. Some of the findings are summarized in this report.

Methods

All the cases studied were subject to very careful clinical examination and detailed case histories were compiled. The isolations were made in the clinic by inoculating slopes of malt extract agar with scrapings taken with a sterile scalpel. Incubation was at 20-25° C., and any fungi which developed were obtained in pure culture for identification. Bacteria and actinomycetes were ignored.

Usually several attempts at isolations were made from each case by taking scrapings from different sites in the oral cavity. For any one case, however, any fungus was recorded once only—for example, as one isolate—irrespective of the number of different sites at which it was found or the number of times it was obtained from one site. In the control series (groups of schoolchildren, university students, and professional and office workers) some isolations were made as above, in others saliva was sampled by a single swabbing of the tongue, gums, and teeth, and streaking plates or slopes of malt agar with the swab within a few minutes of sampling.

Results

Of the 175 cases examined, 26 that were of miscellaneous conditions are excluded from Tables I and II. These conditions, which showed no distinctive mycological findings, were lichen planus, lupus erythematosus disseminatus, leukoplakia, fungating antrum carcinoma, and dry socket. The remaining 149 cases have been grouped as six reasonably clearly marked clinical conditions—namely, angular cheilosis, gingivostomatitis (comprising aphthous, herpetic, acute ulcerative, mycotic, and various stages of inflammatory periodontal conditions), lingua nigra, lingua geographica, coated tongue, and denture sore mouth—for which the sex and age incidences are summarized in Table I.

TABLE I.—Material

	No. of Cases	Male Female Ratio	Age	
			Range	Mean
Angular cheilosis	24	1.0	16-66	36
Gingivostomatitis	36	0.9	4-74	27
Lingua nigra	40	2.1	23-68	35
Lingua geographica	22	0.27	16-65	37
Coated tongue	20	0.43	10-61	38
Denture sore mouth	7	0.4	30-78	52
Controls	188	1.1	7-60	18

Angular Cheilosis.—This condition is characterized by cracks, fissures, and inflammatory changes at the angles of the mouth, usually accompanied by induration of the edges of the lesion. **Mycology.**—The mycological pattern was of the lesion. Only three of the 24 cases were negative for fungi and 17 of the remaining 21 yielded *Candida albicans*, one of which was in pure culture. Two of the four negative for *C. albicans* gave *C. krusei* and one *C. parapsilosis*—that is, only one case positive for fungi failed to yield a species of *Candida*. Of the other 13 species isolated, *Torulopsis glabrata* was recorded twice and the others were recorded once each. The results show a marked correlation between *C. albicans* and angular cheilosis and support the generally accepted view that *C. albicans* is present as a pathogen.

Gingivostomatitis.—This term is used to describe all inflammatory changes of the gingivae and oral mucosa. As noted above, only aphthous, herpetic, acute ulcerative (Vincent), and mycotic forms and various stages of periodontal disease are included here. **Mycology.**—The general mycological pattern resembled that for angular cheilosis. Although the proportion of cases yielding *C. albicans* was

lower than for angular cheilosis (52.8% as against 70.8%), in 14 of the 19 cases yielding *C. albicans* it was the only isolate. Two other cases gave *C. tropicalis* only. The only other species recorded more than once was *Aspergillus niger* (four times).

Lingua Nigra.—In this tongue condition there is an accumulation of densely matted patches of highly pigmented hypertrophied filiform papillae in front of the circumvallate papillae which may extend into the anterior third. The early literature on this disorder, first described by Rayner in 1835, is summarized by Swinburne (1939), and among other publications on lingua nigra the paper by Kennedy and Howles (1940) and the account by Schaffer (1951-2) may be noted. **Mycology.**—The "random" distribution of isolates from lingua nigra suggested that the isolates were present by chance and bore no causal relation to the clinical condition. This incidence of *C. albicans* was lower than in the control series, but Table II shows the incidence of fungi to have been higher than in either the controls or for angular cheilosis and gingivostomatitis.

TABLE II.—Summary of Isolations From the Controls and From Various Clinical Conditions of the Mouth

Condition	No. of Cases	No. Positive for Fungi	Isolates		
			Total	No. of Species	<i>C. albicans</i>
Angular cheilosis	24	21 (87.5%)	36	16	17
Gingivostomatitis	36	29 (80.6%)	39	17	19
Lingua nigra	40	37 (92.5%)	56	24	9
Lingua geographica	22	18 (81.8%)	35	22	8
Coated tongue	20	15 (75%)	19	10	4
Denture sore mouth	7	6 (85.7%)	8	7	2
Total	149	126 (84.5%)	193	A*	59
Controls (normal mouth)	188	124 (66.0%)	162	B*	52

* No figures are shown in A and B as the same species was often recorded for more than one condition. The net total of different species isolated was 54 for A and 37 for B.

Lingua Geographica.—This condition (see Schaffer, 1951-2) is characterized by a circumscribed circinate desquamation of the epithelium of the dorsum and of the edges of the tongue which seems to spread at the periphery whilst it is healing at the centre. It is a chronic condition of unknown aetiology which continuously changes its appearance. **Mycology.**—Table II shows the mycological pattern of the isolates for lingua geographica to be similar to that of lingua nigra. The incidence of *C. albicans* was about "normal" and the incidence of the other species recorded suggested that they were present by chance.

Coated Tongue and Denture Sore Mouth.—Coated tongue is a term applied to a non-specific furred appearance of the tongue. It is a common feature in many diseases of very varied aetiology. Denture sore mouth is a chronic erythema of the denture-bearing area of the oral mucosa and gingivae which has been attributed to traumatic, allergic, and toxic factors, and to yeasts. **Mycology.**—Fewer fungi were isolated from these two conditions of uncertain aetiology than from the other four, and the more or less random incidence of the isolates suggests that both are non-mycotic.

Discussion and Conclusions

The mycological findings from the clinically abnormal mouth must be considered against a background of the control series summarized in Table II. This Table shows fungi to have been isolated approximately as often from normal mouths (66.0%) as from abnormal (84.5%); the larger number of isolates and species from the abnormal series probably only reflecting the larger number of attempts at isolation. Little evidence was obtained of a characteristic fungus flora of the mouth. Of the 76 different species of fungi recorded, only 15 were common to the two series. Of these, *C. albicans* headed the list with 52 isolates from normal mouths and 59 from the abnormal. Only seven other species were recorded five times or more from abnormal mouths. These were *C. tropicalis* 9 isolates (5 from

the controls), *A. niger* 8 (2), *C. krusei* 7 (1), *T. glabrata* 7 (1), *C. parapsilosis* 6 (5), and *C. zeylanoides* 5 (5). The only species recorded more frequently from the control than from the pathological series was *Aspergillus versicolor* 8 (2), of which six of the isolates occurred in one group of Birmingham schoolchildren. Among all the isolates there was only one of *Absidia ramosa*, an interesting and striking contrast to the frequency of this species among isolates from animal sources (Ainsworth and Austwick, 1955) and from the sputum of agricultural workers.

When the usual significance tests are applied to the material in Table II, it is clear that there is an excess of *C. albicans* isolates in both angular cheilosis and gingivostomatitis (when they are compared with either the other pathological conditions or the controls) which is very unlikely to be due to chance. This is in agreement with the currently accepted view (see Conant *et al.*, 1954), but, bearing in mind the common occurrence of *C. albicans* in the human mouth, predisposing factors must also operate. Many factors may play a part, such as for angular cheilosis lack of vertical dimension with saliva dribbling.

The similarity between the incidence of *C. albicans* in the other conditions (25.8%) and the controls (27.7%) (see Table III) suggests that the control group is reliable and

TABLE III.—Incidence of *C. albicans*

	No. of Cases	<i>C. albicans</i> Isolates	
		No.	%
Angular cheilosis	24	17	70.8 ± 9.3*
Gingivostomatitis	36	19	52.8 ± 8.3*
Other conditions	89	23	25.8 ± 4.6*
Controls	188	52	27.7 ± 3.4*

* Standard error $\sqrt{\frac{pq}{n}}$

that the presence of *C. albicans* seems to be associated with the two specific diseases and not just with any abnormal pathological condition of the mouth. That the isolation of *C. albicans* from the mouth may have no pathological significance hardly needs reiteration, but it should be emphasized that a clinical diagnosis of moniliasis must be confirmed by culture. This is well borne out by the case of a boy aged 19 months who, on examination, showed extensive curd-like whitish plaques on the inner aspects of the upper and lower lip, floor of the mouth, and anterior third of the tongue. The plaques could be peeled off and left raw bleeding surfaces. A clinical diagnosis of oral moniliasis was made, but the only organisms cultured were *Aspergillus fumigatus* and *A. niger*. *C. albicans* is easily cultured and would appear to have been absent in this case. Unfortunately no microscopic examination was made of the fresh clinical material.

The assessment of 37 cases of lingua nigra strongly suggests that this condition is not mycotic. The number of different fungi isolated was greater than for any of the other conditions. No one fungus was isolated with regularity, and the incidence of *C. albicans* was lower than that in the normal mouth. It would appear that the proliferations of the epithelial cells provide a favourable site for the development of common saprophytic fungi. Lingua nigra is thought to be a dyskeratosis. In support of this view further evidence with full case histories will be published elsewhere.

The similar mycological pattern to that of lingua nigra shown by lingua geographica, coated tongue, and denture sore mouth suggests that fungi are not involved in the aetiology of these three conditions. No evidence was obtained for the claim that monilial infections are very often a cause of denture sore mouth. As can be seen from Tables II and III, the incidence of *C. albicans* was rather lower both in denture sore mouth and in coated tongue than in normal mouths, possibly due to the effects of bacterial competition.

It is interesting to record that during this survey no case of mycotic infection of the mouth which could be wholly

attributed to antibiotic treatment was observed. This is in agreement with Heymer and Doepfner (1957), who obtained no evidence of a higher incidence of mycotic disease of the oral cavity at the present time than that found by Knighton (1939) before the introduction of antibiotic therapy.

Summary

From the mycological findings in 149 cases of angular cheilosis, gingivostomatitis, lingua nigra, lingua geographica, coated tongue, and denture sore mouth (see Tables II and III) it is concluded that *Candida albicans* seems to play a primary part in the aetiology of angular cheilosis and has some connexion with the aetiology of gingivostomatitis. The diverse fungi associated with the remaining four conditions are of uncertain aetiological significance.

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HAEMOGLOBIN J TRAIT IN TWO INDIAN WOMEN

ASSOCIATED WITH THALASSAEMIA IN ONE

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Haemoglobin J was first discovered in an American Negro by Thorup, Itano, Wheby, and Leavell (1956). It has since been described in various parts of the world and in people of different racial stock. Raper (1957) found an example in a Gujarati Indian living in Uganda. This paper records the finding of haemoglobin J in two unrelated women belonging to the Gujarati-speaking Lohana. Of particular interest was that one of the two was also carrying a thalassaemia gene, and that it was therefore possible to observe the interaction of thalassaemia and of haemoglobin J.

Techniques

The haematological investigations were carried out by the accepted methods. Osmotic fragility was determined by measuring haemolysis in concentrations varying from 0.1 to 0.7% of Simmel's Tyrode solution, of which 0.4% was

taken as a critical dilution for differentiation (Silvestroni and Bianco, 1945). In more than a hundred normal adults examined haemolysis was found to be 90–100%. Foetal haemoglobin was measured according to the method of Singer, Chernoff, and Singer (1951). Electrophoresis of the haemoglobin was performed with the same haemoglobin solutions that had been used for the determination of the foetal haemoglobin. Paper electrophoresis was carried out by the hanging-strip technique as described by Lehmann and Smith (1954), and starch electrophoresis according to the method of Kunkel (1954). Electrophoresis on agar was performed according to the method described by Robinson, Robson, Harrison, and Zuelzer (1957). The plasma iron was measured after Walker (1938).

The identification of haemoglobin J was based on a comparison with known haemoglobin J samples kindly provided by Colonel W. H. Crosby, Dr. Lie-Injo Luan Eng, Dr. A. B. Raper, and Dr. F. Vella. On paper electrophoresis and starch electrophoresis at pH 8.6 haemoglobin J moves faster than haemoglobin K and more slowly than haemoglobin H (and the recently defined haemoglobin N). At pH 6.5 on paper and on agar electrophoresis haemoglobin J does not separate from haemoglobin A.

Haemoglobin A₂ was determined either by the elution of the separated haemoglobin fractions from starch or after paper electrophoresis by dyeing the dried paper strip with light green and by eluting the stain from the separated bands of haemoglobin.

The P. Family

This family was investigated after an infant had been examined because of severe jaundice 24 hours after birth. There was no haemoglobinopathy, and when the child was seen again nine months later no foetal haemoglobin was found and nothing haematologically abnormal could be demonstrated. It was, however, then noted that the infant was mentally retarded. In the routine investigation of the

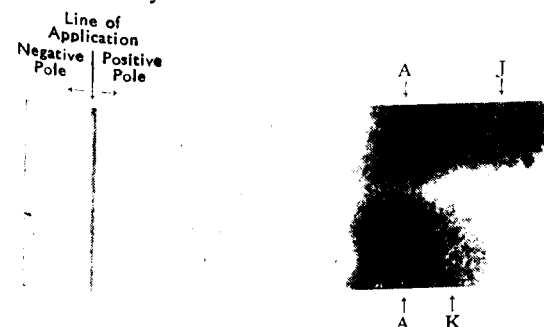


FIG. 1.—Comparison by paper electrophoresis at pH 8.6 of the haemoglobin of Mrs. P. (A+J) with a haemoglobin A+K control. At the end of the electrophoresis (hanging-strip technique) the paper was dried and the haemoglobin stained with light green.

TABLE I.—The P. Family

	Age in Years	Red Cells per c.mm. × 10 ⁶	Haemoglobin g./100 ml.	P.C.V. %	M.C.V. cubic μ	M.C.H. γγ	M.C.H.C. %	Osmotic Fragility % (0.4% Simmel's Tyrode Solution)	Foetal Haemoglobin %	Electrophoresis of Haemoglobin
Father	30	4.83	14.5	46	91	29	30	90.0	<1.7	A
Mother	19	4.90	12.5	44	94	26	29	97.7	<1.7	A+J (25%)
Baby	1	4.67	13.6	39	83	28	33	70.0	<1.7	A

TABLE II.—The K. Family

	Age in Years	Red Cells per c.mm. × 10 ⁶	Haemoglobin g./100 ml.	P.C.V. %	M.C.V. cubic μ	M.C.H. γγ	M.C.H.C. %	Reticulocytes %	Osmotic Fragility % (0.4% Simmel's Tyrode Solution)	Foetal Haemoglobin %	Electrophoresis of Haemoglobin
Father	32	6.15	12.5	39	63	20	32	1.6	34.6	<1.7	A
Mother	20/5/57	5.61	12	38	68	22	31.5	2.8	38.0	2.8	A+J (25%)
Baby	14/12/57	5.58	12.5	39	69	23	32	2.2	49.0	2.0	A+J (25%)
	1½	1.61	3	13	84	19	23	10.3	34.3	68.5	A+F

painful conditions of the nipple, such as simple pain or cracked nipple, will be expected to lead to a decrease of breast-feeding, but not necessarily to failure to gain in the infant, as a complement would be offered to avoid this. Further, it must be remembered that changes in weight gain and the introduction of bottle-feeds may be either the result or the cause of breast and nipple complications.

Table IV shows that only a small number of infants were adversely affected by their mothers' breast complications as judged by the weight criterion. On the other hand, a painful

TABLE IV

	Total	Infants Over Birth Weight on 10th Day	Infants Breast-fed on 10th Day
Complications with pain	258	52%	61%
" without pain	171	58%	78%
No. complications	598	56%	73%

or cracked nipple led to a fall in the breast-feeding rate from 73% to 61%. Common sense would suggest that this should be attributed to the pain experienced by the mother, but it is equally possible that failure to breast-feed was responsible for some of the instances of pain recorded. In any event, it can be stated that out of 306 mothers not breast-feeding on the 10th day, 33% suffered breast pain, where of the 721 mothers who were breast-feeding on the 10th day, only 23% had either a painful breast or nipple.

Summary and Conclusions

Of 1,027 mothers observed during the 10 days following delivery, 42% were found to have one or more breast or nipple complications during that time. Engorgement was most frequently encountered, particularly in elderly primiparae. This complication was not related to the infant's birth weight or the infant's sex, nor to the mother's obstetrical history. The same findings held for the next most common complication, simple nipple pain. Cracked nipples were slightly more common in the younger than the older primipara. Its incidence was unrelated to the infant's birth weight or the mother's obstetric history, but the trouble was distinctly more common in mothers with male babies.

As regards treatment of the breast complications, stilboestrol cream applied to the nipple did not decrease the incidence of simple nipple pain, but did prove slightly more useful than other methods in avoiding fissured nipples. A "no treatment" routine was found to be the best all-round method of avoiding the various complications of breast-feeding. Most of these complications were of short duration, the great majority lasting less than four days. Because of this, and because of the relatively smaller incidence of painful as opposed to painless breast complications, there was little effect on the introduction of complementary bottle-feeds. The infants' weight gain was not interfered with, as bottle-feeds were offered when necessary.

I am grateful to Mr. M. P. Curwen, statistician, St. Bartholomew's Hospital, for his expert help. I am indebted to the maternity sisters and staff nurses of Lewisham Hospital for their enthusiasm and co-operation, and to Midland Silicones Ltd. for the supply of the silicone barrier cream.

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APPENDICITIS IN THE AGED

BY

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Appendicitis is still a serious disease even if its mortality has fallen considerably. During 1952 there were 127 deaths from appendicitis in Denmark. The British figure for 1948 given by the Registrar-General was 1,257—that is, more than 100 people die from appendicitis every month in England and Wales (Rees, 1952). With the generally rising life expectancy, a corresponding rise has taken place in the number of appendicitis cases among older persons admitted to hospital (Stalker, 1940; Simpson, 1946; Schullinger, 1950; Boyce, 1954; Brotherus, 1955).

In Surgical Department A of Frederiksberg Hospital this rise has also been registered. As it was felt that a higher percentage of complicated cases occurred among this group of patients, the cases of appendicitis occurring in the period 1948 to 1952 were investigated.

Present Investigation

Among 1,254 cases of acute appendicitis there were 9 (0.7%) deaths (all in the group of appendicitis with perforation). Ninety (7%) of the cases occurred in patients aged 60 years and above (7%), distributed as follows: 56 aged 60–69 years, 30 aged 70–79 years, and 4 aged 80 and above, the average age being 68 years. Five of the 90 patients died, a mortality of 5.6%, while the mortality among the 1,164 patients below 60 was 0.34%.

In Table I these results are compared with the figures from similar published series.

TABLE I.—Appendicitis in the Aged

	No.	Mortality
Fitch (1928)	13	54%
Lewin (1931)	28	28%
Wood (1934)	43	28%
Taylor (1935)	20	20%
Stalker (1940)	82	15.9%
Simpson (1946)	53	25%
Schiebel and Moise (1949)	53	13%
Wolff and Hindman (1952)	88	4.5%
Surgical Dept. A, Frederiksberg Hospital (1955)	90	5.6%

In Table II a comparison is made between the 142 patients aged 30–39 years and the 90 patients aged 60 or more. The incidence of complicated cases is four times greater in the older group. This is in complete agreement with the findings of Wolff and Hindman (1952).

The cause of this high incidence of perforation in the older age group is to be sought in diagnostic difficulties. Hoffman and Suzuki (1954) maintain that "the diagnosis of appendicitis is frequently difficult in the very young, the very old, the obese, and the pregnant patient." According to Lewin (1931) and others the peritoneum of the aged reacts only slightly, and muscular guarding is seldom to be elicited, perhaps owing to slackness of the abdominal wall. He points out that the sense of pain is blunted and the bowel reflexes are weakened; this leads to less nausea and vomiting. Since many of these elderly patients are suffering from habitual constipation, the symptoms are not taken into account and perhaps only an aperient is used. The disease is thus allowed to progress before medical advice is sought. As Rolleston (1932) puts it: "The organs suffer in silence without any local or general disturbance."

From the standpoint of pathology the more widespread arteriosclerosis found leads to vascular occlusion and a correspondingly earlier onset of ischaemic gangrene and perforation. Thus Brotherus (1955), in his series of appendi-

TABLE II.—Comparison Between 90 Patients Aged 60 or More and 142 Aged 30–39

	60+ Years	30–39 Years
Acute appendicitis	42 46.2%	124 87.9%
Acute appendicitis with perforation and acute appendicitis with perforation and abscess	40 44.9%	15 9.5%
Acute appendicitis and diffuse peritonitis	8 8.9%	3 2.6%

citis cases in the aged, found that if the arteries were sclerotic a more destructive type of appendicitis arose. According to Carp and Arminio (1952) the atrophy or complete lack of lymphoid tissue follicles found at histological examination of the vermiform appendix of the aged might explain the early setting in of gangrene. A case is recorded below in detail.

A 79-year-old woman was admitted with a history of a tender lump in the right groin for five days. On examination her temperature was 37.8° C., and no signs of peritoneal reaction were seen. An irreducible, slightly tender right-sided femoral hernia was found, and the abdomen showed slight meteorism. Operation was found, and the abdomen showed slight meteorism. Operation disclosed oedema of the hernial sac, which contained a gangrenous appendix with perforation at its base and an abscess. Appendectomy, excision of the hernial sac, and a repair making use of Cooper's ligament were followed by an uneventful post-operative course.

Post-operative complications of appendicectomy are listed in Table III; these also show higher figures in the older age group.

TABLE III.—Post-operative Complications

	Patients Aged 60+	Patients Aged 30–39
Wound infection and delayed healing	10	15
Intraperitoneal abscess	2	2
Thrombophlebitis	1	0
Pulmonary embolism	3	0
Bronchopneumonia	3	0
Paralytic ileus	5	0
Cardiac incompenation	7	0
Atelectasis	2	0
Post-operative hernia	3	1

Treatment

Treatment has been along the usual lines—that is, primary operation—except when a palpable lump was present. In such cases conservative treatment with opium and antibiotics was instituted, followed by a secondary operation in the cold stage four to five months later (as in most Scandinavian departments of surgery). Eight cases among very debilitated or very fat patients were treated conservatively; in these there was no histological diagnosis. In perforated cases penicillin and streptomycin were administered, and in a few cases chlortetracycline was used. During the first four years of the period under review sulphadiazine-penicillin powder was applied intraperitoneally or subfascially; in some cases drainage of either the peritoneal cavity or the subfascial space was done. Bowel decompression by means of a duodenal tube and continuous suction was carried out as an adjunct to surgery; during the last year of the period a Miller-Abbott tube was the routine in cases of bowel paralysis.

Parenteral fluids and electrolytes, infusions of plasma, and blood transfusions were widely used. The standard approach to the appendix was through a muscle-splitting incision in the right iliac fossa. A pararectal incision was made in some very obese patients and in cases in women where doubt existed about the pre-operative diagnosis. Post-operative hernia occurred only in the drained cases, but as no follow-up has been undertaken the figures are minimal values. They are in accordance with Wolff and Hindman's (1952) figures for the same groups—namely, 3 and 0.9%.

Discussion

Our results are comparable to those found in the literature, and support the view that active treatment should be insti-

tuted in appendicitis among the aged. Furthermore, as emphasized by several authors (Povlsen, 1943; Costello and Saxton, 1951; Semb, 1953; Thomas, 1953), acute appendicitis may be the first symptom of a caecal cancer.

Three cases of caecal cancer were admitted to our department in the period surveyed (1948–52). None of these patients was over 60, but two showed signs of appendicitis. One patient with cancer of the appendix came for treatment during the period. (A woman of 61 was treated conservatively for a periappendicular abscess. Secondary operation, four months later, revealed a carcinoma of the appendix.)

In Costello and Saxton's (1951) series of 122 cases of caecal cancer the pre-operative diagnosis was appendicitis in one-fourth. Symptoms of appendicitis arise because of tumour obstruction of the appendix or its blood and lymph vessels. The surgeon may in some cases overlook the tumour; this happened in 60% of the cases in Thomas's (1953) series. Symptoms continued to be present in these patients, in several of whom faecal fistulas developed, causing an average delay of six months before the secondary operation was performed. For this reason, in some cases it was undertaken too late. Thomas advises the use of an incision large enough for inspection of the right colon in all patients over 30 coming for operation for acute appendicitis. Semb (1953) takes a more moderate view: in operations for appendicitis in the older age group the surgeon should, if possible, explore the right colon.

Summary

Appendicitis is no rarity in patients over 60 years of age. Among 1,254 cases in a surgical department 7% occurred in patients of this group.

In the older age group appendicitis very often leads to early gangrene and perforation without causing alarming symptoms. The mortality rate and the rate of complications are therefore considerable.

Early operation is advised irrespective of age. If a tender lump is felt, conservative treatment is preferred, with later appendicectomy in the cold stage.

By this early operative treatment tumours of the caecum or appendix may be detected and treated at an early stage of their development. The right colon should, if at all possible, be examined when patients of the older age group are operated upon.

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The Antioxidant in Food Regulations, 1958, made jointly by the Ministers of Agriculture and Health, permit the sale and importation of certain foods containing propyl octyl, or dodecyl gallate, butylated hydroxyanisole, or butylated hydroxytoluene, or mixtures of these five substances, within prescribed limits; the regulations also lay down the manner of labelling antioxidants when sold as such and of certain foods containing them.

SALT-LOSING OTORRHOEA

BY

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AND

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Basal fractures of the skull are uncommon in children (Harris, 1957), and the following report is presented because it illustrates the development of two complications in a case of this nature.

Case Report

A boy, aged 3 years and 11 months, was admitted to the Bristol Royal Infirmary following an accident in which he ran into the road and was knocked down by a car.

On admission he was crying, and was drowsy but rousable. There was clinical evidence of a closed fracture of the right femur, and blood and cerebrospinal fluid were coming from his left ear. No other abnormality was found on clinical examination of the central nervous system. An antero-posterior view of the skull showed a vertical fracture in the middle of the left petrous temporal bone in a position to implicate the ear. Radiological examination also confirmed the presence of a transverse fracture of the upper third of the right femur. Traction was applied to the right leg and he was given 500,000 units of crystalline penicillin intramuscularly twice daily.

Thirty-six hours after admission the child complained of a severe headache and vomited. His temperature was 101° F. (38.3° C.), and pulse rate 144. Severe opisthotonos with marked head retraction was present. Lumbar puncture was performed and yielded a turbid fluid at a pressure of 50 mm. C.S.F. There were 2,000 cells per c.mm., of which 70% were polymorphs and 30% lymphocytes. The protein content of the fluid was 180 mg./100 ml. Examination of a film made of the centrifuged deposit showed numerous pus cells and possibly two isolated groups of pneumococci.

In view of these findings, intramuscular penicillin was increased to 1 mega unit four-hourly and intrathecal treatment with 10,000 units of crystalline penicillin daily was begun. Oral sulphadimidine, 0.5 g. four-hourly, was added. Cultures later confirmed the presence of pneumococci. The parents now recalled that a week before the accident the child had been seen by the school doctor for earache. Although they could not recollect which ear was painful it seemed possible that the pneumococcal meningitis may have arisen from a pre-existing ear infection.

Clinically, the patient showed a satisfactory response to treatment so far as his meningitis was concerned. Forty-eight hours after the onset, although neck retraction had increased still further, there was no disorder of consciousness to indicate deterioration. The rectal temperature had fallen to between 99 and 100° F. (37.2 and 37.8° C.). The C.S.F. showed a falling cell count, and no pneumococci were now seen on microscopy or obtained on culture. Dehydration, however, was becoming quite marked, and examination showed a dry, inelastic skin and soft eyeball tension. Oral intake of fluids was still excellent, and these were therefore increased.

Lumbar punctures on each of the first three days of treatment of the meningitis showed that the pressure of C.S.F. was very low. The fluid escaped from the needle only when the child cried. On the fourth day lumbar puncture failed. The possibility of a spinal block was considered, and because of this and the continued loss of C.S.F. from the ear, a neurosurgeon (Mr. G. L. Alexander) was asked to see the child. Cisternal punctures were attempted under both local and general anaesthesia, and because these were un-

successful tonsillar herniation was considered. A further lumbar puncture was, however, successful, and hyalase was given intrathecally with the penicillin.

The fluid balance chart for the four days following the commencement of treatment for the meningitis showed a daily oral intake of fluid of 1,290 ml., 1,780 ml., 1,300 ml., and 1,250 ml. respectively. His renal output for the corresponding period was 250 ml., 120 ml. plus wet beds, 100 ml. plus wet beds, and on the fourth day wet beds only. There was no visible sweating. The child's pillows were, however, persistently saturated by the discharge of C.S.F. from the left ear.

Five days after admission, and in spite of increased and adequate intake of fluids, it was obvious that his dehydration was increasing. The child was now apathetic and anorexic, and had generalized muscular hypotonia. The blood pressure was 95/50. Inelasticity of the skin and soft eyeball tension were more exaggerated. Examination of the electrolytes showed: plasma N.P.N., 50 mg./100 ml.; plasma Na, 122 mEq/l.; plasma K, 4.1 mEq/l.; plasma Cl, 82 mEq/l.; plasma proteins, 20.5 mEq/l. Dehydration was therefore confirmed biochemically and a profound loss of Na and Cl demonstrated.

The loss of C.S.F. from the ear continued, and it was now apparent that surgical intervention would be necessary to seal the fistula. On the evening of the sixth day after admission the child was transferred to the neurosurgical unit at Frenchay Hospital. The next day left temporal craniotomy and exploration of the upper surface of the left petrous bone was performed (Mr. G. L. Alexander). No crack or leak was seen, and muscle was tacked in blindly beneath the dura below the petrous ridge. The wound was closed.

The first operation was unsuccessful, and Mr. Alexander carried out a second operation four days later. During the period between the two operations the child's fluid intake by mouth had continued to be excellent, and in addition 3 g. of extra salt was given daily.

At the second operation retromastoid exposure of the petrous bone was performed. A vertical crack was seen in the petrous bone, occupying most of its length and extending down to the jugular foramen. No fluid could be seen escaping, but a thin layer of extradural blood clot was organizing over the fracture. This might have obscured a small opening. A sheet of muscle was laid in an extradural position and the wound closed.

This procedure was a complete success. The C.S.F. otorrhoea ceased and all clinical signs of dehydration disappeared. Two days later antibiotic therapy was discontinued. Estimation of the blood electrolytes showed them to be entirely normal. Treatment of the fractured femur was continued, and eight weeks after admission the child was returned home, having made an excellent recovery. His C.S.F. then showed no abnormality.

Discussion

There is no doubt that the low sodium chloride in the blood of this patient was due to the copious loss of C.S.F. from the ear as a result of the fractured base of skull. Most fistulous fractures into the ear seal off spontaneously, and it is very rarely necessary for the surgeon to have to explore the posterior fossa in order to stop an aural leak (Alexander, 1958, personal communication).

Pneumococcal meningitis itself still carries a very high mortality in spite of modern antibiotic therapy (Pengelly, 1955). Electrolyte imbalance is a well-recognized complication of cerebral lesions, and if a condition of hyponatraemia and hypochloreaemia is met with during the course of a meningitis three possibilities usually present themselves.

Doxiadis *et al.* (1954) studied 19 children with tuberculous meningitis and came to the conclusion that a correlation was to be found between the abnormal electrolyte pattern and the occurrence of serious vomiting. In this case no vomiting

Medical Memoranda

Sensitivity to Penicillin in British Poliomyelitis Vaccine

This poliomyelitis vaccine contains a small amount of penicillin. In a recent reply to a question regarding the safety of giving it to a penicillin-sensitive person, it was stated, "To our knowledge no report has been made of any case of sensitization to the antibiotics" (*Brit. med. J.*, 1958, 1, 1555). In view of this reply, and the increasing use of the vaccine, the following report of a case may be of general interest.

CASE REPORT

An apparently healthy boy aged 12 was given an injection of 1 ml. of the British vaccine into the left upper arm. He had a history of sinus trouble, and was known to be sensitive to penicillin, having developed a generalized erythematous rash during treatment with the drug following a toe injury. There was no history of any other specific allergic disorder, and he had never had an attack of bronchospasm. In his family, two maternal aunts have skin disorders. One develops eczematous reactions when in contact with the metal of jewellery and suspenders. The other has urticarial reactions with no apparent specific cause.

The day after the injection I was called to see the boy. He complained of a severe frontal headache, and was lethargic, anorexic, and generally unwell. A few hours after the injection a sparse itchy rash had appeared on the trunk and limbs, with the rapid development of vesicles, especially on the right buttock and leg. He was apyrexial, the chest was clear, and there were no abnormal signs referable to the central nervous system. Treatment with an antihistamine was begun with good results.

Three days after the injection, however, he complained of breathlessness and of a tight feeling across the chest. Bronchospasm was present, but was quickly abolished with an antispasmodic. Treatment with this and the antihistamine was continued. Six days after the injection a dose of the antihistamine was missed. He felt worse generally, and the bronchospasm returned, but settled when treatment was resumed.

Though the acute chest and skin symptoms and signs settled, the headache persisted, being severe at times and difficult to relieve. The general malaise also remained. He was therefore examined by Dr. J. P. Bound, consultant paediatrician, Victoria Hospital, Blackpool, who agreed, however, that there were no abnormal signs referable to the central nervous system.

After 10 days the persistent symptoms began to improve, and on the thirteenth day treatment was stopped, with no recurrence of them. He had been apyrexial throughout. Eleven days after treatment ended (twenty-four days after the injection) the signs and symptoms of mumps appeared.

COMMENT

In view of the known sensitivity to penicillin in this case, and the absence of other precipitating factors, I think that the skin reaction must be considered as part of a sensitivity reaction to the small amount of penicillin in the vaccine. The bronchospasm may have been related. The precise origin of the severe headache must be conjectural.

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Treatment of Cardiac Arrest

Several articles on cardiac arrest have appeared in the medical press (*Brit. med. J.*, 1956; Briggs *et al.*, 1956; Milstein, 1956; O'Reilly and Ohlke, 1956; Wylie, 1956). These have stimulated us to consider afresh how our efficiency in dealing with this emergency can be improved. As Milstein (1956) has said, cardiac arrest is an emergency which may suddenly face any surgeon, anaesthetist, radiologist, or physician, and it is well that even the most junior member

was encountered after the three hours during which the acute meningitis became clinically apparent, and hence this possibility is excluded.

Welt *et al.* (1952) discuss the salt-wasting syndrome which has been described in a group of patients with a variety of cerebral lesions (Peters *et al.*, 1950). The very nature of the cerebral disease, which was diffuse in each instance, defied any attempt to analyse the site of the responsible lesion. It would seem that hypothalamic involvement leads to renal tubular loss of sodium and chloride. These patients, however, responded favourably to the administration of salt; this was not so in the present case.

Adrenal apoplexy due to the Waterhouse-Friderichsen syndrome presents a typical fulminating picture; this was not seen during the evolution of the present case, and can undoubtedly be dismissed on clinical grounds alone.

The normal daily production of cerebrospinal fluid in a patient of this age is only 100–150 ml., but it has been shown that if artificial drainage is provided several litres a day may be produced (Best and Taylor, 1955). It is impossible to estimate the amount of C.S.F. lost by this child, but it must have been considerable. On one day alone, the child received 3,050 ml. of fluid plus additional salt orally and 925 ml. of normal saline intravenously. In spite of this, although the clinical evidence of dehydration became less marked, the blood electrolytes failed to return to normal. The low pressure of the cerebrospinal fluid is probably another indication of the seriousness of the leak. It was only after the fistula was sealed off surgically that the patient rapidly improved and the blood electrolytes returned to normal values.

Summary

A case is presented in which a child sustained a fracture of the base of the skull complicated by pneumococcal meningitis and a copious C.S.F. otorrhoea.

The loss of C.S.F. induced serious dehydration due to a "salt-losing" syndrome, and surgical intervention was necessary to close the fistula.

Our thanks are due to Professor A. V. Neale for much helpful criticism and advice. We are also grateful to Dr. J. E. Cates, Mr. G. L. Alexander, and Mr. A. L. Eyre-Brook, under whose united care the patient came during his stay in hospital, for permission to publish this case.

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"There appear to be two schools of thought as to the duty of hospitals towards the elderly. One is to try to provide little else than a permanent residence for as many as possible and the other is to consider each admission to be temporary unless or until continuous care is proved to be unavoidable. The former system will give permanent care only to the few who are admitted. These will be well looked after while a vast and increasing majority will continue in distress. The latter system, on the other hand, makes the hospital service available to a larger number of people because beds will become vacant by frequent discharges. It will be possible to give early treatment and care to those who need it when they need it and enable them to return to the community, which is surely a hospital's purpose."—Report to December 31, 1957, of Hospital Personal Aid Service for the Elderly (King Edward's Hospital Fund).

of the hospital staff should know what are the essential steps in initiating immediate and adequate cardiac massage. In a patient who is well oxygenated before cardiac arrest, the maximum time which can be allowed before the establishment of artificial circulation is three and a half minutes; if, as so often happens, hypoxia has been a contributing factor in causing the arrest, then the time limit before irreversible cerebral damage occurs is even shorter than this.

The steps necessary for establishing cardiac massage through a thoracotomy incision are unfamiliar to most general surgeons and other clinicians, and they very often

cardium must be incised. (5) Adequate cardiac massage produces a palpable peripheral pulse and a systolic pressure of 70-80 mm. Hg; therefore an assistant must check the blood pressure while massage is being continued. (6) The rate of massage depends chiefly on the speed with which the ventricles fill during diastole. (7) Electrical defibrillation should not be attempted by anyone who is not familiar with this procedure.

The chart has been divided into two sections in order to emphasize that the only treatment necessary *without delay* is the institution of *efficient cardiac massage*; once adequate

MANAGEMENT OF CARDIAC ARREST

DUTIES OF PERSONNEL

ANAESTHETIST	SURGEON	NURSE	ASSISTANT SURGEON	OTHERS
1. When carotid pulse cannot be felt or heart cannot be heard inform surgeon and ask assistant to record time. 2a. Stop all anaesthesia. 2b. Respire patient with 100% oxygen. 2c. Tilt patient head down 15 degrees. 2d. Pass endotracheal tube as soon as possible. 3a. When cardiac massage is established check radial or carotid pulse. 3b. Check B.P.	1. When possible confirm presence or absence of pulsation in aorta. 2a. Open left chest in 4th interspace with transverse incision from sternal margin to mid-axillary line. 2b. Massage the heart.* 3. When adequate massage has been continued for 3 minutes, pause to see if contractions have returned; if not, follow col. 2 below.	1. As soon as absent pulse is reported bring emergency thoracotomy set. 2. Bring emergency tray of syringes and drugs. 3. Start I.V. if no one else is available.	1. Insert rib spreader and cut 1 or 2 adjacent cartilages for adequate exposure. 2. Stand by to relieve surgeon massaging the heart. 3. Start I.V. if no one else is available.	1. One person call out time at one minute intervals until adequate massage is established. 2. One person start I.V. and assist anaesthetist.

Don't—Wait for electrocardiograph or cardioscope to diagnose and begin treatment. An absent B.P. and absent pulse in a major vessel (e.g., carotid) means cardiac arrest.

Don't—Give drug of any type until type and cause of arrest is determined.

Don't—Fiddle and hope the heart restarts. You have only 3 minutes to establish circulation before irreversible damage occurs. So cut and massage.

Possible situation existing after adequate Massage and Oxygenation.

- The heart resumes a normal beat
 - Continue massage in rhythm with beat until contractions are vigorous and B.P. is maintained at 80 systolic.
 - If contractions do not improve or if they become weaker give adrenaline 1:1,000 0.5-1 ml. into the cavity of the right ventricle.
 - If the heart is contracting well but the B.P. remains low a noradrenaline (4 mg. in 500 ml. 5% glucose) drip should be started.
 - Observe the heart for at least 30 minutes of adequate action before closing the chest.
 - Close the chest with adequate haemostasis.
- The heart remains in arrest
 - Open the pericardium.
 - Observe the action of the ventricles for diagnosis.
 - Observe the colour of the heart: if it is well oxygenated it will be a good pink colour.

A. The heart is in fibrillation

- Procaine 1% 2-10 ml. into cavity of right ventricle.
- Give CaCl 10% 5-10 ml. into cavity of right ventricle.
- Massage for 3 minutes awaiting action of procaine.
- If no result use electric defibrillator (one of the thoracic surgical unit or a senior anaesthetist will be responsible for this).
- If shock is ineffective (or defibrillator is not available) give adrenaline 1:1,000 0.5-1 ml. into cavity of right ventricle.
- If spontaneous beat returns follow col. 1.
- If heart is in asystole follow col. 2 B.

B. The heart is in asystole

- Continue adequate massage.
- Give CaCl 10% 5-10 ml. into cavity of right ventricle.
- If asystole persists and the heart is a good colour, give adrenaline 1:1,000 0.5-1 ml.
- If heart beat returns follow col. 1.
- If asystole persists continue massage up to two hours or until the heart fails to fill in diastole.

*CARDIAC MASSAGE

Adequate Cardiac Massage should produce a palpable peripheral pulse and should be carried out thus:

Grasp the heart with the whole hand, apply pressure with the palmar surfaces of the fingers and the thenar eminence. Do not use the finger-tips. If the heart is large use both hands. 80-90 contractions per minute is the most effective rate, but this may be difficult to maintain. The rate must be slow enough for the heart to fill during diastole, and the maximum rate possible may be only 60-80 per minute.

The cerebral and coronary circulations can be improved by occluding the aorta below the origin of the left subclavian artery. The clamp should be released every 20 minutes to allow circulation to the kidney.

hesitate too long before embarking upon what seems to them a very drastic procedure. Even when the chest has been opened and the heart exposed there is much uncertainty about the correct way to massage the heart, and valuable time may be wasted injecting drugs which can do more harm than good at this stage. It has therefore seemed good to us to follow the example of Nowill and Hobler (1956), who have reported their chart on "The Management of Cardiac Arrest."

After consultation with the surgeons and their assistants who may need the help of such instructions we have modified the chart to include only the information that is immediately necessary, first, to establish adequate cardiac massage, and, secondly, to re-establish spontaneous cardiac action.

We have stressed the importance of the following points:

- The thoracotomy incision must be large enough to allow good exposure of the heart. (2) Because of the danger of rupture of the ventricles the finger-tips must not be used to massage the heart; if the heart is compressed between the thenar eminence and the palmar surfaces of the fingers this danger is avoided. (3) Drugs must not be given until adequate massage has been continued for at least three minutes and until the type of arrest has been diagnosed. (4) This diagnosis cannot be made until the pericardium has been opened; therefore, if the heart does not start contracting within three minutes of the onset of massage the peri-

culation has been established there is time to consider the next steps that may be necessary to restore spontaneous action. A sterile emergency thoracotomy set is always ready in every operating suite of our hospital and is available also for the x-ray rooms in which the cardiac and neurological diagnostic procedures are carried out, since these adjoin the main operating theatres.

The chart is hung in every scrub-room in a position where it can be studied by surgeons, nurses, and anaesthetists whenever they wash their hands, and a copy is given to each new resident together with further information that will enlarge upon some of the points given in the chart.

No doubt many hospitals have a similar routine worked out already, but, since we have seen no reference to such a chart in the British medical literature, we think that publication of our chart may be of value.

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Reviews

PNEUMOENCEPHALOGRAPHY

Pneumoencephalography. By E. Graeme Robertson, M.D. (Melb.), F.R.C.P., F.R.A.C.P. (Pp. 482+xxi; illustrated. £5 10s. 6d.). Oxford: Blackwell Scientific Publications. 1957.

Dr. Graeme Robertson has been keenly interested in the technique of encephalography for many years, his first paper on this subject appearing in 1941. The present volume gathers together previously published material and presents his very considerable experience in the use of this valuable method of investigation. It is always a matter to marvel at that bubbles of air introduced by lumbar puncture can be persuaded, by appropriate positioning of the patient, to pass by a devious route into the ventricles of the brain. The first part of this book deals with the anatomical and physical factors governing the successful passage of air and describes the ingenious apparatus by which the author studied the entry of air into the lateral ventricles depends largely upon a flow of cerebrospinal fluid from the convexity subarachnoid spaces, thus allowing a slight expansion of the lateral ventricles, which renders their pressure lower than that within the third ventricle. The physical factors show that the passage of air through the aqueduct and other narrow orifices depends upon the diameter of these "narrows" and the surface tension of the fluid. The technique of pneumoencephalography is given in detail, including advice on the important items of speed of injection, time intervals at which the ray films should be explored, and the position in which the head should be placed. Most failures of encephalography—excepting those due to the nature of the lesion—result from the head being flexed too much or too little during the introduction of the air. The rest of the book—about three-quarters—forms an atlas of the normal appearances and the most frequent abnormalities. An advantage of encephalography over ventriculography is the ability to demonstrate (and to recognize) the various cerebrospinal fluid cisterns. The value of this in the diagnosis particularly of posterior-fossa and of basal lesions has only been appreciated in recent years, and the author has given proper prominence to this aspect of his subject.

The book is beautifully produced, with superb illustrations, the radiographic reproductions being for the most part excellent. There are many line drawings which are most helpful in clarifying the shadows of air seen in accompanying radiographs; these have been executed by the author, and with their stippling and hatching in contrasting colours and set a high standard. Both author and publisher are to be congratulated; and neurosurgeons and those radiologists whose work includes encephalography cannot fail to gain enjoyment and instruction from studying this volume.

D. W. C. NORTHFIELD.

HOMOSEXUALITY

Homosexuality: A Subjective and Objective Investigation. British edition edited by Charles Berg, M.D.; American edition edited by A. M. Krich. (Pp. 415. 30s.) London: George Allen and Unwin, Ltd. 1958.

Female Homosexuality: A Psychodynamic Study of Lesbianism. By Frank S. Caprio, M.D. Foreword by Karl M. Bowman, M.D. (Pp. 334+xxviii. 30s.) London: Peter Owen Ltd. 1957.

Homosexuality: Its Nature, Causation, and Treatment. By Clifford Allen, M.D., M.R.C.P., D.P.M. (Pp. 143. 15s.) London: Staples Press Ltd. 1958.

Live and Let Live: The Moral of the Wolfenden Report. By Eustace Chesser. Foreword by Sir John Wolfenden. (Pp. 126. 8s. 6d.) London, Melbourne, Toronto: Heinemann. 1958.

The authors or editors of these four books agree that the prevalence of homosexuality (however defined) is commonly unsuspected; that the whole subject is surrounded by emotion and prejudice; and that ignorance concerning homosexuality is widespread and should if possible be overcome. The emphasis is on exposition and interpretation. The

reader will seek in vain for new proven facts that add to knowledge, although much that is known or considered probable as regards causation, incidence, manifestations, and possibilities in treatment is recapitulated or rehearsed, with, however, so many personal trimmings that "you can't see the fish for the parsley."

The book edited by Dr. Krich is a scissors-and-paste production or anthology of "the thoughtful studies of more than thirty authorities on the subject," to which Dr. Berg has added a discursive "Editorial Survey" for the English edition in which he expounds his own views. (The emphasis Dr. Berg himself lays upon the fetishistic element in homosexuality is interesting.) The field drawn upon is wide and includes many well-known names, ranging from Hirschfeld to Freud and beyond. The numerous papers and extracts reprinted here vary greatly in date, length, value, and interest. Why this particular selection of writings on homosexuality and allied topics should have been chosen is not clear; the effect of the book is kaleidoscopic and confusing.

Dr. Caprio points out that the subject of female homosexuality has been strangely neglected; but he has muffed his chance. It might be argued that much of his book does not rise above the level of traveller's anecdote—some of it interesting. Here too the orientation is interpretative. The rules are: don't be taken in by the obvious; things may (rarely) be what they seem, but are more probably the opposite. For example: "In short, many prostitutes are latent homosexuals in so far as they resort to sexual excesses with many men to convince themselves that they are heterosexual." Although "psycho-analysts have demonstrated" that this is so—only the naïve would suppose that girls become prostitutes because they like the life and the pay—Dr. Caprio considered that confirmatory field work was called for. Accordingly he embarked upon a world tour "from China to Peru," not omitting "London, England; Paris, France," "Whenever necessary" (for example, "Tokyo, Japan; Bombay, India") "I engaged the services of a taxi-driver who acted as interpreter during the interviews with prostitutes." The results obtained confirmed Dr. Caprio's expectations.

Dr. Allen, whilst recognizing that homosexuals, "like Leonardo da Vinci, are sometimes very creative," is a firm advocate of the view that "homosexuality is just as much a disease as cancer or hysteria." The psychogenic origin is proved by the excellent response, in skilled hands, to psychotherapy, as to the efficacy of which Dr. Allen draws special attention from his own experience in private practice. "It is well known that homosexuals dislike attending clinics and do not respond half so well as when treated privately." Concerning prevention, Dr. Allen claims: "It is unkind to force milk puddings on a child who is trying (by hating them) to overcome its longing for milk"—that is, presumably from the maternal breast, and hence a "mother fixation" danger, and hence possible homosexuality. Many of us may never have connected milk pudding with homosexuality in any way; the deeper significance of a "cissie" being a "milkop" had probably escaped us.

Dr. Eustace Chesser has produced another confident and fluently written little book on a sexual topic. It is commended by Sir John Wolfenden in a foreword in which he stresses the importance of being broad-minded.

Much in these books can justly be criticized for lax thinking, unverified speculation, and complacent dogmatism. All four—with the possible exception of the anthology, which does include some valuable pieces—can safely be omitted from our library lists. It is, however, important to stress that the works reviewed here are not representative of informed medical opinion on the subject. The major part of the medical evidence submitted to the Wolfenden Committee rightly impressed the lay as well as the medical members by its high standard, able presentation, critical approach, and modesty in claim. For those who want to read a short, informative monograph, *Homosexuality*, by Dr. D. J. West (Duckworth, London, 1955), can be commended.

DESMOND CURRAN.

PSYCHO-ANALYSIS OF THE CHILD

The Psychoanalytic Study of the Child. Volume XII. Managing Editors: Ruth S. Eisler, M.D., Anna Freud, LL.D., Heinz Hartmann, M.D., and Ernst Kris, Ph.D. (Pp. 417. 50s.) London: Imago Publishing Company, Ltd. 1958.

The first section of this new volume of the series contains six papers which are classified as "Contributions to Psychoanalytic Theory." Of these the first, "The Nature and Development of the Concept of Repression in Freud's Writings," by Charles Brenner, gives a historical survey of the kind that is invaluable in the teaching of psychoanalytical theory to students. When Freud's work is presented in this way it seems logical to expect developments in the theory, and the student is not left with a sense of a closed system. Phyllis Greenacre, in "The Childhood of the Artist," tries to get at some of the elements of genius apart from those that are a "gift from the gods," and she discusses the "love affair with the world which seems to be an obligatory condition." Loewenstein examines interpretation in the "Theory and Practice of Psychoanalysis," concluding with the comment that "every psychoanalysis can and perhaps ought to be conducted as though the theory were never completely taken for granted." In the second section, named "Aspects of Early Development," an analyst gives a description of his own child who at 10 months discovered his genital. The relationship of this discovery to his emotional development in general is of great interest. In another intimate study, by William Niederland, the earliest dreams of a child are recounted. This was possible because the mother was in analysis—a fact which enabled the author to have a full biographical background of the dreamer and of his immediate environment. The dreams were experienced in a non-therapeutic situation and communicated spontaneously and verbally. They represent "a sort of recorded longitudinal dream history during the first years of life." The first was a nightmare and non-verbal, occurring when the boy was 17 months old. In another chapter in this section various authors draw attention to the effect of inconsistencies in the mother on the character development of children. In the clinical section, consisting of seven short contributions, there is one by Margarete Ruben which describes a boy of 10 who was treated for delinquency. The delinquency was a defence against loss of objects and reality. In the "Applied Psychoanalysis" section there is a study of the childhood of Stanislavski by Philip Weissman.

I can only pick out what interests me most when reviewing these volumes, of which this number is a good sample. Volume XIII will be published in November, 1958, and will be dedicated to the memory of Ernst Kris, and the present volume starts with an appreciation of Kris by Heinz Hartmann.

D. W. WINNICOTT.

BRITISH SURGERY

Textbook of British Surgery. Edited by Sir Henry Souttar, C.B.E., D.M.(Oxon.), F.R.C.S., and J. C. Goligher, Ch.M.(Edin.), F.R.C.S.(Edin. and Eng.). Volume 3: Genito-Urinary Surgery—Peripheral Vascular Diseases—Plastic Surgery—Actinomycosis—Surgery in the Tropics—Venereal and Allied Diseases—Radiology and Radiotherapy—Surgery of the Adrenal and Parathyroid Glands—Blood Transfusion—Fluids and Electrolytes—Haemorrhage—Chemotherapy. (Pp. 619+vii; illustrated. £5 5s.) London: William Heinemann Medical Books Ltd. 1958.

The first two volumes of the *Textbook of British Surgery* have already been very favourably reviewed; it is therefore pleasing to record that the present third volume (of four) maintains the characteristics and high standard of the previous issues. The subjects covered include genito-urinary surgery—a textbook in itself of 150 pages; a considerable section on vascular surgery, which modern work on the subject clearly demands; plastic surgery, including a special chapter on the hand; and radiology both diagnostic and therapeutic, giving a sufficiency of information for the general surgeon. Other rather less extensive sections deal

with surgery in the tropics, venereal diseases, the adrenal and parathyroid glands, actinomycosis, blood transfusion, electrolytes, shock, and chemotherapy. The information provided in all parts of the book is up to date and well suited to the needs of candidates for the higher examinations. The numerous illustrations are maintained at an excellent level of reproduction.

As was commented in reviewing the second volume, the proof-reading could have been more carefully done, so that there are numerous spelling and other errors, such as "anastomosis" for "anastomosis," vaso-epididymal "reflex" for "reflex," "right" side of scrotum when "affected" side is meant, and so on. The use of the term "radial" instead of the commoner "radiation" is probably etymologically correct, but in this particular application is perhaps ambiguous in view of its usual anatomical use—for example, radial nerve. One error almost verges on the comic when we read that if, for incontinence, a ureterocolic anastomosis is impossible "an ideal hoop may help." But the fact that I have mentioned these small points shows that I have no major criticism to offer of the work as a whole, for it appears to be a well-balanced account of present-day British surgery.

NORMAN C. LAKE.

COLD COMFORT

Doctor Tonrondo. By Owen Guinness. (Pp. 352. 16s.) London: Chapman and Hall, Ltd. 1958.

This is a story about Wales, where (as all Englishmen know already) the farmers go to bed in their best boots after leaving milk and honey on the doorstep, to assure the fertility of their unions. The result of one of them is a brilliant young man who takes up medicine and marries an Englishwoman who (as all Welshmen know already) are dreadfully frigid. Mrs. Tonrondo's sexual disability appears, understandably, on a honeymoon in a Welsh hotel, with the landlord stoking up the husband with whisky downstairs while an engraving of the local preacher glares down on the marriage bed. Her difficult clinical problem is resolved suddenly on page 157, and she becomes in time the mother of two little psychopaths. But her constitutional coldness sends her husband on all manner of adventures, including a rather jolly romp with two barmaids up a mountain. It is all treated with disarming gusto, and might have been written by Mr. Eric Linklater while he was still a medical student. The editorial staff of the *B.M.J.* may be gratified to learn of the hero's first reaction to his agonizing marital crisis—"He paced wildly round the room, picking up old *British Medical Journals* and staring at them."

RICHARD GORDON.

The Evolution of Modern Medicine, the first Maurice Bloch Lecture, delivered at the University of Glasgow by Lord Cohen of Birkenhead in October, 1957, has now been published by Jackson, Son and Co., Ltd., 73, West George Street, Glasgow, C.2 (pp. 30; 5s.).

A symposium on hospital coccal infections arranged by the Association of Clinical Pathologists and the Committee on Cross-infection in Hospitals of the Medical Research Council took place in London on January 2, 1957. A report of the proceedings (*Hospital Coccal Infections*; Swan Press Ltd., 20, Bakers Row, E.C.1; 3s. 6d.), edited by R. E. O. Williams and R. A. Shooter, contains 14 papers and accounts of the discussions. The papers are in four groups: general aspects, infection in operating theatres and in wards, and methods of control. All who are faced with the problems of staphylococcal cross-infection—and in surgical and maternity hospital practice who, at some time, is not?—will find this booklet a useful compendium of information on the investigation of such outbreaks and on measures for dealing with them, including the control of ventilation, methods of sterilization, and the treatment of carriers.

Psychiatry in the Modern World, by Dr. E. B. Strauss (pp. 71; Michael Joseph, Ltd., 8s. 6d.), which appeared originally as a series of articles in the *Sunday Times*, is an outline of the nature and causation of mental and emotional disorders, written primarily for the non-medical reader.

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PATHOGENESIS OF FEVER

It has long been thought possible that naturally occurring fever might be due to endogenous pyrogenic substances. In fact almost one hundred years ago Billroth,¹ Weber,² and Frese³ independently showed that pus can cause fever when injected into animals. However, it always seemed likely that this effect was due to the presence of bacteria, especially since the discovery that endotoxins from many organisms, notably Gram-negative bacilli, cause pyrexia on injection.⁴

These endotoxins are heat-stable polysaccharides or lipopolysaccharides, and it is they which under the name of pyrogens contaminate injection solutions and apparatus and give rise to febrile reactions. Polysaccharides with similar properties exist also in the body tissues and even in the skin of fruits. V. Menkin described a substance in inflammatory exudates called by him "pyrexin" which produced fever on injection.⁵ The properties of pyrexin make it almost certain that it belongs to the group of polysaccharide pyrogens. Its source may have been contaminating bacteria or tissue polysaccharide. The pyrexia which follows injection of all such polysaccharides has certain well-defined characteristics, recently described by W. B. Wood.⁶ There is a relatively long latent period between the injection and the onset of fever. After the injection there is a leucopenia, which is ultimately replaced by a leucocytosis. Another important sequel, observed only after repeated, frequent injections, is that the animal acquires tolerance. It becomes immune to the pyrogenic action not only of further injections of endotoxin but also of infections and trauma. The immunity is non-specific between different endotoxins, disappears

within about two weeks, and is not due to formation of antibodies.

The recent sweeping advances in the study of the pathogenesis of fever were ushered in by the discovery that saline extracts of polymorphonuclear leucocytes cause pyrexia on injection into animals.⁷ The importance of this observation lies in the differences between the properties of leucocytic pyrogen and those of the endotoxic pyrogen described above. The fever caused by leucocytic pyrogen has only a short latent period and is not associated with significant leucopenia. In addition, leucocytic pyrogen fails to cause tolerance, is fully active in animals rendered tolerant by endotoxin, and is partly species-specific in its action. The next major advance was the discovery that injection of bacterial pyrogen in the form of typhoid vaccine was followed by the rapid disappearance of this endotoxin from the circulation and the equally rapid appearance in the blood of a pyrogenic substance with all the properties of leucocytic pyrogen. The concentration of this leucocytic-pyrogen varied directly with the height of fever.⁸⁻⁹

These experiments showed that the fever which follows injection of endotoxin is due to release of endogenous pyrogen of the leucocytic type, probably because of damage to the polymorphs themselves. That it is this substance which acts on the thermoregulatory centre in the brain was shown by injecting both types of pyrogen into the carotid artery and a peripheral vein. Endotoxin caused a similar delayed response when injected by both routes. Leucocytic pyrogen, on the other hand, yielded a more rapid and intense pyrexia when given into the carotid artery than into the venous system.¹⁰

Study of the pathogenesis of fever in experimental infections has shown that injection of influenza virus is followed by the appearance in the animal's circulation of a pyrogenic substance indistinguishable from leucocytic pyrogen.¹¹ In pneumococcal peritonitis in rabbits leucocytic pyrogen has been detected¹²⁻¹³ at the height of the infection in the peritoneal exudate, in lymph from the thoracic duct, and in the circulation. The pyrogen disappeared after penicillin therapy had led to defervescence. In experimental cellulitis induced by group-A haemolytic streptococci, in which, unlike the pneumococcal experiments, there was no septicaemia, similar results have been obtained.⁵

It would seem desirable to repeat some of these experiments in species other than the rabbit. The suppression of naturally occurring fever by measures antagonistic to leucocytic pyrogen would also provide useful evidence. Nevertheless, it seems likely that, as Wood has stated,⁶ the cause of fever in acute

¹ Billroth, T., *Arch. klin. Chir.*, 1864-65, 6, 372.

² Weber, O., *Dtsch. Klin.*, 1864, 16, 461.

³ Frese, J. B., *Experimentelle Beiträge zur Ätiologie des Fiebers*, 1866. Inaugural Dissertation, Universität zu Dorpat.

⁴ Bennett, I. L., Jr., and Cluff, L. E., *Pharmacol. Rev.*, 1957, 9, 427.

⁵ Menkin, V., *Science*, 1944, 100, 337.

⁶ Wood, W. B., Jr., *New Engl. J. Med.*, 1958, 258, 1023.

⁷ Bennett, I. L., Jr., and Beeson, P. B., *J. exp. Med.*, 1953, 98, 493.

⁸ Grant, R., and Whalen, W. J., *Amer. J. Physiol.*, 1953, 173, 47.

⁹ Atkins, E., and Wood, W. B., Jr., *J. exp. Med.*, 1955, 102, 499.

¹⁰ King, M. K., and Wood, W. B., Jr., *ibid.*, 1958, 107, 291.

¹¹ Atkins, E., and Huang, W. C., *ibid.*, 1958, 107, 383.

¹² Bennett, I. L., Jr., *Bull. Johns Hopk. Hosp.*, 1956, 98, 216.

¹³ King, M. K., and Wood, W. B., Jr., *J. exp. Med.*, 1958, 107, 279, 305.

bacterial infections has been established. It is also apparent that hypotheses based on experimental infections can be extended to some types of naturally occurring fever, though leucocytic pyrogen, whose chemical nature is not yet known, has been detected so far only in polymorphonuclear leucocytes. These successful experiments lend great encouragement to those research workers who look for endogenous mechanisms in inflammation and other bodily reactions to injury, and the imagination is stirred by the thought that fever, one of the most ancient signs of illness, is at last yielding up its secrets.

DIAGNOSIS OF HYPERPARATHYROIDISM

Primary parathyroid overactivity is not a common disorder, but it can no longer be described as rare. Unfortunately the clinical picture, which may include anorexia, constipation, polyuria, and hypotonia, is not a specific one, and the patient usually presents with some complication such as renal calculus, renal failure, or pathological fracture. Once the disorder is suspected the diagnosis becomes a biochemical problem, and the investigation tends to be a protracted affair entailing considerable laboratory work and frequent abortive discussions between biochemist and clinician before the decision to operate is finally reached. Discussion usually turns on the reliability of the serum-calcium estimations and the significance of hypercalcaemia, and is inevitably influenced by the technical difficulty of parathyroidectomy and the consequent reluctance to advise exploration in the doubtful case.

There is general agreement at the present time on the paramount importance of accurate estimation of serum calcium in the diagnosis of primary hyperpara-

thyroidism, and this point was emphasized again in a letter from W. M. Keynes which appeared in our correspondence columns recently.¹ It is therefore unfortunate that the application of flame photometry to the estimation of calcium has presented a number of technical problems which are only now being overcome.² However, it is when the presence of hypercalcaemia has been convincingly established that the diagnostic problem really begins, for it is not always easy to exclude other causes of this abnormality.

Exclusion of the diagnosis of sarcoidosis may be helpful by giving cortisone,³ and the same presumably applies to adrenal insufficiency.⁴ Myelomatosis can usually be diagnosed by the examination of proteins in plasma and urine. In milk-alkali syndrome and hypervitaminosis D the serum calcium returns to a normal level soon after withdrawal of the offending agents. Malignant disease may be exceedingly difficult to exclude, since it can be associated with hypercalcaemia even in the absence of bone metastases.⁵

The finding of a consistently low concentration of inorganic phosphate in the serum is another diagnostic point in favour of hyperparathyroidism. This low serum phosphate is usually associated with a high renal clearance of phosphate.⁶ Some workers express this as a phosphate/creatinine clearance ratio,⁷ whereas others employ the converse value—tubular reabsorption of phosphate.^{8,9} Like most biochemical tests, these procedures may yield both false negative and false positive results,¹⁰ and it is particularly confusing that some patients with hypercalcaemia not due to parathyroid overactivity have recently been shown to excrete abnormally large amounts of phosphate.⁸

A number of other features of primary hyperparathyroidism are inconstant and their diagnostic value is as yet unknown. The incidence of peptic ulceration and gastro-intestinal symptoms is high,¹¹ which may well be attributable to the hypercalcaemia, and pancreatitis has also been seen.¹² The serum-alkali reserve is said to be low rather than high even in the absence of renal failure,⁸ and polyuria¹³ and potassium depletion¹⁴ are sometimes found. Examination of the neck for a palpable tumour should never be omitted,¹⁵ and barium swallow¹⁶ and angiography¹⁷ have helped to locate the tumour. Osteitis fibrosa is the classical skeletal disorder, but the commonest bone lesion is probably osteoporosis,¹⁵ and even rickets has recently been reported.¹⁸ Some workers claim that resorption of bone at the distal ends of the clavicles is the earliest radiological change.⁷

The knowledge that renal calculus is the commonest complication of primary hyperparathyroidism

continues to trouble the practising urologist, who urgently requires some simple screening procedure. Recently G. L. Mouzas¹⁹ reported the results obtained with a test entailing the simultaneous collection of samples of blood and urine for the estimation of calcium, phosphate, and creatinine. The object was to determine not only the serum concentrations of calcium and phosphate but also their urinary excretion. Since the cases in which Mouzas obtained results suggestive of parathyroid overactivity had not been surgically explored at the time of publication, the true value of this screening test remains uncertain.

The present situation is unsatisfactory, and perhaps progress will have to await the assay of the hormone itself in the body fluids. B. M. A. Davies²⁰ has reported some interesting results on the measurement of parathyroid activity in urine, but existing bioassay methods are relatively crude, and the purification of the hormone is still in its infancy.²¹ When it becomes possible to measure with ease the hormone in blood or urine, it may well be found that hyperparathyroidism is commoner than we at present suspect, and that hypercalcaemia is a relatively late manifestation.

THE PRESCRIBED DISEASES

Before 1897, when the first Workmen's Compensation Act was passed, a workman injured in his work had to resort to the Common Law for protection. In 1906 an Act introduced into the scheme of compensation six diseases which could be considered as occupational in origin. When this Act was before Parliament a departmental committee, with the present Lord Samuel as chairman, was appointed to report what diseases and accidents were "due to industrial occupations, distinguishable as such." This committee recommended three tests for including a disease or accident, the most important being whether "it was so specific to the employment that causation by the employment could be established in individual cases." The tests were endorsed in 1920 by the Holman Gregory Committee, which also rejected the suggestion for extending the scheme to cover every case of disease or injury that could be shown to the satisfaction of the court to be due to employment. The Rolleston Committee in 1933 further endorsed the Samuel Committee's findings and brought the number of scheduled diseases up to a total of forty-one, and this increased to forty-eight by 1948.

A workman could always obtain compensation for any disease or injury whether it was scheduled or not if he could show that it had occurred as a result of a

provable accident, including any consequences following from the accident; these conditions continued while the Workmen's Compensation Acts were in force. In 1946, on the passing of the National Insurance (Industrial Injuries) Act the present State-administered scheme of social insurance came into being. Instead of compensation there was a system of injury, disablement, and death benefit. The Minister was empowered to extend insurance to other diseases he might prescribe by regulation, and also to promote research into the causes and prevention of accidents.

A departmental committee under the chairmanship of Judge (now Sir) Edgar T. Dale reported in 1948¹ that the tests propounded by the Samuel Committee were no longer appropriate, and to clarify the exact conditions that had to be realized before a disease could be scheduled, it considered that the

"primary matter to be decided was whether a disease is specific to the occupations of the persons concerned, or, if it is not so specific, whether the occupations of those persons cause special exposure to risk of the disease, such risk being inherent in the conditions under which the occupations are carried on."

The committee considered, however, that the wording of the Act gave such wide powers of discretion that there was no need to amend it.

In a developing industrial community the problem of the Industrial Injuries Scheme must be under constant review, and another departmental committee reported on the problems in 1955,² especially on diseases and personal injuries not caused by accident. This year a committee has again presented a Review of the Prescribed Diseases Schedule.³ It was particularly asked to recommend any adjustments that should be made in the terms of the prescription of industrial diseases (apart from pneumoconiosis and byssinosis), in order to achieve a greater precision in the description of the disease or injury, or in an appreciation of the risk. The report states that some of the scheduled diseases are now of little consequence—e.g., no case of poisoning by *Gonioma kamassi* has been reported for many years. New compounds have been introduced, such as phosphorus insecticides. Likewise the descriptions of lead, manganese, and other metals have been expanded to include compounds of the element. Other suggested additions to the list are chlorderivatives of benzene and poisoning by nitrochlorobenzene; it is recommended that there should also be the addition of poisoning by "substituted dinitrophenols or by the salts of such substances" to the dinitrophenol group. It was considered that the group of conditions "beat hand, knee and elbow" should be more precisely

¹ Keynes, W. M., *Brit. med. J.*, 1958, 2, 325.

² MacIntyre, I., *Biochem. J.*, 1957, 67, 164.

³ Dent, C. E., *Brit. med. J.*, 1956, 1, 230.

⁴ Leeksa, C. H. W., De Graeff, J., and De Cock, J., *Acta med. scand.*, 1957, 158, 455.

⁵ Plimpton, C. H., and Gellhorn, A., *Amer. J. Med.*, 1956, 21, 750.

⁶ Kyle, L. H., Schaaf, M., and Canary, J. J., *ibid.*, 1958, 24, 240.

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¹ Cmd. 7557.

² Cmd. 9548.

³ Cmd. 416.

described to include bursitis due to severe or prolonged pressure friction. Another important recommendation is associated with the description "Epitheliomatous cancer or ulceration of the skin, due to tar, pitch, bitumen, mineral oils (including paraffin), soot, or any compound product or residue of any of these substances." These conditions would be more precisely designated as "squamous celled carcinoma"; this would exclude rodent ulcer, which does not appear to have any occupational association. The new description also recognizes the carcinogenic properties of some arsenic compounds used in preparing colours. The diseases associated in the present groups 24 and 25 received special consideration. These are chrome ulceration, and those inflammatory and ulcerative conditions of the skin and mucous membranes of the upper respiratory tract resulting from exposure to dust, liquid, or vapour, together with the effects of radioactivity. A more rational classification is now possible for these conditions. A separate category has been suggested for occupations involving exposure to electromagnetic radiations other than radiant heat or ionizing particles, and which give rise to inflammation, ulceration, or malignant disease of tissues. This is more in keeping with developments in industry.

Canicola infection is now recognized as an occupational hazard. Work in a post-mortem room associated with "examination of human remains" is accepted as a possible factor in causing tuberculosis, and the report recognizes that there may be demands for extending the cover against this disease to other occupational groups besides nurses, research and laboratory workers, and the post-mortem room workers already accepted.

The report also acknowledges that primary neoplasm may occur not only in the bladder but also in the renal pelvis and ureter following exposure to aniline and some diphenyl compounds and certain derivatives of them.

This last report is an interesting attempt to provide cover for the occupational accident or disease for which the growing evidence is sufficient to meet the stringent legal criteria. The recommendations will not satisfy everybody. Some observers believe, for instance, that common diseases such as rheumatism and cardiovascular disease, which are prevalent in a few occupations or are said to be aggravated by some types of working conditions, should receive further consideration. The risks in some of the smaller industries may also not be fully recognized. This report cannot in the nature of things be a final pronouncement on the subject, and the need for further research is clear.

ORDEAL BY EXAMINATION

Medical teachers from the U.S.A., Sweden, and different British centres cast some doubt last week on the value of the examination as a professional test. Opening a two-day conference held by the Association for the Study of Medical Education (reported on page 851), Sir Russell Brain suggested that, if it were true that examinations determined the teaching of medicine, so was the converse true, for the same people were responsible for both. From the observations of subsequent speakers it seems as if the sense of responsibility might, in some places and at some times, be higher than it is. Sir George Pickering, for example, projected on the screen examination papers recently set for the Oxford B.M. degree to illustrate his contention that medical faculties were not interested in training the student's mind, but principally in stuffing it with facts. The three characteristics of a university medical course, he said, were its length, its complexity, and the rigours of its examinations. The test of any innovation in education should be in the answer it gave to the question, "Will it improve the student's mind as an instrument of precision?" Professor G. M. Bull brought the slide-rule down on the examiners' heads, and said that he and his colleagues in Belfast were replacing half their papers by multiple-choice questionnaires, some of the questions requiring only single-line answers. Such a test eliminated the examiner's marking error. It was possible in this way to test not only knowledge of facts but also skills such as the ability to make deductions from facts. Dr. J. Z. Bowers observed that in the U.S.A. the examination was not the severe final test that it was in Britain. In America much more attention was paid to reports from college teachers, to the continued observation of the student in his day-to-day activities throughout the medical course. All this was looked upon as being more important than the final examination, which would never be the cause of failure of someone who was regarded by his teachers as a good student. The failure rate was between 5% and 10%, and failure was often due to such factors as psychological disability. Roughly the same failure rate is the experience of Sweden, where, as Professor B. Rexed, of Upsala University, told the conference, the examination is "an affair between the student and the professor." The student could demand an examination, and if he failed and was dissatisfied with the way the professor conducted it he could ask for an examination in public before witnesses. In his summary at the end of the meeting Professor Robert Platt criticized the external examination in Britain and suggested that we must devise methods of testing students which cut across this.

It is encouraging to see the final examination, in particular, coming in for such criticism by such experienced teachers here and abroad. The examinations deaden the mind and cripple the spirit of inquiry latent in even the most cautious student. With the careful selection of students now prevailing, the percentage failing at the final examination should be much lower than it is if the British system of medical education were what some delude themselves it is. The theme of last

week's conference at the Royal College of Physicians was "experiment in medical education," and Dr. Hale Ham, of Western Reserve, Cleveland, gave an entrancing account of the new methods introduced there; and Dr. Nicolas Malleson intrigued his audience with his description of operational research on the London student. A.S.M.E., under its energetic secretary, Dr. John Ellis, has made such a good start that it is to be hoped its future will be made secure. In the meanwhile the examination of examinations must be carried through to a successful conclusion.

REACTIONS TO PENICILLIN IN POLIOMYELITIS VACCINE

Tissue cultures on the scale required for the commercial production of poliomyelitis vaccine cannot be entirely protected from bacterial contamination by physical means. It is therefore necessary to add antibiotics to which most bacteria are sensitive, whereas the virus is of course resistant to them. The medium used contains 200 units each of penicillin and streptomycin per ml. These antibiotics are not altogether eliminated from the final product, and there is at least a theoretical risk that a dose of the vaccine may cause a reaction in a subject sensitized to one of them. This is more likely to be penicillin, since sensitivity to this is commoner than to streptomycin and often of higher degree. This risk was pointed out in these columns¹ when the Ministry of Health announced the availability of the vaccine in this country to the lay press without prior information to the profession or any information about the composition of the product available.

That this is an actual and not merely a theoretical risk is evident from the report of a case by Dr. A. Fowden at p. 835 of the *Journal* this week. His patient developed a vesicular rash a few hours after the injection, and bronchospasm several days later. In the U.S.A., C. Zimmerman² has recorded six cases from his own practice in a seven-month period, and describes such reactions as "relatively common." In these six patients they were all of an urticarial type, developing at intervals of one to several or many days after the injection of vaccine, and apparently very resistant to treatment with A.C.T.H. and anti-histamines. Proof of their nature was obtained in several ways. All subjects gave a history of previous reactions to penicillin. A further dose of a make of vaccine containing penicillin provoked a further reaction of the same type, but one manufacturer's product in which the penicillin content has been reduced to below 0.001 unit per ml. did not have this effect. Finally, persistent reactions were rapidly relieved by administering penicillinase.

Sensitization to penicillin is believed to be much commoner in the United States than in Great Britain, but other cases may have gone unreported here. It would be worth while to bear in mind that urticaria and other skin rashes developing after an injection of poliomyelitis vaccine are probably of this nature.

COLOURED IMMIGRANTS

Earlier this year an estimate of about 190,000 was given in Parliament as the total of coloured people in Great Britain.¹ This is about one coloured to 250 white, though the distribution of the coloured people is notably uneven owing to the greater prospects of employment in the industrial cities. Of these 190,000, about 100,000 had come from the West Indies (chiefly Jamaica) and 50,000 from India and Pakistan. Because members of the British Commonwealth are free to come here, no administrative machinery exists to keep a count of their exact numbers, hence only estimates are available. But there is no doubt that, in the words of a broadsheet issued this week by the Eugenics Society,² this is "a phenomenon of the last decade."

Unrestricted immigration from any country, whatever the colour of its inhabitants' skins, is likely to cause difficulties when the country they enter is already densely populated. The social evils of slum life are apt to spread and defy attempts at their eradication. Fraud and frustration, says the broadsheet, appear, and the immigrants, "uprooted from gay and friendly company . . . will seek ephemeral friendship and sexual solace where they can find it." An additional problem, apparently specific to the migrants from the West Indies, is that over there marriage as understood in Britain has now largely given way, through a transition stage of "faithful concubinage," to "what may be described as promiscuity." It is thus not surprising that many half-caste children—and some full West Indian babies—are to be found in residential nurseries here. Indeed, a quota of four coloured children in ten has already been filled in these nurseries in some parts of the country.

While the social prospects of these considerable movements of population are not notably favourable, the strictly biological prospects are unfortunately obscure. As the broadsheet says, there is "an inconvenient lack of precise knowledge about the long-term implications of human genetic mixtures taking place in our times," partly because of the relatively slow rate of breeding in the human race, and partly because experimental breeding is out of the question. Moreover, it is debatable what, if any, inferences about miscegenation in human populations can be drawn from animal experiments, and in particular whether heterosis, or hybrid vigour, can be detected.

All would agree with the society's advocacy of more research into the results of race-mixing, for ease of travel is likely to increase rather than impede it. Nor can anyone doubt the need for more education of people in a "proper appreciation of the qualities" distinctive of unlike or alien nations. But the thorny question remains, Should immigration to Great Britain from the Commonwealth countries be restricted? While this is an issue that has many features outside the immediate professional interests of medical men and women, it is one that members of our profession are well equipped to provide evidence upon and to judge dispassionately. The

¹ *Brit. med. J.*, 1958, 1, 949.

² *West Indian Immigration*, Broadsheet No. 1, by G. C. L. Bertram.

Eugenics Society, 1958. Price 1s. 6d.

Eugenics Society goes no further than expressing the opinion that the time has come "for very careful consideration."

SEXUAL FUNCTION IN MALE DIABETICS

The increased incidence of abortions and stillbirths among women with diabetes mellitus is well recognized, but little attention has been paid to the sexual functions of the male diabetic. A recent report by A. Rubin¹ on the reproductive capacity of 198 diabetic men, over three-quarters of whom were married, is therefore welcome. The impression that impotence is common was confirmed by the finding that this symptom was present in 25% of patients aged 30-34, and the incidence rose steadily to almost 75% by the age of 60. The overall figures are between two and five times those reported by Kinsey and his colleagues² in the normal male population. While impotence is particularly common in the early stages of diabetes, potency may return when the disease is adequately controlled. Nevertheless, approximately two in every five diabetics will be found to be permanently impotent, the cause being unknown and treatment ineffective. It does not appear to be related to the severity of the diabetes or to the presence of complications, though a connexion with neuropathy has been suggested. Fertility among diabetic males is said to be normal, which seems surprising in view of the greater frequency of impotence. Apart from a slight increase in the number of abortions there is no evidence that diabetes in the male affects the incidence of prematurity, stillbirths, or congenital malformations.

ANTHRAX FROM BONE MEAL

The terminal stage of anthrax is a profuse septicaemia, and anything derived from the carcass of an animal dying of this disease is therefore heavily infected. Moreover, the spores of *B. anthracis* are highly resistant and capable of prolonged survival. From many of the countries in which anthrax is endemic, wool, hair, and hides are imported into Britain. Another product is bone, which is imported chiefly for conversion into fertilizer. That bone meal may carry the infection has been recognized for many years, though cases of human disease are not often traceable to it. It is therefore remarkable that D. M. Green and W. M. Jamieson,³ of Dundee, who three years ago described 6 cases of anthrax derived from bone-meal fertilizer, are now able to report 4 more, all in agricultural workers who had been handling this type of material. An accompanying paper by R. Lamb,⁴ of Greenock, reports 4 cases from a factory in which imported bone is put to two different uses—fragments of a certain size are reduced to charcoal for use in sugar refining, while the remaining

powder is sold as fertilizer. The conditions in this factory appear from the description to have been insanitary: "bone dust is to be found everywhere, even in the offices," and, despite protective clothing, penetrates this and reaches the underclothing. All these cases were cutaneous, and were it not for the wearing of face masks there might well have been pulmonary infections, with a high probability of fatality. Indeed, it is perhaps surprising that there were not, because Lamb also describes two cases of empyema in workers in the bone-crushing plant due to species of *Clostridium*, another resistant type of organism invariably present in large numbers in material of this kind.

A committee of the Ministry of Health appointed early last year is inquiring into the hazards of imported materials infected with anthrax and possible precautions against them. If an economically feasible method of disinfecting bone can be devised it should evidently be made obligatory. In the meanwhile the possibility of this infection should always be borne in mind when suspicious skin lesions occur in agricultural or horticultural workers. Fortunately anthrax responds well to penicillin. In pursuance of a policy adopted at the Gateside Hospital, Greenock, of which the results⁵ were reported in this *Journal* last year, three of Lamb's cases were treated simply with penicillin V given by mouth, with evidently satisfactory results.

"DRUG TREATMENT OF DISEASE"

Nothing in the doctor's daily round has changed so much in recent years as his prescribing. The inventive capacity of chemists and pharmacologists seems unbounded. New drugs come from the laboratories with bewildering speed, and any doctor may be pardoned for feeling puzzled about when to prescribe a new vasoconstrictor called, for instance, "luvomine," whose composition is given in a chemical name that is in large part Greek letters and Arabic numerals. His bewilderment increases when he finds that half a dozen similar preparations are on the market, each having a different "side-chain" attached somewhere and each varying to a greater or less extent in its effects. In order to try to give some guidance on the pharmacology and therapeutic uses of drugs, we have invited distinguished contributors to provide a series of signed articles which it is hoped will be helpful to the general physician and surgeon. The first is on the antihistamines, by Professor J. H. Burn, F.R.S., and appears at p. 845 of the *Journal* this week. These articles, by comparing drugs with one another and providing some pharmacological background for an understanding of their effects on the patient, will supplement the comments that appear under the heading "To-day's Drugs." In that column individual contributors who have had experience of the drugs they comment upon give advice on their use.

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³ Green, D. M., and Jamieson, W. M., *Lancet*, 1958, 2, 153.

⁴ Lamb, R., *ibid.*, 1958, 2, 151.

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Drug Treatment of Disease

THE ANTIHISTAMINE COMPOUNDS

BY

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An illuminating approach to the action of antihistamine compounds can be made by looking at them from the point of view of the pharmaceutical manufacturer. When a compound with new properties is introduced which are likely to command for it a wide use in medicine, each pharmaceutical firm is anxious to introduce a different compound with the same properties for the manufacture of which it will have the sole rights. Many compounds are prepared and tested first by laboratory methods and then clinically, but it is often difficult to make a final appraisal of the value of any substance until after it has been launched on the market.

The first antihistamine was mepyramine maleate ("neo-antergan"), and it has been sold in Great Britain under the trade name "anthisan." The aim of other manufacturers was therefore either to introduce a compound of a quite different formula with the same properties or to introduce a similar compound with a modified formula. As examples of a similar compound with a modified formula we may take tripeleennamine ("pyribenzamine"), methapyrilene ("histadyl"), halopyramine ("synopen"), and also chlorpheniramine maleate ("piriton"), all of which are very close chemically to anthisan. Diphenhydramine, or "benadryl," differs considerably from anthisan, though both contain the grouping dimethylaminoethyl. Substances chemically close to benadryl are bromazepam ("ambodryl") and diphenylpyraline ("histyl"); while chlorcyclizine ("histanin"), "diparalene", meclozine ("ancolan"), and buclizine ("vibazine") form a third group.

The substances which have been steadily added to the original antihistamines mepyramine (anthisan) and diphenhydramine (benadryl) have not greatly extended the scope of therapy. They differ from the original drugs mainly in two ways—first, in their rates of absorption and excretion, and secondly in the relative strength of other properties besides antihistamine action which all compounds of this type possess. It is thus possible to choose a drug with a brief or prolonged action, a drug which is a sedative or one which is not, according to the needs of the patient. It is also often found empirically that a particular patient will respond better to one drug than to another, even though statistics show the first drug to be less potent or to produce a higher incidence of toxic side-effects than the second.

Antihistamine Action

The action of all these substances on allergic symptoms is very similar. They act by combining with the receptors with which histamine normally reacts to produce its characteristic effects, and so they prevent the symptoms which result from the release of histamine. They have no direct action with histamine itself; they do not prevent the release of histamine from cells in response to injury or foreign substances, and they have no direct physiological action of their own which can account for their antihistaminic properties.

There are two consequences of this mode of action which are of practical importance in the treatment of allergy. The

first is that the administration of antihistamine drugs is only one part of the treatment, and must often be accompanied by measures either to prevent the release of histamine or to counteract its effects after it has been released, or both. The cause of histamine release may sometimes be removed by discovering the antigen responsible and desensitizing the patient. The release of histamine may also be suppressed by giving cortisone (Medical Research Council, 1956; Halpern, 1957). Finally the vasodilatation and fall in blood pressure due to histamine may be overcome by administering adrenaline or ephedrine, which have powerful properties opposed to those of histamine.

The second consequence of the competitive blocking action of the antihistamine drugs is that their effectiveness is limited by their ability to reach the site of action of the released histamine. While they are effective in about 60-80% of patients with urticaria or hay-fever, they are very rarely effective in asthma, even though histamine release has clearly been shown to be at least partly responsible for the symptoms of asthma. Sir Henry Dale (1950) suggested that the antihistamine drugs would be expected to prevent the action of "exogenous" histamine, which is liberated in one site, such as the epidermis, and acts on a site some distance away, such as the blood vessels, but would not prevent the action of "endogenous" histamine, liberated close to the receptors on which it acts. Schild (1956) showed that in segments of bronchial chain taken from asthmatic subjects at operation, mepyramine in a minute dose would prevent the contraction due to added histamine, but that a dose 10,000 times greater was necessary to prevent the contraction which was caused in the sensitized tissue when the appropriate antigen (pollen) was added. Smaller doses caused a graded reduction of the anaphylactic contraction.

It is still not possible to say how far the symptoms of asthma are due to histamine acting on receptors which the antihistamine drugs are unable to reach, and how far they are due to factors other than histamine. Halpern (1957) points out that the dyspnoea in asthma may be variously caused by oedema, spasm, bronchial congestion, secretory disorders, and imbalance of the autonomic nervous system. He has found that the antihistamine drugs are sometimes effective in treating asthma due to large protein molecules—for example, from feathers or animal danders—where the predominant symptom is oedema. Recently it has been shown (Hawkins, 1955) that a number of antihistamine drugs have a direct bronchoconstrictor action. This may be another factor contributing to the ineffectiveness of these substances in the treatment of asthma.

Another action of histamine on which the antihistamine drugs have no effect at all is the stimulation of gastric secretion. It has been suggested that the receptors for histamine in the gastric glands are of a different kind from those in smooth muscle, but there is no direct evidence for this.

In most allergic diseases the antihistamine drugs are very valuable in reducing the severity of the symptoms. In acute anaphylactic shock they may be life-saving. In serum sickness, urticaria, and hay-fever they are effective in a high proportion of patients. Their effects are, however, not always predictable, and some patients may fail to respond, or respond to one drug but not another, for unexplained reasons. There is no evidence that one antihistamine drug is more specifically effective than another in any particular form of allergic disease or type of patient. These unpredictable effects are not surprising, since the factors controlling

the release of histamine are still very incompletely understood. Much of the recent research on the problem has made use of histamine-releasing substances. These when injected into a normal subject cause symptoms identical with those produced when histamine is injected. In allergic patients, however, these initial symptoms are followed by reactions which closely reproduce the spontaneous symptoms of the individual's disease.

Other Properties

Drugs which act by combining with a histamine receptor will also be likely to have some effect on other physiological receptors. All the antihistamine drugs possess some anti-acetylcholine properties. They act like hyoscine in causing sedation and inhibiting the vomiting reflex, and they cause side-effects such as dryness of the mouth and constipation. They are also local anaesthetics. The potency of these secondary actions is not proportional to the potency of the antihistaminic action.

The most strongly sedative drugs are diphenhydramine and promethazine ("phenergan"). Sometimes this sedative action is useful, but it is better not to give these drugs to patients who work during the day, and they may be dangerous when taken by drivers or people working with machinery. Moderate sedation is produced by mepyramine, tripelemamine, and bromazine, and the other drugs, though usually free from sedative effects, may induce drowsiness in some individuals. The patients should be warned of this possibility.

Diphenhydramine and promethazine are also highly effective in preventing travel sickness. They are usually given for this purpose in the form of their chlorotheophyllinate salts ("dramamine" and "avomine"). Meclozine is also effective in preventing sickness. Other antihistamine drugs have weaker anti-emetic properties: this action is not related to the antihistaminic activity.

The local anaesthetic action of the drugs is a useful additional property when they are applied to the skin to relieve the itching of urticaria or insect bites. Sensitization reactions, however, are rather frequent, and antihistamine creams are best not used indiscriminately for skin diseases (*British Medical Journal*, 1954).

The antihistamine drugs do not cause addiction. A few cases of agranulocytosis have occurred, but these have been rare considering how frequently the drugs are prescribed. They are dangerous poisons if swallowed by children, producing ataxia and convulsions which may be followed by fatal respiratory depression. The treatment (Craig, 1955) depends chiefly on gastric lavage and artificial respiration.

Administration

All these drugs can be given orally, and this is the usual method of administration for the treatment of allergic symptoms. Since a continuous action is required, the drugs are usually given several times during the day. Some of the drugs have a more prolonged action, and adequate treatment is possible with a single daily dose. The non-sedative drugs chlorcyclizine and diphenylpyraline may be given once daily. Chlorpheniramine is made in double tablets, in which half the dose is in the outer shell and half in a coated inner core for delayed action; they are effective for 8-10 hours. Promethazine also has a long-lasting action. Because of its sedative properties it should be given at night, and on the following day it continues to exert antihistaminic activity after the sedative effect has worn off. Meclozine is also given at night. When avomine and ancolan are taken to prevent travel sickness they should be taken on the night before the journey; dramamine should be taken every four hours.

The administration of the correct dose for each patient, giving relief from symptoms with minimum side-effects, is an important factor in treatment. The dose of any drug required by different individuals varies considerably, and the

amount needed by the same patient may also vary at different times, depending on such factors as the weather (for hay-fever subjects) and emotional stress.

When a rapid action is required an antihistaminic drug may be injected, and those which are suitable for injection are supplied in injectable form. Triprolidine ("actidil") is reported to act more quickly than the other drugs when given orally. Several of the drugs are supplied as creams and ointments, but they should not be applied too freely to the skin. Antazoline ("antistin"), which is the weakest and also the least toxic, is supplied as the phosphate for application to the eye and the nasal mucous membrane.

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THE PHARMACEUTICAL INDUSTRY

BY

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The astonishing expansion of the pharmaceutical industry during the last quarter of a century, and in particular its even more accelerated growth during the past ten years, has, not surprisingly, resulted in certain conflicts. That there should be an undercurrent of disagreement between the industry and dispensing pharmacists is quite understandable, for the latter can claim that the expansion of the industry has resulted in an inevitable loss of prestige (and demonstration of skill), which for so long has been vested in the dispensing chemist. What is not so clear, except when considered in retrospect, is that the pharmaceutical industry should have become involved in a series of clashes with the medical profession and the State. The various aspects of this problem are here reviewed so as to establish, if possible, a better basis for understanding between the various parties involved.

Background to the Problem

The application of a critical approach came to medicine much later than it did to the other sciences. In 1865 Claude Bernard defined the attitude of modern medicine, emphasizing the absolute necessity of an experimental approach. This concept, when associated with the discovery of new synthetic compounds such as chloroform, "salvarsan," and aspirin, gave rise to what we now call pharmacology, a discipline which is so essential to any real advance in treatment. As compounds were synthesized it became necessary to screen them, and these functions were carried on for many years in the academic atmosphere of the university or technical college. In time, however, the complexity as well as the speed with which new compounds were produced necessitated the employment of various industrial techniques, so that more money had to be invested in the equipment of plant to make the compounds.

This transfer of emphasis from the academic to the industrial sphere resulted in the rise of a new class of technologists and scientists working for industry with a definite commercial aim as well as for the advancement of learning. Thus it was from industry that the next great advance, the sulphonamides, originated.

While progress continued in organic chemistry, equally great strides were made in biology. Unfortunately, when the probable therapeutic scope of penicillin was appreciated in 1941 there came coincidentally the realization that we in

this country had not the manufacturing facilities for large-scale production of the life-saving substance. Consequently the initial development work and manufacture had to be carried out in the U.S.A. The lead gained by the United States in pharmaceutical research and development has subsequently been maintained, though during the past few years it has shortened and many other countries have made valuable contributions.

It is now fully recognized that to produce the wide range of modern therapeutic agents a very high standard of technical skill is necessary. The production of these compounds on a commercial scale often necessitates costly and complicated plant; furthermore, the compounds must be manufactured to a uniformly high standard of quality.

The foregoing applies to the manufacture and quality of accepted products, but no mention has yet been made of the place that research must occupy in this already complicated picture. When standard drugs are being manufactured any research that goes on in parallel need only attempt to improve methods of manufacture so that a better quality, at a lower cost if possible, may result. However, when a firm is producing either new permutations of known drugs or is producing totally new compounds, research spreads far wider, so that it covers virtually the whole of medicine and still enlarges its scope to take in many other scientific disciplines. In subsequent sections the various implications that this vast structure imposes are dealt with, and it is hoped that a clearer picture of the pharmaceutical industry may emerge.

Criticisms of the Industry

Criticism is levelled at the pharmaceutical industry from three different sources: (1) medicine, (2) pharmacy, and (3) the State.

Medicine

A legitimate criticism is applicable to a few products such as "tonic" preparations containing drugs which may lead to the masking of serious symptoms or to the indiscriminate use of antibiotics. Another example, not in the therapeutic field, is the tendency of a few manufacturers to exaggerate their claims for a product in an attempt to persuade the less perspicacious physicians that the product is of greater value than is actually the case. A further complaint concerns the weight of advertising that comes through the post, particularly the purely "sales mailings" which make little attempt at being informative. In addition to this some doctors say that they are assailed by an increasing number of representatives from the drug firms extolling their products, sometimes without giving the doctor any real help or information about their true worth or mode of action. Though some of these criticisms are unfortunately true, there is, however, an increasing sense of responsibility in the pharmaceutical industry, and the Association of the British Pharmaceutical Industry does everything possible to promote the standing of the industry as a whole and encourage a high ethical level.

The medical profession in general is largely ignorant about the work of the pharmaceutical industry, and it is unfortunate that medical students are given so little insight into the wider aspects of it. A very brief course of lectures and a visit to one of the factories might enlighten them considerably.

Pharmacy

Some pharmacists complain that the industry is infringing their professional status and cite the decreasing number of their contemporaneously prepared prescriptions in support of this. This trend is inevitable, and it is unrealistic of the pharmacist to expect that it should be reversed. The main reason is that the great majority of new compounds have to be made on a large scale under special conditions and cannot be compounded in the retail pharmacy. Furthermore, with an increasing realization of the importance of uniformity, sterility, and quality, doctors are beginning to prefer the safety and predictability associated with a branded product. It is knowledge rather than craftsmanship that is required

to-day to ensure that potent drugs are supplied to the patient as the doctor wishes. Thus the pharmacist who wants to devote his life to compounding should, early in his career, consider entering the pharmaceutical industry, where a wide scope for his qualifications and capabilities exists.

The State

The conflict between the legislature and the industry mainly concerns the question of the cost of pharmaceutical products to the State. In this country probably well over 90% of the pharmaceuticals prescribed are paid for by the National Health Service, and the actual amount spent on drugs has been regularly increasing since the inception of the Service in 1948. But, as may be seen (Fig. 1), the total sum received by the manufacturers of proprietary drugs is less than 4% of the total cost of the N.H.S., while the cost of the hospital services is 57%. In making this comparison the national expenditures on alcoholic drink and tobacco have been included, as they are of considerable comparative interest.

So far as the State is concerned it is unfortunate that the first 10 years of the National Health Service coincided with inflation as well as with a period of quite unprecedented advance in therapeutics. Some officials seem to attribute this increase to extravagance on the part of the doctor or the pharmaceutical industry, rather than to the inevitable reflection of therapeutic advance. Fig. 2 shows the proportion of proprietary drugs supplied in other countries compared with the United Kingdom, and it is significant that in the U.S.A. and Canada, where they are paid for by individuals, there has been no comparable outcry about the rising costs.

In order to try to curb the mounting drug bill some rather makeshift measures have been introduced, such as the insti-

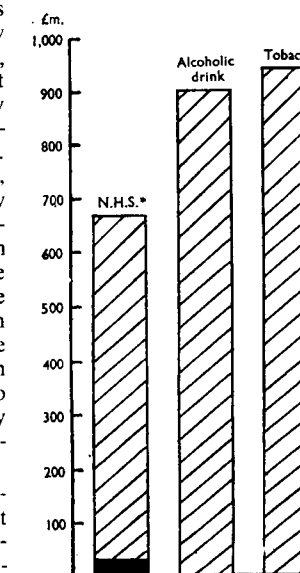


FIG. 1.—Cost of proprietary drugs (black portion of N.H.S. column) compared with other items of expenditure in the United Kingdom. *Hospital services accounted for 57% of N.H.S. costs.

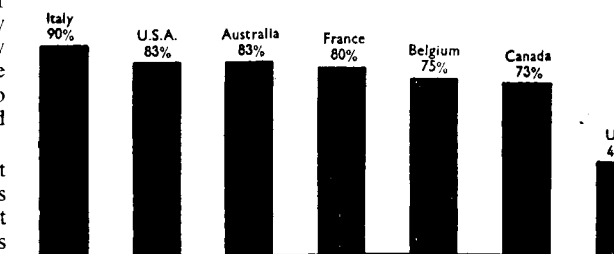


FIG. 2.—Proportion of proprietary drugs prescribed in various countries.

tution of the prescription charge and the organization of local prescribing tribunals where doctors may be called upon to justify what is considered to be extravagant prescribing. Although the prescribing charge may restrain some unnecessary demands on the Service, the prescribing tribunals raise a very different problem. As they are constituted at present they do not seriously limit the freedom of the doctor to prescribe whatever he thinks best, but their existence raises the possibility that at some future date a government may enforce more stringent limitations on what the doctor may prescribe. Should this happen the medical profession would have to consider very seriously some form

of concerted action to prevent the State from interfering with the essential liberty of professional freedom.

A surprising feature of this complex situation is that so little has been said about the quality and general standard of the preparations prescribed. Until recently it has been tacitly assumed that the standard equivalents of proprietary preparations were in fact truly equivalent and as good as the proprietary product in every way. Recently, however, Bagnall and Stock¹ and McClure Browne *et al.*² have shown in impartial surveys that this is not always the case. They have demonstrated that many standard drugs were below the official requirements laid down by the B.P. and B.P.C. and in some cases were much less effective than their proprietary equivalents. These interesting findings have received little comment from official sources, where the policy holds that, whenever possible, practitioners should prescribe the official standard drug rather than its proprietary equivalent. If this opinion was based on comparative prices and if the standard equivalent was always identical as well as cheaper this policy would be justifiable. It is, however, by no means universally valid, and, when this is considered in association with the knowledge that some "standard" preparations are actually substandard, there can be little justification for the sweeping directives of the health authorities to avoid proprietary preparations whenever possible.

Propaganda

The dissemination of information about new drugs presents a peculiarly difficult problem. With the increasing speed at which new remedies are discovered it is obviously essential that doctors in general, and general practitioners in particular, should be advised about them. It is no longer possible, as it was even 50 years ago, to learn materia medica as a student and expect to go through professional life drawing on this small treasury of knowledge. Various methods have therefore been evolved in order to keep doctors up to date with therapeutic advances. It is generally agreed that the most valuable channel is through the pages of the reputable medical journals, but many doctors do not avail themselves regularly of this source of knowledge. Consequently, over the years pharmaceutical firms have devised other means of spreading knowledge about their products. The necessity for this is accepted by the great majority of the profession, but criticism is not unnaturally levelled at some of the means employed by certain firms.³

Although advertising in medical journals is a valuable reminder to doctors, this cannot be relied upon as the sole means of approaching the profession. Mailings have therefore to be sent direct to the doctor, and, as is to be expected from a large industry, the methods of individual companies vary greatly. In this respect it should be remembered that an increasing number of other groups, such as insurance brokers and motor manufacturers, have been using this method in recent years.

Some doctors complain about the type and content of the actual advertisements, and it must be admitted that some of the less ethical manufacturers do overstate their claims. This is quite indefensible, but at the same time the righteous indignation of doctors should be tempered somewhat by the knowledge that all of them, even the least qualified, have had at least six years' scientific training, and they should be better able to assess in a critical way the claims made by the pharmaceutical manufacturers than, for example, the general public is able to assess the claims made by manufacturers of soap or toothpaste.

The widespread sending of samples constitutes another problem, and certain groups of drugs likely to be dangerous cannot be sent except on the request of the physician. Sampling, however, has the advantage of allowing the physician to try out a particular remedy, and in this way to assess its value with no cost to himself or the patient.

Finally, as a means of disseminating information, come the pharmaceutical representatives. These men, many of whom are trained pharmacists and all of whom have

received some fundamental training, are in a position to give precise information to the doctor about their firms' products. Although their visits may, if they become too frequent, take up too much of the doctor's time, it seems to be generally agreed that the pharmaceutical representatives of the majority of firms are able to render a valuable service to the doctor by keeping him abreast of recent developments and at times by arranging for him to try out newer preparations on an experimental scale. Of all the methods of propaganda the representative is the most effective, and it is in the interests of the individual representative and the firm that he represents to maintain as high a standard as possible, for it is by him very often that the firm and its products are judged.

It seems likely that unless the pharmaceutical industry becomes State-controlled, which has already occurred in some of the "Iron Curtain" countries with most unfortunate results on therapeutic progress, advertising by the pharmaceutical industry to the doctor must continue. There would appear to be no simple solution, and the medical profession should try to adopt a tolerant attitude to what, at worst, is a relatively minor nuisance.

The Patent Position

Broadly speaking, pharmaceutical manufacturers may be divided into two distinct groups—those who carry out fundamental research, synthesis, and screening of new compounds, and who may spend on this up to a million pounds annually, and those other firms who make standard preparations and whose profits depend on the size of their sales and the economy of their manufacturing processes. These latter firms operate to a varying extent some form of quality control, but they do not take part in any coherent research programme. Consequently, it is in their interest to manufacture as much and as wide a range as possible, and, as they have no research commitments, the selling price of their drugs can be considerably lower.

With this background it should now be fairly simple to consider an example which has occurred not infrequently. As a result of their own research, a firm discovers a new drug which proves to be of considerable value. When it is marketed a selling price is fixed which takes into account the cost of the basic research and development. It is interesting to remember here that the Cohen Committee in its classification made a special category (Category 1) for new compounds considered to be of value and not subject to any price restriction. Furthermore, in recent negotiations between the pharmaceutical industry and the Ministry of Health a three-year period has been granted to the manufacturers of totally new compounds, during which time their prices fixed for the compound would not be subject to any criticism by the Ministry. If, however, the new compound has no patent coverage, it will almost certainly be copied by other firms who, as they have no research costs to cover, will be able to undersell the discoverers of the drug, and the outcome of this might well result in a serious financial loss to the original discoverers. Also, an international respect for patent law means that a country can build up a valuable pharmaceutical export trade with resulting benefit to its economy, as has been happening in Britain during the last few years.

When patent law as applied to the pharmaceutical industry is considered in this way it should be appreciated immediately that it is in fact based on the accepted principles of fair play and is not an aspect of wicked commercial monopoly.

Social and Economic Aspects of Prescribing

The wider economic aspects of prescribing are seldom considered, though recently J. P. Martin⁴ has thrown considerable light on the problem. It is generally appreciated that during the past twenty years there has been a striking fall in both morbidity and mortality figures, and associated with this there is an increase in life expectancy. This has been produced by an all-round improvement in living

conditions as well as by purely medical means, but nobody would deny the important part that the recently discovered drugs have played. As a result there has been a considerable decrease in the number and duration of admissions to hospital. This saving is not fully appreciated, yet the cost per patient per week varies from £24 to £34 for a convalescent to £63 1s. 11d. for an inmate of an acute hospital,⁵ whereas the average cost for a prescription over the same period under consideration is 57.08d.

In spite of these advances further progress is likely to continue, as it is estimated that the loss of man-hours due to sickness at the present time is 75 times greater than that from industrial disputes, and at any one time there are about one million people absent from work on account of illness.⁶ There is every reason to believe that future advances in therapeutics will further this progress, but it must be appreciated that any improvement will almost inevitably result in an increased expenditure on drugs. Consequently it is most important that not only politicians but the general public should realize that the slowly increasing drug bill does not necessarily reflect an increase in the total expenditure on the Health Service. If suitable figures become available at a future date it might be shown that this increasing expenditure has resulted in a striking saving to the community not only in hospital in-patient and out-patient treatment but in decreased absenteeism due to sickness.

At present, patients are required to report to their doctor for sickness certificates. This not only results in an increase in the bureaucratic type of work demanded of a doctor, but, as a visit to the doctor is traditionally associated with "getting some medicine," in many cases it must result in the patient also getting a prescription thought to be suitable to his malady even when this may not be really necessary. There is thus an inevitable increase in prescribing, and in this respect it is interesting that Martin has shown that in areas where prescribing is heavy it is due to an increase in the number of prescriptions issued rather than the high individual cost per prescription.

Finally, as is well known, we are entering a decade in which there will be an ever-increasing proportion of aged wage-earners, and it is becoming more and more important to keep the elderly at gainful employment as long as possible, not only for social but for economic reasons. A great deal of research work is being carried out in the degenerative diseases, and already geriatrics is established as a specialty. The pharmaceutical industry is fully aware of this important and growing section of the population, and it is not unreasonable to hope that before long some new discoveries will be made towards the prevention and treatment of degenerative conditions.

Future of the Industry

It should be clear that the place occupied by the pharmaceutical industry in the future should be an important one. Up to the present its record has been outstanding and its investment in the future by way of research is consistent. In Great Britain it is estimated that some £4m. a year is spent on pharmaceutical research,⁷ though this figure is small when compared with the Swiss pharmaceutical industry, which it is believed spends about £7m., or the American pharmaceutical industry, which spends over £45m., annually.⁸

The benefits accruing to the community from the pharmaceutical industry have not only been confined to individual countries but have affected the export market, so that during the past year Great Britain exported some £39m. of pharmaceutical goods compared with a quite insignificant sum ten years ago.

Because of the splendid prospects of the industry it should attract well-qualified people. Apart from the need for research chemists, physicists, and pharmacists, there is increasing scope for well-qualified doctors, and in particular pharmacologists, to engage in fundamental as

well as clinical research. At a time when serious bottlenecks are occurring in many medical specialties it is strange that there should still be such a great shortage of well-trained pharmacologists and bacteriologists, to name only two special groups. Already the number of specialists employed in the industry has increased enormously, and this in turn has promoted, though somewhat slowly, good public relations among widely different intellectual and social groups. The organic growth of public relations in this way is a gradual process, and the time is already overdue when a wider appreciation of the place occupied by the pharmaceutical industry should be put before the community as a whole. For only when the obstacles caused by lack of information and understanding are removed will the proper atmosphere of co-operation develop that will further the growth in size and status of the pharmaceutical industry.

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SEVENTH INTERNATIONAL CONGRESS OF HAEMATOLOGY

ROME, SEPTEMBER 7-13

[FROM A SPECIAL CORRESPONDENT]

The Seventh International Congress of Haematology was held at the Palace of Congresses, Rome, from September 7 to 13, under the auspices of the International Society of Haematology. It was opened by the Italian Minister of Health, and attended by 1,700 delegates from more than 50 countries. The president of the Congress was Professor GIOVANNI DI GUGLIELMO, emeritus professor of medicine at the University of Rome. The subjects discussed included immunohaematology, haemorrhagic diseases, leukaemia, the spleen and the reticulo-endothelial system, anaemia, isotopes in haematology, anticoagulants, haematological genetics, and paediatric haematology. More than 600 papers were given, and in the main lecture hall there was simultaneous translation into English, French, German, Italian, and Spanish.

The first part of this report records some of the more important contributions to the plenary sessions on the first three days. Then follow summaries of symposia on human desoxyribonucleic acid, haematological genetics, and paediatric haematology.

Immunohaematology

In the first plenary session, Dr. J. H. JANDL (Boston) outlined some modern views on the acquired or auto-immune haemolytic anaemias. These anaemias were characterized by the adsorption on to the red-cell envelope of protein substances which diminish the cell's suspension stability. Antigen-antibody complexes could adhere to the cell's surface and caused agglutination either directly or by making the cells susceptible to agglutination by antiglobulin serum. Sensitized red cells were easily filtered by the spleen, but agglutinated red cells were filtered by the liver. Red-cell destruction did not correspond, however, with the amount of protein on the surface. Colonel W. H. CROSBY (Washington, D.C.), discussing therapy, said the haemolytic anaemia did not always need to be treated, as the patient might learn to live with his anaemia; the decision depended on careful diagnosis and observation, as in acute and severe haemolytic crises prompt intervention might be life-saving.

Dr. J. DAUSSET (Paris) discussed antileucocytic auto-immunization, which might be allergic or spontaneous. The

allergic antibodies were mostly antinuclear, as in disseminated lupus erythematosus. They could be assessed by leuco-precipitation tests and by complement fixation. The others were mostly anticytoplasmic. Dr. W. J. HARRINGTON (St. Louis) reviewed immune reactions affecting the platelets. These had been only partially defined owing to the lack of useful serological tests. The platelet had a complex antigenic structure and was peculiarly susceptible to auto-immune reactions. Antibodies for platelet antigens might be natural or immune, complete or incomplete, of the auto- or iso-type, or agglutinins or lysins. Steroids inhibited antibody production; splenectomy removed the site of antibody production.

Other papers on immunohaematology concerned the antigenic constitution of red cells, particularly in acquired haemolytic anaemia, the antigenic constitution of white cells (Dr. M. SELIGMANN, Paris), and a study of leucocyte and platelet agglutinins assayed by a quantitative determination of the total cytotoxic activity of the serum (Dr. J. L. TULLIS, Jamaica Plain, Mass.). According to this study, the platelet agglutinin was a single specific protein migrating as a γ -globulin. The leucocyte activity comprised two separate proteins which usually had the mobility of α_1 - or β_2 -globulins.

Leukaemia

The Adolfo Ferrata Lecture was given by Dr. W. DAMESHEK (Boston, Mass.) on the subject of the myelo-proliferative syndromes, with particular reference to Di Guglielmo's disease. He suggested that there were three stages in this disease—"erythraemia" (e.g., erythroblastosis), erythro-leukaemia, and myeloblastic leukaemia. The anaemia was probably due to ineffective erythropoiesis and possibly also to a haemolytic component due to haem diversion. The high vitamin-B₁₂ level and the presence of cells resembling megaloblasts might be due to vitamin-B₁₂ deficiency, just as in pernicious anaemia. Dr. Dameshek paid tribute to the president of the Congress, who 40 years ago had put forward his theory of erythraemic myelosis, which was now widely accepted. Dr. E. NEUMARK (London) described the pathological changes in erythraemic myelosis in a series of seven cases, which showed that the infiltration in the spleen, liver, and other organs differed from that seen in myeloid leukaemia, and that most of the cells in the marrow and other tissues were in fact abnormal erythroblasts, but not megaloblasts. Dr. J. H. BURCHENAL (New York) described how by the use of purine antagonists, folic acid antagonists, and steroids the average survival of a group of 253 children with acute leukaemia had been increased to over 12 months.

Experimental Studies

Dr. E. B. HARRIS (Belmont, Surrey) reported on the effects of single doses of x rays on the erythropoiesis of the rat, using as her index absolute counts of red-cell precursors in the marrow. Dr. E. P. CRONKITE (Upton, N.Y.), who divided the acute radiation syndrome into cerebral, gastrointestinal, and haemopoietic forms, said that only the last was typical of mid-lethal exposure and therefore of clinical importance. Dr. G. B. JERZY GLASS (New York) had studied the surface radioactivity over the liver following the administration of vitamin B₁₂ containing radioactive cobalt. The maximal uptake by the liver occurred about 7-20 days after the start of treatment and then remained level for some time, radioactivity declining by only 1-10% per month. In about a third of a series of patients with liver disease the uptake of labelled vitamin B₁₂ was reduced and in three patients it was abolished, a finding which might partly explain the high vitamin-B₁₂ levels in some cases of liver disease. Dr. C. V. MOORE (St. Louis) had investigated the biosynthesis of haemoglobin in thalassaemia, using labelled glycine and protoporphyrin. This suggested that there was a defect of haem synthesis.

The problem of increased susceptibility to infection after splenectomy had been studied by Dr. C. A. DOAN (Colum-

bus, Ohio) using Foshay heat-killed tularaemia vaccine. Although hypogammaglobulinaemia and atypical globulin patterns were found in some patients, he concluded that the capacity to form specific antibodies depended on the underlying disease rather than the presence or absence of the spleen. Dr. A. J. QUICK (Milwaukee) thought it was still uncertain whether a precursor or an activator of the Christmas factor was what was lacking in Christmas disease.

Human Desoxyribonucleic Acid

A special symposium on human desoxyribonucleic acid (D.N.A.) with particular reference to the D.N.A. of the haemopoietic system was held under the chairmanship of Dr. J. A. V. BUTLER (London). Dr. E. CHARGAFF (New York) outlined the fractionation of high polymers of biological origin such as nucleic acids. Dr. E. DEICHER (New York) presented evidence, obtained mainly by electrophoretic methods, suggesting that the serum of patients with lupus erythematosus may contain antibodies directed specifically against D.N.A. Dr. K. V. SHOOTER (London) pointed out that the rate of sedimentation of D.N.A. is a measure of its molecular weight. The D.N.A. of leucocytes from cases of lymphatic leukaemia had a higher, and the D.N.A. of leucocytes from cases of myeloid leukaemia a lower, molecular weight than the D.N.A. of normal white cells. D.N.A. from the spleen of a patient with Brill-Symmers disease resembled that of D.N.A. from lymphatic leukaemia leucocytes. Using chromatographic methods Dr. A. BENDICH (New York) found that the D.N.A.s from leucocytes of myeloid and lymphatic leukaemia and from normal spleen differed characteristically.

Dr. BURCHENAL said that antimetabolites active against leukaemia interfered with the synthesis of nucleic acids by blocking the synthesis of purines and pyrimidines or their incorporation into polynucleotides.

Haematological Genetics

The symposium on haematological genetics was held at the Institute of Medical Genetics under the chairmanship of Dr. L. GEDDA, its director. Dr. GEDDA and Dr. R. G. TORRIOLI (Rome) emphasized that the limits of genetic investigations had not nearly been reached so far as the red cells are concerned. They found that in twins the Price-Jones curves showed similar changes. Dr. L. I. UNGER (New York) had found differences in the Rhesus blood-group systems between a group of almost 500 caucasoid Rh-positive people and 400 negroid Rh-positive people.

Dr. W. LEHMANN (Kiel) discussed genetical problems of blood coagulation. It had been found that deficiency of factors VIII or IX does not necessarily cause death in homozygous females in a family of bleeders. The diagnosis of haemophilia in a female, however, must depend on coagulation and genetic studies. Thalassaemia, sickle-cell anaemia, favism, and other haemoglobinopathies were discussed in another part of this symposium, and cytomorphological sex determination in the third part.

Paediatric Haematology

In the symposium on paediatric haematology Dr. M. GERBASI (Palermo) said that in infancy megaloblastic anaemia might occur as a constitutional endogenous form, in goat's milk anaemia, during breast-feeding, in coeliac disease, kwashiorkor, and occasionally in cases of leukaemia.

Dr. C. GASSER (Zurich) discussed auto-immune haemolytic anaemia and related conditions. Idiopathic hyperacute autohaemolytic anaemia of the Lederer-Brill type was due to incomplete warm antibodies. Cold antibodies were rare in infancy, but immuno-aplastic and pseudo-aplastic crises in haemolytic anaemia were occasionally seen. Auto-antibodies occasionally developed in renal insufficiency complicated by acquired haemolytic anaemia. Dr. P. LEVINE (Raritan, N.J.) discussed neonatal haemolytic anaemia due to ABO or Rh-factor incompatibility. Professor S. VAN CREVELD (Amsterdam) classified the disorders of coagulation in

children. Phase 1 of blood coagulation was disturbed in haemophilia and Christmas disease; phase 2 in hypoprothrombinaemia, in hypoproconvertinaemia, and in deficiency of accelerin or parahemophilia; phase 3 in hypofibrinogenemia. Dr. R. CEPPELLINI (Turin) reviewed haemoglobinopathies in childhood.

Other symposia were concerned with vitamin B₁₂, the aetiology of leukaemia, the chemotherapy of leukaemia, anticoagulants, haemophilia, and blood and blood-forming cell tissue culture.

EXPERIMENT IN MEDICAL EDUCATION CONFERENCE AT ROYAL COLLEGE OF PHYSICIANS

The Association for the Study of Medical Education, whose aims include the exchange of information about medical education and the promotion of research,* held its first conference on September 25 and 26 at the Royal College of Physicians of London. The subject of the conference was "Experiment in Medical Education."

A Conscious Response

With the president of the College, Professor ROBERT PLATT, in the chair, Sir RUSSELL BRAIN, the opening speaker, said the significance of the occasion was that it represented a conscious response to a challenge. There was nothing new in an interest in medical education, but now the whole problem had emerged fully into consciousness. If there had been a conscious purpose in medical education, it had started with the idea that a qualified doctor must know something about certain subjects, and it had been left to the teachers of those subjects to teach them as ends in themselves rather than as means. The aim had been to make safe doctors, but that was by no means the same thing as a good doctor. The question was whether the present requirements were likely to produce good doctors, and that in turn raised the question, What was a good doctor? They had to decide what should be the relationship between the basic training recognized by qualification and the more specialized skills involved in general practice and the long-established specialties. One kind of good doctor might be needed in the United Kingdom, another in the United States, and yet others in Australia or Nigeria.

There were those who sometimes spoke as though examinations were the dead hand of medical education, and there were those who thought, with a pathetic faith, that the only way to get a student to take an interest in his subjects was to have examination papers on them. What a comment on to have examination papers on them. The relationship between teaching and medical education! The relationship between teaching and examinations was more subtle than that. While there was a sense in which examinations determined the teaching, it was equally true that the teaching determined the examinations—after all, the same people were responsible for both. To pass an examination it might be necessary to have not only the requisite knowledge and skill but an additional skill in passing examinations. Some of these problems, which were unsolved in education generally, were especially pressing in medical education.

Medical Education in the United States

Dr. J. Z. BOWERS, dean of the Medical School of Wisconsin and editor of the *Journal of Medical Education*, describing the study of medical education in the United States, said they must remember the great diversity of medical education, medical schools, medical research, medical faculties, and medical students in the United States. This diversity was much greater than in Britain, possibly because over the last 30 years their standards had been nowhere

*See *British Medical Journal*, June 14, 1958, p. 1405.

near as rigid, so that some schools had been able to surge ahead. The system was not perfect, but that was obviously a good reason for studying medical education. The medical schools were the most dynamic area in education in the United States to-day.

The United States required quality in quantity, and one of the major concerns was the student. One of the primary aims in medical schools was to create an environment in which the student could enjoy the maximum opportunity to learn, though many people felt that this was a rather low-pressure type of medical education, and there had been much concern about getting the environment which would be most conducive to learning. Much thought had been given to the preparation of students for medical school. It had been felt that the students were being given only a sound preparation in basic science and that they were ill-prepared to become citizens of the world, to be physicians able to deal with the various social, economic, and cultural factors which affected the practice of medicine. As a result of a study some ten years ago the preparation of students for medical school had been broadened, the attitude being that science requirements should be held to a minimum—although this was recognized as being an important minimum—and that the students should be encouraged to diversify their educational process.

A second important study had concerned the selection of students for medical school. Although a major factor, academic performance was not the sole criterion; the evaluation of the college teacher was also taken into account. Another interesting development had been the use of a national testing procedure, the medical college admission test. This tested scientific ability, quantitative ability, creative ability, and knowledge of modern society. More than 95% of the applicants for admission to medical school underwent the test, which was found to be a useful indicator, often giving a good line on the student's academic ability. The interview had also received some study. Opinions about it were still sharply divided, teachers being more favourable to it than psychologists.

In most medical schools the student's day-to-day activities were the fundamental basis upon which his final standing in the class was determined. In most cases the final examination contributed no more than about 30% to the final grading. Certainly a good student would never fail for having failed the final examination, and vice versa. It might be argued that this method put pressure on the student every day instead of only at examination times, but the student in the United States was accustomed to this.

The British System

Sir GEORGE PICKERING, Regius professor of medicine at Oxford, considered the British system. He defined the objects of education as twofold: first, to train the student's mind to acquire method in collecting facts, verifying them, arranging them, drawing conclusions, and testing his conclusions; secondly, to make him familiar with the material with which he proposed to work and, in the case of a practical art, to give him an acquaintance with the elements of the current practical techniques. The first was common to all education, the second peculiar to each faculty. The results of education could be assessed immediately by examinations or similar tests, or over a long period by the achievements of its graduates. His experience of examinations at several universities had shown him that medical faculties were interested not in training the student's mind but rather in his familiarity with the subject and its practical handling. With few exceptions medical examination papers were not designed to test the student's ability to arrange or evaluate evidence or his appreciation of method.

In recent years there had been evidence that the attitude of teachers was changing, one of the pieces of evidence being the changing form of examinations. However, it was not changing fast enough. It was extraordinary how little attention teachers had paid to the objectives

and the form of examinations. Examinations were the chief outward manifestation of the teachers' purpose, determining not only the fate of the individual student but his attitude to what he felt he should learn. As a test of education they were of limited value. The second difficulty in experimenting with education was to know precisely what factors were changing. It had been shown that research work undertaken on a group of factory workers had had a profound effect on productivity. It therefore seemed not improbable that if a university or medical school conducted an experiment in medical education the enthusiasm aroused would be an important factor in determining the success or failure of the experiment.

Outlining the system of education followed in this country, Sir George said that the universities often complained that too early specialization was the fault of the school. He unhesitatingly placed the blame on the shoulders of the universities. His chief conclusion from his survey was that, while medical education achieved its object of making the student familiar with the subject-matter with which he would have to deal later in his career—although some revision was desirable in that respect—its failure was in training the mind. The fault was partly with the curriculum and partly with the teachers, but fundamentally it was the attitude of mind of the teachers. While it was nonsense to suppose that the subject-matter of an arts course was inherently more suitable for sharpening the wits than that of a science course, it was true that science faculties, including medicine, were smothering their students with technological detail.

In the discussion which followed, Dr. LESTER EVANS (Commonwealth Fund) said that when the student entered medical school he was still at an age when, like every other young animal, he wanted to explore and roam. Like all other living things, his mind would respond to his environment. If his environment was one of freedom and inquiry, he would become a learner, like his teacher. Professor J. W. CROFTON (Edinburgh) thought the most difficult problem in designing experiments in education was to find the right criteria of success. Dr. A. M. COOKE (Oxford) pointed out that anyone who wished to teach in an elementary school was encouraged to take a diploma in education, which among other things meant studying methods of teaching. Possession of the diploma entitled its holder to a slightly increased salary. He had never met a teacher in a medical school who had been taught how to teach.

Mr. D. W. C. NORTHFIELD (London) said that if they were to build for the future they had to know where they had failed in the past. He supposed that it was an English characteristic to criticize so devastatingly what had been done. He did not think that they need feel ashamed of what had been achieved in the past. Professor B. REXED (Uppsala, Sweden) said that it was obviously difficult to be a teacher in a medical faculty. This was because the university had two conflicting interests or responsibilities—to the student and to the patient. The student's mind should be stirred, but the patient had to be protected. This was becoming more important as patients began to look at the profession in a more critical fashion. Professor ROBERT PLATT, closing the session, said that they had come to grief in the past in trying to devise examinations for medical students. He hoped that they would not now come to grief in trying to devise numerical tests by which the results of their experiments could be judged.

Students and Examinations

The afternoon session, at which Sir JAMES PATERSON ROSS, P.R.C.S., took the chair, opened with a paper on the study of students, by Dr. N. MALLESON, physician in charge of student health at University College, London. Dr. Malleison said that it had been suggested that there was a sort of mechanism by which a standard number of students

were failed and sent down at the end of the first year—a kind of norm vaguely and unconsciously held in the mind of the department which allowed borderline students through if there were too many failures and which raised the standard if there were too many passes. Any such process nullified student selection research. Operational research, as opposed to student selection, meant looking into that process, and that meant looking at the staff and at departmental procedures. Its methodology was still primitive; operational research was an aid to "good deanery," not a substitute for it.

A number of figures had been produced, but their meaning was not always clear. Examples included the fact that students who married in their third year were more likely to get a first-class honours degree than students who did not take out a girl; students who habitually sat in the front of the class stood a better chance of getting a good degree than those who sat at the back. It was also the case that some students spent far longer than average on private work and yet failed or did badly in examinations, while others spending a shorter time on private study did well. This suggested that research into the techniques of private study might prove rewarding.

Professor G. M. BULL, professor of medicine at Queen's University, Belfast, then discussed examinations. When an examiner marked a single question answered by a class of students he created an array of marks with two sources of variance, said Professor Bull—that due to the students and that due to the examiner's error. If the examiner re-marked the question on another occasion, or if the same question was marked by another examiner, it was possible to divide the total variance into two components, that of the student and that of the examiner. One examiner might be more lenient than another; one examiner might spread his marks more widely than another. The first type of error was unimportant because the students were graded correctly. A third type of error was much more important. This was a random error, and any statistical assessment of marking required its isolation. It had been shown that the correlation coefficient between two markings of the same question isolated the two components of student's and examiner's random error. After showing slides illustrating marking variations, Professor Bull said that in the last five years he and his colleagues had replaced half of their papers by multiple-choice questionnaires, some of the questions requiring single-line answers. Such tests did not carry any examiner's marking error and it was possible to take a much wider sample of the student's knowledge. There could be questions testing both the honours candidate and the failed candidate satisfactorily. It was possible to test not only factual knowledge but other skills such as the ability to make deductions from facts. Finally, the papers made it possible to compare one group of students with another.

Interview examinations were very much more difficult to study, because there was an additional source of variance, in particular that introduced by the students examining different patients, and also because examiners did not necessarily ask the same questions of each student. He had made some estimates of the student's variance in interview examinations and had found it surprisingly high.

Professor G. M. WILSON (Sheffield) said that the precise order of examination results was not tremendously important. Examiners first determined what was very good and what was very bad. With that in mind he had examined papers going back over several years and had asked members of the Royal College of Physicians to mark some of the papers. The top 10% of examinees had been constant, but there was wide variation with the bottom 10%. Similar results had been obtained when six examiners had been present at interviews, with two examiners asking questions but all six marking. Dr. A. C. DORNHORST (London) said it was a remarkable response to the available evidence that the General Medical Council should have recently increased the time to be spent on long cases. Dr. R. L. RICHARDS

(Glasgow) said that Glasgow students in their fourth year took an examination which, while not affecting their final results, gave them prizes and so on; it lacked the strain of the final examination. Traditionally the examination was to answer three out of four questions, but in the last three years there had been added multiple-choice questions with the questions standardized so far as possible. What had been surprising was the general agreement between the results of the two types of examination. Professor G. A. SMART (Newcastle) said that about seven years ago, while at Bristol, he had asked students to volunteer for multiple-choice-question examinations. He also had been astounded at the degree of correlation. Professor G. P. MEREDITH (Leeds) pointed out that multiple-choice questions involved a great deal of work. They could not be made up overnight, and he hoped that it would be possible to build up a large pool of such questions.

Teaching of Social Medicine

The final paper of the day was by Dr. J. N. MORRIS, director of the Medical Research Council's social medicine research unit. He thought it interesting how the attitude of general practitioners to quantitative methods had changed over the years. Every doctor now knew that he had to deal with the problems of vaccination, polio, and smoking and lung cancer. It was important also for the doctor to know about the patient's background. For instance, a surgeon dealing with a crushed foot, the result of an industrial injury, had been surprised to find that in many factories there was a kind of collusion between management and labour to ignore safety measures. If students were to be taught in the best clinical tradition, by example and experience, the place to do it was in the family, in the home of the general practitioner and of all the other services to the community, not in the hospital. If it was desired to train students to keep people out of hospital, the place for that to be done was obviously not in the hospital.

Dr. J. K. RUSSELL (Newcastle upon Tyne) agreed that, if one was to make a complete study of the influence of environment on obstetrics, the place to do that was outside the hospital, but one needed a complete section of the community. Professor T. HALE HAM (Western Reserve) said that students in hospitals in the United States often dealt with one ethnic group, a limitation which introduced a number of problems. Dr. BOWERS added that in the United States the importance of "preventive medicine," as they preferred to call social medicine, had been increasingly recognized in the last 10 years.

Professor K. R. HILL (London) said that there might be an argument for a shorter course of perhaps four years with postgraduate work to follow. It had to be remembered that in many parts of the world the proportion of population to doctor was enormously higher than it was in Britain, and that what was done in England or in the United States had a marked effect on attitudes in places like India, where the shortage of doctors was acute.

The Western Reserve Experiment

On the second day of the conference the morning session was devoted to a paper and discussion on medical education at Western Reserve University. Dr. J. G. MCCRIE, dean of the medical faculty at Sheffield, was in the chair.

Professor T. HALE HAM, professor of medicine at Western Reserve, said that in planning the experiment in medical education at Western Reserve they had decided that policy should be the responsibility of the general faculty. This was composed of part-time and full-time members. Revision of the programme was undertaken through a standing committee of nominated representatives from each department, and the programme itself was the subject of research and report. Two-day summer meetings were held, when about 80 heads of departments and others discussed

problems and reports. There had been remarkable participation by the faculty members in the development of policy and deciding what should be done. The experiment had been begun shortly after the second world war, when most heads of departments were newcomers.

The faculty had worked on the principle that the medical student was to be treated as a mature individual and colleague, and given increasing responsibility for his own education, for knowledge of medicine, and for care of patients. That required a mature system of examination and grading. The student's initiative and resourcefulness were to be encouraged, and in each year students were to be given time for elective subjects or courses. The examination system, which had been very much a quiz system, was overhauled. During the first and second years there were interim examinations about every eight weeks. The students were not given grades on the examinations, which were intellectual exercises based on the work that had gone before. Only those students having difficulty were identified. Papers were handed back with helpful comments. At the end of the first year there was a comprehensive three-day examination and again those having difficulty were identified, but otherwise there was no grade or report other than a pass grade. About 5% of the students fell by the wayside during the four-year course. A few repeated their early years' work. National Board examinations came at the end of the third year, and clinical examinations at the end of the fourth year. Students expected to pass these examinations, and did so without making them a major problem. There was neither cramming nor loss of time. Students were characterized but not necessarily graded.

Every week students had a substantial amount of free time during which they could begin to learn on their own. Although about a third of the students had difficulty in usefully employing their free time in the first six months, by the end of the first year they were all using it and would not give it up. They spent it on academic subjects, studying for examinations, or working on the projects which formed part of the system. Free time had done a great deal to set the environment for the student.

It had also been decided that there should be longer contact between student and instructor to provide the education and personal guidance of a graduate school. This was obviously the tutorial method. They tried to correlate the teaching of biological and medical subjects, and this allowed multiple approaches to a subject and the avoidance of certain extremes of specialization. It also fostered inter-departmental communication and it had certain advantages for the faculty as well as for the student. Working independently, Harvard University had decided to use a similar system for teaching the biological sciences, and, with modifications, the programme was now to be extended to Harvard Medical School. Preliminary results at Western Reserve were such that there did not seem much likelihood that students or staff would want to change back to the old system.

The projects undertaken by the students very early in their course were not meant to be intensive studies of small areas of medical science. They afforded the student an opportunity of taking part in his education, and the students liked them. At least half the students worked on their projects for the second year. At the end of their second year students were required to write a thesis, which meant that they had to think carefully about what they undertook. Very early in his career each student worked with a newly born child, having met the mother during the latter part of her pregnancy. He made visits and discussed cases. Going into homes gave students an opportunity to observe the normal course of preventive medicine and gave them an insight into the lives of patients. The student examined patients, with his preceptor, or tutor, acting as consultant and ultimately responsible. That was different from being an apprentice, because the contact was between patient and student direct.

Some Criticisms

Opening the discussion, Professor G. A. G. MITCHELL (Manchester) said that they were apt to forget that dissatisfaction with medical education was not new. The medical journals of a century ago contained bitter denunciations of the teachers and methods of those days. The difference was that the subject was now receiving more attention and the Flexner Report had crystallized matters in the United States. The situation at Western Reserve after the war had been unusually favourable in that most heads of departments were changed in a relatively short period. One factor to consider was whether students on each side of the Atlantic were sufficiently similar for ours to be subjected to the same programme. On average, American students were three or four years older. Those years had been spent at college undergoing what was called a liberal arts training. Others were experienced in assisting in medical research projects. The result was that the American student was more mature than his British counterpart. He had found that many American students were married and that their wives worked full-time to help to defray the very heavy cost of a medical education in America. When there was a high failure rate, the blame was all too often attributed to the student. Only rarely, if ever, was it asked whether the teaching methods were sound. In the United States the failure rate was 5% to 8%. Here rates of between 25% and 40% were not uncommon among those training for the professions. Some examiners unfortunately regarded that as a matter for praise and not for blame, and referred to "keeping up the standards." They should examine themselves or their methods of teaching to see why there was such a shocking failure rate among students usually carefully selected.

Students being introduced to patients at a very early stage in their careers, as at Western Reserve, certainly stimulated enthusiasm. However, in his visit there he had gained the impression that some students were completely at sea, and he wondered whether a later introduction might not have been more profitable. He had questioned Western Reserve students and had found that none of them was treating "free time" as time off. They were using it for study and so on. Schools in Britain mostly left students a certain time to do as they chose.

Most American schools now devoted time to elective projects, but he had not been over-impressed by the results he had seen. The students seemed to be trying to run before they could walk. He thought that not more than 5% of students were capable of being taught and trained in that way. Too little time was devoted to basic subjects such as anatomy, physiology, and pathology, and to clinical work. The closer integration of preclinical and clinical subjects was admirable because it eliminated duplication and overlapping, made learning easier, instilled the idea of essential unity, and accomplished more in less time. However, he did not think four years was a sufficient training.

Professor W. M. ARNOTT (Birmingham) said that he did not take so gloomy a view as Professor Mitchell. He did not think that teachers knew how much talent students had. If students were encouraged more and given more opportunity for medical research, it would be found that they had a great deal more talent than was expected. Although Professor Mitchell had been disappointed with the papers published by Western Reserve students, it was a fact that papers by students had been published in medical journals in this country. The general physician had an important part to play in bringing together all the specialties in medicine, and in that way could be of great assistance to the student.

New Swedish Curriculum

Sir RUSSELL BRAIN presided at the final session, which was devoted to discussion of a paper on the new Swedish curriculum by Professor B. REXED, of Upsala University.

After explaining that all five Swedish universities were fully supported by the Government, Professor REXED said that until the introduction of the new system the regulations

operating in Sweden had dated from 1907. Since then new subjects had been born and science had made great progress. A committee headed by a senior administrator from the Department of Finance, and which included a Member of Parliament as well as representatives from different branches of medicine and a student, had therefore been appointed to go into the matter. This committee drew up a provisional curriculum which was offered to the different medical faculties three times, on each occasion incorporating fresh suggestions, until it was finally accepted and approved by the Government.

The old course had lasted eight years, followed by four in a junior hospital post. The present course lasted six and a half years, followed by hospital training. The first two years of the course were devoted to preclinical subjects, and then there was the four-and-a-half-years period leading to the examination required for medical registration. The Swedish system was not to have general examinations. Examinations came at the end of each subject and were a matter between student and teacher. At a time which the student decided, he could go to his professor and ask for an examination, which the professor was obliged to provide within two weeks. There was then an interview, after which the professor said whether the student had passed or failed. The student could take the examination again and again, though not more than twice in the same term; and, if the student was dissatisfied with the professor's way of asking questions, he had the right to ask for a public examination before witnesses. The failure rate was between 5% and 10%—about the same as in the United States—and the principal reason for a student failing an examination was not intellectual but psychiatric or some other cause. When a student passed an examination his professor signed the appropriate place in the student's examination book, and when the student had the necessary number of signatures he presented his book to the faculty and got a formal diploma. Although Swedish medical courses did not specifically provide for correlation, teachers were encouraged to correlate as much as possible and were doing so more and more.

Dr. J. R. ELLIS, secretary of the association, opened a short discussion on Professor Rexed's paper. Dr. Ellis said that from what he had seen on Swedish medical education it was clear to him that it succeeded in marrying clinical art and science. A big difference between the Swedish and British approaches was that in Sweden students and teachers recognized that most people would take more than the minimum period of time allowed in the curriculum, and arrangements were made accordingly. It seemed illogical and educationally unsound that all students should be expected to cover the same ground at the same speed.

Professor ROBERT PLATT then summarized the conference, and declared it concluded.

Officers of the Association

The following are the officers of the Association for the Study of Medical Education: Chairman, Professor Robert Platt; vice-chairman, Dr. J. G. McCrie; treasurer, Dr. M. I. A. Hunter; secretary, Dr. J. R. Ellis; executive council, Dr. E. R. Boland, Sir Russell Brain, Professor J. H. F. Brotherton, Sir David Campbell, Professor A. M. Claye, Professor M. W. Fullerton, Professor G. A. G. Mitchell, Professor G. W. Howie, Professor G. P. Meredith, Mr. M. F. Nicholls, Sir Harry Platt, Professor H. Scarborough, Dr. R. Scott, and Professor A. P. Thomson.

Higher Education in the United Kingdom, compiled jointly by the British Council and the Association of Universities of the British Commonwealth (Longmans, Green and Co., 5s.) is intended primarily for students from overseas, but should also be of value to anyone in Britain concerned with advising and placing such students. Medicine and related subjects are fully covered.

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

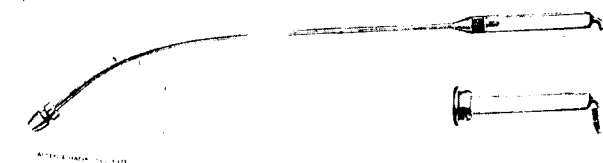
Arterochol (Ward, Casson Ltd.).—This emulsion contains 8.33 g. of corn oil, 0.6 mg. of pyridoxine hydrochloride, and 12 mg. of α -tocopherol acetate. It lowers the level of serum cholesterol. The active constituent is almost certainly corn oil, since there is at present no satisfactory evidence that either pyridoxine hydrochloride or α -tocopherol acetate produces any significant or lasting reduction of the level of serum cholesterol in man. To some patients an emulsion may be more palatable than an oil, but it is worth noting that corn oil is already available more cheaply as maize oil B.P.C.; it will produce comparable depression of the level of serum cholesterol when administered in a smaller quantity than as an emulsion. On present evidence the administration of any corn oil preparation is best restricted to hypercholesterolaemic patients with a bad family history of coronary disease or with xanthomatosis.

N.H.S. basic price: 12 fl. oz., 18s. 1½d.

New Appliances

BRONCHIAL MUCUS SPECIMEN TRAP

Mr. K. S. MULLARD, F.R.C.S., writes: A quantitative investigation into some of the constituents of normal and abnormal bronchial mucus required the collection of specimens of bronchial mucus uncontaminated and undiluted. The U-tube specimen trap, which is usually attached by a short length of rubber tubing to the proximal end of the sucker, is unsuitable because the specimen of



mucus must traverse the full length of the metal bronchoscope suction tube. The small amount of mucus present normally makes it impossible to collect any measurable quantity by this technique.

To overcome this difficulty Messrs. Allen & Hanburys have made for me a mucus specimen collecting-tube and have made for me a mucus specimen collecting-tube and special bronchoscopic sucker, as illustrated. The collecting-tube is attached to the distal end of the metal sucker, and its calibre is such that it passes down an adult male Negus bronchoscope. The specimen tube, made of plastic, has a screw thread by which it is attached to the distal end of the metal sucker tube. The tip of the specimen tube is curved to one side so as to bring it in contact with the bronchial mucosa. The metal bronchoscopic suction tube, which is otherwise of the usual pattern, is fitted with a bevelled flange which has a screw thread, to which the specimen tube is fitted. The flange allows the instrument to be withdrawn easily up the bronchoscope. The orifice at the tip of the metal sucker is placed to one side to prevent the mucus specimens being withdrawn into the metal sucker tube. The specimen tubes are provided with rubber caps, which are fitted to each end when the specimen has been collected, and they are then sent direct to the laboratory. It is necessary to be able to control the pressure of the suction motor, as only a very small amount of suction is needed to draw the mucus into the specimen tube; excessive suction empties the specimen tube.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Tonsillectomy and Poliomyelitis

SIR,—A boy aged 6 years had his tonsils removed three weeks ago. While the boy was in hospital for tonsillectomy, his father became ill at home with headache, neck stiffness, and backache. This illness cleared up after a few days, but a fortnight after returning home the boy developed bulbar poliomyelitis. The father's illness must have been non-paralytic poliomyelitis, but tonsillectomy made sure the son's attack was bulbar.

The relationship between tonsillectomy and bulbar poliomyelitis is accepted. Poliomyelitis vaccine almost certainly gives some protection against the disease. Is there any justification for carrying out tonsillectomy in children, or adults, who have not been inoculated against poliomyelitis? It should very seldom be difficult to postpone the operation till two injections of vaccine have been given to the uninoculated, or a booster dose to those already inoculated.—I am, etc.,

A. B. CHRISTIE.

Liverpool, 2.

Physiotherapy for Bell's Palsy

SIR,—The article by Mrs. J. Mosforth and Dr. D. Taverner (*Journal*, September 13, p. 675) is a valuable contribution to the literature on this subject, but the conclusions, unless amplified, may give an erroneous impression to many readers seeking information on this much debated subject.

During the past 10 years we have investigated about 2,000 cases of facial palsy at this clinic, and on the experience so gained we have based the following routine: (1) All cases, following clinical investigation, are referred to an aural surgeon so that aural pathology can be assessed or excluded. Facial palsies originating from trauma, cholesteatoma, neuroma, infections of the middle ear, and mastoid cells may thus be given the earliest possible opportunity of surgical treatment. (2) Transcutaneous electrical tests and an electromyographic examination are carried out about four weeks after onset. These tests are repeated at intervals until a final assessment has been reached. (3) No electrical stimulation is given to the affected facial muscles, but physiotherapy, in the form of mild heat, gentle effleurage, and re-educational movements, begins as early as possible, a support for the weak side of the mouth being fitted if necessary.

In regard to speed of recovery, a high percentage of Bell's palsies show considerable improvement a few weeks after onset and can soon be discharged from hospital clinics. All the uncomplicated Bell's palsy cases in our series improved without surgical treatment. Electromyography is of the most valuable help in determining the earliest evidence of recovery of innervation, but much patience and perseverance are required, as the earliest electromyographic evidence of reinnervation may be delayed for many months—one case in our series only showed its first electromyographic evidence of recovery 13 months after onset.

In their discussion portion of the article Mrs. Mosforth and Dr. Taverner appear to draw no distinction between electrotherapy and physiotherapy, and this may be misinterpreted by some readers as implying that such cases need not be referred to hospital clinics. Our own experience leaves no doubt that the most valuable part of physiotherapy in Bell's palsy is re-education in facial movements. This is not easy for most patients to carry out without much guidance and supervision. Frequently, where there has been a delay of several weeks or months before attendance at hospital, we have found that what appears clinically to be a severe facial palsy may, on electromyographic examination of the affected facial muscles, show excellent motor unit action-potentials on attempted voluntary movement. In other words, reinnervation has occurred but the patient is

unable to translate the cortical message into voluntary movement of the facial musculature—almost a replica of the Kenny conception of alienation in paralytic poliomyelitis. Such patients will improve on re-education in facial movements, although for weeks or months prior to such treatment the local condition would appear clinically to have been deteriorating.

There are many other interesting aspects of this fascinating problem, but for purposes of brevity I shall conclude by suggesting that, for exclusion diagnosis and for assessment of treatment, all cases of facial palsy should be referred as early as possible to hospital clinics.—I am, etc.,

Coventry and Warwickshire Hospital,
Coventry.

J. SHULMAN.

Attempted Suicide

SIR.—It is clear from Dr. A. A. Bartholomew's letter (*Journal*, September 20, p. 740) that our profession has developed a puzzling ataxia in its attitude towards individuals who have attempted suicide. While there is a consensus of medical opinion that genuine attempted suicide is a matter for the doctors and not for the police, some mental hospitals are disclaiming responsibility for a proportion of these patients. Many are intractable psychopaths and some are known to discharge themselves prematurely, but I have no doubt that hospital is a better place for them than prison. There is much to be said for the view that anyone who has made a recent serious suicidal attempt is *ipso facto* certifiably insane, being certainly in need of care, supervision, and control for his own safety.

However, if the recommendations of the Royal Commission on the Law Relating to Mental Illness and Mental Deficiency, 1954-7, become law, mental hospitals will not be obliged to accept certified patients and will be able to refuse them as they now refuse would-be voluntary patients. It is evident that, if the creation of a class of neglected outcasts is to be prevented, new legislation must embody provision for an overriding authority capable of securing a patient's admission to hospital, of ordering a given hospital to take him, in fact. This power should include voluntary patients as well as certified.—I am, etc.,

London, S.E.26.

A. HARRIS.

Isoniazid Absorption

SIR.—Since 1952 isoniazid has been administered as a standard adult dose of 300 mg. daily in a number of centres. The tissue concentration of this freely diffusible drug will vary inversely as the body weight.¹ Hughes *et al.*² have shown the wide individual range in the rate at which isoniazid is handled biochemically. Therefore, before embarking on a prolonged course of antituberculous drugs of which isoniazid is to be one, these variables should be assessed to avoid ineffective treatment which may only become apparent when sputum conversion is delayed, often associated with the emergence of a strain resistant to the complementary drug, as occurred in the following case:

H.C., a 40-kg. woman aged 42 years, had excavating tuberculosis confined to the left upper lobe. The gastric contents contained virulent tubercle bacilli. Chemotherapy consisted of streptomycin 1 g., isoniazid 400 mg. by mouth, daily for 90 weeks. Although the x-ray appearance improved a little, the E.S.R. remained raised and the gastric contents grew tubercle bacilli insensitive to streptomycin at a concentration of 10 µg./ml. but sensitive to isoniazid in a concentration less than 0.3 µg./ml. Isoniazid-handling studies showed less than 0.02 µg./ml. in the serum when 40 mg./kg./day was given orally, and it was not until the dose was 80 mg./kg./day that a six-hour serum level of 1.6 µg./ml. was achieved. There were no side-effects save the inconvenience of swallowing so many pills. However, 100 mg. isoniazid given into muscle produced the same serum level of 1.6 µg./ml. in half an hour and this was sustained for one hour, when the level fell to 0.4 µg./ml. in 1 hour 40 minutes. It was concluded that her failure to respond to adequate chemotherapy over the preceding year and a half was accounted for by an inability to absorb oral isoniazid.

The decreasing number of new cases is now sufficiently small to permit routine isoniazid-absorption and handling

studies before instituting treatment. The method of assaying serum-isoniazid levels with cultures of H37RvS-RSM described by Kass *et al.*³ can be used routinely, although modification in detail was necessary in this case. Treated cases of pulmonary tuberculosis which relapse may repay investigation along these lines, but so far the number investigated by us is not large enough to provide evidence that abnormal isoniazid-handling is a significant factor.—We are, etc.,

Perth, Western Australia

S. E. SLADE.
J. M. FOLEY.

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Cutting Pains

SIR.—The cutting pains of short duration in which I am interested may be of no significance from a therapeutic point of view, and should usually cause no anxiety, but I believe that they are not "imaginary" and that they have an actual mechanical causation. Growing pains in children have sometimes been regarded as very mild forms of acute rheumatism, but the pains which I have in mind are, I think, not usually connected with joints but rather with the shafts of long bones, such as the tibia. I suggest that they are caused by the formation of the septa in the cancellous bone marrow, some of which may for a time have an irritating, cutting edge. I suggest that the occasional feeling in young persons as if their thorax were transfixed with a dagger may be due to calcification in some of the hilar lymph glands (bovine tuberculosis?) mechanically irritating nervous structures in their neighbourhood. Some kinds of sudden abdominal pains may have an analogous origin. When Sir Arthur Keith was demonstrating some spicules of calcification at the base of the brain, a well-known coroner's pathologist near me said: "That's where I come in; one of those spicules might cause death by perforating a blood vessel."

A sufferer from chronic hypertrophy of the prostate gland in addition to his ordinary pains and inconveniences may sometimes complain of a sharp, transitory, cutting pain, which, I suppose, is due to calcification connected with his disease.—I am, etc.,

London, N.W.1

F. PARKES WEBER.

Calf-pulse Sign

SIR.—In Scherf and Boyd's textbook¹ we read that aortic regurgitation, one of the commonest pure valvular lesions, is often discovered only late, as most patients have but few symptoms. It seems all the more important therefore to give very close attention to the physical signs of the condition.

The typical pulse is variously known as *pulsus altus* (or *magnus*) *et celer*, Corrigan's pulse, the collapsing-artery pulse, or the water-hammer pulse. According to Major² the term water-hammer pulse is more often used than understood. He reminds us that a water-hammer was a kind of toy or physical apparatus common during the nineteenth century. It consisted of a thick glass tube, about 1 ft. (30 cm.) long, half-filled with water. The air was expelled by boiling the water, and immediately afterwards the end of the tube was sealed. If such a tube is then inverted the water falls through the vacuum like a solid body, and the hand gripping the tube feels a hard blow or knock similar to the knocking of the pulse wave in aortic regurgitation. This hard short blow of the pulse wave is particularly well felt by gripping the volar surface of the patient's forearm with the whole hand.

I wish to draw attention to the fact that the water-hammer pulse can be felt even more distinctly, and moreover in several arteries, in the calf. The postero-medial aspect of the lower part of the calf is grasped firmly in the examiner's hand and relatively strong upward pressure applied on the lower calf muscles.

Why should the water-hammer pulse be felt so easily here? The reason is that the arterial pressure in the legs, especially in cases of aortic regurgitation, is higher than in

the arms, unless, of course, there is arterial occlusion; and this is also true of the pulse pressure, whose characteristic elevation accounts for the water-hammer pulse. For instance, in a patient of 25 with aortic regurgitation the blood pressure in the arms was 140/70 mm. Hg, while in the legs it was 240/115 mm. Hg—a pulse pressure of 125 mm. Hg. In normal subjects the differences in pressure in the arms and legs are usually much less (at least at this age). This peculiarity of aortic regurgitation has been called the Hill phenomenon.³

A water-hammer pulse is sometimes found in other pathological conditions besides aortic regurgitation—such as arteriovenous fistula, patent ductus arteriosus, aortic aneurysm, and occasionally where there are senile arteriosclerotic changes in the aorta and great vessels. However, closer examination will usually allow such conditions to be distinguished. In aortic regurgitation the calf-pulse sign is almost always present. Conversely, the forearm pulse can sometimes be felt in normal individuals, but except in the case of the elderly people with arteriosclerotic changes mentioned above I have not so far felt the calf pulse in a normal subject. I suggest, therefore, that the calf grip should be adopted routinely, in preference to the forearm grip, in the examination of cardiac patients.—I am, etc.,

Fritz O. P. Trautmann.

Berlin.

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Ergometrine with Hyaluronidase

SIR.—I have read with interest the paper by Drs. M. P. Embrey and W. J. Garrett (*Journal*, July 19, p. 138) on the speed of action of ergometrine with hyaluronidase. Their results confirm and amplify the observations made at University College Hospital three years ago, using the same method.¹ Examination of the two sets of results suggests that the extent to which hyaluronidase accelerates the action is dependent on the dose of ergometrine used. In our experiments, two doses of ergometrine, 0.25 mg. and 1 mg., were used. With the 0.25 mg. dose, addition of hyaluronidase to the intramuscular injection resulted in a reduction of the average time between injection and response from 9.9 to 5.4 minutes. With 1 mg. doses, hyaluronidase did not affect the latency, which was about 4 minutes. The observation by Drs. Embrey and Garrett that the latency of an intermediate dose, 0.5 mg., is reduced from 7.0 to 4.6 minutes by addition of hyaluronidase completes the picture. The reduction in latency is, however, only one of several effects of hyaluronidase. I found that with 0.25 mg. and 1 mg. doses of ergometrine addition of hyaluronidase increased the strength of the resulting uterine contraction by 30% and 50% respectively.

The results of clinical trials using ergometrine, alone or with hyaluronidase, do not substantiate the view of Drs. Embrey and Garrett that the addition of the latter is of questionable value. Using intramuscular ergometrine alone, Daley² obtained a post-partum haemorrhage rate of 9.2%. Soiva³ an incidence of 8.7%, and Kimbell⁴ 3.5%. Combining ergometrine with hyaluronidase, Kimbell⁴ reduced the post-partum haemorrhage rate to 0.9%, and, using this combination, Dutton⁵ obtained a figure of 2.6%. If the ergometrine-hyaluronidase combination is made up ready for each delivery, then the disadvantage of the longer time taken to mix the injection need not be considered. The cost of an ampoule of hyaluronidase is 2s. 4d., which compares favourably with a course of "ferrivenin," a course of "imferon," or a bottle of blood, which may otherwise be required.—I am, etc.,

A. H. LABRUM.

Wolverhampton, Staffs.

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- 1 Labrum, A. H., *Lancet*, 1955, 2, 522.
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- 3 Soiva, K., *Ann. Chir. Gynaec. Fenn.*, 1954, 43, Suppl. 1, 7.
- 4 Kimbell, N., *Brit. med. J.*, 1954, 2, 130.
- 5 Dutton, W. A. W., *J. Obstet. Gynaec. Brit. Emp.*, 1958, 65, 315.

Iodine and Adrenocortical Function

SIR.—Clinical observations have suggested the possibility of adrenocortical function being decreased by inorganic iodine. To elucidate this question the corticoid (neutral phosphomolybdic-acid-reducing lipid-soluble substance) output of dogs was examined in conjunction with prolonged administration daily of 30 to 60 drops of Plummer's solution (iodine 0.5 g., potassium iodide 1 g., and distilled water to 10 ml.). In a great number of controls excretion of this steroid was found to be 10-20 µg. per hour. In dogs given Plummer's solution continuously, determination mostly showed values below 10 µg. per hour. After discontinuing the Plummer's solution corticoid excretion returned to normal; in some cases it even exceeded normal values, but decreased again upon administration of iodine.

The excretion of these corticoids as well as that of the 17-ketosteroids was then determined during the administration of Plummer's solution to four patients with adrenal hyperfunction. Almost always excretion of the reducing steroid definitely decreased, e.g., values of 990 and 920 µg. per 24 hours fell to 490, 410, 320, 650 µg. per 24 hours during the administration of the Plummer's solution. In another case, when Plummer's solution was given, initial values of 580 and 630 µg. per 24 hours declined to 260, 520, 290 µg. per 24 hours. In two patients with Cushing's disease body weight and blood pressure also diminished. In two instances ketosteroid excretion was likewise reduced—e.g., from values of 19.6, 17.7, 18.7 mg. per 24 hours to 11.5, 12.5 mg. per 24 hours.

Assuming that iodine may inhibit the secretion of corticotrophin, we carried out trials in rats of Wistar strain in order to clarify the mechanism of action. The ascorbic acid content of the opposite adrenal was examined one hour after unilateral adrenalectomy in animals iodinated in the usual manner and in controls. The experiment failed to confirm our assumption. After unilateral adrenalectomy the loss of ascorbic acid in the opposite adrenal was exactly the same in the animals receiving Plummer's solution as in the controls; and likewise no difference was observed in the degree of hypertrophy of the remaining adrenal. It was, however, striking that from the first the ascorbic acid content of iodinated animals was without exception consistently (about 30%) lower than that of the controls. According to our present knowledge, the lower ascorbic acid level cannot be ascribed to the use of iodine causing stress, since comparison between the adrenals of iodinated animals and control groups revealed no difference in weight.—We are, etc.,

Budapest.

I. HOLLÓ.

E. STARK.

O. VÁGI.

Human Mammothrophin

SIR.—Professor Geoffrey Hadfield's letter (*Journal*, September 6, p. 633) concerning the mammothrophic activity of human urine will be welcomed by those who, on a humble scale, have been following his methods of investigation. It is reassuring to know that he and his colleagues have also found "the investigation of human pituitary function in the intact animal to be fallacious and confusing." As he has suggested, there are several reasons why this should be so, quite apart from the variation in control animals noted by Williams.¹ Even when the very pure sheep-prolactin kindly supplied by the Endocrinological Study Group of the National Institutes of Health, Bethesda, U.S.A., is used, relatively large quantities are necessary to induce breast growth in hypophysectomized or intact A2G weanling male mice in combination with other steroids. Until the properties of human prolactin have been determined it is difficult to equate the response of mice to human urine or to prolactin from other sources. Crude acetone extracts of 200 mg. wet weight of fresh human pituitary appear to be more effective in stimulating mouse breast growth than a total dose of 20 mg. of ovine prolactin. Another complication may arise from the presence of prolactin inhibitors or oestrogen competitors in human urine. For instance,

Starr and his colleagues² have recently described thyrotrophin (T.S.H.) inhibitors in the urine of certain patients. These and other factors may influence another aspect of this work, the correlation of urinary mammothrophic activity with the clinical response to hypophysectomy of patients with cancer of the breast.

Professor Hadfield has recorded that "significant regression of tumour growth was obtained only when the pre-operative specimen possessed easily recognizable mammothrophic potency, whilst little or no regression was the rule when no pre-operative potency could be demonstrated."³ This has not been our experience at the Royal Free Hospital.⁴ All investigations which may illuminate the shadows surrounding the problem of hormone sensitivity in breast and prostatic cancer are, as Dr. A. C. Crooke stated (*Journal*, July 26, p. 225), of potential value. But the facilities needed for the effective processing of large volumes of urine,⁵ the preparation of hypophysectomized mice of pure strain, and the sometimes neglected correlation of laboratory and clinical observations are not readily available at the present time. I hope that Professor Hadfield and his colleagues will continue to publish the results of their extensive and laborious clinico-pathological researches, for many of us are indebted to him for awakening interest in this field.—I am, etc.,

London, N.W.3.

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- ¹ Williams, R. E., in *Endocrine Aspects of Breast Cancer*, 1958, ed. A. R. Currie, p. 175. Livingstone, Edinburgh.
- ² Starr, P., Lepp, A., and Katz, Y., *J. clin. Endocr.*, 1958, 18, 278.
- ³ Hadfield, G., *Acta endocr. (Kbh.)*, 1957, 24, Suppl. 31, 254.
- ⁴ Baron, D. N., Gurling, K. J., and Smith, E. J. R., *Brit. J. Surg.*, 1958, 45, 593.
- ⁵ Albert, A., in *Recent Progress in Hormone Research*, 1956, 12, 227.

Vitamin E in Habitual Abortion

SIR,—It is usually the concern of the general practitioner to advise a patient who has had one or more miscarriages and who wants to know what to do if she again becomes pregnant. I have been particularly interested in habitual abortion for nearly three years and can now report on the treatment of 32 patients. One case was of particular interest, and, in fact, it was the good result achieved in this patient which prompted me to treat more patients in the same way.

This patient already had a history of three miscarriages when I was called in to give her emergency treatment for a threatened abortion (she had recently moved into the district). She was admitted to hospital, where she again aborted. She came to see me afterwards, and the hospital notes stated that any treatment, hormonal or otherwise, would be unlikely to achieve a live birth. In view of previous successes with vitamin E, I encouraged this patient to become pregnant, and, as soon as she had missed her first period, she was instructed to take "ephynal," 50 mg. t.d.s., until the 28th week of pregnancy. At the end of the second month she had a chest infection and, as a result of coughing, she started to have a threatened abortion (i.e., bleeding). She was treated with sulphonamides and the bleeding stopped when her chest infection cleared. During the third month she again had a chest infection and untreated abortion, but bleeding again ceased as the infection resolved after treatment with an antibiotic. She had a home confinement, and I was present when she gave birth to a male child weighing 10 lb. 2 oz. (5.6 kg.).

Of the present series of 32 patients treated with vitamin E, all had had one or more miscarriages (usually two) occurring at the second or third month. One patient had had three miscarriages and another had had four. Following treatment, 19 have been successfully delivered and two are now due; three are six months and three are three months pregnant. Two patients have moved from the area and three have had another miscarriage.

It is often stated that progesterone is much more effective than vitamin E, but I have not found this to be the case. In addition, the administration of progesterone to pregnant women is not without danger, as there have been reports (see *Journal*, July 26, p. 218) of pseudohermaphroditism in babies whose mothers had been treated for habitual abortion with methyltestosterone or progesterone (which is partly converted to testosterone in the body). From my own results, I am fully convinced that vitamin E is effective in many cases of habitual abortion.—I am, etc.,

Hemel Hempstead.

R. V. SUTTON.

Congenital Deaf-mutism

SIR,—I agree with Dr. L. Fisch (*Journal*, September 13, p. 692) that the arguments produced by Dr. J. McKenzie (*Journal*, July 26, p. 201) in support of his thesis that the cases described had a gross middle-ear involvement are far from convincing. His assumption that congenital defects of the middle ear lead to a disuse atrophy of the cochlea is quite incorrect. It is well known that children with bilateral congenital atresia of the auditory meatus with malformation of the incus have an excellent inner-ear function and may be operated on successfully by tympanoplasty and made to hear even after many years of deafness.

Dr. McKenzie writes that "it is unlikely that a less degree of perceptive deafness could cause a major degree of conduction deafness." That is indeed true—in fact, no clinical condition is known in which perceptive deafness is the cause of a middle-ear deafness. Dr. McKenzie states that in his cases "no morphological evidence of a defect of the middle ear is available; x-ray examination with various projections has been of no assistance in identifying the presence or absence of the ossicles, far less their normality. . . ." It is unlikely that audiological and clinical arguments would convince an embryologist. The central problem, whether or not the middle ears of these deaf-mute children are grossly abnormal, can, however, be settled by direct inspection. Since the introduction of an operating microscope the middle ear is no longer a field for academic speculations and the state of the auditory ossicles need not be investigated by x rays.

As so many pathological conditions of the middle ear are now amenable to surgical treatment, it would be justified to explore the cases in which the bone conduction is considered to be good. (Dr. Fisch is sceptical about the reliability of the bone conduction audiograms in these cases, in my opinion rightly.) After reflecting a tympanomeatal flap from the postero-superior meatal wall forward over the handle of the malleus (Rosen's approach to the middle ear) with the aid of an operating microscope, the shape of the incus and the stapes can be seen and their mobility tested and the presence or absence of movement of the light reflex in the round-window niche observed. Thus direct inspection of the middle ear would prove or disprove Dr. McKenzie's assumption of a gross middle-ear lesion in his deaf-mutes.—I am, etc.,

Liverpool, 22.

FRANCIS BAUER.

Prevention of Lung Cancer

SIR,—I am a member of a unit into which annually 400 patients suffering from carcinoma of the bronchus are now admitted. As a man who enjoys tobacco smoking and as an ardent follower of the maxim that "a little of what you like does you good," I have tried to remain aloof from the enthusiastic evangelism of the anti-smoking crusaders. It becomes impossible, however, to maintain a neutral attitude. It is one thing for statisticians to demonstrate their theses with a slide rule and quite another when, having become aware of the possibilities, the truth shrieks at one from countless bedside ash-trays. I do not believe that any thinking man can see large numbers of patients suffering from this condition without becoming convinced beyond reasonable doubt that excessive cigarette smoking is a major aetiological factor.

Having accepted this, the duty of our profession is quite clear. We are no more entitled to issue a certificate of natural death for an excessive smoker who dies of carcinoma of the bronchus than we would be to certify natural death in a coal-miner dying of pneumoconiosis or a mule-spinner of cancer of the scrotum. It is in our hands to see that inquests are held in all such cases, and the cause of death—the poisonous effect of inhaled cigarette smoke—made plain. If only 50% of doctors will follow this course, the publicity that will follow in every local community might abort many of the tragedies now gestating. I propose in future to pursue this course of action.—I am, etc.,

Liverpool, 1.

LESLIE J. TEMPLE.

Imbecile Children

SIR,—Drs. Evelyn B. Lind and Brian H. Kirman (*Journal*, September 20, p. 743) show that the death rate in young imbecile children admitted to the Fountain Hospital is high—est in the immediate post-admission period, and give this as an additional reason for keeping them at home. The argument seems to be fallacious unless it can be shown that the death rate would have been lower had the children remained at home. As the patients admitted are likely to constitute a highly selected series by reason of difficulty in their upbringing, it would probably be quite impossible to check this by means of a control series. One would hardly expect, however, that skilled nursing and medical attention would hasten the death of these children.—I am, etc.,

C. GUY MILLMAN.

Morpeth, Northumberland.

Why Are Medical Journals So Dull?

SIR, I enjoyed reading Dr. Richard Asher's article "Why Are Medical Journals So Dull?" (*Journal*, August 23, p. 502). However, I cannot agree with all his suggestions. A medical journal contains articles of interest to physicians, most of whom are quite capable of disentangling the medical phraseology and separating the wheat from the chaff. On the other hand, the *Reader's Digest* and other popular magazines are written for sale to the general public, and technical terms and language are reduced to a minimum. Suppose, for example, that I had an article to write for a medical journal: a comparison between two analgesics. I might entitle the article "A Comparison of the Analgesic Properties of Morphine and Pethidine in the Geriatric Patient." In it I might show that in a series of 25 cases 15 patients seemed to have more relief from pain with pethidine than with an equivalent dose of morphine, 5 noticed no difference, and the remainder had more relief from morphine. This is no earth-shaking discovery; in fact, considering the small number of cases in the series it doesn't mean a thing. However, entitle the article "Pethidine More Effective than Morphine in 60% of Old People" and include a few dramatic pictures of elderly patients leaping out of bed, and the whole thing becomes much more dramatic. Even a layman could read and understand [sic] it. After a few such articles newspaper editors would start eagerly scouring each journal as it came out. Picture the headlines: "Does Your Doctor Still Use Morphine? Recent Scientific Tests Conclusively Prove that Pethidine is More Effective than Morphine, Although Many Physicians Still Use the Older Preparation," and so on. I agree with Dr. Asher that there is a need for more simplicity in the writing of articles for medical journals. There is, however, a danger in making medical journals too attractive, too easily (mis)understood. Let's keep them for doctors only.—I am, etc.,

PETER D. SEARS.

Flushing, N.Y.

Immunization Card

SIR,—Many difficulties arise as a result of the multiplicity of immunizing procedures (*Journal*, September 13, p. 691). One is that of ensuring that there is a complete and accurate record, and I feel that local health authorities should undertake the responsibility of ensuring that this is done. Every child and eventually every adult should have a record card which contains an adequate account of the immunizing procedures. Though there can be no guarantee that any such record will be complete and accurate it would be an improvement on the arrangements now prevailing. The record should of course be freely available at short notice to the hospital and the patient's doctor.—I am, etc.,

Sheffield, 1.

LYWELYN ROBERTS.

SIR,—For several years I have issued my patients with an immunization record card as sent to me free of charge by Messrs. Glaxo Laboratories Ltd. These cards are the same size as the National Health medical cards, and are very use-

ful to the parents when the children go to school, etc. Details of immunization are of course entered on the National Health Service record card at the same time.—I am, etc.,

Hartgate, Yorks.

RUTH BLACKWOOD.

Buzzers for Bed-wetters

SIR,—In your very fair and valuable annotation (*Journal*, August 23, p. 499) there is one disadvantage that you do not list. As the buzzer works when the child passes urine he becomes conditioned this way. I call it the "back to front reflex" and treat it by counter-suggestion—i.e., under hypnosis the child is told that the buzzer means getting up and not passing his water.—I am, etc.,

London, W.1.

GORDON AMBROSE.

SIR,—Discussing in your annotation on buzzers for bed-wetters (*Journal*, August 23, p. 499) the disadvantages of the enuretic apparatus, you mention firstly the cost. I feel I must add that a small-electrode machine lessens this considerably. Two perforated plates the size of a penny can be separated by a small piece of cloth or blotting-paper and wrapped up with a rubber band. This little parcel is arranged suitably to be alongside the external meatus so that it is the first thing to be wetted. A miniature relay is necessary in the "watching" circuit, which uses a hearing-aid 22.5-volt battery instead of the lower-voltage one. A larger bell is then used in the second circuit, since I have found that a really loud noise is often required after the patient gets used to it. After the first wetting the patient changes the small piece of cloth for a dry one and replaces the parcel.

This machine fires off in a fraction of a second and requires less than a drop of water to activate it. The increased sensitivity means much greater reliability. There are advantages apart from the cost of the electrode, which can be restored with waste rag indefinitely. Firstly, the reflex established is to urine which has only just left the urethra, and bears more comparison with the reflexes of the normal person initiated by urine in the posterior urethra. Trying to establish a reflex from a soaked bed must be less effective. Secondly, there is no wet bed and even the pyjamas usually stay dry. This means, particularly in the older more intractable case, that the patient can take the machine to hotels and holiday places without leaving his mark, even before he has attained a cure. The increase in confidence hastens the cure, and the relief from washing sheets changes the silently exasperated mother into a firm ally.—I am, etc.,

Sheffield, 6.

G. WYNNE-JONES.

"Nilergex"

SIR,—This new antihistamine has recently been introduced as having no, or minimum, soporific side-effects. It is reported that in an American trial only 5 out of 602 patients had drowsiness. During the early part of this year I carried out a pilot trial of this drug in 13 patients with chronic urticaria, all of whom had been on various antihistamines up to the time of the trial. Six patients had much more drowsiness than with the previous antihistamines, and in five of these the rash was also more severe whilst on nilergex. In only one patient was the side-effect, a feeling of tension, less than when on the previous antihistamines.

I have been used to comparing antihistamines in a separate out-patient clinic for cases of chronic urticaria held during the last nine years, and I appreciate the snags connected with such trials. One of the difficulties is to establish equipotent doses of the drugs, as the degree of urticaria often fluctuates. Because of the small number of patients, I did not feel that the trial was worth reporting. However, since this time I have seen a few patients treated with nilergex by their family doctors, and have been impressed by the number who have had drowsy side-effects, and now Dr. A. Fry in his letter (*Journal*, September 6, p. 636) records drowsi-

ness after taking this drug. Dr. Fry also raises the serious question of car-driving whilst on antihistamines. It is a difficult subject, and, perhaps wrongly, I do not seek to impose restrictions on my patients other than to advise that they take the tablets for a few days before driving, in order to assess any soporific effects. I cannot bring myself to talk of, or write about, antihistamines without adding that the patients should always be advised to keep them away from children.—I am, etc.,

Bristol.

ROBERT P. WARIN.

REFERENCE

¹ Report to the American College of Allergists at the 13th Annual Congress, Chicago, Illinois, 1957, *Ann. Allergy*. In press.

Posture and Blood Pressure in Pregnancy

SIR.—Further to the letter from Dr. P. R. Boucher and Dr. Margaret J. Turpin (*Journal*, September 13, p. 693), I have found that the pressure in the sitting position is nearly always lower than in the recumbent. It seems desirable to use the latter in most cases, for the patient is more at ease and it is less difficult to standardize conditions. I think that, as the arm rises or falls above or below heart level, the phenomenon is explainable on ordinary hydrostatic principles.

What is not in the books, or at least what I have failed to find, is the effect of alcohol on arterial pressure. I remember a young man of 30 who was quite frank about a drinking party the night before. His pressure was 155/115 and he was passing sugar. I told him to come the next day, when the readings were 130/80 and no sugar was found. I have seen several similar cases. I hope to start some investigations in this matter if I can obtain the necessary facilities. Because alcohol is a vasodilator it has been too easily assumed that it will lower pressure. Some other mechanism is clearly involved.—I am, etc.,

Hitchin, Herts.

G. C. PETHER.

Complications of Pertussis Immunization

SIR.—I was interested to read Dr. D. Leigh's letter (*Journal*, September 6, p. 637). I have had a similar experience, but following the third diphtheria-pertussis immunization, the baby presumably being sensitized by the first two doses.

I gave a 5-months-old boy his third diphtheria-pertussis injection. Within four hours I was called back to find the baby collapsed and pulseless. I noticed baby food on the kitchen table, and, assuming that he had inhaled some, I immediately turned the baby upside down and put my finger down his throat. After a minute or two the child's colour improved and its pulse became palpable. On questioning the mother, who was a midwife, I discovered that the child had not yet been fed and that there had been no convulsion preceding the collapse. Some three hours later the baby once again became collapsed, but soon after my arrival it recovered without any treatment and there has been no further trouble.

The only history of allergy in the family is that the paternal grandmother was an asthmatic.—I am, etc.,

York.

PETER JONES

Radiological Societies

SIR.—It is with mixed feelings that one sees an announcement in the *Journal* of September 20 (p. 751) of the formation of yet another society of radiology. You were kind enough to publish a letter from me in 1950¹ drawing attention to the number of radiological societies of varying ages and activities already in existence in this country, and suggesting that the specialty could no longer adequately maintain all these societies. As a result of that letter a liaison committee was formed between two of the principal organizations, and this committee has prevented some overlapping of effort and has co-ordinated activities when a common front appeared to be appropriate.

Unfortunately, however, since that time various smaller private and public splinter groups have been set up to further social, political, or specialist radiological activities

both at national and regional levels. Now one is faced with yet another body. Surely it would have been preferable if those engaged in dental radiology, feeling that their needs were catered for inadequately, had approached some of the established bodies to discuss the best method of meeting those needs. This multiplicity of bodies in the organization of radiology can do nothing but harm, and may, indeed, through misdirection of effort, become actually dangerous.—I am, etc.,

Newton Abbot.

A. ROBINSON THOMAS.

REFERENCE

¹ Thomas, A. Robinson, *Brit. med. J.*, 1950, 2, 530.

Trials of Contraceptive Methods

SIR.—The Council for the Investigation of Fertility Control is trying to organize clinical trials to test the efficacy of existing methods of contraception. We are also hoping to try modifications of these methods, and ultimately, we hope, entirely new methods will be tested in the same way.

To establish any new method of contraception needs volunteers who are willing to run a reasonable risk of becoming pregnant and who are also likely to be fertile. We have in fact two groups of trials running at present: Group 1, in which the volunteers use the method for from 3 to 12 months and then prove both its effectiveness and their fertility by becoming pregnant; Group 2, in which volunteers use a method for about a year, being prepared to run the risk of its failing but not being willing to undertake deliberate pregnancy after the trial. There is also a third trial in which patients are seen and medically examined at a special clinic session in London. Groups 1 and 2 patients are not seen unless the patient/volunteer specifically wants to be seen.

In view of our lack of accurate figures about the effectiveness of modern contraceptive methods and because of the importance of this problem both to individual families and to world population trends, we feel that the trials are of vital importance. If any of your readers can put us in touch with volunteers (who should write to the Medical Secretary at this address) we would be most grateful.—We are, etc.,

Council for the Investigation of
Fertility Control,
64, Sloane Street,
London, S.W.1.

G. I. M. SWYER,
Chairman, Technical Subcommittee.
H. B. WRIGHT,
Medical Secretary, Technical Subcommittee.

POINTS FROM LETTERS

Electrified

Dr. J. LAMB (Edinburgh) writes: With regard to the electric shocks received on examining patients, may I offer a similar experience and explanation? When I was a house-physician I found that I was unable to wear a certain pair of crêpe-soled sandals in the wards, because touching the patient or their beds gave rise to sparks at the place of contact. . . . The explanation was, I think, that the crêpe soles of the shoes acted as insulators, and so one's body became charged up with static electricity (e.g., by rubbing against blankets), and touching the patient or bed allowed this static charge to discharge to earth.

Tattooing

Dr. JNO. CRAWFORD (Sutton) writes: I wish to support heartily the suggestion of Dr. Derek Bunting (*Journal*, August 2, p. 326) that steps should be taken to protect juveniles from the mutilation of tattoos. As a ship surgeon for some years, I have seen many hundreds, some quite elaborate, and a very large proportion a matter of regret in later years; as a rule, the more improved the social status, the more acute the shame. In a simple case a young man with a ring tattoo on each finger and thumb, and tattoo bracelet on each wrist, would probably find his chances of advancement, social or otherwise, seriously handicapped. In ships there are a number of deck boys, saloon boys, laundry boys, joining usually at the age of 16, less often 17. Boys must be men, and quite commonly at the first port, possibly under the influence of unaccustomed alcohol, they are persuaded to have these operations. Restrictions at home would no doubt help, but I believe the bulk of seamen have these things done in foreign ports.

Obituary

A. C. PEARSON, M.D., M.R.C.O.G.

Dr. A. C. Pearson, consultant obstetrician and gynaecologist to the Chelmsford and Essex Hospital, was killed in a car accident at St. Inglevert, between Calais and Boulogne, on September 22. He was 40 years of age.

Anthony Cecil Pearson was born on July 28, 1918. He received his medical training at the Middlesex Hospital, graduating M.B., B.S. from London University in 1943 and proceeding to the M.D. six years later. He was elected a Member of the Royal College of Obstetricians and Gynaecologists in 1948. After graduation he held the appointments of registrar in the department of obstetrics and gynaecology at the Middlesex Hospital, resident medical officer at Queen Charlotte's Hospital, and senior registrar in the department of obstetrics and gynaecology at the London Hospital. From 1944 to 1946 he was in the R.A.M.C., and served with No. 2 Field Ambulance in the Middle East Force. In 1950 he was appointed consultant obstetrician and gynaecologist to the Chelmsford and Essex Hospital and to other Essex hospitals. He was elected chairman of the Mid-Essex Division of the British Medical Association in July, 1957.

K. O. G. writes: It was a pleasure to know Tony Pearson. As a colleague his opinion was of the best, and he showed a sympathy and understanding towards his patients which endeared him to them. He took every opportunity, in the local clinical societies, to discuss cases and problems with his colleagues. In this way he gave an example of what to-day is called intraprofessional relationship which made us feel very lucky to have such a man with us. He enjoyed teaching, and besides those in the hospital there are many who have been stimulated by the clarity with which he was able to elucidate the many clinical problems brought to him. He always appeared serene, unhurried, and, at times, one to whom time was of secondary consideration, but if late for an appointment his charm soon made us forget any irritation we may have felt. His friendship was very genuine, and in his kindness, sympathy, and unhesitating help to those in personal distress was no less real. He had a nice sense of the ridiculous; this, with his humour and enthusiasm, made many an encounter a gay affair. Much of his serenity came from his home, as it was there with his wife and children that he was completely happy. It is this knowledge that makes his death such a tragedy. He will be sadly missed by his friends and colleagues, who extend their deepest sympathy to his widow and three young children.

JAMES MILLER, M.D., D.Sc., F.R.C.P.Ed.

Dr. James Miller, who was professor of pathology in Queen's University, Kingston, Ontario, for a quarter of a century, died at his home at Painswick, Gloucestershire, on September 21. He was 82 years of age.

James Miller was born on October 1, 1875, the eldest son of Dr. A. G. Miller, and was educated at Edinburgh Academy and at Edinburgh University. He first graduated in science, in 1896, but went on to read medicine and obtained the degrees of M.B., Ch.B., with second-class honours, in 1899. Elected a Member of the Royal College of Physicians of Edinburgh in 1902, he was admitted a Fellow of the College nine years later. After graduating in medicine he held the appointment of resident physician at Edinburgh Royal Infirmary, and in 1900 served in South Africa as an assistant surgeon with the Edinburgh and East of Scotland Hospital. From 1902 to 1909 he was lecturer in pathology

and bacteriology in Birmingham University, and during the last three years was visiting pathologist to Birmingham General Hospital. He proceeded to the M.D. in 1903, gaining a gold medal for his thesis, and in the following year was granted the Birmingham D.Sc. For a few years, until the outbreak of the first world war in 1914, he examined in his subject for Aberdeen University. During the war he was pathologist to the 2nd Scottish General Hospital, with the rank of captain in the R.A.M.C., and at the same time he held the appointments of lecturer in the school of medicine of the Edinburgh Royal Colleges and in Edinburgh University and pathologist to the Royal Edinburgh Hospital for Incurables. He left Scotland in 1920 to become professor of pathology in Queen's University, Kingston, Ontario, and occupied the chair until 1946, when he returned to the United Kingdom, finally settling at Painswick in 1950. While in Canada he was also consulting pathologist to the Ontario Department of Health. A member of the British Medical Association for fifty-seven years, he served as a vice-president of the Section of Bacteriology, Pathology, Physiology, and Biochemistry when the Association held its Annual Meeting at Winnipeg in 1930. He was the author of *Practical Pathology, including Morbid Anatomy and Post-mortem Technique*, published in 1914. In 1907 he married Miss Margaret E. Clare, by whom he had one son and three daughters.

A. R. JORDAN, M.D., F.R.C.S.

Mr. A. R. Jordan, who was a general practitioner, with a particular interest in surgery, at Dover for many years, died at Ashford Hospital on September 11. He was 75 years of age.

Anson Robertson Jordan was born at Woolwich on July 4, 1883, the son of the Rev. Joseph Jordan, vicar of that parish. After the death of his father at an early age, his family moved to Bedford. He won an exhibition to Bedford School, and from there entered Clare College, Cambridge, where he obtained a first-class in the Natural Sciences Tripos in 1904. He graduated M.B., B.Chir. in 1907, proceeded to the M.D. in 1910, and was admitted a Fellow of the Royal College of Surgeons of England in 1911. After graduation he held the appointments of house-surgeon at the London Hospital, where he received his clinical training, and house-physician at Bristol Royal Infirmary. He first began general practice at Cambridge, where he was ophthalmic clinical assistant at Addenbrooke's Hospital, but before long he moved to Dover in 1913, to start his long association with that town. He joined the R.A.M.C. in 1914, on the outbreak of the first world war, and spent most of his Army career as a captain with No. 29 Casualty Clearing Station in France, working extensively on abdominal surgery. On his return to Dover he again took up general practice, and also surgery at the Royal Victoria Hospital, Dover. Between the two world wars he worked unceasingly at his surgical work and practice, endearing himself to his patients by his understanding and to his colleagues by his example and for his help to the younger members of his profession. He never married, and the loss of his sister (herself for some time on the staff of the London Hospital) in 1930 left him very much alone. In 1937 he went into temporary retirement at Cambridge, but found the inactivity did not suit him. He re-entered general practice a year later at Sandgate, Kent. After the outbreak of the second world war in 1939 his surgical skill was used to the full when he took up residence in Buckland Hospital, Dover, and worked for long hours dealing with casualties resulting from the British evacuation of the Dunkirk beaches; and later under most difficult circumstances during attacks by bombs, shells, and flying bombs. With the cessation of hostilities he returned to his practice in Sandgate. In 1948, as he never wished to go into complete retirement, he left Sandgate to take up a small administrative post in Buckland Hospital, which kept him in daily touch with his colleagues and friends of long standing. He

died as he wished, still part of the hospital staff. By way of relaxation he read extensively, especially theology and history, and was always eager to answer questions and hold long conversations on these subjects. He was a keen motorist and mechanic, and in the early days of motoring toured the country extensively, encountering all the hazards on his itinerary. A member of the British Medical Association for over forty years, he was honorary secretary of the Folkestone and Dover Division from 1922 to 1926 and acting honorary secretary from 1940 to 1945. He was also chairman of the Division from 1933 to 1935.

M. F. O'HEA, M.B., B.Ch.

Dr. M. F. O'Hea, radiologist to St. Vincent's Hospital, Dublin, died on September 8.

Michael Fergus O'Hea was born in County Cork, and received his early education at Castleknock College, Dublin, from which he entered the old medical school of Newman's foundation (now merged in University College, Dublin). After qualifying by taking the Irish Conjoint diploma in 1910, in which year he gained the Bellingham gold medal in medicine at St. Vincent's Hospital, he held house appointments at that hospital and the Children's Hospital, Dublin. In 1915 he obtained the degrees of M.B., B.Ch. of the National University of Ireland. He succeeded the late Mr. H. S. Meade as lecturer in radiology at St. Vincent's Hospital, and it was as a radiologist that he continued to serve the hospital until his death. He also examined in his subject at University College.

W. D. writes: After a long and busy professional life, punctuated uncomplainingly with periodical struggles against ill-health, Michael O'Hea has slipped away from our midst to the peace he so richly deserves. As one grows older the bare spaces on one's skyline increase in number, and to-day we mourn the passing of one of the bravest and most loyal colleagues any man could wish to have. He qualified in 1910 with P. T. O'Farrell, a Past-president of the British Medical Association, and the late Harry Meade, and all three served, with me, in their first house appointments at St. Vincent's Hospital, Dublin. From there O'Hea went on to a similar post at the Children's Hospital, Temple Street. A year or two later he was appointed to our x-ray department, in succession to Meade, on the latter's promotion as assistant surgeon. The department was then a small one, and the duties part-time only. With the rapid increase in calls on his time owing to the growing expansion of radiological services, O'Hea was beginning to feel the strain of the combination of private practice and long hours of service within the department, when fate struck. But recently married, he was compelled to lay aside work of either kind, and a tedious spell in a Welsh sanatorium ensued. On his return, he knew that henceforward radiology alone was to be his *métier*. Securing an active and energetic assistant, he devoted himself wholly to the development of his department, each year slipping away quietly to one or other of the bigger centres in England to return with a new technique or better equipment. On one such expedition he invited me to accompany him to Germany as an interpreter, that we might together report to the hospital authorities on the recent introduction by Wintz, of Erlangen, of deep x-ray therapy. We travelled by boat from Rotterdam up the Rhine to Mainz, breaking off there for our objective, Victor Schmieden's Klinik at Frankfurt-am-Main. It was an unforgettable fortnight, for reasons grave and gay. In our student days he had been a shy and silent companion, wholly concentrated on the work immediately ahead of him. Now was suddenly revealed the mature man of unsuspected delicate taste, who revelled in the beauties of nature and the colours on either bank as we steamed slowly up-river over a succession of days, and later in the old mediaeval city with its Römer and its many *Gassen*. But they were the days of devaluation, in which none paid more hardly for defeat than the children in the hospital upon whom had fallen

the penalties of undernourishment. Even O'Hea's epicurean choice of a new wine at dinner or his love of music refreshed on a visit to the opera could not wipe the memory of those emaciated infants from his mind. In all things he was a very gentle man, the "gentil parfit knight" of Chaucer's *Tales*. His courtesy was that of a bygone, less hurried age. Tall, erect, impeccably tailored, the manner was the man, whom past students and friends never failed to visit on their return to the hospital. He loved good-fellowship, and to him we entrusted the arrangement of our hospital dinners even when he was debarred in wintry weather from attending them. From the first ill stroke of fate he had learned to fit his life to its handicap. In every step of this he was nobly assisted by his wife and children. They had been his first thought when he had to reconstruct his manner of living, and, one is sure, his last as he slipped across to his reward on the other side.

R. H. SWINDELLS, M.B., Ch.B., F.R.C.S.Ed.

Dr. R. H. Swindells, formerly medical superintendent of New End Hospital, Hampstead, died suddenly at his home at Richmond, Surrey, on August 28. He was 77 years of age.

Raymond Herbert Swindells was born on November 26, 1880, and was educated at Owens College, Manchester, graduating M.B., Ch.B. from the Victoria University of Manchester in 1903. He was elected F.R.C.S.Ed. in 1908. After graduation he held the appointments of assistant house-surgeon at Taunton and Somerset Hospital and at Derbyshire Royal Infirmary, house-physician at Manchester Royal Infirmary, house-surgeon at York County Hospital, and assistant medical officer to the outpatient department of Manchester Children's Hospital. In 1911 he was appointed assistant medical superintendent to Fulham Infirmary. During the first world war he was a captain in the R.A.M.C. attached to the 3rd East Anglian Field Ambulance, and saw service in Gallipoli and Palestine. After demobilization he returned to Fulham to his former post, which he held until his appointment to New End Hospital in 1930 as medical superintendent. After his retirement in 1946 he lived at Richmond. He leaves a widow and two sons.

C. H. GUNSON, M.B., Ch.B.

Dr. C. H. Gunson, who was in general practice at Wisbech, Cambridgeshire, for over fifty years, died at his home there on September 8, after an illness of six weeks' duration.

Charles Herbert Gunson was born at Glasgow in 1876, the son of the Rev. John Gunson, and was educated at Dollar Academy, Glasgow High School, and at Glasgow University. He graduated M.B., Ch.B. in 1900, gaining a first-class certificate of merit, a high distinction in surgery, and distinctions in materia medica, therapeutics, pathology, and midwifery. Soon after graduation he became resident medical officer at the North Cambridgeshire Hospital, Wisbech, and two years later settled in general practice in the town. In 1904 he was appointed to the honorary medical staff of the hospital. He was medical officer to Wisbech Post Office from 1905 to 1948, when the appointment lapsed on the inception of the National Health Service, and from 1907 to 1939 he was part-time medical officer of health for the Wisbech rural district. During the first world war he served as a captain in the R.A.M.C. in Alexandria and Gaza. Keenly interested in the work of the British Legion, he was a founder-member of the Wisbech branch and its president for many years. He was honorary assistant county director of the Cambridgeshire branch of the British Red Cross Society during the second world war. A member of the British Medical Association for nearly 50 years, he was chairman of the Isle of Ely Division in 1915. For six years he was a member of the

Wisbech town council, having previously served on the Walsoken urban district council for some years before it was merged in the borough of Wisbech. He was also vicar's warden and bishop's reader at St. Augustine's Church, and a founder-member of the Wisbech Caledonian Society, of which he was president in 1951. At the funeral service of St. Peter's Church was filled to capacity, an indication of the esteem in which he was held by the townspeople. He was twice married. First, in 1901, to Miss Alice M. Greene, who died in 1951, three weeks after the golden anniversary of their wedding; and secondly, in 1953, to Miss Hilda M. Goodbody, formerly headmistress of a local school, who survives him, together with the son and daughter, Dr. Vivienne M. Hurst, of his first marriage.

G. W. POOL, M.R.C.S., L.R.C.P.

Dr. G. W. Pool, who was in general practice at Felixstowe for some forty years, died at his home there on September 14.

Garnet Wolseley Pool was born at Hayle, Cornwall, in 1884. He studied medicine at St. Thomas's Hospital, qualifying M.R.C.S., L.R.C.P. in 1915. Shortly afterwards he joined the Royal Navy for service during the first world war. He was transferred to the Royal Naval Air Service and posted to Felixstowe, and, later, as fleet surgeon, served in the Mediterranean in H.M.S. *St. George*. After the war he returned to Felixstowe, where he was in practice until three weeks before his death. He soon became an established and well-loved figure in the town, taking part in its activities and life. An excellent and conscientious physician, he was also a skilled obstetrician and an accomplished anaesthetist. He leaves a widow, the daughter of the late Mr. Samuel Rowbotham, of Felixstowe, one son, and one daughter.—A. S.

L. A. WILSON, M.R.C.S., L.R.C.P.

Dr. L. A. Wilson, who was in general practice at Barrow-in-Furness for some forty years, died at Littleover, Derby, on September 15. He was 79 years of age.

Lorton Alexander Wilson was born at Skipton-in-Craven, Yorkshire, on August 10, 1879. His father was Dr. J. Forsythe Wilson, and he was the elder brother of Charles McMoran Wilson (now Lord Moran). He was educated at Epsom College and Owens College, Manchester, qualifying M.R.C.S., L.R.C.P. in 1907. After qualification he joined his father in Barrow-in-Furness, succeeding to the practice a few years later. During the first world war he was a captain in the R.A.M.C. attached to the 4th battalion of the King's Own Royal Rifles and served in France. After the war he returned to his practice, and retired in 1946. A member of the British Medical Association for nearly forty years, he was honorary secretary of the Furness Division for the exceptionally long period of twenty-five years. He was also chairman of the Division in 1930-1 and president of the old North Lancashire and South Westmorland Branch in the latter year.

J. R. T. writes: The passing of Dr. Lorton Alexander Wilson from our midst brings back many memories of over twenty years' association with him in Barrow-in-Furness. Coming to Barrow a year or two before the first world war, he entered general practice and became a member of the local panel committee. During the war he was on active service for some years, but on returning to practice he became honorary secretary of the panel committee, and shortly afterwards began his great work as honorary secretary of the Furness Division of the B.M.A. In addition to these duties he took on the secretaryship of the Juvenile Medical Club in the town. His service as secretary of the Division of the B.M.A. continued until his retirement in 1946—of the twenty-five years. This is the period during which I had the opportunity of observing his capacity and talent for organization. In spite of the burden of a busy practice, he was always ready to meet any of his colleagues in any difficulty or trouble connected with the Association. Meet-

ings in some matters were held at his home, pleasantly enlivened by his hospitality. During the second world war additional responsibility was thrust upon him by the protection of practices scheme and by the local medical recruitment committee. He was also the medical officer in charge of the Home Guard in the town. Only by a gift for organization in a superlative degree could one man carry out, for years, all these manifold duties in addition to his work as a general practitioner. In conclusion I like to remember his kindness to me and to all he came in contact with, his welcome to newcomers to the Division, and his complete freedom from professional jealousy.

M. MARITSCHKE, M.D.

Dr. M. Maritschek died at his home in London on September 10. He was 83 years of age.

Moriz Maritschek was born in Vienna on May 15, 1875. He studied medicine at Vienna University and obtained his M.D. there in 1901. After clinical appointments in both Vienna and Dresden he started a practice as a physician in Vienna, well before the outbreak of the first world war. He made a name for himself as an excellent diagnostician. Devoting all his ability and experience to the well-being of his patients, he was able to build up a considerable practice. A victim of Nazi persecution, Dr. Maritschek had to leave Austria, and came to London only a few days before the outbreak of the second world war. Having lost everything, it was not easy for him to settle in the new country which he regarded with gratefulness as his second homeland. His profession meant so much to him that he gladly attended courses at London hospitals, and, when permitted to do so, worked as assistant to medical practitioners during the war. Although advanced in age, he was happy to join the National Health Service from its inception in 1948. Once again, settling in Hampstead, Dr. Maritschek started to build up a practice. Many of his former patients returned to him, and many others also sought his medical advice. His modesty, his friendliness, and his noble character were outstanding. He was the ideal family doctor of the "old school" who had always time for his patients. When he was taken ill in 1957, only temporarily recovering, he once said: "As I feel I cannot give any more of my best to my patients, I have to retire." This he did. After more than 50 years in general practice, Dr. Maritschek could unfortunately not enjoy his days of retirement. His health was failing and he passed away, 83 years old. He is survived by his devoted wife, so dear to him and an invaluable help in his practice. His many friends will always cherish his memory, and so will many of his colleagues, who held him in high esteem.—L. N.

FREDERICK ELLIOTT, M.B., B.S.

Dr. Frederick Elliott died on August 29 at his home at East Sheen, London, at the age of 47.

Frederick Elliott was born at Sunderland in 1911, and was educated at the Royal Grammar School, Newcastle upon Tyne, entering the medical school at Newcastle in 1931. After graduating M.B., B.S. (Durham) in 1936, he held the posts of house-surgeon at the Victoria Jubilee Infirmary and Fleming Memorial Hospital, Newcastle upon Tyne. It was his original intention to enter general practice, but before doing so he wished to see something of conditions overseas, and, with this object in view, he joined a steamship line as a ship surgeon, completing several voyages to the Middle and Far East. He married Miss Joan Bullen in 1939, but his intention to settle down in general practice was interrupted by the outbreak of war. Joining the Territorial Army in September, 1939, as a captain in the R.A.M.C., he saw active service in the Western Desert, Persia, Iraq, and Sicily. It was in Sicily, in January, 1944, that he was severely wounded in action, remaining in hospital for over a year before discharge in 1945 as medically unfit for further service, his right leg having been

amputated below the knee and his left knee-joint ankylosed. Some months after his discharge from the Army he joined the staff of the Ministry of Pensions, serving as a limb-fitting surgeon in the Ministry's establishment at Roehampton, where his specialized knowledge of artificial limbs was of the greatest value to his patients. Literary contributions of his during this period at Roehampton included a chapter in *Disabilities and How to Live With Them*, and "Loss of a Leg" (*Lancet*, 1948). In 1949 he joined the Home Office as an established medical officer and served in that capacity until his death.

P. L. C. C. writes: Frederick Elliott's death is a great loss to his friends and colleagues. His cheerful acceptance of his physical disability, the result of his war service, endeared him to all who knew him. Possessing a keen sense of responsibility, he brought to his work not only high professional capability but a quality of understanding and tact which impressed itself upon all with whom he came in contact. It will not surprise his many friends that, throughout his last illness and up to the end, he faced with great fortitude and patience what his own medical knowledge must have told him from the onset was a hopeless prognosis. To his wife and young daughter, the small family to which he was so devoted, and in which he had so much happiness, they will wish to extend their deepest sympathy.

H. A. SANDIFORD, M.C., M.B., D.P.H.

The obituary of Brigadier H. A. Sandiford was printed in the *Journal* of August 23 (p. 513).

Dr. GERALD I. PHILLIPS writes from Durban, South Africa: Among the many tributes to the late Brigadier Sandiford which have appeared, I would appreciate a small amount of space to add a sincere tribute from one of the "common men" from a far-off land. On a cold, cheerless January day in 1954—the coldest on record for 17 years—I arrived in London, unknown, unheralded, and, it appeared to me, unwanted. Armed with despondency and a fair share of fear for the future, I made my way to the Mecca of overseas students, the B.M.A.'s Commonwealth Medical Advisory Bureau, where I was introduced to Brigadier Sandiford. I spent only 15 minutes with him at that initial meeting, but it took no more to make me realize that, in spite of all the official posts which he had held in the past, he was to all of us a plain and simple "father." He turned a chilly, wet, miserable London day into one as sunny and warm as any I had ever experienced in my own South Africa. Where there was despondency he brought hope, where there was fear he brought confidence, and for my loneliness he exchanged friendship. However great the loss his departure will seem to those who knew him, so much greater will it be to those who were unfortunate not to have come within his sphere of influence. It is an accepted dictum in life that nobody is indispensable, but, just as there is an exception to every rule, so Brigadier Sandiford became the exception to this ancient dictum. In my country, when we bid farewell to friends we have known and loved, we say, "Totsiens." To Brigadier Sandiford—for the privilege of having known whom I thank God—I, too, bid a fond farewell and *totsiens*.

Medico-Legal

DRIVER'S UNSUSPECTED DIABETES

[FROM OUR LEGAL CORRESPONDENT]

Thomas George Wickins was convicted at Bournemouth Quarter Sessions after pleading guilty to driving his car while under the influence of drink or drugs to such an extent as to be incapable of having proper control. The Recorder found that his condition was due to the combined effect of

¹ *The Times*, July 15.

diabetes and his normal beer intake, and at the time of the offence he had not known that he was suffering from diabetes. He was disqualified from driving for 12 months, since the Recorder, though considering the case not to be serious from the moral point of view, did not think these circumstances could amount in law to a "special reason" within s. 15(2) of the Road Traffic Act, 1930, for not disqualifying him.

The Court of Criminal Appeal on July 14 allowed his appeal against the disqualification.¹ They held that in Mr. Wickins's case there was a mitigating circumstance which while not amounting to a defence was directly connected with the offence and might properly be considered in imposing punishment. Had it not been for the diabetes, of which he was ignorant, the offence would not have occurred. The requirements of a "special reason" for not disqualifying were thus fulfilled.

Vital Statistics

Health in R.A.F.

Athletic sports were the most common cause of injury in the R.A.F. in 1954, according to the report for that year, just published. They accounted for 27% of all injuries as compared with 28% in 1953 and 22% in 1952. Motor-cycle accidents caused 10% of all injuries and flying accidents 2.3%.

The chief cause of invaliding from the Service was mental disorder (22.5%). This was followed by tuberculosis (11.8%), locomotor diseases (10.2%), and diseases of the ear and mastoid (8.7%).

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in August was 56, compared with 104 in the previous month, and 98 in August, 1957.

The number of cases of industrial diseases in the United Kingdom reported during August, 1958, were as follows: lead poisoning 1, aniline poisoning 1, compressed-air illness 1, epitheliomatous ulceration 10, chrome ulceration 13: total 26. There were no deaths.—*Ministry of Labour Gazette*, September, 1958.

Week Ending September 20

The largest rises in the number of notifications of infectious diseases in England and Wales during the week ending September 20 were 138 for scarlet fever, from 296 to 434, 81 for dysentery, from 329 to 410, 67 for food-poisoning, from 302 to 369, and 30 for acute pneumonia, from 145 to 175; the largest falls were 133 for measles, from 1,603 to 1,470, and 28 for whooping-cough, from 746 to 718.

A notable increase in the notifications of measles was 60 in Lancashire, from 226 to 286. The increase in the incidence of scarlet fever was due to a small rise in most areas of the northern half of the country. Only small fluctuations were reported in the local returns of whooping-cough. 2 cases of diphtheria were notified, being 1 less than in the preceding week.

6 of the 11 cases of paratyphoid and typhoid fever were notified in London.

The notifications of acute poliomyelitis numbered 79, and these were 8 more for paralytic and 9 more for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 19 (Leeds C.B. 5, Dewsbury C.B. 3, Shipley U.D. 3, Ripponden U.D. 2, Hemsworth R.D. 2), Lancashire 18 (Manchester C.B. 7, Burnley C.B. 3, Bolton C.B. 2), Somersetshire 6 (Burnham-on-Sea U.D. 4).

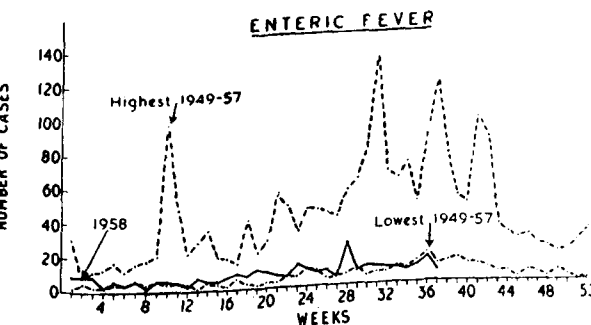
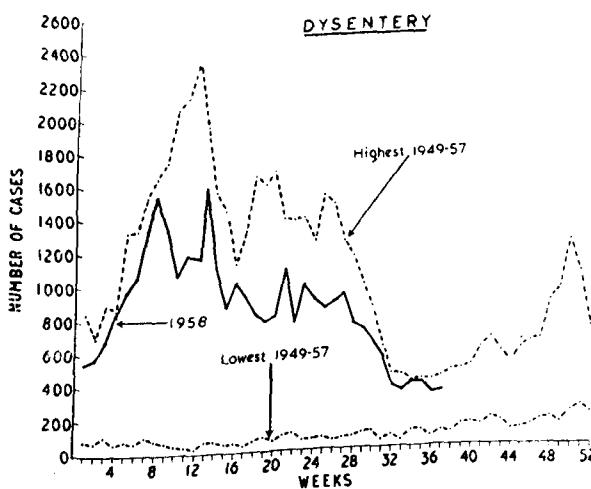
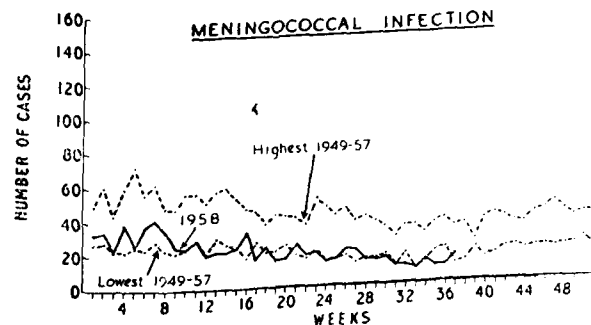
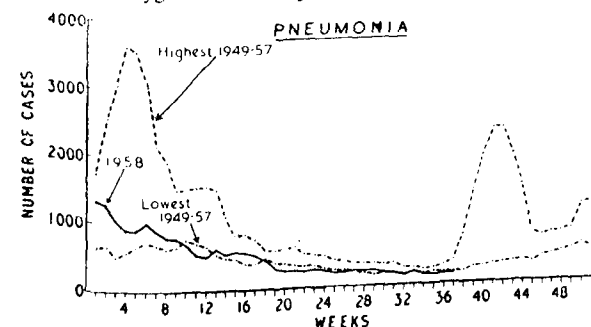
The chief centres for dysentery were London 63 (Islington 17, Bermondsey 10), Lancashire 60 (Liverpool C.B. 28), Yorkshire West Riding 46 (Leeds C.B. 12), Nottinghamshire

35 (Basford R.D. 17), and Warwickshire 20 (Birmingham C.B. 14).

The largest outbreaks of food-poisoning were 29 in Doncaster C.B. and 30 in West Lancashire R.D.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus -----, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending September 13 (No. 37) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	3	0	0	0	0	2	0	2	0	1
Dysentery	329	54	141	15	14	213	18	99	11	10
Encephalitis, acute	2	1		0		6	0		0	
Enteric fever: Typhoid	2	0	0	1		4	0	0	2	
Paratyphoid	4	0	4(B)	0	4(B)	15	0	2	0	
Food-poisoning	302	55	21	2		260	40	32	0	
Infective enteritis or diarrhoea under 2 years				11	67				16	34
Measles*	1,603	94	20	12	34	1,237	28	18	19	22
Meningococcal infection	16	2	9	1		18	1	8	2	1
Ophthalmia neonatorum	48	7	4	0		38	1	6	0	
Pneumonia†	145	12	127	1	1	333	30	165	0	
Poliomyelitis, acute: Paralytic	40	1		0	9	116	8		13	18
Non-paralytic	22	0	16	0		84	7			6
Puerperal fever§	206	33	6	0		237	42	4	1	
Scarlet fever	296	30	66	10	28	323	34	57	10	16
Tuberculosis: Respiratory	500	71	90	31		473	64	95	13	
Non-respiratory	69	5	19	2		69	6	15	1	
Whooping-cough	746	38	115	56	24	771	50	50	1	9

DEATHS	1958					1957				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0		0	0	0	0
Dysentery	1	0		0			0		0	
Encephalitis, acute		0		0			0			0
Enteric fever	0	0	0	0			0	0	0	
Infective enteritis or diarrhoea under 2 years	4	0	0	0	1		0	0	2	1
Influenza	2	0	0	0	0		3	1	0	0
Measles		0	0	0			0	0	0	0
Meningococcal infection		0	0				0	0		
Pneumonia	273	14	7	10	11		23	10	9	4
Poliomyelitis, acute	4	0	1	0	0		0	0	1	0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory	67	6	3	0			1	2	0	2
Non-respiratory		0	0	0			0	1	0	0
Whooping-cough	1	0	0	0	0		0	0	0	0
Deaths 0-1 year	281	26	29	4	22		26	25	3	9
Deaths (excluding stillbirths)	7,759	614	467	89	151		634	529	101	167
LIVE BIRTHS	13,702	1,159	918	197	324		11,031	900	228	301
STILLBIRTHS	298	22	15				14	18		

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

Medical News

Royal College of Surgeons.—The College held its annual meeting in Cardiff on September 26 and 27, under its president, Sir JAMES PATERSON ROSS. This is the first time the annual meeting has been held in Wales, and only the second occasion it has been outside London. The surgeons of Bristol joined with those in Cardiff in acting as hosts to the College, and the Lord Mayor and Council of Cardiff signified the city's welcome by a reception at the Castle. Besides the annual business meeting of the College, there was a dinner for fellows and members on the first evening; a clinical morning at the Royal Infirmary, where operations, films, and scientific exhibits were demonstrated; followed by a luncheon given by the governors of the United Cardiff Hospitals, and a lecture by Sir RUSSELL BRAIN, who had earlier been made an honorary F.R.C.S. The College's visit was greatly appreciated; as one speaker at the dinner put it, why should not the College add Wales to its title? The dinner, under the chairmanship of the president, was attended by some 200 fellows and members and their guests. Sir PHILIP MORRIS, Vice-Chancellor of Bristol University, proposing the toast to the College, congratulated them on venturing outside London, leaving the barbarity of the metropolis for the ancient civilization of Wales. In the last resort, standards of treatment depended not on administrative arrangements and new techniques but on the friendly intercourse of those engaged in the practice of medicine. Sir JAMES PATERSON ROSS, replying, referred to the College's intense activity in teaching and research. At the moment about 1,000 postgraduate students a year, from all parts of the Commonwealth, were attending the College's courses. He appealed for a sense of belonging to the College on the part of its fellows and members, and for their support in maintaining the College's work. New fellows were now being asked for an annual subscription for this reason. The toast of "The Guests," who included the Lord-Lieutenant of Glamorgan, the Lord and Lady Mayoress, the presidents of two sister Colleges, and Sir CLEMENT PRICE THOMAS, the new president of the Welsh National School of Medicine, was proposed by Professor LAMBERT ROGERS. Guided by a letter in this *Journal* on after-dinner speeches (*Supplement*, August 30, p. 130), he toasted them collectively while assuring them that their invitations had indeed been truly individual. The Lord Mayor of Cardiff, Alderman A. J. WILLIAMS, and the chairman of the board of governors of the Bristol United Hospitals, Colonel H. BLAND STOKES, replied.

Teaching Hospital for Cardiff.—Speaking at Brecon on September 16, Mr. DEREK WALKER-SMITH announced a further step in the planning of a new teaching hospital at Cardiff and the Welsh National School of Medicine. "I have now been able to authorize the board of governors to proceed to the next stage," he said, "the appointment of the architects; and I understand that it is their intention to hold an architectural competition. The board will now be able to get on with the drawing of detailed plans, including provision for a dental school. This, however, will inevitably take a considerable time, and it is not possible at this point to name a starting date for building, which, of course, will have to be fitted into the total capital investment programme for hospitals."

Royal College of Obstetricians and Gynaecologists.—Professor G. SHEDDEN ADAM, of Brisbane, has been appointed Bernhard Baron travelling scholar for 1959. The following were admitted to membership of the College at a meeting of the council on September 26:

P. Aiman, P. H. Amarasinghe, D. T. C. Barber, C. T. H. Barrett, W. P. Bonnici, J. Breeze, J. M. Brudenell, D. P. Chan, H. J. H. Claassens, C. J. T. Craig, D. R. Das, R. M. Davie, R. F. Drake, G. R. Duncan, D. Edwards, G. H. Ellidge, W. H. Fernando, L. H. Fienberg, J. M. G. Harley, D. Heginbotham,

J. B. Hemsley, A. H. Hsu, T. R. Hunt, P. J. Huntingford, S. R. Ingold, K. I. Jack, R. D. Johnstone, E. W. P. Jones, A. J. Keane, A. C. Keast, D. M. D. King, S. V. Kinley, D. R. Lowe, J. McGlone, S. Malhotra, D. T. Mathews, C. C. Mitra, W. P. L. Morrison, A. D. Muirhead, S. Muscat, I. R. Napier, H. J. Pash, J. H. Peters, D. W. Pfanner, D. M. Reader, W. J. C. Rebello, J. St. George, P. C. Stichbury, J. O. Struthers, W. M. E. Tweed, R. N. Udipti, T. Visvanathan, A. W. G. Weir, D. J. Whitney, W. G. Wicks, and B. Yoganathan.

Haemoglobinopathies.—At the 6th International Congress on Tropical Medicine and Malaria, held at Lisbon on September 5-13, it was resolved that surveys of the distribution of thalassaemia and of the abnormal haemoglobins should be encouraged. Though much had been done, there were still wide gaps in knowledge, and without such information planning of public health measures would be handicapped. With the rapid rate of discoveries of new haemoglobins and new disorders a real risk arose that the terminology would become confused. The congress therefore expressed the hope that steps would soon be taken to arrive at international agreement. Cognizance was taken of the "Recommendations for Terminology of the Hereditary Haemoglobinopathies with Haemoglobin Variants" prepared by the Colonial Medical Research Committee's Working Party on Sickle-cell Traits and Sickle-cell Anaemia, London (*Journal*, May 25, 1957, p. 1235).

Resident Hospital Posts in Australia.—There are vacancies for junior residents, senior residents, and medical superintendents in country base hospitals in the State of Victoria. These posts are tenable for two or three years (return first-class fare is paid for doctor and family for a three-year period of service, and single fare for a two-year period). They offer an opportunity for medical graduates who have completed their pre-registration year of hospital residence and their National Service to widen their hospital experience in Australia. The salaries paid and other details were given in an advertisement (p. 57) in the *Journal* of September 6.

Medical Electronics.—The council of the Institution of Electrical Engineers, with the encouragement of members of the medical profession, has instituted a Medical Electronics Discussion Group. This will provide a forum where electrical engineers specializing in electronics can meet doctors to discuss problems of common interest. Further information may be obtained from the Institution of Electrical Engineers, Savoy Place, London, W.C.2.

Van Meter Prize.—The American Goiter Association again offers the Van Meter prize award of \$300 and two honourable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the association's annual meeting in Chicago on April 30 and May 1 and 2. Further information is obtainable from Dr. JOHN C. MCCLINTOCK, 149½ Washington Avenue, Albany, 10, New York. The closing date is January 15.

Mr. R. B. Duthie, a graduate of Edinburgh and research fellow of the Scottish Hospitals Endowment Research Trust, has been appointed professor of orthopaedic surgery and orthopaedic surgeon-in-chief in the University of Rochester School of Medicine and Dentistry, New York.

Family Doctor.—The October issue of *Family Doctor* includes articles on partial gastrectomy (by Sir Cecil Wakeley), the British Red Cross and Order of St. John, alcoholics (by Dr. F. R. C. Casson), and industrial psychology (by Dr. J. A. C. Brown).

COMING EVENTS

Harveian Oration.—SIR GEOFFREY KEYNES will deliver the Harveian Oration at the Royal College of Physicians of London on October 17 at 3 p.m. His subject will be "Harvey through John Aubrey's Eyes."

Edinburgh Postgraduate Board of Medicine.—Details of courses in endocrinology, gastroenterology, surgery, medical sciences, and internal medicine are given at p. 64 of the advertisements.

London Jewish Hospital Medical Society.—Mr. I. PREISKEL, F.R.C.S., will deliver the presidential address on October 9 at 8.15 p.m. at the Medical Society of London, 11, Chandos Street, W.1. His subject will be "Some Milestones in the Progress of Surgery."

American Heart Association.—Annual meeting and scientific sessions, October 24-28 in San Francisco. The association's address is 44, East 23rd Street, New York, 10.

Maudsley Lecture.—Dr. LEO KANNER, of Baltimore, will deliver the Royal Medico-Psychological Association's 33rd Maudsley lecture on November 13 at 2.15 p.m. at the Royal Society of Medicine. His subject will be "Trends in Child Psychiatry."

NEW ISSUES

SPECIALIST JOURNALS AND ABSTRACTS

The journals listed below are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Ophthalmology.—Issued monthly (£6 annually). The new issue, Vol. 42, No. 9, includes:

SOPRACYCIN: ITS PENETRATION INTO THE EYE AND ITS EFFECT UPON EXPERIMENTALLY PRODUCED STAPH. AUREUS AND PS. PYOCYANEA CORNEAL INFECTIONS. D. Ainslie and W. G. Henderson.
DENervation OF THE LACRIMAL GLAND. J. Whitwell.
DIVERTICULUM OF THE LACRIMAL SAC. J. N. Ormrod.
STUDIES ON THE CORNEAL AND TRABECULAR ENDOTHELIUM. I. CEMENT SUBSTANCE OF THE CORNEAL ENDOTHELIUM. F. Vrabc.
RETINAL VASCULAR MICROMETRY BY THE USE OF A MEASURING OPHTHALMOSCOPIC EXAMINATION INCLUDING MEASUREMENT OF SELECTED RETINAL ARTERIOLES IN FIFTEEN CASES OF PRE-ECLAMPTIC TOXAEMIA. M. Snodgrass.
RETROLENTAL FIBROPLASIA ASSOCIATED WITH MENTAL DEFECT. C. E. Williams.
EXPERIMENTAL DEGENERATION OF THE RETINA. III. INHIBITORS OF GLYCOLYSIS AND OF RESPIRATION AS INDUCING AGENTS. A. Sorsby and A. Nakajima.
EXPERIMENTAL DEGENERATION OF THE RETINA. IV. DIAMINODIPHENOXYALKANES AS INDUCING AGENTS. A. Sorsby and A. Nakajima.
OCULAR RHINOSPORIDIOSIS. K. D. Sharma, J. B. Shrivastav, and S. Agarwal.

Ophthalmic Literature.—Vol. 11, No. 5, and Vol. 12, No. 1, are now available. This journal contains a comprehensive selection of abstracts of the literature on ophthalmology and related subjects. Issued quarterly with a volume index each year. £4 4s. annually or in combination with the *British Journal of Ophthalmology*, £9 annually.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Sunday, October 5

MANCHESTER UNIVERSITY: FACULTY OF MEDICINE AND NORTH-WEST ENGLAND FACULTY, COLLEGE OF GENERAL PRACTITIONERS.—At Theatre 1, Clinical Sciences Building, York Place, 11 a.m., Professor W. Gaisford: Problems of Immunization.

Monday, October 6

INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. D. Richter: Protein Metabolism of the Brain.
LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., special university lecture in pathology by Dr. A. J. Quick (U.S.A.): The Hereditary Haemorrhagic Diseases—Their Classification and Diagnosis.
MARLBOROUGH DAY HOSPITAL.—8.15 p.m., reports by Dr. J. Bierer, Dr. E. Ledermann, Dr. A. J. Martin, and Mr. P. Sent on the International Conference for Psychotherapy, held recently in Barcelona.

Tuesday, October 7

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. J. Hare: Keratinization.
KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.—4.45 p.m., 11th Thomas Percy Legg Memorial Lecture by Mr. H. J. Seddon: Recent Work on Polio-myelitis.
LONDON UNIVERSITY.—At Physiology Lecture Theatre, University College, W.C., 5.30 p.m., special university lecture in psychology by Professor Wolfgang Köhler (Princeton): Postulate of Invariance in Evolution.
MANCHESTER UNIVERSITY: DEPARTMENT OF OCCUPATIONAL HEALTH AND NORTH-WEST ENGLAND FACULTY, COLLEGE OF GENERAL PRACTITIONERS.—At Theatre 1, Clinical Sciences Building, York Place, 8.30 p.m., Professor R. E. Lane: Industrial Dusts and the Chest.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. W. J. Dempster: Kidney Transplantation.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—6.30 p.m., Mr. A. Gorevitch: Intestinal Obstruction in the Newborn.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Mr. J. Minton: Ocular Manifestations in Clinical Neurology (Part I).

Wednesday, October 8

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. A. Tickner: Fats and the Skin.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. F. P. Lee Lander: Lung Manifestations of General Diseases.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. H. G. Hanley: Tuberculosis of the Renal Tract.
LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Royal Free Hospital School of Medicine, 8.30 p.m., Dr. Jean Mackintosh: Future of Medical Women in the Public Health Service.
MANCHESTER MEDICAL SOCIETY: SECTION OF PATHOLOGY.—At Large Anatomy Theatre, Medical School, Manchester University, 4.30 for 5 p.m., Dr. H. Lehmann: Abnormal Haemoglobins.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. A. W. Wilkinson: Water and Mineral Requirements After Operation; 6.30 p.m., Mr. A. H. M. Siddons: Bronchiectasis.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Lecture Theatre, 5 p.m., Dr. E. A. Brown (Boston): Single Annual Emulsion Injection for Pollinosis.

Thursday, October 9

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.15 p.m., Presidential Address by Mr. I. Preiskel: Some Milestones in the Progress of Surgery.
LONDON UNIVERSITY.—At Physiology Lecture Theatre, University College, W.C., 5.30 p.m., special university lecture in psychology by Professor Wolfgang Köhler (Princeton): Cortical Correlate of Perceptual Organization.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor W. E. Tucker: Traumatic Syndrome Phases and Stages: Certain Injuries, Their Prevention and Treatment.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—6.15 p.m., Mr. Dickson Wright: Exophthalmos.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. Desmond Curran: postgraduate demonstration in psychiatry.
UNIVERSITY COLLEGE LONDON.—At Anatomy Theatre, Gower Street, W.C., 1.15 p.m., Professor L. S. Penrose, F.R.S.: Mutation in Man.
WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Clarendon Restaurant, Hammersmith, W., 7.30 for 8 p.m., dinner meeting. Presidential address by Mr. A. Walker: Midwifery Before We Were Born.

Friday, October 10

● CHARTEHOUSE RHEUMATISM CLINIC.—At 54-60, Weymouth Street, W., 5.30 p.m., Gilbert Scott Memorial Lecture by Professor Agrégé S. de Séze (Paris): Le Syndrome Dououreux Tropho-statique de la Post-menopause. (Lecture in English.)
● INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. F. R. Bentley: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. E. H. Hudson: clinical demonstration.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. O. G. Vaughan-Jackson: Hand Infections; 6.30 p.m., Dr. A. Crampton-Smith: Treatment of Tetanus.
ROYAL SOCIETY OF HEALTH.—At Corn Exchange, Dorchester, 10 a.m., Mr. L. Abbott: Winfrith Atomic Research Establishment—Anticipated Impact on Dorset; Dr. A. C. Sinclair: Mental Health—Outlook for the Future.

Saturday, October 11

NORTH-EAST METROPOLITAN THORACIC SOCIETY.—At St. Helen's Hospital, Ipswich, 10.30 a.m. joint meeting with East Anglian Thoracic Society. Papers by Mr. J. R. Belcher, Mr. E. C. Wynne Edwards, Dr. G. R. McNab, Dr. R. S. Francis and Mr. M. P. Curwen, and Dr. L. C. Lum.

Sunday, October 12

COLLEGE OF GENERAL PRACTITIONERS: YORKSHIRE FACULTY.—At General Infirmary at Leeds, 11.30 a.m., Dr. Richard Asher: Things are Not What They Seem.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Brooks.—On July 25, 1958, at 73, Elm Walk, Raynes Park, London, S.W., to Barbara (formerly Sutton), wife of Dr. Jack W. Brooks, a sister for Jennifer, Michael, and Peter—Anne Elizabeth Sutton.
Durham.—On September 25, 1958, at Ryde Nursing Home, 76, Pellhurst Road, Ryde, Isle of Wight, to Mabel (formerly Lewis), wife of Surgeon Lieutenant Commander P. D. A. Durham, R.N., a brother for Anthony—Jonathan Mark.
Gielw.—On September 21, 1958, at St. Bartholomew's Hospital, London, E.C., to Shirley (formerly Gazeman), wife of Dr. Harvey J. Gielw, M.B., M.R.C.S., D.Obst.R.C.O.G., of "Park Lodge," East End Road, East Finchley, London, N., a sister for Daryl Marsha—Lynne Janice.
Suchett-Kaye.—On September 18, 1958, in London, to Dr. Beryl White, wife of A. I. Suchett-Kaye, M.D., M.R.C.P., of 82, Christchurch Avenue, London, N.W., a brother for Charles, Robert, and Richard—George Henry Philip.

DEATHS

Attenborough.—On September 7, 1958, Cuthbert Hastings Attenborough, M.B., B.S., of Lismore, Camberley, Surrey.
Coope.—On September 8, 1958, at Zarauz, Spain, Hubert Macgowan Coope, M.B., Ch.B., of 10, Cambridge Road, Andsell, Lytham St. Annes, Lancs.
Corrigan.—On September 8, 1958, at Bretby House, Sherwood, Nottingham, David Richardson Goodlatte Corrigan, M.B., Ch.B.
Frier.—On September 24, 1958, at Ellesmere, Barrowby Road, Grantham, Lincs, Charles Matthew Frier, M.B., Ch.B., J.P., aged 87.
Johnston.—On September 10, 1958, in hospital, John Johnston, M.B., Ch.B., of 16, Worsley Road, Farnworth, Lancs, aged 86.
Jordan.—On September 11, 1958, at Ashford Hospital, Ashford, Kent, Anson Robertson Jordan, M.D., F.R.C.S., of Dover, Kent, aged 75.
Kirk.—On September 10, 1958, at Ryecroft, High Birthing, Harrogate, Yorks, George William Lister Kirk, M.B., Ch.B.
Thompson.—On August 27, 1958, at British Military Hospital, Iserlohn, Germany, Brian George Thompson, M.D., D.M.R., Major, R.A.M.C.
Winton.—On September 5, 1958, at his home, 2, Fairhaven, 71/73, Putney Hill, London, S.W., William Balcombe Winton, M.D., M.R.C.P., aged 85.
Young.—On September 5, 1958, at Apex Lodge, Highgate Village, London, N., Robin Edward Victor Bryce Young, M.B., B.Chir., aged 36.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Pregnancy After Hydatidiform Mole

Q.—What are the prospects of a successful pregnancy in a woman of 27 whose first pregnancy terminated as a hydatidiform mole and her second as an abortion? Is there any danger of a chorion epithelioma developing if she becomes pregnant again?

A.—The prospects are reasonably good, being 70–80%. The recurrence of hydatidiform mole has been reported in a subsequent pregnancy in the same woman, but this is extremely rare. The chances of chorion epithelioma developing from a hydatidiform mole after the intervention of one or more pregnancies are likewise extremely small. It is true that a few cases have been published of chorion epithelioma developing some years after a hydatidiform mole with the intervention of one¹ or more² pregnancies, but as it is believed that about 25% of chorion epitheliomas develop subsequent to a normal pregnancy these occurrences may not have been related to the earlier moles. Further reassurance can be offered on the basis of a report³ that out of 87 women treated conservatively for hydatidiform mole 65 later had normal viable pregnancies, with no recurrences or malignant sequels.

REFERENCES

- ¹ Barkla, P. C., *J. Obstet. Gynaec. Brit. Emp.*, 1955, **62**, 239.
- ² Gérin-Lajoie, L., *Amer. J. Obstet. Gynec.*, 1954, **68**, 291.
- ³ Alter, N. M., and Cosgrove, S. A., *Obstet. and Gynaec.*, 1955, **5**, 755.

Antibiotic-treated Foods

Q.—What is known about the ill effects of consuming meat and poultry which has been treated with antibiotics to promote growth or to preserve the flesh?

A.—Antibiotics used as feed supplements to accelerate growth are believed to be entirely innocuous to the eventual consumer, because the amounts administered are quite small, and only the minutest traces could conceivably be present in the meat, even if such feeding had been continued until the time of slaughter.

The preservation of meat, fish, and poultry by dipping them in a solution of a tetracycline is a rather different matter: it was discussed in an annotation in this *Journal* (October 13, 1956, p. 870) and there is little to add to what was said then. In spite of widespread employment of this process in the U.S.A., Canada, and elsewhere, no ill effects have been seen. Some countries, including the U.S.A., have so far permitted its application only to poultry, because cooking has been shown to destroy remaining traces of the antibiotic in this class of food. Some kinds of cooking used for fish do not entirely destroy it. The theoretical dangers of consuming food containing detectable amounts of one of the tetracyclines are two: that a sensitized person may react to the antibiotic or that repeated consumption may itself sensitize, and, secondly, that resistance to the antibiotic may be induced in potentially pathogenic bacteria in the alimentary tract. There is no proof that amounts which are likely to be consumed can have either of these effects.

Intestinal Hurry

Q.—What is the treatment for intestinal hurry?

A.—The first consideration must be to stop the patient taking any drugs which might cause increased intestinal motility, to remove from the diet any foods which may appear to be irritating the intestines, and to look for and treat any condition of the gastro-intestinal tract which might be causing intestinal hurry. In some patients with ulcerative colitis or diverticulitis a low-residue diet may be helpful.

Opium is a drug commonly used to reduce intestinal motility. It is often prescribed in the form of the tincture with kaolin. Codeine is another useful drug. In severe dysentery morphine by injection may greatly help the patient, but it can only be used once or twice. Anticholinergic drugs, such as propantheline, in doses of 15 mg. thrice daily, will slow intestinal movements considerably. The constipating effects of ganglion-blocking hypotensive drugs are well known. In doses which hardly affect the blood pressure these substances can be useful in cases of intestinal hurry when other measures have failed. All these drugs must be used with circumspection in ulcerative colitis because of the danger of colonic dilatation.

NOTES AND COMMENTS

Midwifery Bag.—Dr. A. GOODMAN (Liverpool, 6) writes: I would like to make one or two modifications to the suggested contents of a general-practitioner obstetric bag ("Any Questions?" September 13, p. 700). I would include ampoules of nalorphine, 5 mg./ml., for intravenous administration to the mother near delivery and a 5-ml. vial of the neonatal nalorphine (1 mg./ml.). These are useful to prevent and overcome respiratory depression of the baby due to narcotics, especially in precipitate labour. 20% magnesium sulphate in 10-ml. ampoules (with ampoules of calcium gluconate as an antidote) is far safer than the use of sodium thiopentone. Morphine sulphate gr. $\frac{1}{4}$ (32 mg.) can also be given with this in cases of eclampsia. General anaesthetics are dangerous in labour, especially at home. It is extremely difficult to transfer an anaesthetized patient to hospital, should the occasion arise, and only those procedures which can be performed under a local anaesthetic should be undertaken at home. The one exception is a manual removal of placenta, and if ergometrine has not been given this can often be done using only gas-and-air or trichlorethylene. For local anaesthesia 1% lignocaine—and I recommend a minimum of 50 ml. should be carried—is safer and more comfortable to the patient. For a pudendal nerve block a lumbar puncture needle is invaluable. Presuming that the intravenous cannulae and the volsellum forceps are to be used, then a good light is automatically a "must." I feel that a Drew Smythe catheter may not only cause the separation of a low-lying placenta (type II or III) on the posterior wall of the uterus but it will introduce infection. If the membranes have to be ruptured, then Kocher's forceps are as good as any.

OUR EXPERT replies: The detailed contents of the midwifery bag suggested were intended to show the scope of equipment required rather than to dogmatize about treatment. Every general practitioner will have his own preferences and techniques, which he may change from year to year. So I would not object to Dr. Goodman's modifications except to say that I carry nalorphine in my "emergency" bag and a large battery torch in my car. The choice of anaesthetic will also depend on individual preferences. I believe that all anaesthetics, including local anaesthetics, are dangerous. It therefore behoves the general practitioner to use the anaesthetic he finds most efficient and least dangerous.

Collected Articles from the "British Medical Journal"

The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

Emergencies in General Practice (26s. 9d.).

Refresher Course for General Practitioners, Volumes 2 and 3 (26s. 9d.).

Clinical Pathology in General Practice (22s. 3d.).

Any Questions?, Volumes 2 and 3 (8s. 3d. each).

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Altology, Westcent, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1. on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad. ADVERTISEMENTS should be addressed to the Advertisement Director, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Brimedads, Westcent, London*. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London*. B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 11 1958

ANTIMALARIAL DRUGS IN NIGERIA: RESULTS OF A NEW SURVEY

BY

L. J. BRUCE-CHWATT, O.B.E., M.D., M.P.H., D.T.M.&H.
*Senior Specialist, Malariologist**

AND

D. W. HORN, M.B., Ch.B., D.P.H., D.T.M.&H.
Specialist, Medical Statistician
Federal Medical Department, Nigeria

The first survey of the use of antimalarial drugs in Nigeria (Bruce-Chwatt and Bruce-Chwatt, 1950) provided data on some special aspects of prophylaxis and treatment of malaria in this the largest British dependency in West Africa. A similar investigation by Nicol (1953) reported on the experience of the expatriate population in Lagos and discussed the value of various protective antimalarials in Nigeria.

Chemotherapy of malaria has progressed a great deal during the past decade, and a resurvey of the situation in Nigeria was called for. It was especially timely, because the difficulties of malaria eradication in holo-endemic areas of tropical Africa by residual insecticides alone have aroused more interest in the possibilities offered by chemotherapy (W.H.O., 1957). Moreover, it was thought that an assessment of the situation might be of value, as some new trends in the use of antimalarial drugs in Nigeria reflect the profound socio-economic changes seen in West Africa to-day.

This paper deals mainly with the small and transient but well-defined group of the non-immune expatriate population; problems of malaria in the indigenous population of Nigeria will be presented at a future date. Nevertheless, a considerable amount of information pertaining to chemotherapy of malaria in Africans was collected and is reported here.

The total population of Nigeria at the 1952–3 census was 31½ millions, and it was estimated that it increases at the rate of nearly 2% per annum.

The non-African population in Nigeria is distributed unevenly and its composition is constantly changing because of an estimated turnover (due to home leave) of about 30% during the year. This population numbered 16,700 in 1953 and nearly 18,000 in 1956. Of the total of 17,953 expatriates (in mid-1956), 30% were residents in the Federal Territory of Lagos, 31% were in the Northern Region, 20% in the Western Region, and 20% in the Eastern Region and the Southern Cameroons. The overall national composition of the non-African population of Nigeria at the census was approximately as follows: 60% were British; 3% Common-wealth citizens, including Indians; 6% Americans; 9%

Syrians and Lebanese; 3% French; 3% Dutch; 3% Irish; and the remaining 13% belonging to various other nationalities (Nigeria, 1954).

There are few reliable figures referring to the incidence of malaria in the expatriate population of the Federation of Nigeria. The reasons for it were discussed before (Bruce-Chwatt and Bruce-Chwatt, 1950), and the situation has not changed.

Reliable diagnosis of malaria in non-immunes in West Africa is not easy for reasons opposite to those discussed with regard to malaria of the indigenous population. The attitude of the individual medical officer towards this problem varies considerably between two extremes: (a) labelling as malaria any disease with vague clinical symptoms which might or might not be due to the plasmodial infection, and (b) recognizing malaria only on the basis of a confirmatory report of a blood examination. Errors are bound to be committed in either case, and some striking differences between two successive annual rates of malaria in the same locality are often due to a change of medical officers.

An additional difficulty arises from the universal use of antimalarial drugs by the expatriate population; this greatly decreases the chance of finding parasites in the blood, and the diagnosis is then made by presumption when the symptoms respond to a tentative specific treatment. Thus the records of malaria incidence among expatriates in Nigeria are not more than estimates subject to many errors.

INFORMATION ON MALARIA AND ANTI-MALARIAL DRUGS FROM TWO QUESTIONNAIRES

Two years ago it was decided that some more reliable information on the incidence of malaria in Nigeria and on the value of modern antimalarial drugs could perhaps be obtained through suitably designed questionnaires, similarly to what had been done in 1950. It was intended to have two polls of opinion: one addressed to the medical profession in Nigeria, the other to a large though selected group of the residential population of Lagos which relies on routine drug prophylaxis for individual protection against malaria.

The medical questionnaire asked the following ques-

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tions: number, sex, and age of expatriates in the relevant station; number of cases of malaria during the year; type of prophylactic drug taken by the patients and regularity of administration; type of treatment favoured by the medical practitioner; evidence of toxic effects during prophylactic or therapeutic regimen; views on malaria prophylaxis and treatment in Africans and expatriates.

The non-medical questionnaire asked for information on the following: nationality, age, and sex; duration of stay in Nigeria and in Lagos; type of antimalarial drug taken and dosage; on whose advice and how regularly; reasons for change of drug if any; incidence of malaria and by whom diagnosed.

In July, 1956, the Federal Malaria Service dispatched two questionnaires. One, numbering 380 copies, was addressed to medical officers in Government stations and medical missions, and to private practitioners; the other was sent to 3,200 householders whose names appeared in 1956 in the official "residential list" of Lagos township.

The response to the questionnaire forwarded to 380 medical officers in Nigeria produced 146 complete replies, an overall percentage of 38.5. Of these replies, 128 came from the three Regions of Nigeria and 18 from Lagos. The expatriate population, under the medical care of 128 medical officers stationed outside the Federal Territory of Lagos, who answered the questionnaire, amounted to 6,859, which represents approximately 54% of the total expatriate population of Nigeria residing outside the Federal Territory in 1956.

Of the 3,200 questionnaires sent out to the "residential" population of Lagos, 1,026 were returned. Of these, 1,016 gave information in respect of 2,222 persons, distributed as shown in Table I.

TABLE I.—"Residential" Population of Lagos. Replies to the Questionnaire by Race and Age Group

	Adults (15 Years and Over)	Children 2-14 Years	Infants Under 2 Years	Total
Europeans (=Caucasians) ..	1,557	395	75	2,027
Africans ..	103	56	12	171
Others ..	20	3	1	24
Total ..	1,680	454	88	2,222

The collected data were coded, put on marginal punch-cards, and numerically assessed; they constitute the main subject of this paper and represent two polls of opinion—one medical, covering the whole country, and the other non-medical, limited to Lagos.

Incidence of Malaria

The two questionnaires provided some interesting data on the incidence of malaria in the expatriate population on a sample which amounts to 49% of the total 1956 population of expatriates in Nigeria (Table II).

Table II quotes for the three regions of Nigeria the number of cases of malaria duly diagnosed and reported by medical practitioners. The incidence of malaria in the

TABLE II.—Malaria Morbidity in the Expatriate Population in Nigeria in 1956

Regions	Men			Women			Children			Total		
	No.	Malaria	Per 1,000	No.	Malaria	Per 1,000	No.	Malaria	Per 1,000	No.	Malaria	Per 1,000
Lagos ..	3,565	628	176	1,977	311	157	1,317	202	153	6,859	1,141	166
Other Regions ..	895	69	78	662	30	45	470	19	40	2,027	118	58
Total ..	4,460	697	157	2,639	341	129	1,787	221	124	8,886	1,259	142

Federal Territory of Lagos is quoted from the replies forwarded by the "residential" population and refers only to malaria diagnosed by a medical officer. Reports of "suspected malaria" (a total of 97) not seen or not confirmed by a doctor were not included, as it was felt that many of the symptoms could have been easily confused with undetermined or minor ailments.

As pointed out previously, the diagnosis of malaria in expatriates in tropical Africa is, paradoxically enough, not easy (even when made by medical practitioners), and the figures quoted must be interpreted with caution, although they are the best data that can be obtained in the circumstances.

Table II indicates that, as one would expect, the incidence of malaria in non-immunes is much less in the mainly urban population of the Federal Territory of Lagos than in the regions, which, with the exception of a few main centres, are predominantly rural areas. Moreover, the overall figures indicate that the incidence of malaria in the expatriate population of Nigeria fell from 225 per 1,000 in 1949 to 142 per 1,000 in 1956. The low mortality from malaria in the expatriate population is striking. There was one fatal case of blackwater fever in a Syrian merchant, following an intramuscular injection of quinine. One death due to cerebral malaria was recorded in a European child, but no details of this case are available.

With regard to the "residential" population of Lagos the data collected during the present survey indicate that the malaria incidence of expatriates decreased during the past eight years from 149 per 1,000 in 1948 to about 60 per 1,000 in 1956.

Thanks to the ready co-operation of the Army medical authorities, it was possible to obtain valuable data on the incidence of malaria in the British military personnel serving in Nigeria and in their families. This group numbers about 1,000, of whom 60% are male adults. The incidence of malaria in the British Army personnel, including the families, was 25 per 1,000 in 1956 (data incomplete) and 35 per 1,000 in 1957. Both figures are well below the rates estimated for the civilian expatriate population and confirm the impression that a number of cases of malaria in expatriates are due to a lapse in the regular routine of drug taking.

Comparative Therapeutic Value of Antimalarial Drugs

From the 146 replies to the questionnaire sent by the members of the medical profession there seems to be nothing approaching a standard treatment of malaria in Nigeria. Although the replies revealed many variations of treatment and a large number of combinations of antimalarial drugs a general pattern was discernible.

For the emergency treatment of severe malaria mepacrine and chloroquine are used with equal frequency, mainly by intramuscular injection; quinine is also used, though somewhat less often, by the intramuscular and occasionally by the intravenous route. The most common single adult dose of quinine injections is 10 gr. (650 mg.); the relevant doses of chloroquine and mepacrine are 200 mg. of base and 300 mg. of base respectively. Because of the frequency of toxic reactions in infants and small children, quinine and chloroquine (in suitably graded dosage) are preferred to mepacrine in paediatric practice.

For peroral treatment of moderately severe malaria chloroquine is the most-favoured single drug, selected by 60% of all medical practitioners, with mepacrine second (24%), amodiaquine third (14%), and quinine fourth (2%).

A few correspondents placed much faith in the therapeutic value of proguanil, and two among them regarded pyrimethamine (at 100 mg. in 36 hours) as a good drug for the treatment of malaria.

Many medical practitioners treat ordinary attacks of malaria by a single intramuscular injection of quinine or mepacrine followed by oral administration of chloroquine or mepacrine or amodiaquine. A few use such combinations as amodiaquine-pyrimethamine, mepacrine-proguanil, etc.

The mean dosage of oral chloroquine is 1.8-2.1 g. of base in three to five days, of mepacrine 1.6-3.0 g. in three to five days, and of amodiaquine 1.2-1.4 g. in four days.

Many medical men adopt the logical principle that the drug used for treatment must be different from that used for prophylaxis. All of them agree that malaria in Africans past early childhood responds well to a less-sustained treatment than the disease seen in non-immunes.

Comparative Value of Prophylactic Antimalarial Drugs

(1) Medical Questionary

Out of 146 replies to the medical questionnaire, 97 (67%) favoured proguanil; of these, 52 advocated the standard dosage at 100 mg. daily, while 45, mainly from the Northern Region, preferred the daily dosage of 200 mg. Twenty-two replies (15%) gave pyrimethamine at 25 mg. or 50 mg. once a week as the best protective antimalarial. Twenty (14%) advocated chloroquine at two doses once a week totalling 300 mg., though a few preferred a weekly dosage of 600 mg. Three medical men considered that mepacrine and amodiaquine were the most reliable protective antimalarials, while two correspondents were staunch defenders of the "good old quinine."

In attempting to assess the protective value of antimalarials it was found from the medical questionnaire that the number of so-called "break-throughs" reported in the people who were taking various drugs was roughly the same as the different ratios of their uses. Thus, of the break-throughs, 75% were reported in takers of proguanil (mainly in those whose daily dose was 100 mg.), 8% in takers of pyrimethamine, 10% in takers of chloroquine, 4% in takers of quinine, and 1% in takers of mepacrine or amodiaquine. In other words, it was alleged that none of the drugs was 100% effective in preventing attacks of malaria.

As the regularity and adequacy of prophylactic drug administration was not always certain, the reports on break-throughs should not be taken too literally. The fact that these break-throughs occurred roughly in proportionately the same number of people taking various antimalarials suggests that many of them were due to an inadequate prophylactic regimen, while others were due to various febrile conditions.

There is evidence of two widely differing attitudes of the medical profession in Nigeria with regard to the use of prophylactic antimalarials in Africans. While 20 doctors maintained that mass prophylaxis for the indigenous population is neither necessary nor beneficial because of the possible loss of acquired tolerance to malaria, 25 doctors were strongly in favour of drug prophylaxis, especially in some selected indigenous groups such as expectant mothers, schools, labour camps, etc.

An interesting observation came from a large leprosy centre directed by a mission: 500 patients were kept for one year on a weekly pyrimethamine prophylaxis, and this not only reduced the incidence of malaria but apparently also only reduced the incidence of leprosy after sulphones. For prophylactic administration in African communities mepacrine, proguanil, or pyrimethamine once a week was favoured.

A few industrial organizations have adopted the policy of regular drug prophylaxis of their indigenous staff, and of reported satisfactory results either because of apparent decrease of sickness or on account of better public relations. The Army has recently introduced a regular prophylactic

regimen for all Nigerian members of the Forces, including their families. The drug selected was pyrimethamine at 25 mg. once a week.

(2) Non-medical Questionary

The results of the non-medical "residential" questionnaire are shown in Table III and refer to 2,027 European (=Caucasian) residents. The replies of 171 African and

TABLE III.—Selection of Protective Antimalarial Drugs by the "Residential" Population of Lagos in 1956

	Adults		Children		Infants		Total	%
	No.	%	No.	%	No.	%		
Europeans:								
Proguanil ..	1,141	73.3	254	64.3	33	44.0	1,428	70.4
Chloroquine ..	92	5.9	9	2.3	2	2.7	103	5.1
Pyrimethamine ..	245	15.7	126	31.9	36	48.0	407	20.1
Mepacrine ..	12	0.8	—	—	—	—	12	0.6
Quinine ..	59	3.8	6	1.5	4	5.3	69	3.4
Amodiaquine ..	3	0.2	—	—	—	—	3	0.1
No drug ..	5	0.3	—	—	—	—	5	0.2
Total ..	1,557	100	395	100	75	100	2,027	100
Africans and Indians:								
Proguanil ..	56	45.5	23	39.0	3	23.0	82	42.1
Chloroquine ..	21	17.1	7	11.8	1	7.7	29	14.9
Pyrimethamine ..	17	13.8	5	8.5	5	38.4	27	13.7
Mepacrine ..	7	5.7	3	5.1	—	—	10	5.2
Quinine ..	6	4.9	13	22.0	4	30.9	23	11.8
Amodiaquine ..	6	4.9	3	5.1	—	—	9	4.6
No drug ..	10	8.1	5	8.5	—	—	15	7.7
Total ..	123	100	59	100	13	100	195	100

24 Indian residents represent a very small group, and for the sake of convenience were grouped together. The replies showed that proguanil was used by 68% of the residential population of Lagos. It was the most popular drug in all races, except for infants and to a less extent for children, in whom it was replaced by pyrimethamine, used by 20% of the public. Chloroquine was the third (6%) most popular prophylactic, while amodiaquine was used by 0.5% of people; mepacrine, which in a previous survey was still being taken by 10.6% of the population, has almost completely dropped out of favour, being taken by only 22 persons (1%). Quinine, which in 1950 was taken by 18.7% of expatriates, has dropped to 4%—mostly "old coasters," though it is still favoured by some, particularly for children and infants. No drug, except perhaps mepacrine, showed any significant difference by sex: this antimalarial is rarely taken by women.

Thus proguanil is shown to be the drug of choice; but where ease of administration is of particular importance, as in children and infants, pyrimethamine replaces it as a favourite. It will be noted from Table III that five Europeans and 15 Africans stated that they take no antimalarials at all. Of the Europeans, one man said that "mosquitoes did not seem to bite him," another said it "was not required in Lagos," one woman put her faith in homoeopathic remedies, and two women stated that all antimalarials upset their digestion.

The "residential" questionnaire attempted to investigate the incidence of malaria in the non-immune population of Lagos on the basis of the information received from 2,027 expatriates.

The reported cases of illness attributed to malaria were divided into three groups: (1) malaria diagnosed as such by a doctor; (2) suspected malaria—not seen by a doctor; and (3) "fever." The results are set out in Table IV, which shows that the so-called "break-throughs" of malaria occur with all drugs in about 6% of persons.

The first and second most favoured dosage schedules of the main drugs taken by adults of the sample of the Lagos residential population are shown in Table V. The percentages in this table refer to the number of people taking the particular drug. The dosage for children is lower by approximately one half.

TABLE IV.—Incidence of "Malaria" in Expatriate Takers of Antimalarials in Lagos

	Diagnosed Malaria		Suspected Malaria		"Fever"		Protected	
	No.	%	No.	%	No.	%	No.	%
Proguanil:								
Adults	72	6.3	51	4.5	146	12.8	872	76.4
Children	15	5.9	12	4.2	32	11.2	228	79.5
All ages	87	6.1	63	4.4	178	12.5	1,100	77.0
Chloroquine:								
Adults	5	5.4	4	4.3	10	10.9	73	79.4
Children	2	22.2	—	—	—	—	9	77.8
All ages	7	6.8	4	3.9	10	9.7	82	79.6
Pyrimethamine:								
Adults	18	7.4	20	8.2	24	9.8	183	74.6
Children	2	1.6	6	3.7	22	13.5	132	81.5
All ages	20	4.9	26	6.4	46	11.3	315	77.4
Mepacrine:								
Adults	—	—	1	8.3	3	25.0	8	66.7
Children	—	—	—	—	—	—	—	—
All ages	—	—	1	8.3	3	25.0	8	66.7
Quinine:								
Adults	4	6.8	3	5.1	5	8.5	47	79.6
Children	—	—	—	—	—	—	10	100.0
All ages	4	5.8	3	4.3	5	7.2	57	82.7
Amodiaquine:								
Adults	—	—	—	—	—	—	3	100.0
Children	—	—	—	—	—	—	—	—
All ages	—	—	—	—	—	—	3	100.0
Total:								
Adults	99	6.4	79	5.1	188	12.1	1,186	76.4
Children	19	4.1	18	3.8	54	11.5	379	81.0
All ages	118	5.8	97	4.8	242	12.0	1,565	77.4

TABLE V

Drug	Modal Dose	Second Mode
Proguanil	7 tablets weekly—86%	14 tablets weekly—7%
Chloroquine	2 tablets weekly (300 mg.)—51%	3-4 tablets weekly (450-600 mg.)—42%
Pyrimethamine	1 tablet weekly—74%	2 tablets weekly—22%

Optimum Dose of Antimalarial.—It was found that there was no clear-cut correlation between the incidence of "malaria" and variation in the weekly dosage. Chloroquine, of which the most popular doses are two and three tablets a week for adults, and one and two tablets a week for children, shows the expected result—that is, 92.3% protection on the higher dose and 74.5% on the lower dose. This difference, however, just fails to reach statistical significance at the 5% level ($p=0.0543$ by Fisher's exact test). Amongst adults taking proguanil the converse is the case: those taking the modal dose of seven tablets a week are 77.2% protected, whereas those taking 14 tablets a week show 67.5% protection. This difference again just misses significance at the 5% level ($t=1.93$, with 1,051 degrees of freedom). Similar unexpected findings refer to samples of children taking proguanil at half-tablet (50 mg.) daily or one tablet (100 mg.) daily respectively. The same applies to two groups of adults: one on one tablet (25 mg.) of pyrimethamine and the other on two tablets (50 mg.) once a week. In children pyrimethamine shows the expected trend: 80.1% protection on the lower dose, and 84.7% on the higher.

The paradox of the higher dose giving the lower degree of protection is of interest though of limited importance. The ambiguous results of this part of the investigation are obviously due to neglect of numerous variables such as body weight, exposure to infection, and, last but not least, vagaries in the diagnosis of malaria.

Regularity in taking a drug is of prime importance for successful chemoprophylaxis, and a specific point was included in the questionnaire. Only 10 Europeans out of 2,022 confessed to irregularity in taking their antimalarials (from our personal experience, one might express some doubts about the reliability of this particular information). Amongst Africans, no fewer than 56 (32.7%) were irregular takers.

Reasons for choice of a particular drug were asked for, and the answers showed two primary reasons: proguanil was "officially recommended" to 57% of people by a doctor or an employer, while pyrimethamine was recommended to 11% and chloroquine to 16%. "Ease of administration" favoured pyrimethamine in 67% of its takers and proguanil in 33%.

(3) Toxic Effects of Antimalarial Drugs

Replies referring to side-effects of antimalarial drugs were of considerable interest. The results of the survey are discussed on the basis of data from the two questionnaires grouped separately for therapeutic and suppressive usage.

Medical observations on toxic reactions due to the therapeutic or protective administration of antimalarials are summarized below. It must be admitted that many side-effects associated with the prophylactic regimen (headache, insomnia, gastro-intestinal disturbances, depression, etc.) were so vague that the relationship between their frequency and the taking of a specific antimalarial was unconvincing.

Quinine.—The symptoms of cinchonism after high dosages of this drug are so well known that they need not be reported here. There was one case, however, of a sciatic nerve injury and paralysis after an intramuscular injection and one fatal case following an intravenous administration of the drug to a child. Intramuscular injections of quinine, nowadays much less common than before, were still advocated by 25 medical officers, particularly in severe malaria in children, apparently with very few local abscesses following the injection. There was one fatal case of blackwater fever following an intramuscular injection of quinine in a Syrian patient and five cases of "blackwater fever" in African children given irregular doses of quinine.

Mepacrine.—The most striking toxic effect of this drug, when given to infants and children up to 3 years of age, was an epileptiform seizure after the intramuscular injection of 100-150 mg. of mepacrine musonate. A total of 37 of these dramatic sequelae with 29 deaths were reported by 18 medical officers, including one case in the Army. The symptoms set off within 10 to 15 minutes after the injection, and consist of sudden clonic and tonic convulsions, dyspnoea, cyanosis, loss of consciousness, and either death or recovery within one to two hours. Two such cases with clonic convulsions of legs or one arm lasting for 20 minutes were observed in adults soon after the injection of 300 mg. of mepacrine. Cases of psychosis, mainly in adults, following the oral administration of mepacrine were reported by 36 medical officers. The incidence of this side-effect cannot be computed, but two correspondents assessed that it averaged 2% of people treated with mepacrine given at the standard dosage. In one small station four patients who were given rather high but not excessive doses of mepacrine developed mental symptoms, some of them of maniacal nature. Other side-effects ascribed to mepacrine were gastric symptoms with vomiting (4), gluteal abscess after intramuscular injection (3), and dermatitis (3).

Chloroquine.—Two epileptiform fits similar to those observed after parenteral mepacrine were reported following an intramuscular injection of 100 mg. of chloroquine—one in an infant, the other in a child of 18 months; one case recovered. The standard therapeutic regimen of chloroquine was followed by a number of side-effects. Vomiting and abdominal discomfort were most commonly reported; the next two common complaints were pruritus and blurring of vision (due probably to a paresis of accommodation). Either one or the other side-effect was seen, according to several correspondents, in 2 to 4% of all patients treated with chloroquine at full dosage. Pruritus seems to have been especially common in women, and was either general or localized in the perineal region or on hands and feet. Antihistamine drugs relieved this symptom, but in a few cases were without effect. Both these side-effects were temporary and abated within one week after the drug had been discontinued. Other minor complaints following

the administration of chloroquine were urticaria and oedema (4 cases), dizziness (8 cases), insomnia (3 cases), mental depression and abdominal discomfort (3 cases).

Amodiaquine.—Except for one case of vomiting, dizziness, and collapse in a child given 600 mg. of amodiaquine by mouth, no other side-effects were recorded, but the number of cases when this drug was used was small.

Proguanil and Pyrimethamine.—These are rarely used for treatment of malaria, and most of the side-effects reported were connected with the prophylactic regimen. Only 13 medical officers noticed any side-effects of proguanil taken in daily dosage of 100-200 mg. Most of these symptoms consisted of abdominal discomfort, diarrhoea, anorexia; there were, however, five cases in which proguanil was apparently causing stomatitis and mouth ulcers in adults, two cases of haematuria in children after an administration of 200 mg. of the drug, and one case of dermatitis resembling erythema nodosum. No side-effects were reported following the administration of pyrimethamine at standard doses, but there were seven cases of acute accidental poisoning of children. Five of these (four in European children and one in an African) proved to be fatal. The history of most of these cases was essentially the same: a child between 2 and 5 years of age found a bottle of pyrimethamine tablets and swallowed a number (15-25) of them. Within 30 minutes to 2 hours the child developed convulsions, occasionally vomited, collapsed, and either died one to three hours later or recovered. In one of these cases prompt medical action saved the child. In one case pyrimethamine could not be incriminated with any certainty. Apart from acute poisoning there were five cases of chronic toxicity of pyrimethamine given to one infant and four children at gross overdosage—for example, three tablets a week for six weeks or one tablet daily for three weeks). This was followed by asthenia, severe megaloblastic anaemia, and, in the case of two African children, death from a condition diagnosed tentatively as agranulocytosis.

Although the medical questionnaire brought some evidence of the type and frequency of side-effects in regular takers of antimalarial drugs for prophylaxis it was thought that more direct information could be obtained from the large residential group in Lagos. A few specific points in the questionnaire designed for the lay public called for definite answers which could be of value in this investigation.

As it was well known that some people keep changing their antimalarial prophylactic drug while others are faithful to one for a long time, an appropriate point calling for a reply was inserted in the questionnaire addressed to the residents in Lagos. The results are shown in Tables VI and VII.

A total of 527 residents of Lagos stated that they had changed at one time from one drug to another. This change was more frequent among adults (29%) than among children (17.5%) or infants (15%), with no significant difference between sexes.

Of all people changing drugs, the greatest number (279) changed from proguanil, forming 52.9% of those who changed drugs and 13.8% of the total in this survey; 75.6% of these went over to pyrimethamine—more children (87.0%) and infants (85.7%) than adults (72.5%). Chloroquine was the next most popular choice (55 persons, 19.7%).

TABLE VI.—Numbers of Residents in Lagos Changing Their Drug

Drug Changed from	Drug Changed to												Total	
	Proguanil		Chloroquine		Pyrimethamine		Mepacrine		Quinine		Amodiaquine			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Proguanil	17	3.2	55	10.4	211	40.0	6	1.1	6	1.1	1	0.2	279	52.9
Chloroquine .. .	10	1.9	8	1.5	5	0.9	—	—	1	0.2	—	—	23	4.4
Pyrimethamine ..	10	1.9	5	0.9	12	2.3	—	—	8	1.5	1	—	19	3.6
Mepacrine .. .	78	14.8	8	1.5	22	4.2	2	0.4	—	—	—	—	103	19.5
Quinine .. .	71	13.5	—	—	—	—	—	—	—	—	—	—	103	19.5
Total ..	176	33.4	76	14.4	250	47.5	8	1.5	15	2.8	2	0.4	527	100.0

Mepacrine and quinine—the two "old-fashioned" drugs—were both abandoned by 19.5% of those who changed. Of those who stopped mepacrine, 75.7% went on to proguanil and 11.7% to pyrimethamine. Of the erstwhile quinine-takers, 68.9% preferred proguanil and 21.4% pyrimethamine. People who took chloroquine and pyrimethamine *ab initio* seem to be well satisfied with these drugs, changes occurring in only about 1% of the series.

The reason for a change of drug was also asked for. The answers were tabulated under the following headings: "Not effective," "personal preference or other reasons," "ill effects" (Table VII). Noticeable is the number of persons

TABLE VII.—Reasons for Changing Antimalarial Drugs in Lagos, 1956

Drug Changed from	Reason for Changing						Total	
	Not Effective		Personal Preference		Ill Effects			
	No.	%	No.	%	No.	%	No.	%
Proguanil ..	52	18.6	114	40.9	113	40.5	279	100
Chloroquine ..	3	13.0	9	39.1	11	47.8	23	100
Pyrimethamine ..	6	31.6	1	5.3	12	63.1	19	100
Mepacrine ..	31	30.1	—	—	72	69.9	103	100
Quinine ..	24	23.3	36	34.9	43	41.8	103	100
Total ..	116	22.0	160	30.4	251	47.6	527	100

Note.—The percentages refer to the relative proportions of the different reasons in the number of people changing from that particular drug.

who abandoned proguanil from personal preference—mostly for pyrimethamine, on account of the convenience of a weekly dose as opposed to a daily one, particularly in children. Nevertheless it is worth remarking that some people gave the contrary reason for changing from pyrimethamine to proguanil, because they found the daily dose easier to remember than the weekly one. As regards the incidence of ill effects, there were no significant differences between the various drugs, except in the case of mepacrine, which always was notoriously unpopular because it stained the skin yellow.

Gastro-intestinal upset was the commonest ill effect attributed to any drug; the usual symptoms were anorexia and nausea, often accompanied by dyspepsia and flatulence. Pyrimethamine appears to be the least offensive in this respect. Headache, insomnia, depression, together with lassitude, forgetfulness, and irritability—a syndrome for long popularly recognized as "coast-head"—was attributed to a drug by 40 people (15.9%) complaining of ill effects: all stated or implied that their symptoms disappeared on changing their drug. As was to be expected, mepacrine was the principal cause of skin trouble, and quinine of symptoms referred to the ears; other complaints, often vague and unconvincing, accounted for 10% of "ill effects," fairly randomly divided between the various drugs.

(4) Consumption of Antimalarial Drugs in Nigeria

A brief reference to the consumption of antimalarial drugs in Nigeria was made in a previous paper (Bruce-Chwatt, 1951), but the changing trends in the demand for these drugs can be assessed best from total amounts issued by the medical departments stores every year. Table VIII quotes the total number of tablets (in thousands) of each of the five main antimalarials indented during the period

1952-7 by medical officers of the Federal and the three Regional Governments. It should be pointed out that this table does not show the straight consumption of anti-malarials; during the past five years the number of hospitals and dispensaries opened in Nigeria had increased very considerably, and the figures in Table VIII reflect to some extent the ordering of new supplies for the greater number of treatment centres. Data concerning the consumption of drugs by private persons and commercial firms are not included in this table as they are not easily available.

Details of the consumption of parenteral preparations of antimalarial drugs are of less interest, but it might be added that the estimated number of ampoules of mepacrine (at 100 and 300 mg.) ordered by the governments in 1956 was 40,000, while the respective figure for quinine ampoules (at 6 and 10 gr. (400 and 650 mg.) was 30,000, and for ampoules of chloroquine 15,000.

The estimated cost to the governments of all antimalarial drugs used in 1956 for both prevention and treatment of malaria was approximately £60,000.

TABLE VIII.—Amounts of Antimalarial Drugs in Tablet Form (in Thousands) Purchased by the Government Medical Departments in Nigeria During the Period 1952-7

Year	Quinine Tablets (All Salts) at 5 gr. (650 mg.) Each	Mepacrine Tablets at 100 mg. Each	Chloro-quine Tablets at 150 mg. Base Each	Proguanil Tablets at 100 mg. Each	Pyrimethamine Tablets at 25 mg. Each	Amodia-quine Tablets at 200 mg. Base Each
1952	636	12,089	—	5,000	—	—
1953	242	8,647	91	2,007	11	—
1954	155	9,380	368	3,278	44	—
1955	240	9,424	1,042	10,618	121	59
1956	171	10,153	1,831	8,466	213	168
1957	92	10,291	3,115	8,522	701	376

(Approx.)

DISCUSSION

Difficulties in the correct diagnosis of malaria mainly from clinical symptoms, with little help from the blood examination, are considerable in West Africa, and are responsible to some extent for the unreliable malaria morbidity statistics of Africans and Europeans in Nigeria.

Information obtained through two questionnaires provided some new data on the incidence of malaria in the expatriate non-African population. It appears that the overall annual malaria morbidity of this population in the Federation of Nigeria fell from 225 per 1,000 in 1950 to 142 per 1,000 in 1956. Improvements in methods of malaria control in urban areas might have contributed to this gratifying decrease in morbidity, but the main cause of this is probably better individual protection and particularly the widespread use of more active prophylactic antimalarials. The disappearance of blackwater fever following the substitution of suppressive quinine by synthetic antimalarials is striking.

A survey of the therapeutic use of antimalarials in Nigeria revealed that as a whole the clinical medical practice in this country reflects creditably the remarkable advances achieved by experimental chemotherapy during the past ten years. Several interesting points were gathered from the answers to the medical questionnaire.

Chloroquine, given orally and parenterally, has become a drug of choice for the treatment of malaria in Nigeria. There can be little doubt that this drug is most effective and that the administration of the "loading dose," which averages two-thirds of the total dose, over three to five days is a correct procedure.

In spite of the popularity of chloroquine, quinine and mepacrine are still used; the former mainly for parenteral administration in severe malaria, the latter both by mouth and intramuscularly, somewhat indiscriminately, especially in rural areas.

The survey revealed a disturbing number of grave side-effects of intramuscular administration of mepacrine in

infants and young children. This disadvantage has been known for some time, but the frequency of these often fatal incidents was underestimated, as they were not widely known. It might be argued that 29 fatal sequelae of the intramuscular injection of mepacrine in children constitute a small proportion of all cases in which this treatment was beneficial, but it should be remembered that the number of accidents quoted above is probably only a proportion of all cases.

Similar observations were made in East Africa a few years ago (Dockeray, 1951) and confirmed in Uganda by Trowell (personal communication) and by Luder (1957). One such case, of toxic mepacrine encephalopathy in a child given a mepacrine injection in the absence of malaria, was described by one of us (Bruce-Chwatt, 1955). The experience in Nigeria is not in agreement with that of Covell *et al.* (1955), who maintain that mepacrine convulsions are alarming but seem to have no serious effects.

It must be admitted that chloroquine is not entirely blameless in this respect, and the two cases of acute toxic effects of intramuscular chloroquine, quoted by our medical correspondents, are similar to those described in Ghana by Harris (1955). Nevertheless at the present time the general consensus of medical opinion is that intramuscular chloroquine is safe when properly administered. It is certain that the danger of parenteral administration of any antimalarial will be greatly decreased if the drug is given in two or three fractional doses, over one to one and a half hours. Attention should be drawn to the importance of calculating the dosage of intramuscular chloroquine in relation to the actual weight of children and not by a rule of thumb referring only to the age of the child (Harris, 1957). Oral administration should be preferred whenever feasible.

Serious side-effects after chloroquine given by the mouth were uncommon; on a full therapeutic dose of about 2 g. over four to five days pruritus and temporary blurring of vision might be quite troublesome in about 1% of patients. Amodiaquine has gained some favour among the medical profession in spite of the fact that there is no evidence that it is superior to chloroquine. A comparative study of the schizontocidal effect of both drugs (Charles, 1958) confirmed Davey's (1955) opinion "that amodiaquine cannot be used in any way—that is, in any particular dosage regimen—which is significantly different from a way in which chloroquine might be used."

The results of the medical questionnaire were of interest with regard to some important points mentioned by Covell *et al.* (1955). (1) Dosage of antimalarial drugs necessary for treatment of malaria in semi-immunes was about one-third to a half of that needed for the non-immune subject, and a short treatment consisting of 600 mg. of chloroquine in a single dose or 800 mg. of mepacrine over two days was usually effective. Good effects were also reported by those who used single-dose treatment of 600 mg. of amodiaquine. (2) There was no evidence of any strain of *Plasmodium falciparum* in Nigeria being resistant to therapeutic doses of chloroquine, mepacrine, or amodiaquine. However, some indirect and inconclusive reports have been quoted of increased tolerance by malaria parasites of proguanil or pyrimethamine given as suppressives. (3) There were justified complaints of the ever-increasing confusion created by the profusion of various proprietary names for the same active drug and by the varying dosages expressed either as a salt or as a base. Need was expressed for a reliable active drug without a bitter taste, suitable for paediatric practice.

With regard to the latter point, attention might be drawn to the recent confirmation by Clyde and Shute (1958), in Tanganyika, of the failure of the chloroquine methylene- β -hydroxynaphthoate reported by Bruce-Chwatt and Charles (1957).

Respective Values of Suppressives

When it comes to discussing the recent trends in the choice of suppressive antimalarials and their respective

values the conclusions deriving from the two questionnaires are on less objective grounds. The use of antimalarial drugs for individual protection has been almost general in the expatriate population of West Africa for the past 50 years.* All senior Government officials and most of the senior staff in commercial undertakings, missions, etc., are supplied with antimalarials free of charge. A few years ago only quinine, mepacrine, or proguanil could be obtained on demand, but nowadays this extends also to chloroquine and pyrimethamine. Since the taking of an antimalarial is a normal feature of everyday life no wonder that the discussion of favourite antimalarial drugs is a popular conversational topic at any social gathering in Nigeria. There are unfathomable "fashions" in drug-taking, and many more or less imaginary complaints connected with them tend to obscure the real incidence of specific side-effects. All this, stimulated by an increasing amount of advertising, has led to an undesirable situation, as many expatriates are experimenting on themselves, using one or another drug, often at dangerously high dosages.

It appears from replies to both the medical and the "residential" questionnaire that proguanil is taken by nearly three-quarters of all expatriates and by an increasing number of educated Nigerians. Pyrimethamine and chloroquine are the next choice, with amodiaquine third. In comparing these findings with those of the 1950 questionnaire the remarkable though expected trend is the eclipse of the remarkable though expected trend is the eclipse of the quinine and mepacrine as protective drugs. The other interesting fact is the generally increased dosage of proguanil used with the modal dose in 1950.

The changing trend in prophylactic antimalarials taken by a representative sample of the expatriate population of Nigeria can be seen best from the comparative figures obtained successively by the Bruce-Chwatts (1950), Nicol (1953), and the present survey.

The percentages of expatriates taking one or the other prophylactic antimalarial were as follows:

	1950	1952	1956
Proguanil ..	65%	68%	70%
Quinine ..	23%	16%	3%
Mepacrine ..	10%	6%	0.6%
Chloroquine ..	1%	2%	5%
Pyrimethamine ..			20%

General Protection

The true comparative value of the main drugs for the "general protection," in the sense given to this term by Covell *et al.* (1955)—that is, suppression of clinical symptoms, suppressive cure of *P. falciparum*, and causal prophylaxis—cannot be established from replies given to the two questionnaires. Every drug, at whatever dosage taken, was alleged to have failed in approximately 6% of takers. This figure is in reasonably good agreement with the results obtained by Nicol (1953), who gave the percentage of "break-throughs" as 10.

Whether these break-throughs are genuine and due to the irregularity of drug-taking, or its underdosage, or an intercurrent gastro-intestinal illness interfering with the absorption of the drug, or unusually great exposure to infection, or the presence of a resistant strain of the malaria parasite or other unknown factors is impossible to tell, though the first suspicion is justified and the following two causes are most likely. The possibility of relapsing infections with *P. malariae* or *P. ovale* of local origin cannot be dismissed, but is likely only in sporadic cases and not in nearly 10% *P. vivax*, usually responsible for relapses of malaria, is so extremely rare in Nigeria that one or two imported cases

*It is generally believed that the regular use of prophylactic quinine was introduced into West Africa in 1835. According to the late G. M. Findlay (*In litt.*), however, the "preventive quinine" was initiated on the West Coast in 1772 by Robert Robertson, a naval surgeon and a friend of James Lind, the promoter of the administration of "the bark for the cure of ague" in India. Robertson later became a Fellow of the Royal Society.

would not account for more than a fraction of the incidence of malaria quoted above.

There is no factual evidence that proguanil- and pyrimethamine-resistant strains of *P. falciparum* might be responsible for some of the "break-throughs." A few personal comments of medical officers who had experienced an attack of malaria (with a positive blood slide) while on proguanil or pyrimethamine prophylaxis are insufficient to support this presumption. The incidence of malaria in regular takers of antimalarials generally and proguanil and pyrimethamine in particular has not increased in comparison with 1950, and it can be safely said that for the time being no drastic changes in the choice of suppressive drugs in Nigeria are necessary (Nigeria, 1949-54).

In Nigeria there has been an obvious trend to substitute pyrimethamine for proguanil, especially in children. The main, and good, arguments in favour of pyrimethamine are the lack of taste and the ease of giving a tablet once a week (usually on Sunday) instead of every day. It is of interest that in several replies to the questionnaires correspondents admitted that they reverted to the daily proguanil regimen, as they found it difficult to remember to take pyrimethamine on only one particular day of the week and felt that the daily routine left much less margin for any possible errors of individual prophylaxis. On the other hand, the use of pyrimethamine once a week was most convenient in hospitals, schools, labour camps, antenatal clinics, etc., whenever a collective prophylaxis is carried out in a reasonably stable or supervised group. The problem of the best routine of prophylactic drug-taking is far from simple and must "take into account economics, human desires, and human failings" (Davey, 1955). This is of considerable importance with regard to the routine administration of prophylactic chloroquine, which is usually given twice a week at 300 mg. base: it is probable that a daily routine of 50-75 mg. would be a far better choice for individual prophylaxis.

It is of interest, therefore, that Davey and Robertson (1957) carried out a successful field trial of chemoprophylaxis with a daily dose of 50 mg. of chloroquine base because the daily regimen has been favoured by the Army authorities. Several years ago French workers adopted the daily prophylactic dosage of 100 mg. of chloroquine base, and since 1953 this method has been used throughout French West and Equatorial Africa with considerable success.

It will thus be understandable why the method of individual prophylaxis by amodiaquine—two tablets twice a month—is quite unrealistic and of doubtful value.

There is little evidence that any of the three commonly used prophylactic drugs (proguanil, chloroquine, pyrimethamine) produce any serious and consistent side-effects when taken at standard dosage. Pyrimethamine is probably the least responsible for any gastro-intestinal or other complaints commonly referred to other drugs. It is therefore all the more regrettable that during 1956 there were five fatal cases of poisoning due to pyrimethamine left within the reach of toddlers, attracted by the small size of the tablets and their lack of bitter taste.

All these cases are much the same as those of accidental pyrimethamine poisoning in children described by Taylor (1953), Davidson (1954), Gunther (1954), Peake (1954), Abbott (1955), Davies (1956), and in the Belgian Congo by Montauban *et al.* (1956), whose paper contains the best clinical description of acute pyrimethamine poisoning.

It should be added, in all fairness to the drug, that these accidents happened in Nigeria in 1956, before the introduction of the modern plastic strip pack of pyrimethamine, which should effectively prevent children from swallowing more than one or two tablets.

Five cases of long-term toxicity of pyrimethamine (megaloblastic type of anaemia), given at doses far in excess of those normally used, were more serious, as they were due to an error of judgment of the medical practitioner or to irresponsible self-medication by laymen. The main cause

of the medical errors of judgment was the lack of appreciation of the differences between proguanil (which has a wide margin of safety) and pyrimethamine, remarkably active in small doses but toxic when given to children at several times its standard dose.

It appears that the conclusions of Myatt *et al.* (1953) about the reversibility of megaloblastic anaemia of adult volunteers on 25 mg. of pyrimethamine daily for several weeks do not necessarily apply to the blood-forming organs of children. The Federal Government of Nigeria, justifiably alarmed at the excessive dosage of pyrimethamine used in 1956 by some medical practitioners and by the lay public, circularized at the end of that year a warning to the medical profession in Nigeria. It appears that this warning was duly heeded, as only one case of overdosage of pyrimethamine came to light during the past year.

The replies to the medical questionnaire showed that there is a considerable measure of disagreement between medical practitioners in Nigeria regarding the value of drug prophylaxis in the indigenous population. The fact that out of 146 replies 100 did not express any definite opinion on this controversial subject indicates the gap in our knowledge of the problem of malaria immunity and its relationship with individual or collective chemotherapy. In view of the absence of a concerted opinion of the medical profession in Nigeria on the value of drug prophylaxis in the African population we express our own point of view.

In discussing the value of protective drugs in the indigenous population three groups of people must be distinguished. The first is a small but growing group of African infants and children either born in Europe or having been away for a long time and who are returning to the malarious areas. These should be treated, especially for some time after their return, as non-immunes and protected by the same drug regimen. The second group is constituted by antenatal clinics, infant welfare centres, schools, labour camps, etc. Such groups can be supervised; and here the value of antimalarial drugs is considerable, since they reduce the amount of sickness and decrease the infectivity of the human reservoir of infection.

An ideal drug in these conditions should have a combined curative and long protective action similar to that shown by pentamidine for prevention of trypanosomiasis. Unfortunately there is no such antimalarial at present, and all known drugs are excreted rapidly and have a short "carry over" value, so that a once-weekly or, at least, once-monthly administration is necessary whenever a long-term effect is sought. The choice lies between proguanil and pyrimethamine on the one hand and mepacrine, chloroquine, and amodiaquine on the other.

The first two have the advantage of low toxicity, low cost, and a potent sporontocidal effect, but they may induce parasite resistance, especially when used for treatment as well as prevention of malaria.

Chloroquine and amodiaquine are excellent for both purposes; their cost is still relatively high. Mepacrine has the advantage of being cheap, but it has several undesirable side-effects. The general consensus of opinion is still rather in favour of proguanil and pyrimethamine, but it is possible that in the long run chloroquine or amodiaquine will be the best in conditions where protection from malaria must start with its cure and especially where resistance to the first two drugs had appeared.

An indigenous child continuously exposed to malarial infection need not be given a continuous uninterrupted protective regimen from its early infancy through its whole life. There is no doubt that the administration to these children of adequate doses of active antimalarial drugs, particularly at the peak of the transmission season, will help the growing organism by easing the load of heavy parasitaemia without thereby hampering the progressive building up of the individual acquired immunity to malaria.

In the third group of the indigenous, large, and scattered rural population mass distribution of antimalarials could

hardly achieve any permanent results (Bruce-Chwatt, 1956). Moreover, administrative difficulties of such mass distribution are enormous, and with the exception of some special circumstances, such as stopping an epidemic, the prevention of malaria by residual insecticides remains the only possibility, though mass treatment will speed up the interruption of transmission.

SUMMARY

Reliable data on the incidence of malaria are difficult to obtain in Nigeria, and the reported figures do not reflect the true situation.

The malaria morbidity of the expatriate population in Nigeria, which was estimated in 1950 at 225 per 1,000, had decreased in 1956 to 142 per 1,000. In an expatriate population of nearly 18,000 there was one death due to malaria and one to blackwater fever.

Information on antimalarial drugs obtained from two questionnaires showed that chloroquine is the most popular therapeutic drug, with mepacrine second, and amodiaquine third. For severe malaria, quinine injections are still frequently used.

As a protective drug proguanil was the most favoured, followed by pyrimethamine and chloroquine. In about 6% of takers of all protective drugs "break-throughs" of malaria were reported, but the reasons for these break-throughs, as well as their diagnosis, are uncertain.

Intramuscular injections of mepacrine in infants and small children may be followed by serious and often fatal sequelae. Both mepacrine and chloroquine given at a full therapeutic dose may produce a number of side-effects which are usually transient. Side-effects due to protective drugs are rare, though in 1956 there were several cases of accidental fatal poisoning of children by pyrimethamine.

An assessment has been made of the amount of antimalarial drugs consumed in Nigeria in 1956.

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MALARIA AND PREMATUREITY IN THE WESTERN REGION OF NIGERIA

BY

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The amount of information available in tropical Africa on the relationship between malaria infection and prematurity is still inadequate. An investigation based on nearly 400 single deliveries is of sufficient interest to warrant this preliminary note.

The Wesley Guild Hospital, where this work was carried out, is a Methodist Mission Hospital which has been established in Ilesha (a town of about 80,000 inhabitants) for 45 years. During 1956 there were almost 12,000 attendances of 2,683 patients at the antenatal clinics and 815 deliveries in the hospital. Not all of these deliveries were from our own clinics; a proportion of these patients were women coming in from the surrounding villages to be delivered, and some were referred from local clinics.

The major problem facing any worker on prematurity in Nigeria is to determine whether an infant is premature or not. The W.H.O. (1950) has defined a premature baby as one which weighs less than 5½ lb. (2,500 g.) at birth, but this standard is not universally accepted for Negro children. The average birth weight of infants born in the Wesley Guild Hospital is between 6 and 6½ lb. (2,720 and 2,950 g.), which is much below the average of 7 lb. (3,180 g.) for England. Most of the African women who attend the antenatal clinics have no record of the last menstrual period, and no accurate estimation of the maturity of the infant can be made on the duration of pregnancy.

Present Investigation

Relationship between the malaria infection of the placenta and the weight of the child at birth was investigated on 392 single deliveries. The above sample had to be selected so as to exclude women who had taken any antimalarial drugs during the late months of the pregnancy. Quinine, mepacrine, and other drugs are readily obtainable in the local market, and a number of women take the drugs during pregnancy for "fever" or for various real or imaginary ailments or as a "tonic."

Immediately after the delivery of the placenta a wedge-shaped piece of it was cut from the maternal aspect of the organ and a smear was made on a slide. The film was fixed with absolute methyl alcohol and stained for 45 minutes in 5% Giemsa diluted in buffered water at pH 7.2. All the films were first examined by the technician and then rechecked without reference to the clinical data. The infants were weighed as soon as possible after delivery. usually within two hours of birth. The results are shown in Table I. The weights of newborn babies were classified into four groups, and the numbers in each of these groups in relation to the infection of the placenta are shown in Table II.

Adopting the term "premature" for all babies weighing less than 5½ lb. (2,500 g.) at birth, with the reservation that not all such Nigerian babies are necessarily premature.

TABLE I.—Relationship Between the Malaria Infection of the Placenta and Birth Weight

	No.	%	Mean Birth Weight
Infected placenta	130	33	5 lb. 12 oz. (2,610 g.)
Non-infected placenta	262	67	6 lb. 7 oz. (2,920 g.)
Total	392	100	6 lb. 3 oz. (2,807 g.)

the percentage of premature babies is 37 in the infected group and 12 in the non-infected. The difference of 25% is 3.4 times its standard error and therefore statistically significant.

TABLE II.—Four Groups of Weights of African Newborn in Relation to the Infection of Their Placenta

Weights of Infants	Infected Placenta		Non-infected Placenta	
	No.	%	No.	%
Up to 3 lb. 4 oz. (1,474 g.)	2	1.5	—	—
3 lb. 5 oz. to 5 lb. 8 oz. (1,500 to 2,495 g.)	46	35.4	32	12.2
5 lb. 9 oz. to 7 lb. 12 oz. (2,523 to 3,515 g.)	76	58.5	215	82.1
More than 7 lb. 12 oz. (3,515 g.)	6	4.6	15	5.7
Total	130	100.0	262	100.0

It was thought to be of interest to analyse the proportion of infected placentae in relation to the parity of the mother, and the results of this investigation are shown in Table III, where all newborn babies below 5½ lb. (2,500 g.) are counted as premature.

TABLE III.—Relationship Between the Parity of the Mother, Frequency of Placental Infection, and Birth Weight

Para	Infected Placentae			Non-infected Placentae			Positive Placentae (%)
	No.	Premature		No.	Premature		
		No.	%		No.	%	
1	75	33	44.0	45	12	26.6	62.5
2	22	9	41.0	41	4	9.7	35.0
3	13	2	15.4	51	5	9.8	20.3
4	7	1	14.3	42	5	11.9	14.3
5	4	1	25.0	40	1	2.5	9.1
6 and over	9	2	22.2	43	5	11.6	13.5
Total ..	130	48	37.0	262	32	12.2	33.0

Of the infants born of the infected placentae, nine died in the first week of life (6.9%), but in the non-infected group only 3.4% died in the first week. These figures are in general agreement with the frequency of prematurity in each group.

In view of the interest in the problem of sickling and malaria infection (Livingstone, 1957), 306 mothers were tested for the presence of the sickle-cell trait, using 2% sodium metabisulphite solution mixed with a drop of blood under a sealed coverslip.

The overall sickling rate in 306 mothers was found to be 10%; the sickling rate of 100 women with infected placentae was 11%, and the corresponding rate in 206 women with non-infected placentae was 9.2%. The difference of 1.8 is less than twice its standard error, and this would suggest that sickling has little effect on the development of the malarial parasite in the placenta.

The problem of congenital malaria in Nigeria has recently been discussed (Atkins, 1957; Bruce-Chwatt, 1957), and the opinions expressed were quite contradictory. In an attempt to obtain some data from Western Nigeria 117 newborn babies were investigated for the presence of malaria parasites in their peripheral blood within 24 hours after birth. The corresponding placentae were also examined. It was found that 30 placentae were infected with malaria parasites, giving a percentage of 25.6. None of the 117 newborn were found to be infected.

Discussion

Prematurity is the commonest cause of neonatal death, and it has been suggested that malarial infection of the mother, and consequently the placenta, is one of the causes of prematurity in Nigeria. Bruce-Chwatt (1952) examined the placentae of 310 single deliveries in Lagos and its vicinity, and showed that 73 (23.6%) were positive, and that the average birth weight of babies born with these placentae was 145 g. (4 oz.) less than the average birth weight of those born with non-infected placentae. Archibald (1956), working at Ilaro in the Western Region of Nigeria, found malarious placentae in 77 cases (15%) out of a series of 463; the average birth weight of babies from infected placentae

was 6 lb. (2,720 g.), and from non-infected placentae 6 lb. 6 oz. (2,890 g.), a difference of 6 oz. (170 g.).

The present investigation confirmed these findings and showed that 130 African babies whose placenta was infected with malaria parasites had a lower mean birth weight than 262 whose placenta was not infected. The difference in birth weight between the two groups was 11 oz. (312 g.). The proportion of newborn with very low birth weights was greater in those whose placenta was infected.

It appeared that there is a negative correlation between frequency of infection of the placenta and the parity of the mother. The increasing resistance to the infection might be due simply to the increasing average age of the women at each successive parity and correspondingly higher degree of immunity. It is of interest, however, that the percentage of babies weighing less than 5½ lb. (2,500 g.) is increased in the malarious group at each parity. The comparison between the average birth weights and percentage of prematurity of South African babies of various races (Salber and Bradshaw, 1953) with Nigerian babies born in Ilesha is of interest. It will be seen from Table IV that the average birth weight of Nigerian infants is lower, and the percentage weighing less than 5½ lb. (2,500 g.) at birth higher than any of the four races, including the Bantu, which are of negro stock.

TABLE IV.—Birth Weights of South African Babies Compared with Nigerian Babies

Race	Average Birth Weight	Percentage Less Than 5½ lb. (2,500 g.)
European S.A.	7 lb. 8 oz. (3,400 g.)	4.2
Coloured S.A.	6 lb. 14 oz. (3,120 g.)	9.6
Bantu S.A.	6 lb. 12 oz. (3,060 g.)	11.5
Indian S.A.	6 lb. 7 oz. (2,920 g.)	18.3
Nigerian (Ilesha)	6 lb. 3 oz. (2,805 g.)	20.4

An investigation of the presence of congenital malaria in a sample of 117 newborn babies showed that, although 25.6% of them had infected placentae, no malaria parasites could be found within 24 hours after birth in any newborn infant. This confirms the results obtained by Bruce-Chwatt (1952) and indicates that congenital malaria is very rare in the indigenous population of Nigeria, in spite of the frequent infection of the placenta.

Summary

Out of 362 newborn African babies 30% had a placenta infected with malaria parasites.

The mean birth weight in the 130 newborn that had an infected placenta was 11 oz. (312 g.) less than the birth weight of 262 whose placenta was not infected.

There were 33% of premature babies in deliveries where the placenta was found infected with malaria parasites; in deliveries with non-infected placenta the respective figure was 12%.

There was no case of congenital malaria among 117 newborn, 25.6% of whom had an infected placenta. There appears to be a negative correlation between frequency of infection of the placenta and the parity of the African mother.

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MECHANISM OF ACUTE HYPOTENSION FROM FEAR OR NAUSEA

BY

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It is common knowledge that emotion, particularly fear, may cause syncope. There are great difficulties, however, in obtaining records of the circulatory events which precede the attack, and many situations, such as high-flying jet aircraft or the altar steps, are impossible to investigate.

There is a small amount of evidence that the final mechanism of syncope induced by fear of needles is the same as syncope induced by haemorrhage, for Brigden *et al.* (1950) and Greenfield (1951) each demonstrated vasodilatation of forearm vessels in a single subject during the phase of low blood pressure.

Further evidence has now become available. An investigation into the cause of cerebral damage following nitrous oxide anaesthesia for extraction of teeth was suggested by the clinical material collected by Bourne (1957). It was at first thought that reduction in arterial oxygen saturation might be the main factor, but it is shown in this paper that severe hypotension is not uncommon, and that a precipitating cause is the well-known fear of the dental chair.

Emotion is often associated with nausea, and either or both may cause syncope. The effects of spontaneous nausea have from time to time been recorded in this laboratory during the course of circulatory observations, and the treatment of alcoholic patients with apomorphine allowed an opportunity of obtaining control records before nausea was induced.

Material and Methods

The subjects were volunteers; the dental patients being young healthy males (21 to 39 years) in need of urgent extraction of one or, at the most, two teeth. The alcoholic patients were older males (40 to 60 years).

Intravascular and intrathoracic pressures were measured with capacitance manometers and changes in arterial oxygen saturation with a continuously recording photoelectric device on the ear. Forearm flow was measured by venous occlusion plethysmography and recorded on the same photographic paper as the measurements of vascular pressure. Plethysmography was unsuitable in the dental cases owing to the inevitable final phase of violent muscular movements. In some subjects, however, the vascular resistance of a limb was measured by an arterial "run-off" method (Hayter and Sharpey-Schafer, 1958). In this method the artery is suddenly occluded by a high-pressure cuff. The rate of fall of arterial pressure distal to the cuff varies with the vascular resistance in the limb. This resistance, calculated by an empirical method, shows a good correlation with the resistance calculated from simultaneous pressure and flow measurements. The method is rapid, as only 2 seconds' occlusion is necessary for calculation, and is relatively free from artifact when violent muscular movements are to be expected.

Results

Effects of Dental Gas

Twenty-one subjects were investigated, five developing hypotension and the remainder showing evidence of the effects of emotional stress on the circulation. Circulatory

Data From Continuous Records Just Before Administration of N₂O

Case No.	Heart Rate	Pulse Pressure (mm. Hg)	Arterial Pressure (mm. Hg)
1	108	80	152.72
2	105	96	191.95
3	143	68	145.77
4	111	100	201.101
5	135	85	175.90
6	92	50	134.84
7	98	68	151.83
8	102	84	174.90
9	109	108	201.93
10	96	75	161.86
11	112	95	135.68
12	96	72	195.100
13	115	72	158.86
14	90	43	115.72
15	94	66	126.60
16	112	60	126.66

data obtained from continuous arterial records just before administration of N₂O are shown in the Table. In many subjects both heart rate and pulse pressure were considerably increased.

On giving gas the mean arterial pressure and pulse pressure increased still further and the arterial oxygen saturation fell to about 60% (Fig. 1). With tooth extraction or severe asphyxia large changes in intrathoracic pressure were superimposed on the arterial pressure trace, while in some subjects violent pronation of the forearm interfered with recording in the brachial artery. During induction of anaesthesia the arterial "run-off" method showed constriction in the forearm.

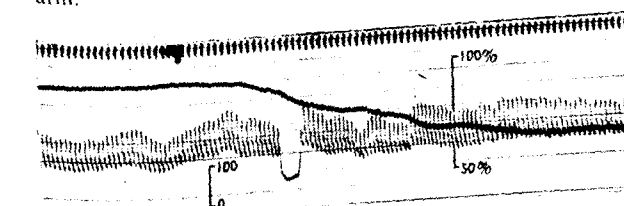


FIG. 1.—Upper trace: arterial O₂ saturation. Lower trace: arterial pressure. N₂O was given at the black signal on the time marker. Calibrations in mm. Hg, % saturation, and time marker in seconds in this and subsequent figures.

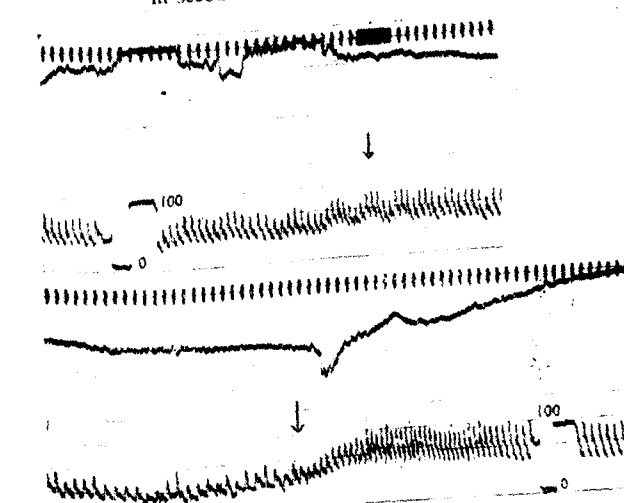


FIG. 2.—Upper trace: arterial O₂ saturation. Lower trace: sub-arterial pressure. N₂O was given at the first arrow and the sub-arterial pressure at the second arrow. Arterial pressure was low before the anaesthetic was given. There is a gap of 15 seconds between the upper and the lower record.

Administration of N₂O was not the main factor in causing hypotension, since in four out of five subjects arterial pressure was low before the mask had been placed on the face (Fig. 2). Indeed, in two subjects the giving of gas raised the previously low blood pressure. One subject had hypotension and syncope when tipped into the erect sitting posture preparatory to proceeding with the dental gas, recovered when tipped into the supine position, again had syncope when erect, and was finally successfully anaesthetized and a tooth extracted while supine.

The final, or efferent, mechanism of the fall in arterial pressure is shown in Fig. 3. The vasodilatation in forearm vessels was similar to that found in syncope induced by haemorrhage (Barcroft *et al.*, 1944) or by fear of needles (Brigden *et al.*, 1950). Bradycardia was also present and pallor of the skin persisted afterwards for many minutes, suggesting discharge of posterior pituitary hormone.

There remains the problem of how this vasovagal fainting reflex is initiated. The evidence presented above suggests that emotion or fear is the main factor. Reduction in arterial oxygen saturation, which can also result in vasovagal fainting (Anderson *et al.*, 1946), would seem to be only a possible additional cause.

Effects of Apomorphine

Five alcoholic patients were investigated in the supine position. Effective right auricular pressure (right auricular pressure minus intrathoracic pressure) was measured by the differential manometer system described by Lee *et al.* (1954).

Arterial pressure and forearm flow were recorded on the same photographic paper. After a control period a suitable alcoholic drink was made available and 4 mg. of apomorphine was given intramuscularly. Some minutes later, when nausea and yawning appeared, effective right auricular pressure fell (3 to 7 mm. Hg), the heart rate increased, but the mean arterial pressure was maintained. Still later, in three subjects, the mean arterial pressure fell below 50 mm. Hg and there was bradycardia and vasodilatation of forearm vessels (Fig. 4).

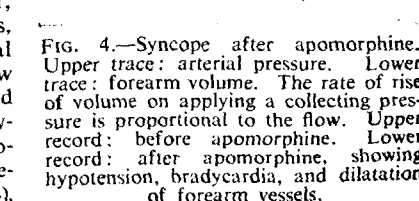


FIG. 4.—Syncope after apomorphine. Upper trace: arterial pressure. Lower trace: forearm volume. The rate of rise of volume on applying a collecting pressure is proportional to the flow. Upper record: before apomorphine. Lower record: after apomorphine, showing hypotension, bradycardia, and dilatation of forearm vessels.

About 30 other cases of spontaneous nausea have been observed, in which right auricular pressure fell with the onset of nausea. Differential manometer systems were not used in these cases, so that possible changes in intrathoracic pressure were not taken into account. The evidence suggests that dilatation of the peripheral venous system precedes hypotension in syncope induced by nausea.

Effects of Emotion in Heart Failure

The vasovagal fainting reflex has not been recorded in patients with heart failure. Such cases have been bled up to 2,000 ml. without firing this reflex (Howarth *et al.*, 1946), while venesections of 1,000 ml. cause fainting in over 50% of normal subjects (Wallace and Sharpey-Schafer, 1941). Circulatory measurements of all kinds have been made by one of us in about 700 patients with heart failure. None fainted from emotion, nausea, or other cause. Any explanation, therefore, of the afferent mechanism of the faint reflex in normal subjects must take into consideration that it does not operate in heart failure.

Discussion

Emotional fainting might be mediated in a simple fashion from the central nervous system via the efferent vasomotor nerves, causing vasodilatation in muscle vessels. If this were so, there is no reason why subjects with heart failure should not faint; indeed, many of those with a low cardiac output might well develop hypotension more easily than normal subjects. So simple a mechanism, therefore, does not cover all the facts. The most attractive explanation at the present time is that there is an afferent pathway for this reflex fired from the heart itself and that diminution of the amount of blood and virtually complete emptying of a ventricular chamber during systole is the stimulus. (With a failing circulation ordinary procedures are unlikely to empty the heart completely and the faint reflex, therefore, is not brought into play.)

The results presented in this paper suggest that there are two ways in which emotion may tend to empty the heart in normal subjects. The first is by nervous stimulation of the contraction of the heart, initially increasing the stroke output; the second is reduction of filling pressure, possibly due to venodilatation in the splanchnic area. Stimulation of the contraction of the heart simultaneously with decreased filling pressure has been studied by Henry and Gauer (1950) in dogs. Following reduction in cardiac filling pressure by bleeding, they gave adrenaline and were able to show that large pressure transients developed during systole in the cavity of the left ventricle when that chamber was virtually emptied of blood. Such large transients might well stimulate receptors which are known to exist in cardiac muscle. It is suggested, therefore, that the effect of emotion is indirect, first causing a diminution of the amount of blood in the heart. Then impulses pass from the heart to the central nervous system. Thence the reflex is mediated via the efferent vasomotor nerves, causing vasodilatation of muscle vessels.

There are other events which support this theory. Recovery occurs in a very few seconds when the filling pressure of the heart is raised by tipping into the supine position (Fig. 2). Continuous records, too, may show conspicuous fluctuations of arterial pressure with respiration during the initial phases of fainting which suggest that reflex vasodilatation is occurring intermittently with small changes in filling pressure. Finally, there seems to be some truth in the popular belief that fainting may be prevented by "taking a grip of oneself," since muscular tensing, or movement, can cause the low arterial pressure to rise (Brigden *et al.*, 1950), presumably by increasing the amount of blood in the heart above the critical level. This last mechanism may explain the recovery that took place in some dental patients when nitrous oxide was given.

Effects of Forced Maintenance of an Upright Posture

Normally a person who faints falls to the ground and arterial pressure is restored in a few seconds. In the dental chair or the ejection seat of a jet aircraft the upright sitting posture is forcibly maintained, and arterial pressure can remain for many minutes below 40 mm. Hg at heart level. Of these two similar situations, the latter is clearly more dangerous. There is some evidence from pilots who have recovered and landed safely that a number of mechanisms may cause syncope. Fear and nausea, hyperventilation, coughing, and the Valsalva manoeuvre have been described, while heat at over Mach 1 and the immobile sitting posture are additional factors. Of these mechanisms, fear and nausea might produce the longest period of hypotension, for, provided no mechanical disaster occurred to the aircraft, baroreceptor constriction should restore consciousness in about 10 seconds in the others. A pressure suit is a complete answer to all these mechanisms, the difficulty being to blow it up when it is needed.

The dental chair is a simpler problem. Unfortunately our observations showed that the dental surgeon and anaesthetist did not recognize that severe hypotension was present and were apt to call this state "a nice quiet gas." They were clearly prepared to go on extracting teeth under relatively good conditions. Dental surgeons seem to be unwilling to extract teeth in the supine posture. They claim that their instruments are unsuitable, but it is more probable that they fear legal action should teeth or the effects of aspirated blood clot appear on an x-ray film of the chest. It is unlikely that the complete answer—extraction in the prone position—will be popular. At second best, patients might be pulled out of the chair on to their faces, on the floor, when palpation of the pulse suggests that severe hypotension is present.

Summary

Continuous circulatory measurements were made before and during N₂O anaesthesia for tooth extraction and the administration of apomorphine for chronic alcoholism. Five out of 21 dental patients developed acute hypotension with vasodilatation of forearm vessels, four of these before the anaesthetic was given. Fear appeared to be the main cause, with a fall in arterial oxygen saturation as a possible minor factor. Apomorphine-induced nausea caused a fall in the effective filling pressure of the heart which preceded hypotension and syncope.

It is suggested that emotional stimulation of the heart beat and a fall in cardiac filling pressure cause virtual emptying of a ventricular chamber during systole which fires the afferent mechanism of the faint reflex. There is strong evidence that subjects with heart failure, whose ventricles are not easily emptied, do not faint.

We are indebted to the anaesthetists and dental surgeons of St. Thomas's Hospital for their collaboration.

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SEX HORMONES AND MAMMARY CANCER

EXPERIENCE WITH DURABOLIN

BY

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Whilst the effect of hormones on the growth of cancer cells in general is still completely unknown, some relationship between sex hormones and cancer of the breast seems highly probable—a relationship that clearly is exceedingly complex. This is at once evident from the various ways in which a patient suffering from mammary cancer may react to sex hormone therapy. Ira T. Nathanson (1949) said: "The point which comes to my mind is that we may have two people of the same age, with the same tumour histologically, with the same physiologic characteristics, with the same mode of spread, who, to all intents and purposes, are metabolically identical; we give them hormones of the same kind, from the same bottle, on the same day; but one patient goes on to death in a short period of time and the other patient has a nice regression and goes on for a year and a half or two years before death."

The fact that of two mammary carcinomas of the same histological structure the one metastasizes in an entirely different way from the other suggests the existence of different kinds of breast cancer. The above-mentioned statement concerning the experience that in spite of similar structure and metastases a different reaction to hormone therapy may occur shows that apparently there are various differences in the nature of these carcinomas which so far we have been unable to distinguish clearly by other means.

Statistics on the incidence of breast cancer in various age groups all show a kind of maximum in the climacteric, followed by a minimum and then a renewed increase. Pirquet (1930) inferred from this that there are two kinds of cancers (1930) inferred from this that there are two kinds of cancers—genital cancers and age cancers. I have recently (van der Werff, 1956) come to a somewhat different conclusion—that is, that two groups of breast cancer exist side by side: (1) oestrogen-dependent cancers which are stimulated by ovarian activity and can develop only in the reproductive period; and (2) age cancers which are independent of this period; and the disposition for which increases regularly with age (Fig. 1). This hypothesis explains why

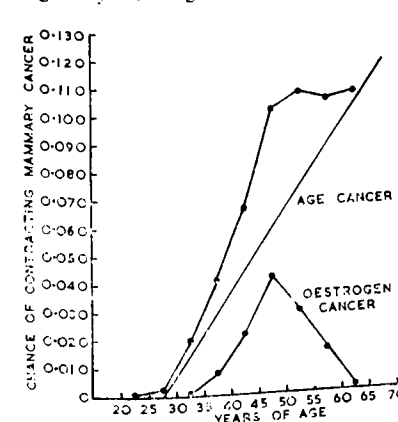


FIG. 1.—Total chance of contracting mammary cancer, being the sum of the chances of age cancer and oestrogen cancer.

in some of the patients in the reproductive period oestrogen therapy results in a rapid exacerbation. In the menopause this seems to be not so, and sometimes oestrogens even have a favourable therapeutic effect.

As regards the androgens, they seldom seem to cause a rapid exacerbation, but have mostly either a clearly favourable, though merely palliative,

effect or none at all. The favourable response is seen mainly after administration of the most commonly used androgen, testosterone propionate, to patients with bone metastases.

Consequently, whereas it may be said of oestrogens that, according to the nature of the cancer, they have a positive, a negative, or no immediate effect on the growth of the tumour, it is far less clear whether androgens in certain cases can have a direct inhibitory effect on tumour growth or whether there is an indirect inhibition by means of the protein- and calcium-sparing action of these hormones, connected with stimulation of the general defence reaction.

However, in recent years it has become clear that, after prolonged administration and even in cases which originally showed a favourable response, androgens also in the end may stimulate tumour growth. This escapes observation because the impression is gained that the preparation has ceased to have effect.

Conversion of Steroids

In fact, according to recent research, the body is capable of gradually and to an increased extent converting certain androgens into oestrogens. This has long been suspected, not only from the similarity in structure of the oestrogenic and androgenic steroids but also from the fact that androgen therapy produced an increase in oestrogen excretion. While at first one might think of another process in which the production of oestrogens could be the result of stimulation by the administered androgens, recently more direct evidence has been obtained of a biological conversion of C19 steroids into C18 steroids by making use of radioactive ¹⁴C. For example, incubation of human ovarian tissue and testicular tissue from stallions with testosterone-4-¹⁴C resulted in the formation of oestradiol-17β-¹⁴C. Intravenous administration of the same labelled androgen to a pregnant mare gave rise to excretion of oestrone-¹⁴C. Finally the direct conversion of Δ⁴-androstene, 3,17-dione-¹⁴C into oestrogenic hormone could be demonstrated, for example, in the ovary, placenta, and adrenal (Meyer, 1955; Dorfman, 1956). It is clear, therefore, that for prolonged administration a steroid is needed which does not show this conversion and yet possesses the favourable properties of the androgens used for the treatment of mammary carcinoma. As already stated, it is not really known in precisely what way the androgen can favourably influence the carcinoma, but if we consider testosterone propionate we can say that the following properties are useful: (1) a pronounced protein-sparing effect; (2) an inhibitory effect on the decalcification process caused by the bone metastases and as a result a reduction in calcium excretion; and (3) an analgesic effect due to the action mentioned under (2). On the other hand, testosterone propionate has certain less desirable properties, the principal one being the virilizing action which becomes manifest in deepening of the voice and in beard growth.

Properties of Durabolin

Apparently the new compound, norandrostenedione phenylpropionate ("durabolin") compares favourably as regards all these properties with testosterone propionate, the first but until now the most important hormone for use in mammary carcinoma (Overbeek and de Visser, 1957). In the first place it seems that conversion in the body into oestrogen is not so easy or is perhaps even impossible, so that there is a possibility that far more prolonged administration is necessary (Meyer, 1955). In addition it has an anabolic effect 12 times more powerful than testosterone propionate, and the calcium excretion in patients with bone metastases can be greatly reduced after administration, while the virilizing effect is far less pronounced. The duration of action is long, so that weekly injections of 25 mg. are sufficient. The preparation is well tolerated, and patients who show a favourable response often begin to feel much better, acquire a good appetite, and look well. Although apparently conversion into oestrogen cannot be the cause, it has

unfortunately been found that in the case of durabolin the action wears off. From a certain moment the responsive patients also are seen to go slowly downhill and finally succumb.

Now, it is a significant fact that hormone therapy is almost exclusively instituted at an advanced stage, when the usual therapeutic measures have been exhausted and the patients show recurrences or generalized metastases, in which cases total recovery is no longer possible. It is feasible, therefore, that hormone therapy might have a curative effect if surgical and radiological treatments are immediately combined with the hormone therapy; but, on the other hand, in that case it will be very difficult to prove that this hormone therapy has been the decisive factor in the complete recovery. Without hormone therapy approximately one-third of the patients treated for cancer of the breast recover. A follow-up of a very large number treated in this way might produce the required evidence only after many years.

Results with Durabolin

The following results were obtained with durabolin in patients suffering from breast cancer. This group included 13 patients with such marked generalized metastases that recovery could not be expected. Eight of these have meanwhile died. In eight other patients the metastases were not yet very pronounced but other conditions made the prognosis very bad, and durabolin was administered to improve this. All are still alive.

In practically all 21 patients considerable improvement in the general condition was observed during weekly administration of 25 mg. of durabolin. This became manifest in alleviation of pain which was sometimes very severe as a result of bone metastases, in a good appetite which led to a considerable weight-gain, and in a general sense of well-being. This satisfactory condition, however, is often in complete contrast to the radiological findings. Although occasionally some slight calcification in bone metastases is observed, this is usually not clearly marked, and, in spite of a seemingly good general condition, the bones prove to be in a deplorable state.

In contrast to testosterone propionate, the durabolin is well tolerated for many months and the unpleasant symptoms of virilization occur only sporadically. The most striking of these is the inability to sing. Van Dommelen (1956) noticed that the administration of a single large dose of durabolin gave rise to such a severe calcium retention in the bones that there was a grave risk of hypocalcaemia and tetany. This was not so in any of the 21 patients, though the blood calcium usually fell slightly. In a number of cases the alkaline phosphatase was determined regularly. Here also varying reactions were found. In responsive cases in which this level was raised it fell fairly soon and continued to vary around a value which often was still too high. In one patient durabolin had no effect and the alkaline phosphatase continued to rise. When finally ethinyl-oestradiol ("lynoral") was given, this level fell critically. The case is discussed below. This patient belonged to the group of 13 of whom it was known beforehand that they could not be saved and of whom eight have died. Some of them, however, showed a dramatic improvement which, though of a temporary nature, was quite unexpected. Two of these cases are discussed in detail.

Case 1

A woman aged 43 had an operation in June, 1953, for carcinoma of the left breast and post-operative irradiation. In November she complained of "rheumatism" and stayed in bed for two months. Her doctor then treated her with testosterone phenylpropionate, and in March, 1954, she felt well and had gained 10 kg. in weight. However, gradually "shooting pains" began to occur again, and on January 1, 1955, having already given radiotherapy to the patient, I was called in for consultation and found her in a deplorable condition. She was suffering excruciating pains as a result

of generalized bone metastases and vomited after administration of morphine or other potent analgesics. The vomiting could be stopped immediately by injections of chlorpromazine. The pain could then be relieved with analgesics and the patient could again take food, after which the general condition improved. This improvement continued for a considerable time, but in July she was again in a hopeless condition. There were widespread metastases throughout the skeletal system.

In August durabolin therapy was instituted, first 25 mg. in a fortnight, then 25 mg. weekly, and still later 50 mg. a week. In September she was already feeling much better. The pain had gone and morphine was no longer needed. There was only a certain feeling of stiffness in the back, which was not surprising considering that the skeletal system was riddled with metastases. The alkaline phosphatase level fell from 39 King-Armstrong units in September, 1955, to 19 in January, 1956, and then remained at that value. An increase in the durabolin dosage was of no avail (Fig. 2). In March, 1956, the pain suddenly became very severe again, and her condition gradually deteriorated. While about Christmas the patient had been so well that she could travel by train and stay with her relatives, she was now confined to bed, began to decline slowly, and died on July 21, 1956.

In the last few months durabolin was no longer tolerated. Virilization symptoms caused by durabolin were present only in a very slight degree.

Case 2

A woman aged 41 noticed a lump in the right breast in January, 1955, but did not go to the doctor until March. when there was also a lump in the axilla. The condition was complicated by a three-months pregnancy. She had an immediate operation, followed by irradiation, but in July there were supraclavicular nodules on the other side. Premature birth was induced and a healthy child was born.

On August 5, five days after parturition, large masses of nodules were observed in the neck. The neck was very painful, owing to a metastasis in C 2. There were also skin metastases around the vulva. Radiotherapy was given to the neck. Early in September the neck was still very painful but the nodules had disappeared. Unfortunately a tumour could now be felt in the left breast. Durabolin therapy was instituted, 25 mg. weekly. By the end of September the general condition had greatly improved. Only the tumour in the left breast was still present, but it had not grown larger. Mobility of the neck was much better. On October 11 her general condition was very good and the tumour in the left breast stationary.

Her general condition continued to be good. She could again do light housework and even ride her bicycle. She

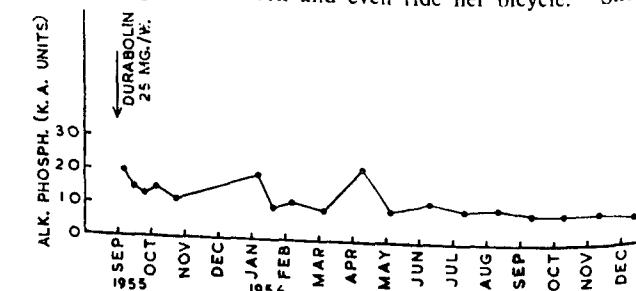


FIG. 3.—Case 2. Alkaline phosphatase during treatment with durabolin.

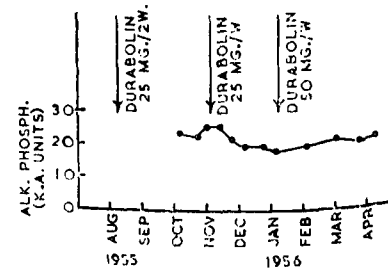


FIG. 2.—Case 1. Alkaline phosphatase during treatment with durabolin.

was troubled only by a repeatedly recurring erysipelas, which could be easily suppressed with sulphonamides and penicillin. In May, 1956, she was looking very well indeed and felt well. The tumour in the left breast was still present, but was smaller and mobile. An ablation now took place, which healed without difficulty. All this time the patient was given durabolin, one dose of 25 mg. a week. The alkaline phosphatase level, which in September, 1955, was 20 K.A. units, had fallen, and in December, 1956, it was normal (Fig. 3). Unfortunately in January, 1957, her condition began to worsen and ascites developed. Durabolin began to lose its effect, and in late February it seemed as if the end was near. In connexion with an article by Goldsbrough (1957) a course of chorionic gonadotrophin was given (500 units three times a week). It has been reported that the patient is beginning to improve once more. She was still alive in April, 1957.

Case 3

This case, referred to above, shows that sometimes durabolin has no effect at all.

In April, 1953, a woman aged 42 felt a strand with three small lumps in the right axilla. When in the course of that year the nodules grew larger she went to see her doctor, and after a biopsy specimen had been taken she had an operation. She had never felt anything in her breast. Post-operative radiotherapy was given and she remained in good condition till July, 1955, when she began to complain of pain in her back and lack of appetite. An x-ray picture showed a shadow in the right lung. The blood sugar was 50-94 mg./100 ml. In the evenings the temperature was subfebrile. After a few weeks' rest in bed her condition had slightly improved, but the subfebrile temperature remained.

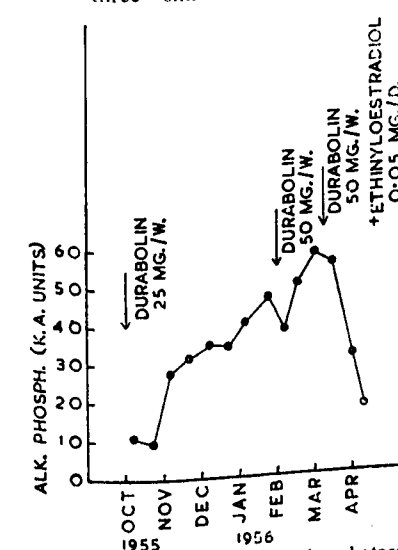


FIG. 4.—Case 3. Alkaline phosphatase during treatment with durabolin and ethinyl-oestradiol.

temperature was subfebrile. After a few weeks' rest in bed her condition had slightly improved, but the subfebrile temperature remained.

Durabolin therapy was now instituted—first 25 mg. every fortnight, later every week. As a result the patient began to look better, but the pain in the back did not diminish. In January, 1956, this pain had increased. In an x-ray film the shadow in the right lung had gone, but there were now clear metastases in the ninth and tenth ribs. The temperature had gone up to 38.5° C. No metastases were observed in the vertebral column. An increase of the durabolin dosage to 50 mg. weekly produced no results.

As regards the alkaline phosphatase level, this had shown a continuous increase ever since October, 1955, till it reached the nearly 60 K.A. units in March, 1956. In addition to the durabolin, 0.05 mg. of ethinyl-oestradiol was now given daily. It is remarkable that the alkaline phosphatase then fell to 17 K.A. units (Fig. 4). However, the pain in the back remained and the patient's condition deteriorated rapidly. Skin metastases began to develop also, and she died in May, 1956.

Comment

The three cases described here, and also the other 10 with marked metastases, show that in such cases we cannot expect a cure with durabolin, but, with the exception of a

single case, mentioned above, durabolin temporarily had an excellent effect. In one case calcification was observed in some of the metastases, as is sometimes seen after administration of testosterone propionate. Virilization symptoms were practically absent, and in no case did they bring inconvenience. Whether it is possible by means of durabolin to suppress metastases right at the beginning is, as already stated, obviously very hard to prove.

All eight patients who had no marked metastases but who gave cause for anxiety—for example, because the carcinoma was present during pregnancy or because they complained of vague and varying "rheumatic" pains—showed an excellent response and at the time of writing were free from cancer symptoms. All things considered, durabolin may justifiably be regarded as a valuable aid in the struggle against mammary carcinoma and as a preparation with clear advantages over testosterone propionate, the palliative value of which is established.

Summary

After a discussion on the effect of certain hormones used so far in the treatment of mammary carcinoma, including the new preparation durabolin (norandrostolone phenylpropionate), some clinical results obtained with this preparation are reported.

It has been found that durabolin is usually a powerful and long-acting palliative which, owing to its very slight virilizing action, is a real asset in this treatment.

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ANTIBIOTICS IN ACUTE TONSILLITIS AND ACUTE OTITIS MEDIA

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Antibiotics are absolutely necessary in the treatment of serious bacterial infections. It is questionable, however, whether these expensive and potentially dangerous drugs are really necessary to treat all the much more frequent infections of the respiratory tract that abound in general practice. When and how should antibiotics be used for these common and relatively minor infections? Opinions differ greatly on the needs and indications, but apart from "opinions" there have been no planned studies into the matter.

This paper is an attempt to assess in a general practice the proportions of patients suffering from two readily definable and very common respiratory infections—namely, acute tonsillitis and acute otitis media—who required antibiotics in order to achieve satisfactory results, and at the same time the proportions who recovered equally well on non-specific treatment.

Methods

In carrying out this investigation the patients' interests were always of the first importance and no risk was taken or sacrifice made for the sake of the experiment. In any case of doubt the specific antibiotics were used, but where possible the aims were to withhold the antibiotics for 24 to 48 hours unless there were certain definite indications.

connected directly to the endotracheal tube. The bellows was compressed at a rate of 16 times a minute and each stroke delivered a tidal volume of 2 litres of air, as calculated from the known volume of the bellows. It was not possible to measure the actual volume of air expired from the subject, neither were any samples taken for carbon dioxide analysis, as there was no rebreathing.

This method of resuscitation was also used for ventilating a further series (53) of patients undergoing surgery under thiopentone and tubocurarine anaesthesia for 30 minutes and upwards.

Results

Manual Methods.—As measured by oximetry, the blood saturation in all these subjects remained above 90%. There was, however, a slight fall during the experiment in practically every case. The mean tidal volumes obtained by the Schafer and Holger Nielsen methods were 262 ml. and 575 ml. respectively (see Table).

Tidal Volumes			
Subject	Sex	Tidal Volumes (ml.)	
		Schafer	Holger Nielsen
1	M	230	580
2	F	300	900
3	M	200	450
4	F	350	500
5	F	240	450
6	F	170	320
7	F	350	750
8	F	360	800
9	F	170	590
10	F	250	410

Intermittent Positive-pressure Methods.—(1) With mouth-to-mouth respiration oximetric studies were undertaken on the first few patients in each group—that is, with and without the carbon dioxide absorber in the donor expired air circuit. As the oxygen saturation never dropped below 96%, oximetry was discontinued for the remainder of the experiments. The mean results of the carbon dioxide and oxygen concentrations of the expired air of the donor are shown in Fig. 3, and those of the recipient, with and without canister, in Fig. 4. With the canister the expired oxygen concentration of any patient did not fall below 14.15%, and the carbon dioxide did not rise above 5.7%. Without the canister the lowest expired oxygen concentration was 11.4%, and the highest carbon dioxide concentration 6.4%. (2) With the bellows resuscitator oximetry showed that no change occurred in the blood oxygen saturation of the eight subjects during the period of ventilation, and clinically there was no deterioration in their condition.

In the larger series ventilated by the bellows during surgery it was in no case possible to distinguish their clinical condition from that obtained with an ordinary, controlled respiration, anaesthetic technique.

Discussion

In this investigation all four forms of artificial respiration were found to be adequate for maintaining oxygenation of the anaesthetized, curarized subject under ideal conditions, but, whereas there was a slight fall-off in oxygen saturation with manual methods in five minutes, no such fall occurred with either form of positive-pressure resuscitation in 30 minutes. This suggests that the tidal volumes obtained with the manual methods were not completely satisfactory, as was in fact confirmed by the experimental measurements. No such deficiency could be attributed to intermittent positive-pressure artificial respiration, where the limiting factor in mouth-to-mouth ventilation was simply the vital capacity of the donor, and that with the resuscitator the 3-litre capacity of the bellows, both these volumes being considerably in excess of the requirements of any subject. Therefore, in an emergency, when conditions are not ideal, positive pressure would be more effective. Moreover, the pressure differential obtainable with mouth-to-mouth respiration, or with the resuscitator, enables better ventilation in the presence of respiratory obstruction, such as bronchospasm.

It has been argued, with little if any evidence, that positive-pressure ventilation inflates the stomach to the detriment of the lungs. There is evidence that this is not so at pressures up to 20 cm. of water (Mushin and Morton, 1958). Even if it were, a state of equilibrium would ultimately be reached in which both the lungs and the stomach would be ventilated. Positive-pressure respiration has also been criticized on the grounds of impairment of the venous return to the heart, but if the respiratory pressure is dropped to zero in between each breath venous return is not impeded, as judged by the absence of any change in mean venous pressure. The essential feature of any form of resuscitation is that the blood reaching the left side of the heart should be well oxygenated, even if the amount is a little reduced.

In the two methods of intermittent positive-pressure respiration used in this investigation there was found to be little difference if the carbon dioxide canister was included in the donor line of the mouth-to-mouth apparatus. When normal expired air was used the patients showed the typical clinical picture of respiratory acidosis under anaesthesia—namely, a flushed skin and a raised pulse rate and blood pressure—and needed an increased amount of barbiturate to maintain the same level of anaesthesia. Such a state has been shown by several authors to predispose to shock (Beecher and Murphy, 1950; Lucas and Milne, 1955). With a canister this form of resuscitation is satisfactory, but, in practice, any suitable canister would soon become exhausted and so replacements would have to be an integral part of the equipment. Apart from aesthetic considerations, an overall disadvantage of mouth-to-mouth ventilation is that there is a tendency on the part of the donor to overventilate, which must ultimately produce fatigue. The bellows resuscitator, on the other hand, has been shown to be entirely satisfactory: there are no components which have to be exchanged, fresh atmospheric air is used for each breath, there is minimal fatigue, and the complete apparatus is extremely simple.

Summary

The relative merits of manual and intermittent positive-pressure artificial respiration have been investi-

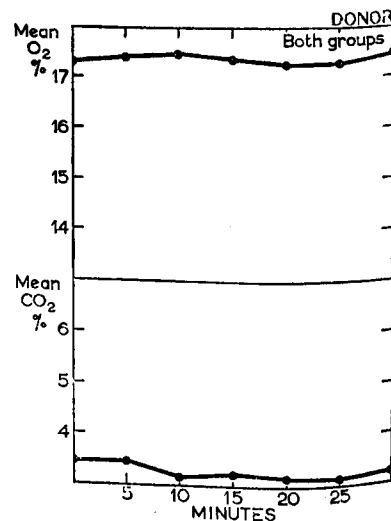


FIG. 3.—Mean carbon dioxide and oxygen concentration of expired air of donor.

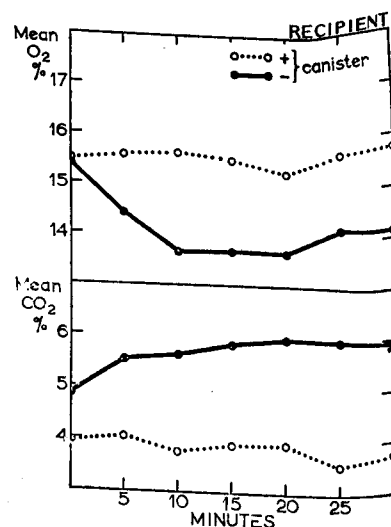


FIG. 4.—Mean carbon dioxide and oxygen concentration of expired air of recipient (with and without canister).

gated in the unconscious, curarized subject. The Schafer and Holger Nielsen methods have been compared with mouth-to-mouth ventilation and a simple bellows resuscitator.

Manual methods have the advantage of requiring no apparatus, but they do require space. They are not so efficient for the oxygenation of the subject and may be relatively ineffective in the presence of bronchoconstriction.

Intermittent positive-pressure methods require apparatus, but are superior in terms of ventilation and oxygenation. The bellows resuscitator, a simple, compact apparatus, was still more efficient than the mouth-to-mouth apparatus.

The bellows resuscitator used in this investigation was designed and supplied by the Chemical Defence Experimental Establishment, Porton, Salisbury.

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CLINICAL EVALUATION OF "MIRADON"

BY

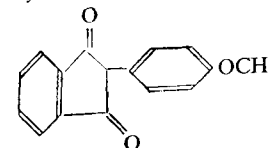
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The value of anticoagulants in the treatment of certain thrombo-embolic conditions is now well established. Since the introduction of dicoumarol about 17 years ago (Butt *et al.*, 1941; Wright and Prandoni, 1942; Overman *et al.*, 1942), a number of hydroxycoumarin and indanedione derivatives, causing depression of the prothrombin activity of blood, have become available for use as anticoagulants. In addition to dicoumarol, these include ethyl biscoumacetate ("tromexan") (Tulloch and Gilchrist, 1951; Burke and Wright, 1951), phenindione ("dindevan") (Jaques *et al.*, 1950), phenylpropylidene ("marcoumar") (Bourgain *et al.*, 1954), cyclocoumarol ("cumopyran") (Hanson *et al.*, 1951), and, more recently, warfarin (Clatanoff *et al.*, 1954) and nicoumalone ("sintrom") (Weiner *et al.*, 1956). They all suffer the disadvantage of being potentially dangerous and require frequent estimations of the prothrombin time for their control. As yet, however, they remain the best available drugs for treatment where prolongation of the prothrombin time is desired.

The purpose of this paper is to report the clinical trial of a new anticoagulant, 2-p-anisyl indanedione—1,3(C₁₆H₁₂O₃), called "miradon" (anisindione). It appears to be more rapidly effective than and just as readily controlled as any anticoagulant in current use.

Material and Methods

Miradon has previously been tested in animals (P. L. Perlman and P. C. Giordano, unpublished work) without evidence of toxicity. It has the following chemical structure.



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D

Like phenindione, to which it is chemically related, miradon exercises its therapeutic action by depression of the prothrombin activity of the blood. In the presence of alkaline urine an orange colour is often detected, the result of katabolites of miradon.

Miradon was supplied in 50-mg. tablets for oral use, and the clinical trial was divided into three parts.

Part I.—A loading dose of 300 mg. was given to 12 healthy subjects, and the onset, rate, degree, and duration of prothrombin activity depression were recorded. None of these patients required anticoagulant therapy and all were free from known renal or hepatic disease. Estimations of the prothrombin time were performed according to the Quick one-stage method (Quick, 1942), using a phenol-saline preparation from human brain as a source of thromboplastin. Each batch of thromboplastin was diluted to obtain prothrombin % activation curves, and the results presented here are given as prothrombin % activity. The normal control using this method varied from 11 to 14 seconds. Prothrombin activity of 10 to 20% was regarded as a satisfactory therapeutic range; this corresponds approximately to two to three times the normal plasma prothrombin time. Prothrombin activation curves were obtained for each patient.

Part II.—This constituted a therapeutic trial in 25 patients in whom anticoagulant therapy was thought to be necessary. These patients comprised 25 consecutive admissions who would otherwise have received therapy with another anticoagulant. Of these patients, 20 were suffering from a recent myocardial infarct, two from acute coronary insufficiency of increasing severity, two from deep venous thromboses of the legs (one of these had also suffered a pulmonary infarct), and one patient was given anticoagulant therapy while he received treatment to convert auricular fibrillation to normal rhythm. The aim in treatment was to maintain the prothrombin activity between 10 and 20%, and the dose for patients was ordered each day by the one observer. Estimations of the prothrombin time were performed before treatment began, 24 hours later, and thereafter daily between 9 and 10 a.m. for the first two weeks and for two out of every three days thereafter until treatment had been completed. During the course of this trial, random 24-hour periods were studied more closely to observe variations in prothrombin activity. The initial dose was 300 mg., except in three patients suffering from myocardial infarction in whom cardiac failure was present. (In these patients the initial dose given was 250 mg.) After 24 hours a further dose of 100 mg. was given, and thereafter the single daily dose depended upon the prothrombin times.

Part III.—The effect of oral vitamin K₁ on the prothrombin time was observed in a number of patients in whom "therapeutic levels" had been maintained for at least three days. The effect of vitamin K₁ was assessed further by the simultaneous oral administration of 20 mg. together with 300 mg. of miradon.

Results

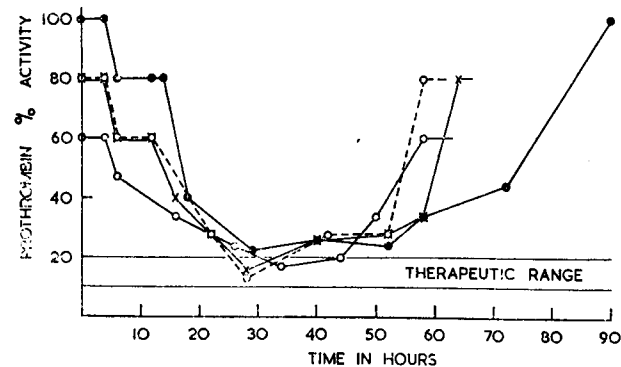
Part I

In 11 of the 12 subjects given 300 mg. of miradon orally there was an effect upon the prothrombin time within six

TABLE I.—Effect of a Loading Dose of 300 mg. of Miradon

Subject	Duration of Effect (Hours)	Prothrombin % Activity at Start	Prothrombin Activity Less than 25% (Hours)	Maximum Effect	
				Prothrombin %	Time (Hours)
1	6-64	40	24-52	12	34
2	8-106	50	26-58	17	50
3	4-58	100	—	30	26
4	6-58	60	26-38	17	34
5	6-96	40	20-52	14	28
6	6-72	40	26-38	17	34
7	6-58	40	20-40	13	34
8	6-96	100	26-58	22	28
9	6-64	80	22-40	13	28
10	6-60	80	22-46	16	28
11	6-58	80	—	30	30
12	6-52	100	—	28	26

hours (Table I). In one subject no effect was evident before eight hours, while in another prolongation of the prothrombin time occurred within four hours. After a sharp fall in prothrombin activity to the region of 50 to 70% of the original level there was a slower decrease over the ensuing 4 to 10 hours, followed again by a steeper fall to the maximum effect, which was present between 20 and 50 hours (average 34 hours). The average duration of effect was from 6 to 70 hours, with an overall range of 4 to 106 hours. Seven of the 12 subjects were within the average range. Typical prothrombin activation curves are illustrated in the Chart. The trial dose was sufficient to produce the desired therapeutic level of 10 to 20% prothrombin activity in 8 of the 12 subjects, while in the other 4 the lowest level produced was between 21 and 30%.



Effect of 300 mg. of miradon upon prothrombin activity in four subjects.

By way of comparison, 12 similar subjects were given 200 mg. of phenindione. The average duration of effect was from 10 to 60 hours, with an overall range of 8 to 100 hours. Eight of the 12 subjects were within the average range, while the average maximum effect occurred at 30 hours. In these subjects the lowest level of prothrombin activity produced by this loading dose varied from 16 to 49%. This may be compared with the range of 12 to 30% observed above with miradon.

Part II

A satisfactory therapeutic effect upon the prothrombin activity was obtained in all patients (Table II). The prothrombin activity was within the therapeutic range (10-20%) within 24 hours of the initial dose in 16 of the 25 patients. When these results are combined with those obtained in

TABLE II.—Response in Prothrombin Activity 24 Hours After the Initial Loading Dose of 300 mg. of Miradon and the Percentage of Subsequent Prothrombin Estimations Within Therapeutic Levels.

Name	Age	Prothrombin Activity at 24 Hours	Days Treated	% Results with Prothrombin Activity 10-20%
H.R.	49	28	28	79
A.J.	80	16	25	88
J.M.	71	17	26	90
T.U.	67	21	28	78
J.H.	75	21	26	80
J.McF.	37	16	21	81 (Died)
G.C.	49	20	26	90
F.W.	51	15	26	72
E.McA.	52	26	26	90
H.K.	65	23	26	87
R.C.	65	23	27	83
J.R.	66	13	26	94
W.A.	56	20	27	95
E.McA.	55	16	5	67 (Died)
A.L.	58	16	28	81
J.S.	56	17	26	84
M.W.	42	17	26	95
I.B.	58	18	36	75
A.S.	56	16	26	94
J.McC.	56	19	26	94
A.H.	45	22	12	86
I.G.	77	22	27	100
J.McK.	66	20	27	94
M.S.	72	19	27	87
	56	24	26	87

Part I, 56% of the 37 subjects had prothrombin activity within the therapeutic range at 24 hours, and a further 30% had a prothrombin activity between 21 and 24% (Table III). After the first 24 hours, 86% of the 472 estimations of the prothrombin time performed were within the therapeutic range, 7% were narrowly outside this range (21-24%), and only 2% occurred in the 25 to 30% group. There were no estimations showing less satisfactory control than this, and, of the 5% recorded as having a prothrombin activity of less than 10%, the most prolonged prothrombin time was one of 62 seconds at a time when the control was 14 seconds.

The uniformity of prothrombin activity as a result of single daily doses of miradon was demonstrated by closer observation of random 24-hour periods in eight patients (Table IV). Little significant variation was evident throughout these periods.

TABLE III.—Effect of 300 mg. of Miradon on the Prothrombin Activity at 24 hours

Prothrombin Activity at 24 Hours	No. of Patients	% of Total
Less than 10%	0	0
10-20%	21	56
21-24%	11	30
25-30%	5	14

TABLE IV.—Uniformity of Prothrombin Levels Throughout Random 24-hour Periods in Eight Patients Treated with Miradon

Subject	0 Hours	8 Hours	12 Hours	20 Hours	24 Hours
1	13	11	10	11	11
2	11	13	11	10	11
3	17	18	19	20	19
4	14	18	18	15	15
5	12	12	18	15	15
6	12	11	12	10	12
7	12	13	14	12	12
8	12	12	15	11	13

Once therapeutic levels had been obtained, the daily maintenance dose varied from 25 to 350 mg. In two-thirds of the patients the variation between maximum and minimum doses required to maintain therapeutic levels was 100 mg. or less. The average maintenance dose was 100 mg. a day. One instance of mild resistance was noted in a patient in whom there was an initial satisfactory response to 300 mg. and subsequent doses of 100 mg. a day. It became necessary to increase the dose by stages to 350 mg. a day to maintain control. This patient was later treated with phenindione, to which he showed a more marked degree of resistance, and doses of 550 mg. daily were necessary to produce therapeutic levels. In the remaining 24 patients the maintenance dose varied from 25 to 250 mg.

The time taken for the prothrombin level to return to normal on discontinuation of therapy was observed in 10 of the 25 patients. In all instances at 24 hours the prothrombin activity was within 3% of the previous reading. At 32 hours the prothrombin time of two patients had returned to normal, and by 72 hours normal prothrombin times were recorded in all 10 patients.

Throughout these trials toxic side-effects were not observed, there were no haemorrhagic episodes, haematuria was not encountered, and in those patients in whom liver-function tests were performed prior to treatment no change was observed after therapy.

Part III

Vitamin K₁ given orally in doses of 20 mg. produced an appreciable response on the prothrombin time within four to six hours, and in six subjects normal levels were produced within 10 to 12 hours. Vitamin K₁ in 20-mg. doses given intravenously resulted in a fall to normal levels within four hours. A similar oral dose of vitamin K₁ given together with the loading dose of miradon resulted in an absence of subsequent hypoprothrombinaemia. Miradon was thus satisfactorily antagonized by vitamin K₁.

Discussion

In general, anticoagulants may be used therapeutically either in short courses of 14 to 28 days, as in deep venous thrombosis and recent myocardial infarction, or for more prolonged therapy in the prophylactic treatment of coronary thrombosis or embolic phenomena.

Ideally, anticoagulants must be free from toxic side-effects. In addition they should be readily metabolized and excreted. They should maintain the prothrombin time within therapeutic levels and without wide variations. In the event of spontaneous haemorrhage a rapid reversal of the anticoagulant action with vitamin K₁ is necessary. In these circumstances of increasing Health Service costs they should also be reasonably priced. In short-term therapy the requirements mentioned, a rapid, uniform, and predictable response to a standard dose is highly desirable. Equally important is the uniformity of prothrombin time response from day to day, so that any doctor unaccustomed to the daily regulation of anticoagulant dosage may not find control difficult.

The relative merits of the various hydroxycoumarin and indanedione anticoagulants have been fully discussed by previous workers (Brodie *et al.*, 1952; Scarrone *et al.*, 1952; Coon *et al.*, 1953; Weiner *et al.*, 1956; Prior, 1957). For long-term therapy the rapid production of therapeutic levels and early uniformity of response are not essential. Once the initial difficulties of stabilization, most anticoagulants prove satisfactory for this form of treatment. The longer-acting anticoagulants (phenylpropylhydroxycoumarin, warfarin, and cyclocoumarol) are suitable for prolonged prophylactic therapy, but the time taken to acquire therapeutic levels and the delay in returning to these levels when the control is unsatisfactory make them less desirable than the shorter-acting anticoagulants ethyl biscoumacetate and phenindione for short-term therapy.

Although ethyl biscoumacetate is very rapidly absorbed the considerable variation in dose required to produce therapeutic levels tends to offset this advantage (Weiner *et al.*, 1953; Vander Veer *et al.*, 1953). Coon *et al.* (1953) thus found that a greater percentage of patients treated with phenindione were within the therapeutic range at 24 hours than with ethyl biscoumacetate, despite its slower absorption. They found also that there was less difficulty in maintaining constant levels with phenindione, and these factors, coupled with the excessive cost of ethyl biscoumacetate, have led to the more general use of phenindione. As phenindione is, in our experience, the most satisfactory anticoagulant at present in use for short-term therapy it is important to compare this drug with miradon. With phenindione, therapeutic levels are obtained within 24 to 48 hours (Sise *et al.*, 1957), although in the majority of patients these levels take 32 to 48 hours to be produced (Blaustein *et al.*, 1950). Coon *et al.* (1953) found that 18% of their patients were controlled at the end of 24 hours, 70% at 36 hours, and 95% at 48 hours. Our own experience with phenindione is in agreement with this finding.

With miradon, 56% of patients were found to have prothrombin times in the desired range of 10 to 20% prothrombin activity within 24 hours, and 30% were narrowly outside this control. The average time taken for production of maximal effect with miradon and phenindione is very similar (miradon 34 hours, phenindione 30 hours), and for the numbers considered the difference is not significant. With miradon, however, there is a narrower range of response to the initial loading dose (prothrombin activity 13-30% compared with phenindione, 15-49%). As compared with phenindione, therefore, the response to a given dose of miradon is a little more predictable. This allows a larger initial dose to be used with safety and leads to a greater number of patients in whom therapeutic levels of prothrombin time are produced within 24 hours. In addition, in the majority of patients, miradon produces some effect upon the prothrombin time within six hours, compared with 10 hours taken by phenindione. Control from

day to day appears very satisfactory with miradon, and only 14% of the estimations in this trial were not within the desired range. Our own experience with phenindione is very similar, and 15% of estimations have been found to be outside this control.

Sise *et al.* (1957) found on stopping phenindione that the prothrombin time of their patients returned to normal levels in 36 to 72 hours in the majority of patients. Miradon was found to take a similar period of time, and, as with phenindione (Guttas *et al.*, 1953), there was a rapid response to vitamin K₁.

It appears, therefore, that miradon has certain advantages over phenindione in the speed and predictability of initial response and subsequent rapidity with which therapeutic levels can be obtained. It is apparently just as readily managed from day to day, and has the advantage that a single dose produces striking uniformity of response, while most workers consider that phenindione requires to be given in divided daily doses to produce satisfactory uniformity of response (Blaustein *et al.*, 1950).

Summary

A new anticoagulant, miradon, has been assessed clinically and used therapeutically in the treatment of 25 patients requiring anticoagulant therapy.

The initial response to a loading dose of 300 mg. was rapid and some effect upon prothrombin time was evident in most subjects in six hours. Over 50% of patients had prothrombin levels within the desired therapeutic limits (prothrombin activity of 10 to 20%) at 24 hours, and 86% of subsequent estimations of the prothrombin time were within similar limits. Normal prothrombin levels were recorded between 36 and 72 hours after cessation of treatment and a very even response was evident during therapy. Vitamin K₁ produced a rapid reversal of anticoagulant action.

Compared with other anticoagulants miradon appears to approach more closely to the "ideals" for a short-term anticoagulant than other preparations at present in common use. The uniformity of response to a single daily dose suggests that it would prove satisfactory also in long-term therapy.

I thank Dr. A. Rae Gilchrist for his help and advice in conducting this trial, and Dr. C. P. Stewart for the laboratory facilities which he made available. I also thank Dr. R. M. Marquis and Dr. M. F. Oliver for criticism in preparing this paper. Miradon was generously supplied by Schering Corporation, who also provided an expense grant.

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CLINICAL EXPERIENCE WITH
WARFARIN SODIUM

BY

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Several reports (Shapiro, 1953; Wolff *et al.*, 1953; Pollock, 1955) are now available on the use of the anti-coagulant warfarin sodium ("coumadin" sodium), and all are very favourable. Indeed, it has been stated that warfarin sodium is the "anticoagulant of choice" (Shapiro, 1956). This paper records the results of using warfarin sodium in 175 patients, most of whom had cardiovascular disease (myocardial infarction or cardiac failure) and the remainder phlebothrombosis and pulmonary embolism. Treatment was controlled by the simultaneous use of Quick's and Owren's "P and P" methods. A therapeutic level of between two and three times the normal control time (ideally two and a half times) was maintained when assessing results by Quick's method. For Owren's technique a level of between 10 and 14% was aimed at. This percentage prothrombin concentration is lower than that advised by Owren—10 to 30%—but I believe that a lower proportion than 30% is desirable, as I have seen fresh thrombo-embolic episodes develop between levels of 20 and 30%.

The same thromboplastin was used for both Quick's and Owren's methods—that is, a saline extraction of human brain stored at -20°C ., where it keeps stable indefinitely. The Quick prothrombin time with pooled plasma from normal controls was 11 to 12 seconds with this thromboplastin.

Initial Dosage

Warfarin sodium is a unique coumarin compound in that it can be given intravenously as well as by mouth. The initial dose was given intravenously to 32 patients and orally to 143. No appreciable difference in rapidity of action was noted between the intravenous and the oral administration; therefore, except for exceptional circumstances—for example, persistent vomiting—the oral route was preferable. The usually recommended initial dose of 60 to 75 mg. was given to the first 42 patients treated. This dose, however, in nearly all instances led to a pronounced rise in the prothrombin time to above the upper limit (three times the normal control time) for therapeutic control. Small doses of vitamin K₁ had to be given to six patients to bring the prothrombin time down to a safe level. For the remaining 133 patients the initial dose was therefore sharply reduced to between 35 and 50 mg., and the latter dose was never exceeded. With these lower doses the results were much more satisfactory and made the whole control of the treatment much easier.

If too big an initial dose of most coumarin-type anti-coagulants is given the peak effect of the drug may be delayed for several days and a sustained effect will still be present for many days thereafter, during which time no further dose of the anticoagulant must be given. This sustained effect is obtained even with the shorter-acting drugs such as warfarin sodium and phenindione, because to some extent sustained action depends on dosage; the larger the dose the longer the effect. If too big an initial dose is given, with the resultant marked sustained effect, it takes much longer to arrive at the correct daily maintenance dose necessary to maintain a steady prothrombin time. By keeping the initial dose to the minimum effective amount, the first maintenance dose can usually be given on the third day of treatment (about 36 to 48 hours after starting therapy). Also, by avoiding the pronounced sustained effect of too large an initial dose, the early maintenance doses will give a good

approximate indication of the correct subsequent doses necessary to maintain a steady prothrombin level throughout the course of anticoagulant treatment.

Very satisfactory results were obtained with the following initial dosages of warfarin sodium: doses of 35–40 mg. were never exceeded for patients over the age of 75 years; doses of 42–50 mg. were given to all patients under 75 years. The smaller doses were given to the frailer and more seriously ill patients. An initial dose of more than 50 mg. is not advised.

The first prothrombin time was taken routinely on the morning of the third day after starting treatment (usually 36 hours after the initial dose), by which time the maximum effect of the initial dose was apparent in most patients.

Rapidly and Duration of Action

With initial doses of 35 to 50 mg. a therapeutic prothrombin time was reached in 36 hours in 95% of cases, whilst a noticeable effect on the prothrombin time was achieved in about 18 hours in most instances. The effect of daily maintenance doses of a size sufficient to maintain an adequate therapeutic level usually lasts for 36 hours. If large doses of warfarin are given, however, there is a pronounced sustained effect and the prothrombin times may remain high for much longer than 36 hours, and often for three to four days.

Warfarin sodium is therefore a rapidly acting drug with a moderately short-lasting action if large doses are avoided. In rapidity of action and duration of effect it is remarkably similar to phenindione and can be classed with that drug as a short-acting anticoagulant, in contrast to the long-acting drugs such as diphenadione ("dipaxin"), dicoumarol, and phenylpropylhydroxycoumarin ("marcoumar"). However, if large doses are given it has a much more pronounced sustained effect than phenindione.

Maintenance Therapy

It was possible to arrive at a very accurate assessment of the daily maintenance dose of warfarin sodium (to within 3 to 5%) in 158 patients (see Table). The average daily maintenance dose for all patients was 9 mg. In 68% the maintenance dose was between 5 and 12 mg., and in only 20% was the maintenance dose outside the range of 5 to 15 mg.

Dose	No. of Patients
2 to 5 mg.	20
5 to 12 mg.	107
12 to 15 mg.	19
15+ mg.	12
Overall average = 9 mg.	

The first maintenance dose was usually given on the third day of treatment. The following scheme provided a good average indication of the first maintenance doses to be given:

Prothrombin time over 3 times the normal (or below 7% by Owren's method)	Nil
Prothrombin time $2\frac{1}{2}$ to 3 times the normal (7 to 9% by Owren's method)	3 to 5 mg.
Prothrombin time 2 to $2\frac{1}{2}$ times the normal (9 to 15% by Owren's method)	4.5 to 10.5 mg.
Prothrombin time $1\frac{1}{2}$ to 2 times the normal (15 to 20% by Owren's method)	10.5 to 15 mg.
Prothrombin time less than $1\frac{1}{2}$ times the normal (above 20% by Owren's method)	15 to 20 mg.

Warfarin sodium acts rapidly enough for any appreciable change in dosage to be quickly reflected in the prothrombin times. The great advantage of rapidly acting drugs, such as warfarin sodium and phenindione, over the long-acting drugs for the treatment of acute thrombo-embolic episodes is that rapid and large changes in dosage can be quickly made, with the result that the correct maintenance dose can be rapidly determined. In the first few days of anticoagulant

therapy, because of the great individual variation in response to all anticoagulant drugs, it is impossible to know whether the patient will need small or large maintenance doses. Regulation of dose has therefore to be by trial and error guided by the results of the blood tests. Thus it is a great advantage to use an anticoagulant whose action is rapid enough for any material change in dosage to be reflected in the prothrombin times the following day.

After the first few doses of maintenance therapy, and once the prothrombin time is in the required therapeutic range, it is rarely necessary to alter the daily maintenance dose of warfarin sodium by more than 1.5 to 2 mg. When the prothrombin time has been steady for three or four days it should be realized that a change in the daily dose of more than 0.5 mg. will lead after a few days to considerable fluctuations in the prothrombin times, owing to the cumulative effect of the drug. Once the approximate daily maintenance dose has been ascertained and the prothrombin times have been steady for three or four days, a good approximate guide to any further changes in the maintenance dose which may be necessary to maintain a steady unfluctuating prothrombin time is not to alter the amount of the dose by more than 5%.

To determine the appropriate small variations in dose at this stage, bearing in mind the cumulative effect of anticoagulants, it is essential not just to consider the effect of a single dose on the prothrombin time the following day. A much clearer picture of the exact daily maintenance requirements of any anticoagulant will be obtained if the treatment is assessed over, say, a three-day period. By taking such a three-day period the full cumulative effect of small changes in dosage in the region of 5 to 10% can be readily seen and the exact daily maintenance requirements easily ascertained with a minimum of blood tests.

Ease of Control

Warfarin sodium is a remarkably easy drug to control, as the response to a given dose can almost invariably be reliably predicted. In this trial 25-mg., 10-mg., 5-mg., and 3-mg. tablets were made available. The 25-mg. tablet was used for initial dosage and the 10-mg., 5-mg., and 3-mg. tablets for maintenance therapy. For the initial doses of 35 to 50 mg. maintenance therapy, the 25-mg. tablet is unnecessary. To prescribe small variations in dose of the order of 5% the strength of tablet available is, however, of great importance. Indeed, to-day, with several good anticoagulants available, what makes one anticoagulant much easier to control than another is often the ease and convenience with which very small variations in dose may be prescribed.

The overall average maintenance dose of warfarin sodium is about 9 mg. and a 5% variation of this amount about 0.5 mg. In assessing the exact daily requirements, as mentioned earlier, it is essential to take a three-day period so that the full cumulative effect of the drug on the prothrombin times can be taken into account. For warfarin sodium one-half of a 3-mg. tablet, more or less, each three-day period, would give the necessary 0.5-mg. variation a day. A tablet strength exceeding 3 mg. makes it much more difficult to prescribe small variations in dose. To cater for initial doses of 35 to 50 mg., and for those patients who need daily maintenance doses of 12 mg. or more, a second tablet of 5 to 6 mg. or so is necessary. With two such strengths of tablet (3 mg. and 5 mg.) accurate assessment of dosage can be quickly and easily made. For long-term therapy a tablet strength of approximately 3 mg. is essential.

Conclusions

Warfarin sodium was used in the treatment of 175 patients with thrombo-embolic diseases. It is a rapidly acting drug, and 95% of all patients reached a therapeutic prothrombin time in 36 hours. With daily doses of the drug just sufficient to maintain a therapeutic prothrombin time the duration of action is approximately 36 hours. However, in large doses warfarin sodium has

a very sustained effect, with a duration of action up to four to five days. It is important, therefore, to avoid large doses. The usually recommended initial dose of 60 to 75 mg. proved far too much in this series; 35 to 50-mg. doses proved perfectly adequate for initial therapy, and it is inadvisable to exceed 50 mg. as an initial dose. The overall average maintenance dose was 9 mg., and 80% of all patients were maintained on daily doses between 5 and 15 mg.

Warfarin sodium proved extremely easy to control, and it probably ranks with phenindione as one of the two best anticoagulant drugs available for short-term therapy. Initial experience with warfarin sodium shows that it is also a very useful anticoagulant for long-term therapy. Great care must be taken in prescribing the anticoagulant to allow for the very definite cumulative effect of the drug. In this respect warfarin sodium resembles in its action that of phenylpropylhydroxycoumarin, which has proved a very reliable anticoagulant for long-term therapy.

To obtain the best results with warfarin sodium it is necessary to have available a strength of tablet with which to prescribe variations in dose of 0.5 mg. easily and quickly. It is considered that scored 3- and 5-mg. tablets would be ideal.

Thanks are due to Dr. Samuel M. Gordon, of Endo Laboratories Inc., New York, for his most helpful advice and for making available the various strengths of coumadin tablets which I have used, and also to Evans Medical Supplies Ltd. for supplying warfarin sodium ("marevan") in 3 mg. and 5 mg. strengths.

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STAPHYLOCOCCUS AUREUS TYPE 80
AND HUMAN INFECTIONS IN UGANDA

BY

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The differentiation of cultures of staphylococci by phage-typing has contributed notably towards an understanding of the epidemiology of staphylococcal disease. As well as being of value in tracing infections to particular sources, the method has provided useful information about the distribution and spread of strains of different phage types. Studies of strains isolated from healthy persons and hospital patients have shown that some phage types occur more frequently than others in certain environments, while an association between phage type and antibiotic resistance has been widely observed.

The high prevalence of antibiotic-resistant strains of phage group III in hospital infections is of special clinical interest (Blair and Carr, 1953; Rountree, 1953; Jackson, Dowling, and Lepper, 1954; Knight and Holzer, 1954). Again, some phage types seem to spread readily, while others are associated with infections possessing distinctive features. Examples of these tendencies are the recovery of type 52A strains from

hospital infections of newborn infants (Barber, Hayhoe, and Whitehead, 1949; Colbeck, 1949) and of type 71 strains from impetigo contagiosa (Spittlehouse, 1955; Parker, Tomlinson, and Williams, 1955; Barrow, 1955) and pemphigus neonatorum (Gillespie, Pope, and Simpson, 1957). Staphylococci of phage type 80 have recently been found in serious infections, often of an epidemic nature; this report is concerned with the relatively high incidence of such strains in a series of cultures from Uganda.

Infections caused by *Staphylococcus aureus* type 80 were first encountered in Australia in 1954 (Rountree and Freeman, 1955; Clarke, McGeoch, and Sippe, 1956). Strains of this type were lysed by a phage adapted from typing phage 52A, the adapted phage being designated typing phage 80. They have been isolated from an epidemic of furunculosis among hospital workers and from many outbreaks of neonatal infection in hospitals throughout Australia. Skin lesions were numerous and some infants developed pyothorax. Nearly all strains were penicillin-resistant and appeared to be of relatively high virulence.

Since 1955, type 80 strains have been identified in Europe. They have been observed in several extensive hospital outbreaks in Britain (Anderson and Williams, 1956). Ruys (1957) has remarked upon their prevalence in the Netherlands, where they have been recovered from a considerable proportion of infective conditions. As in Australia, the strains were generally penicillin-resistant, and Bijlmer (1957) recovered them from some fatal infections.

In view of the association of type 80 staphylococci with virulent infections in Australia and Europe, it was of interest to find that about 40% of 248 strains recently sent to us from East Africa belonged to this type. The strains had been recovered from pus and other specimens collected from patients at two hospitals in Uganda. The results of phage-typing and antibiotic sensitivity tests are given below.

Materials and Methods

Between November, 1955, and March, 1957, batches of staphylococci isolated at the Central Laboratory, Kampala, were sent to us at intervals of a few months for study of their lysogenic properties. These strains, which were unselected, came from routine cultures of material collected in the wards and out-patient departments of two general hospitals at Kampala; one (Mulago Hospital) served Africans and the other (Nakasero Hospital) served mainly Asians and Europeans. Strains were tested for coagulase production in tubes with 1/5 dilution of human plasma. Coagulase-positive strains were phage-typed by the method of Williams and Rippon (1952) and tested for antibiotic sensitivity on agar plates by means of "sentest" tablets.

Phage-typing

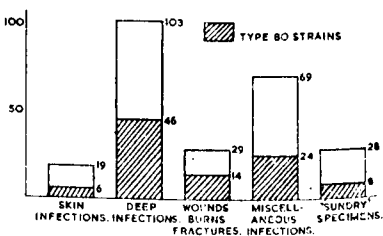
A total of 248 strains proved to be coagulase-positive. They all produced yellow pigment and were taken to be *Staph. aureus*. Table I gives the numbers of strains belonging to the various phage groups and to phage type 80 which were recovered from specimens received from each hospital.

TABLE I.—Phage-typing of Strains of *Staph. aureus* from Two Kampala Hospitals

	Group I		Group II	Group III	"Mixed" Groups				Total
	Type 80	Other			I-II	II-III	III-IV	Not Typable	
Mulago Hospital	73	23	13	22	19	1	1	9	161
Nakasero Hospital	25	16	12	22	2	0	0	10	87
Total	98	39	25	44	21	1	1	19	248
	40%	15%	10%	18%	8%	1%	1%	8%	100%

ing to the various phage groups and to phage type 80 which were recovered from specimens received from each hospital.

The proportions of type 80 strains derived from Mulago and Nakasero Hospitals were thus 73/161 (45%) and 25/87 (29%) respectively. Type 80 strains were by far the commonest single phage type in the whole series; as shown in the Chart, they were frequently recovered from all sources except "sundry specimens" (sputa, urines, blood cultures, swabs from the upper respiratory tract). They made up 45% of 103 strains from "deep" infections which included 80 abscesses (23 classed as "pyomyositis," 6 cases of osteomyelitis, and 4 of empyema); 48% of 29 strains from wounds, burns, and fractures; and 35% of 69 strains from miscellaneous pyogenic infections which could not be allocated to the "skin" or "deep" category on the clinical data.



The incidence of type 80 infections among patients of different races was 45% (73 out of 161) in Africans, 30% (10 out of 33) in Asians, and 28% (15 out of 54) in Europeans.

When type 80 strains were tested for lysogenicity, it was found that 9 out of the 98 strains released phage which lysed the remaining strains of this type. Except for these nine strains, no other type 80 strain yielded phage which could be detected on any of the indicator strains used. A non-typable strain released a phage which formed plaques on all type 80 strains; strains which were made lysogenic with this phage became resistant to typing phage 80.

Antibiotic Sensitivity

The results of tests for antibiotic sensitivity are given in Table II. The proportion of penicillin-resistant strains was highest among staphylococci of phage groups I (90%) and III (64%). Strains resistant to both penicillin and streptomycin were much more frequent in group I, where 41 strains (30%) belonged to this category.

TABLE II.—Sensitivity of 248 Strains of *Staph. aureus* to Antibiotics*

	No. of Strains	No. of Strains Resistant to						No. of Strains Sensitive to P S A T C E
		P	S	A	T	C	E	
Group I (Type 80)	98	95	30	3	3	0	0	3
Group II (Others)	39	28	15	0	0	0	0	10
Group III	25	2	0	0	0	0	0	23
"Mixed" groups	44	28	7	6	6	4	0	16
Not typable	23	3	0	0	0	0	0	20
Total	19	6	3	1	0	0	1	9
Total	248	162	55	10	9	4	1	81

* P = Penicillin. S = Streptomycin. A = Chlorotetracycline. T = Tetracycline. C = Chloramphenicol. E = Erythromycin.

Table II shows the extent of penicillin resistance in strains of each group and of type 80. Resistance to both penicillin and streptomycin was present in 28% (27 out of 98) of type 80 strains.

Discussion

Information about the phage types of staphylococci which are responsible for human infections in tropical Africa seems to be lacking. This series of strains from Uganda is of interest in that the predominant phage type (type 80) is one which has displayed marked pathogenicity in Australia and Europe. Type 80 strains made up 40% of the series, the remainder showing a wide range of differing lytic patterns. Among the staphylococci of phage group I, which

Medical Memoranda

Arteriovenous Fistula Following Blunt Trauma

Recently we had occasion to treat an arteriovenous fistula which seemingly resulted from a non-penetrating wound and had no features to suggest a congenital origin. A review of the modern literature failed to reveal a similar fistula following trauma by a blunt instrument which did not penetrate the tissues.

Post-traumatic arteriovenous fistulae and false aneurysms are a frequent complication of penetrating wounds in war. In civilian life congenital arteriovenous fistulae are often encountered, but an arteriovenous fistula or false aneurysm following a non-penetrating wound is a rarity. The case under discussion represents another form of aetiology of arteriovenous fistulae which is uncommon enough to be of interest to others.

CASE REPORT

A man aged 21 was referred because of a history that he had been struck on the left temple by a hockey ball. He was not rendered unconscious, but noted the immediate formation of a swelling at the area of impact, which in three to four hours' time had assumed the size of half a goose's egg. The skin was not broken nor was there any bleeding. On the evening of his injury he noticed a "buzzing" sensation just in front of the left ear. Within the next few days the swelling disappeared, but he continued to be aware of a whirring sensation in the area of trauma, noted when recumbent with the head turned so that the left side was down. It was only the persistence of this annoying buzzing in front of the ear for four months that led him to seek medical attention. Close questioning failed to disclose any history of previous penetrating injury in the left temple area or any skin lesion such as a capillary naevus or angioma.

On examination the pulse rate and volume were normal; blood pressure 130/80 mm. Hg. The significant physical findings were limited to the left temporal area, where there were several conspicuous subcutaneous veins anterior to the ear. Light palpation disclosed a systolic thrill, and on auscultation there was a continuous murmur with a crescendo in systole. Firm pressure upon the superficial temporal artery abolished the bruit; lighter pressure over the dilated veins caused marked engorgement of the veins of the scalp, and the bruit again disappeared. In view of the history and findings a diagnosis of post-traumatic arteriovenous fistula of the superficial temporal artery and vein was made, and at operation the superficial temporal artery and vein were exposed and found to have a fistulous communication. Accordingly a quadruple ligation was performed with excision of included vein, artery, and fistula. Recovery was uneventful and the patient has noted no further symptoms.

COMMENT

The pathogenesis of the fistula presents the point of major interest in this case. The patient absolutely denied any abnormal prominence of the veins of his temple, peculiar vibrations, or whirring prior to the traumatic episode. In fact, there was nothing to suggest that he might have had a small arteriovenous fistula which was enlarged by the blow. It seems most likely that the two vessels lying in close proximity must have been ruptured partially by the severe force, forming a communicating haematoma between them. A vascular channel subsequently developed and remained patent after resorption of the confined haematoma. Owing to the anatomy of the temporal region the haematoma was enclosed in a small space limited by the epicranial aponeurosis and its attachments to the zygomatic arch. There was little chance of dissection of the extravascular blood such as would be allowed in the areolar tissues surrounding vessels in most parts of the body.

outnumbered those of group III by more than 3 to 1, the proportion of type 80 strains was 72%.

Type 80 strains were associated with a variety of infective conditions, some of which may have been acquired in hospital. The proportion of type 80 strains among staphylococci recovered from different sources ranged from 32% (skin lesions) to 48% (wounds, burns, and fractures). There was no indication that type 80 infections occurred as part of a definite "outbreak"; between 20% and 60% of each of five batches of strains received over 17 months were of this type.

The high incidence of penicillin resistance among type 80 strains accords with experience elsewhere. These staphylococci, possessing a distinctive lytic pattern and a marked insensitivity to penicillin, seem to form a group of considerable pathogenic potentiality. From the lysogenic standpoint, the 98 strains classed as type 80 were not homogeneous, nine strains liberating a phage to which all the remaining type 80 strains were sensitive. It would appear that type 80 strains, like type 52A strains, possess properties which favour their growth and spread in man; further data relating to their prevalence among the patients and staff of hospitals in tropical Africa would be valuable.

Summary

Strains of *Staph. aureus* type 80 formed 40% of 248 cultures of coagulase-positive staphylococci recovered from patients suffering from various infective conditions in Uganda. Type 80 strains were by far the commonest phage type in this series, and nearly all (97%) were penicillin-resistant. Strains of this type appear to be responsible for serious infections; their prevalence among hospital workers deserves study.

We are indebted to Dr. A. B. Raper and Dr. E. C. Buck for strains of staphylococci, and to Dr. R. E. O. Williams and Dr. Joan E. Rippon for typing phages and helpful information.

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Speaking at the conference of the National Society for Clean Air on October 1, the Minister of Housing and Local Government, Mr. HENRY BROOKE, said that on the industrial side we ought to see a substantial improvement within the next five years or so. The period allowed by the Clean Air Act for alterations to plant expired in the middle of 1963. During this time all the necessary improvements to the furnaces and boilers would have to be carried out—the fitting of mechanical stokers, and the provision of instruments for observing and checking smoke. There ought also to be a steady growth in the fitting of dust and grit arrestors to be a steady growth in the fitting of dust and grit arrestors to furnaces. In the processes which came under the Alkali Act there should also be improvements coming along by then. For instance, in the gas and electricity and pottery industries the process of shutting down older works would have gone yet a stage further; and it was the older works which so often were responsible for the most smoke.

Large haematomas are, of course, frequent after blunt trauma, and it is surprising that more arteriovenous fistulae do not develop. As stated above, a special anatomical situation must necessarily exist in which vessels rupture into a confined space. The open venous channel affords the line of least resistance for the blood under arterial pressure, rather than diffusion of the blood into the tissues such as normally occurs. If the vascular shunt is maintained the channel will gradually become organized and lined with endothelium, and an arteriovenous fistula will have been established.

I thank Professor Sir James Paterson Ross for allowing me to publish this case and for advice and help in the preparation of this paper.

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Empyema Caused by *Pasteurella septica*

In the fatal case of empyema described below, *Pasteurella septica* was isolated both during life and after death. This organism is not infrequently isolated from the upper respiratory tract in man, but its importance as a pathogen is extremely difficult to assess. In Britain it has only twice been incriminated as the causal agent in infection of the respiratory tract—once in a case of sinusitis (Bartley and Hunter, 1947), and once as the cause of repeated exacerbations in a case of bronchiectasis (Cawson and Talbot, 1955). Elsewhere, cases of empyema caused by *P. septica* have been described, but only nine reports can be regarded as adequately substantiated by the bacteriological findings.

CASE REPORT

A 76-year-old woman was admitted to hospital on December 20, 1955, complaining of pain in the right hypochondrium and vomiting for three days. On examination she was dyspnoeic and pyrexial—99.2° F. (37.3° C.). Right subcostal tenderness and guarding were present, but there were no other abnormal findings. She had a remittent pyrexia for two days, and then developed grunting respirations and a rust-coloured sputum. Signs of a right lower-lobe pneumonia with pleural effusion were confirmed by x-ray examination. A blood count revealed a leucocytosis of 22,900/c.mm. Treatment with penicillin (crystalline) intramuscularly, 500,000 units six-hourly, produced temporary improvement, but after two more days signs of congestive cardiac failure developed. There now seemed to be an effusion only at the right base, and, in view of the continued deterioration, chest aspiration was performed. A small volume of blood-stained pus was withdrawn, which contained numerous polymorphonuclear leucocytes and minute Gram-negative coccobacilli. Culture yielded a heavy pure growth of *P. septica*. Penicillin was instilled into the loculus entered, and chlortetracycline was given orally, but in spite of all supportive therapy the patient became increasingly feeble, dying on January 16, 1956.

Necropsy Findings.—Necropsy was performed four hours after death. A fibrino-purulent pleurisy involved the lower lobe of the right lung. In the right costophrenic recess there was a collection of 50 ml. of thick yellow pus, walled off by dense fibrous tissue. No gross consolidation was detected in the lungs, but histological examination showed the right lower lobe to be the site of an organizing pneumonia. Other positive findings were confined to the kidneys, which were contracted and coarsely scarred, and the large intestine, which presented an appearance compatible with a uraemic colitis. Cerebrospinal fluid taken at necropsy gave a urea level of 322 mg./100 ml. A specimen of the empyema pus produced, as before, a heavy growth of *P. septica*. The organism was not recovered from material taken from the lungs, trachea, fauces, liver, spleen, heart blood, or cerebrospinal fluid, nor did Gram stains on all organs sectioned show any evidence of Gram-negative coccobacilli. The

final post-mortem diagnosis was "chronic pyelonephritis, pneumonia with empyema occurring as a terminal event."

Bacteriological Findings.—In films prepared from the empyema pus the organism was seen to be a coccobacillus measuring approximately 1.5 by 0.5 μ . Bipolar staining was easily demonstrable, but capsules were not seen. The organism was Gram-negative and non-acid-fast. Its cultural characteristics were typically those of *P. septica*. It grew easily on blood agar and on nutrient agar, but not at all on MacConkey's agar. Two notable features were a peculiar brownish discoloration produced on blood agar after 48–72 hours' incubation, and a semen-like odour given by cultures on this medium. Biochemical reactions were again typical, with the single but important exception of the production of acid from lactose. The antigenic structure and pathogenicity of the organism were investigated by Dr. G. H. Tee. He found it to be agglutinated to a titre of 1:5,120 by an antiserum prepared against a lactose-fermenting organism which had been isolated from a cat-bite and which appeared to be *P. septica*. He also inoculated two mice intraperitoneally with 0.1 ml. of an 18-hour broth culture of our organism diluted 1:100. Both mice died within 24 hours, and were found to have peritonitis with free fluid in the abdominal cavity. A pure growth of an organism with similar properties was recovered from their spleens. Finally the organism was tested against antibiotics, using a standard dried-disk technique; it was found to be sensitive to penicillin, streptomycin, chloramphenicol, the tetracycline group, and polymyxin, but resistant to erythromycin.

COMMENT

Two features in this case are noteworthy. First, it adds to the slowly accumulating body of evidence implicating *P. septica* as a definite potential pathogen in the respiratory tract in man. When Schipper (1947) reviewed human infections with *P. septica*, he divided them into two main groups—local infections due to animal bites, and infections, usually systemic, not obviously attributable to any direct cause. It seems to us, however, that cases of respiratory infection might well be separated from this second rather vague group, with consequently increased emphasis on their frequency and importance. The relatively large series of cases of bronchiectasis, including two complicated by empyema, reported by Olsen and Needham (1952) lends support to this view.

The second feature is of primarily bacteriological interest, and concerns the unusual property possessed by our strain of *P. septica* of producing acid from lactose. There is no published reference to a lactose-fermenting strain being isolated from man. However, such strains have often been described by veterinary workers (Jones, 1921; Rosenbusch and Merchant, 1939), and were referred to by Allin (1942) in a review of cat-bite infections. Moreover, Tee (1956, personal communication) has obtained from sputa several strains of lactose-fermenting organisms which otherwise seemed typically *P. septica*. There is therefore strong evidence that the production of acid from lactose is a property of certain not uncommon strains of *P. septica*, and that such strains may on occasion be pathogenic for man.

We are indebted to Dr. G. H. Tee for his invaluable assistance in carrying out the serological and pathogenicity tests; to Dr. C. S. S. Don for permission to publish the clinical details of the case; to Dr. A. Nicol for the necropsy report; and to Dr. R. W. Fairbrother for his advice and encouragement.

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Reviews

HYPERTENSION

High Arterial Pressure. By F. H. Smirk, M.D., F.R.C.P., F.R.A.C.P. (Pp. 764+xxxvi; illustrated. 75s.) Oxford: Blackwell Scientific Publications. 1957.

The recent recognition of Sir Frederick Smirk's contribution to medicine was well timed in relation to the publication of his most important work. In this monumental volume he describes in detail virtually all that a clinician could want to know about hypertension, and few have studied it clinically so exhaustively or treated it more successfully. The book is essentially clinical and will be appreciated most by those who have to look after the patients.

While a monograph of this size must be classed as a reference book—and there are, incidentally, some 2,500 references—it is very readable and has that desirable conciseness so often lacking in books of multiple authorship. The first four chapters are concerned chiefly with the relationship of blood pressure to environment, diet, or reaction of the blood pressure to environment, diet, or somatotype, race, and daily activities, and constitute an excellent introduction. Chapter V., on the clinical manifestations of hypertension, is less convincing, but how unimportant these seem in relation to the whole! Known causes of hypertension, including psychiatric factors, are then considered in detail, and this is followed by chapters on the physiology of blood-pressure regulation and on experimental hypertension. All this leads up to the author's views on the pathogenesis of essential hypertension: very briefly he contends that all the clinical manifestations are the results of high pressure itself, however produced or maintained; that a wide variety of neurogenic and non-neurogenic factors may be responsible for the rise of pressure; and that certain mechanisms exist which tend to make hypertension self-perpetuating. It is interesting to reflect that quite independently almost exactly similar views have been expressed recently in relation to pulmonary hypertension after a very much shorter period of study.

Apart from a chapter on prognosis, the rest of the book (330 pages) is devoted to treatment. Far from engendering respect for such careful, complete, and detailed work, this elaborate therapeutic section has excited a curious reaction in some quarters: remarks such as, "What treatment that in some quarters: remarks such as, 'What treatment that is any good requires 330 pages to describe?' and, 'Devil's brew,' illustrate this reaction. But it is both stupid and churlish to deny the value of this therapeutic section, because hypertension is not as well treated as it should be, and successful management demands close attention to detail and familiarity with the potency and side-effects of a fairly large range of hypotensive agents.

While many books have been written about hypertension, there is no other that provides so much practical information, and it is therefore highly recommended to all who have to deal with this common and troublesome condition.

PAUL WOOD.

HORMONES AND BREAST CANCER

Endocrine Aspects of Breast Cancer: Proceedings of a Conference held at the University of Glasgow, 8th to 10th July, 1957. Edited by Alastair R. Currie, B.Sc., M.B., F.R.C.P.E.D. Foreword by C. F. W. Illingworth, C.B.E., M.D., Ch.M., F.R.C.S.E.D., F.R.F.P.S. (Pp. 340+xvi; illustrated. 37s. 6d.) Edinburgh and London: E. and S. Livingstone Ltd. 1958.

This book deals with the proceedings of a conference held at the University of Glasgow from July 8 to 10, 1957, in which there were over 90 participants from Great Britain and other countries. This should not, however, deter the reader, because by skilful editorship Dr. A. R. Currie has managed to give the book a continuity which is rare in volumes of this kind. A discussion follows the reading of most papers. The first part deals with the clinical aspects of breast cancer, and the remaining three sections are on

hormone studies and experimental pathology. In conclusion there is a comprehensive review of the work discussed at the conference, ably presented by Professor C. F. W. Illingworth.

During the last decade some interesting facts have been brought to light on the role of hormones in carcinogenesis. Not only have new hormones been recognized and isolated, but knowledge of the mechanisms which regulate these secretions has also been extended. It is therefore heartening to find that many of the discoveries which have been achieved in the laboratory are now applied clinically. This is especially true in the case of breast cancer, for it is now firmly established that the sex hormones of gonadal and adrenal origin play an important role in the development of breast cancer. Unfortunately at the present moment the role of the pituitary gland is less well understood, though one reads in this volume of promising researches on pituitary function which might have important clinical applications. Certain types of breast cancer, following application of endocrine therapy, undergo remission, and, even if the improvement is only of temporary duration, this in itself is a stimulating achievement. Recurrences of tumour growth after periods of remission following both gonadectomy and adrenalectomy suggest that the anterior pituitary may be capable of stimulating adrenal rests to secrete oestrogens to a degree sufficient to reactivate the neoplasm, or it may even be that the recurrence of some breast carcinomas is due to a pituitary hormone or hormones acting in addition to oestrogen. Clinical results following hypophysectomy without previous gonadectomy and adrenalectomy for patients with breast cancer suggest that this might be so. As Professor Illingworth rightly emphasizes in his concluding remarks, oestrogens may not be the only offenders in the induction of breast cancer. More research should still be done on the possible influence and sources of other hormones, such as progesterone and gonadotrophins, as well as prolactin and the growth hormone.

This volume is to be recommended particularly because it links together a vast mass of data on the endocrine induction and control of breast cancer in a way that can be appreciated by the medical practitioner and scientist alike. It is also a most useful book of reference for those interested in the general subject of hormones and cancer.

E. S. HORNING.

PSYCHOTHERAPY

Psychotherapy: A Modern Theory and Practice. By E. Lakin Phillips, Ph.D. (Pp. 334+xviii. 30s.) London: Staples Press Limited. 1957.

In a study of communication Ruesch and Bateson¹ note the remark of a Freudian, "The more experience I have in psychiatry the more convinced I become that it is impossible to verbalize what I do." It is indeed a characteristic of psychotherapists of all persuasions that they are unable to describe how their results are achieved, coupled with a certain reluctance to consider critically the efficacy of their efforts. This is an attitude which one cannot expect scientifically trained psychologists to tolerate, and, as they become interested in psychotherapy, a situation which obtains in the United States, so it is to be expected that they will examine the theories, assumptions, and results of psychotherapy in the same way as, say, intelligence or personality testing.

The author of this book notes, for example, that psychotherapists seem to get much the same sort of results though they hold very different theories and employ different methods. What effects the improvement in the patient—if, indeed, there is any improvement beyond that which would occur spontaneously—would seem to lie, not in the particular nature of the theories held by the individual psychotherapist, but in some other factor or factors common to all psychotherapy. It is obviously a matter of some interest and importance to consider these common factors, but this

¹ Ruesch, J., and Bateson, G., *Communication: The Social Matrix of Society*, Norton, New York, 1951.

is a task for which the clinician, engrossed with the particular aspects of his own brand of psychotherapy, is unfitted.

The author's attitude towards the critical study of psychotherapy is a most salutary one, whether or not one agrees with his views on the particular nature of psychotherapy which should be followed. He criticizes depth therapy on the grounds that it is fundamentally unsound, that its concepts are unnecessary, and that its duration is protracted because the psychotherapist is dealing with irrelevancies rather than tackling the present problems. He comes out in favour of a conflict theory and of a short-term directive psychotherapy consisting in bringing to the patient's notice his immediate conflicts which are responsible for his symptoms. On this basis he discusses the applicability of the work on experimental neuroses, much of which, however, he regards as naive. He attempts to evaluate the results of his therapy and claims that it is more effective than grubbing around in the unconscious for years; indeed, the whole concept of the unconscious comes in for sharp scrutiny.

The author devotes a chapter to the controversy between the monothetic approach—that is, the analytic approach in search of general laws which are statistically verifiable—and the idiographic or intuitive approach. He does not decry the intuitive approach, which would seem to be indispensable in dealing with particular problems ("no monothetist can tell what his wife would like for a Christmas present by applying the general laws of psychology"), and he regards the method of the clinician as that of adding an idiographic touch to the monothetic data he obtains from the patient.

Apart from the views expressed in this book, its main importance is that it emphasizes the lively nature of psychology in the U.S.A. Psychotherapy is in great need of a critical scrutiny of its basic assumptions and its *modus operandi*. Such a study is more likely to be made by psychologists than clinicians, and this book demonstrates the sort of contributions that psychologists can most valuably make to psychiatry. It is a book which should be read by all psychiatrists, not only for the views of the author on his short-term directive psychotherapy, but for the insight it gives as to how psychology might truly come to bear the relationship to psychiatry that pathology bears to medicine—still a very distant ideal.

A. W. BEARD.

MODERN ENDOCRINOLOGY

Modern Trends in Endocrinology. Edited by H. Gardiner-Hill, M.D., F.R.C.P. (Pp. 298+x; illustrated. 65s.) London: Butterworth and Co. (Publishers), Ltd. 1958.

Dr. Gardiner-Hill is the doyen of English clinical endocrinologists, and those of us who have followed him must ever be grateful for the aura of respectability which he cast around a specialty which a quarter of a century ago was not quite "a profession for a gentleman." He re-emerges now as editor of what must be the most star-spangled of all books on endocrinology. The late Michael Todd hardly did better when he collected his cast for "Around the World in Eighty Days." To list the authors would be merely to name two dozen from amongst the most distinguished endocrinologists from the laboratories and wards of the English-speaking world. To pick out any from such a company may be unfair, but at the risk of being so I would say that no one (however learned) who treats thyroid diseases can fail to learn something from the masterly chapters by Dr. Rosalind Pitt-Rivers, Dr. E. E. Pochin, and Dr. G. C. Kennedy and Professor R. A. McCance.

Of course there are omissions which strike the eye. In a book called "Modern Trends" dated last October and containing five chapters on the thyroid it is surprising to find no reference to auto-immunization. The authors of the chapter on tests of thyroid function, by what was obviously a momentary lapse of memory, forgot to say that patients with goitres without thyrotoxicosis often have a great avidity for radio-iodine. There is no mention of the valuable part played by triiodothyronine in the control of

patients with thyroid carcinoma. Dr. P. J. Randle, who writes with admirable clarity about diabetes mellitus, expressly excludes a discussion of the importance of the thyroid, obesity, and heredity, which is a pity. Space should have been found for the recent work of Kekwick and Pavan, who have succeeded in proving (what so many of us have long believed) that there are more things in heaven and earth than calories in the diet of the obese. And of course there are bound to be points of disagreement between any reviewer and any author, but reviewers are not, as once they were assumed to be, omniscient, and such matters are best left unnoticed unless a brick has been dropped large enough to be a stumbling-block. There are no such bricks here. Indeed, the only criticism which is likely to be general is that the book lacks balance. Though all parts are very good, the whole is less than their sum. The editor's answer, and a satisfactory one, is that this is not intended to be a textbook of endocrinology, but a series of essays planned to indicate some of the salients on the endocrine front. He says himself—and he should know—that the book "will be a helpful addition to the library of physicians, endocrinologists, postgraduates and others." I agree.

RAYMOND GREENE.

SANCTITY OF LIFE

The Sanctity of Life and the Criminal Law. By Glanville Williams. (Pp. 319. 30s.) London: Faber Ltd. 1958.

Concealed behind the pedestrian title of this book lies a topical volcano bubbling with ideas founded on a profound substratum of legal and historical knowledge. You begin with a placid first chapter on the protection of human life. This investigates the medico-legal niceties of birth and death—when the unborn child can be considered as alive, and when in the light of resuscitative techniques you should be regarded as really dead. It deals with the associated problems of concealment of birth, child destruction, infanticide, and what is to be done about monsters. From this you pass to the topical and controversial—to the control of conception, to sterilization, to artificial insemination, to abortion, to suicide, and to euthanasia. Professor Glanville Williams examines each of these problems against its historical background and in its present social context. Lawyers and politicians, Protestants and Popes, come in for searching criticism. He reviews the law as it is in England and in the American jurisdictions. On suicide, for example, he reminds us that the Christian attitude originates not from the Gospels or St. Paul but from St. Augustine's condemnation of the Circumcelliones. These cast themselves by the hundreds in ecstasy from lofty cliffs, for "to kill themselves out of respect for martyrdom is their daily sport." On eugenic sterilization he reminds us of Justice Holmes's observation in the United States Supreme Court in *Buck v. Bell*, decided in 1927, "Three generations of imbeciles are enough."

Not all will agree with all of Professor Williams's criticisms and suggestions for improvement; but this is a stimulating and instructive book which will give all but the most firmly closed minds considerable food for thought.

"A BARRISTER."

A second edition of Mr. J. C. Adams's *Outline of Orthopaedics* has appeared only two years after the first (reviewed in this *Journal* on May 12, 1956, p. 1089). This book, intended primarily for senior students, gives an adequate outline of orthopaedic conditions and their management. It is published by E. and S. Livingstone, Ltd., Edinburgh (pp. 428, 300 illustrations; 35s.).

Professor Oliver E. Byrd, of Stanford University, has selected 254 articles from 78 journals to form the basis of *Health Yearbook, 1956* (pp. 278; London, Oxford University Press, 1957; 40s.). These articles "represent the research, experience, and opinion of approximately 300 authors, committees, organizations, and other groups in the fields of public health, medicine, and allied scientific areas," but only nine come from outside the United States, and none from foreign-language journals.

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FAINTING

A wide variety of conditions may precipitate fainting. It may occur after prolonged standing in the erect posture, sympathectomy, violent coughing, or the administration of ganglion-blocking drugs and nitrites, and it may be a complication of haemorrhage or pregnancy. Arterial hypotension is a constant feature of it. Now Professor E. P. Sharpey-Schafer and Drs. C. J. Hayter and E. D. Barlow show in an article at p. 878 this week that severe hypotension is not uncommonly precipitated by fear before the administration of nitrous oxide for dental extraction. Nausea caused by apomorphine was also found to lead to a similar vascular reaction.

Since arterial pressure is a product of total peripheral resistance and cardiac output, it follows that acute hypotension is due to a profound fall in one or both of these factors. The normal slight fall in venous filling pressure and cardiac output which occurs with a change to the upright posture in man is balanced by vasoconstriction; this "baroreceptor constriction" has been observed in the vascular reactions accompanying squatting and performing the Valsalva manoeuvre.¹⁻³ Fainting occurs when normal vascular reactions are inadequate and fail to maintain arterial pressure above some 50 mm. Hg. The constituents of the faint reaction, apart from the hypotension and resulting syncope, are independent of the cause, and include sudden bradycardia, pallor, sweating, and hyperpnoea, suggesting that the whole is a reflex phenomenon. Sudden vasodilatation, as shown by an increase of blood flow in the forearm, has been observed in fainting reactions accompanying haemorrhage,⁴ tilting to the upright posture, spinal anaesthesia, and pregnancy.⁵ Thus fainting will be enhanced in susceptible subjects by any factors which tend to increase vasodilatation, such as a warm atmosphere or thick clothing.

In most types of fainting there is evidence that inadequate filling of the heart, and consequently a

reduced output and lower pulse pressure, is a crucial factor. The inadequate filling is due to venous pooling, which is why fainting is usually associated with the erect posture and is more likely to occur when the subject is in the lordotic position or has been standing for long. In pregnancy venous pooling is probably due to partial occlusion of the inferior vena cava by pressure of the gravid uterus.

Nitrites readily produce faintness because they cause venous dilatation as well as arteriolar relaxation. Venous pooling may be stopped by an anti-gravity suit, which thus prevents syncope.⁶ Diminished filling of the right atrium is also an important factor in the mechanism of cough syncope.⁷ Professor Sharpey-Schafer and his colleagues now suggest that the whole faint reflex may be initiated from afferent nerves stimulated by a relatively empty heart, this being caused not only by venous pooling but by vigorous systolic emptying owing to emotional stimulation. This ingenious hypothesis explains the strange absence of faint reactions in patients with congestive heart failure, when a residue of blood remains in the ventricles in diastole.

In a rare form of idiopathic postural hypotension there is syncope on standing, anhidrosis, and impotence.⁸ These are the result of a central paralysis of vasoconstriction, and the effect is similar to that caused by extensive sympathectomy or an overdose of ganglion-blocking drugs. In these conditions syncope may occur before the full picture of vasovagal fainting develops; unconsciousness may supervene without bradycardia. However, the contributions of Sharpey-Schafer and others have shown that, apart from minor differences in degree of vascular reaction, in all forms of fainting the final mechanism is similar. There is sudden vasomotor failure in conjunction with reduced filling of the heart. The only homeostatic feature of the reaction appears to be final collapse from the upright position, which leads to restoration of the venous filling pressure.

INFECTIOUS MONONUCLEOSIS

Infectious mononucleosis, or glandular fever, is still a baffling disease. It is presumed to be a viral infection, though no causal organism has yet been found. A. Nyfeldt,¹ C. A. Pons and L. A. Julianelle,² and R. A. Webb³ all thought that *Listeria monocytogenes*, a Gram-positive motile bacillus occurring naturally in rodents and ruminants, was the likely aetiological agent. *L. monocytogenes* is being found with increasing frequency in human infections,^{4 5 6} and B. H. Chaiken and D. T. Michaud⁷ report a case of infectious mononucleosis from which this organism was

¹ Sharpey-Schafer, E. P., *J. Physiol. (Lond.)*, 1953, **122**, 351.

² — *Brit. med. J.*, 1956, **1**, 1072.

³ — *ibid.*, 1955, **1**, 693.

⁴ Barcroft, H., Edholm, O. G., McMichael, J., and Sharpey-Schafer, E. P., *Lancet*, 1944, **1**, 489.

⁵ Bridgen, W. W., Howarth, S., and Sharpey-Schafer, E. P., *Clin. Sci.*, 1950, **9**, 79.

⁶ Weissler, A. M., Warren, J. V., Estes, E. H., McIntosh, H. D., and Leonard, J. J., *Circulation*, 1957, **15**, 875.

⁷ Baker, C. G., *Guy's Hosp. Rep.*, 1949, **98**, 132.

⁸ East, C. F. T., and Bridgen, W. W., *Brit. Heart J.*, 1946, **8**, 103.

isolated in 6 out of 8 blood cultures: the heterophil antibody titre was 1:448. But in the majority of cases *L. monocytogenes* has not been isolated, nor have positive agglutinins appeared. It seems possible that this is a syndrome with more than one cause. K. F. Girard and E. G. D. Murray⁸ summarized the evidence in favour of a viral cause and of the view that *L. monocytogenes* was responsible, and suggested that the heterophil antibody was not directly produced by either organism but by some other non-specific immune mechanism set in motion by the affected lymphatic or liver tissue and by alteration in serum globulin. D. A. Goldthwait and J. W. Eliot⁹ regard infectious mononucleosis as a disease presenting the triad of lymphatic hyperplasia, circulating abnormal lymphocytes, and the appearance of heterophil antibodies that are absorbed by ox red-blood cells but not by guinea-pig kidney. Heterophil antibodies of this pattern are generally regarded as occurring only in infectious mononucleosis,¹⁰ and absorption tests are therefore essential in assessing the significance of a positive Paul-Bunnell reaction.

A. Bernstein,¹¹ in a comprehensive review, suggested that a negative Paul-Bunnell test almost excluded a diagnosis of glandular fever. C. E. Bender¹² was of a similar opinion, but pointed out that in certain forms, notably the "febrile" type and those cases with neurological manifestations, heterophil antibodies appear only in the later stages or even in convalescence. A rising titre of antibody is stronger evidence of the disease than an arbitrarily chosen level such as 1:64¹³ or 1:56.¹² S. Leibowitz¹⁰ originally regarded a positive Paul-Bunnell test as "almost an absolute yardstick of infectious mononucleosis": in 1956 he revised his opinion and said that "the validity of the diagnosis of infectious mono-

nucleosis in sero-negative cases still remains to be established with certainty and will continue in some doubt until the aetiological agent is identified and an unquestioned diagnostic test results." In a field survey of 498 cases suspected on clinical grounds to be cases of glandular fever F. G. Hobson, B. Lawson, and M. Wigfield¹⁴ found 242 had a positive Paul-Bunnell reaction, 100 were negative to the test but showed haematological evidence of the disease, and 156 had illnesses due to other conditions. It was not possible to differentiate sero-positive and sero-negative cases on purely clinical grounds except in retrospect, but the former tended to be more severe, while, though infectivity was low in both groups, the latter appeared to be the more infectious. There were notable differences in the two groups in seasonal onset and in the age and sex incidence, and glandular-fever cells were found to persist twice as long in the cases with a positive Paul-Bunnell reaction. The authors' conclusions supported the findings of S. Shubert and his colleagues¹⁵ that sero-negative cases should be regarded as examples of a different disease. More detailed investigation of sero-negative cases is clearly required.

Serological surveys for toxoplasma antibodies in Britain¹⁶ and in America have shown that by adult life between one-quarter and one-half of the entire population have become infected,¹⁸ while the close resemblance of some cases of acquired toxoplasmosis to infectious mononucleosis has often been noted.¹⁹ M. Bateman²¹ has reported three cases in which an initial diagnosis of infectious mononucleosis had been made but subsequent Paul-Bunnell tests were negative and serological tests for toxoplasmosis were positive. In a more recent survey of 30 cases of toxoplasmosis in Sheffield, J. K. A. Beverley and C. P. Beattie²² report that four were proved by isolation of the parasite and the remainder showed significantly high antibody titres. While lymphadenopathy appeared to be the commonest manifestation, the severity and duration of the illness varied enormously; five of their patients were never really ill, whereas in others the illness dragged on for months. All had negative Paul Bunnell reactions. It is clear, therefore, that routine investigation for toxoplasma antibodies should be made both in cases resembling infectious mononucleosis with negative Paul-Bunnell tests and in cases of pyrexia of unexplained origin.

Evidence of widespread visceral disease in infectious mononucleosis has accumulated in recent years. Hepatic, cardiac, or neurological symptoms may predominate. Jaundice is a well-known development in proved cases (Leibowitz¹⁰ found it in 28% of his series of 25 cases), but R. S. Nelson and J. H.

Darragh²³ have shown by serial liver biopsies that non-icteric hepatitis is present in most cases. L. E. Rennie and F. Wroblewski²⁴ found that alterations in serum glutamic pyruvate transaminase (S.G.P.-T.) reflected most sensitively the presence and extent of hepatic infection, while the subjective manifestations of the disease appeared to coincide with the S.G.P.-T. levels, suggesting that fluctuations and variations in the symptoms of the disease might be explained in part by the amount of hepatic inflammation. B. H. Webster,²⁵ in a report on five cases of infectious mononucleosis—confirmed by increasing absorption titres of heterophil antibody with beef cells—which showed electrocardiographic as well as clinical evidence of severe cardiac complications, believes that the heart is more often affected than is generally suspected. D. M. Roseman and R. M. Barry²⁶ describe what they consider to be the eighth reported case of acute pericarditis occurring in association with infectious mononucleosis, and it is noteworthy that the signs of pericardial inflammation preceded those of mononucleosis by one week. Neurological complications of infectious mononucleosis are being reported with increasing frequency. Leibowitz¹⁰ suggests that in the majority of cases the symptoms become manifest in the first to third weeks but that the clinical picture may be confusing; he noted that in the 71 cases recorded in the literature the mortality rate was 11%. E. P. Frenkel and his colleagues²⁷ have claimed good results with steroid therapy.

In the absence of notification the incidence of the disease cannot be calculated, but in common with some other viral infections it seems to be on the increase, and in semi-closed communities like the Army may be as common as infectious hepatitis and poliomyelitis. So varied is the symptomatology and mode of onset that infectious mononucleosis should be kept in mind in any infection of unexplained origin. The development of exudative tonsillitis after a variable period of febrile disturbance with malaise and possibly lymphadenopathy is one of the commonest patterns of the disease; while macular rashes, clinically indistinguishable from rubella, are often seen. The study of a blood film is thus an indispensable procedure in all such cases. Many references have been made to the enanthem of glandular fever,²⁸⁻³⁴ and F. I. Caird and P. R. Holt³⁵ have made a detailed study of this phenomenon. They describe five types of lesion, the most important being multiple pin-point petechiae at the junction of the hard and soft palate. Red macules, linear macules, white macules, and vesicular lesions may also be seen. Caird and Holt maintain that such lesions are not generally found in diseases which infectious mononucleosis may simulate and may therefore prove helpful in a diagnosis which

so often remains in doubt until the results of the Paul-Bunnell test are known. Much more might be learned about the aetiology and epidemiology of this infection if it was made notifiable, at least temporarily, in areas where the incidence is believed to be high.

WAITING FOR DOCTOR

To a patient already worried about his ill-health a long wait in the out-patient hall can seem uncommonly irksome. He may be suffering loss of earnings as a result of it, or the housewife may have trouble over getting her children looked after. It can be no surprise if they, like Marvell, are sometimes obsessed with the thought of "time's winged chariot hurrying near." Marvell was addressing his mistress, not his doctor (and hence in verse), but many people do find it a frustrating experience to fidget about for an hour or more in strange company waiting for their slightly alarming turn to come before the doctor. A number of investigations have by now been carried out into the various causes of long waits at the hospital clinic; a considerable literature on it has appeared; and last week a further contribution, partly reviewing previous work but adding fresh observations, was published by the Ministry of Health.¹ "Waiting in the clinic before seeing the doctor," says the report, "is the most frequent and most irritating cause of complaint."

As the report recognizes, many kinds of disturbance can upset the smooth running of an appointments system. The authors found that on the average about 10% of patients booked do not attend (though some give warning), and, though most patients come early, "there are often enough late comers to jeopardize the efficiency of an appointments system." The doctors in charge of the clinic may themselves be late, or have to leave suddenly to deal with an emergency, or to go off for a few minutes to consult a colleague. Again, the length of each consultation may vary enormously. To the statistician—and most studies of these problems have been executed by statisticians—these problems appear as measurable variables which, after some technical processing, can provide data from which to deduce the framework of a scheme. An appointments system may thus be constructed by which, for example, in 19 out of 20 successive out-patient sessions not more than 5 out of 100 patients would, on the average, have to wait more than one hour. The objective recommended in this report is that 75% of patients should be seen within half an hour of their appointment time, and that no more than 3% should have to wait over an hour.

¹ Out-patient Waiting Time, Hospital O and M Service Reports. H.M.S.O., 1s. 3d.

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²⁰ *Ann. N.Y. Acad. Sci.*, 1956, 64, 185.
²¹ Bateman, M., *Brit. med. J.*, 1957, 2, 141.
²² Beverley, J. K. A., and Beattie, C. P., *Lancet*, 1958, 2, 379.
²³ Nelson, R. S., and Darragh, J. H., *Amer. J. Med.*, 1956, 21, 26.
²⁴ Rennie, L. E., and Wroblewski, F., *New Engl. J. Med.*, 1957, 257, 547.
²⁵ Webster, B. H., *Amer. J. med. Sci.*, 1957, 234, 62.
²⁶ Roseman, D. M., and Barry, R. M., *Ann. Intern. Med.*, 1957, 47, 351.
²⁷ Frenkel, E. P., et al., *J. Amer. med. Ass.*, 1956, 162, 885.
²⁸ Downey, H., and McKinlay, C. A., *Arch. intern. Med.*, 1923, 32, 82.
²⁹ Glanzmann, E., *Das Lymphknoten-Drüsenfieber*, 1930, Berlin.
³⁰ Berberich, W. F., and Thomas, F. H., *U.S. nav. med. Bull.*, 1949, 49, 271.
³¹ Hoagland, R. J., *Amer. J. Med.*, 1952, 13, 158.
³² Bender, C. E., *J. Lancet*, 1954, 74, 7.
³³ Holzel, A., *Lancet*, 1954, 2, 1054.
³⁴ Shiver, C. B., Berg, P., and Frenkel, E. P., *J. Amer. med. Ass.*, 1956, 161, 592.
³⁵ Caird, F. I., and Holt, P. R., *Brit. med. J.*, 1958, 1, 85.

It is possible by this approach to provide a scheme that is helpful to everyone concerned, though sometimes the variables are distributed in an exceedingly complex and irregular manner; in other words, the unexpected is apt to happen. Moreover, chronic overworking of the clinic staff by too many patients coming along can cause difficulties that no appointments system will satisfactorily resolve. The best thing to do here, as the report says, is to hold more sessions, but it unaccountably omits to add that more consultants would be needed to do that.

Though waiting for the doctor can be a worry, it is possible to make too much of it. The problem happens to be one that can readily be cast in terms of measurement, so that analyses of it are tempting to anyone handy with a slide-rule. That it should be a cause of complaint among patients is natural—travellers complain about delay on the railways, litigants about delay in the courts, and babies about delay in getting the next feed. As is well known in hospitals, these are often as much problems of human personality as of administrative machinery, and in the great majority of hospitals a proper concern for the patients' welfare is never allowed to become obscured on the one hand by forgetfulness, on the other by over-zealous supervision. And has it escaped the investigators' notice that for many people the regular visit to the out-patient department is the equivalent of going to a club for a good gossip?

ANTISERUM AGAINST CANCER

A report has been published in Canada¹ of the treatment by means of an antiserum of patients with cancer. Though no cures are claimed, considerable palliative effect is reported. The patients treated were all in the terminal stages of the disease after surgeons, radiotherapists, and others had done what they could. Two main forms of cancer were treated, breast and stomach, and an antiserum against each was prepared by injecting horses with suspensions of the appropriate human cancer tissue. A globulin fraction of the horse serum, presumably the gamma globulin, was used to treat the patients, and was injected intravenously until the equivalent of 300 ml. of serum had been administered over three or four weeks. Only patients who gave negative responses to skin sensitization tests were treated. Some of these developed later adverse reactions to the injections of serum, but many did not.

Three patients with metastatic breast cancer had secondaries in the brain, and experienced a return of eye function on serum therapy. In 9 out of 24 cases with metastatic gastric carcinoma there was a disappearance of symptoms for four to eight months. Patients with severe bone pain obtained relief, often complete, and there was radiographic evidence of recalcification of the osteolytic metastatic bone lesions. In some cases of breast

cancer in which radiation treatment had combined with the malignant disease to give a massive ulceration, the author reports healing, epithelization, and relief of pain following serum therapy. A group of patients with mediastinal infiltration, who had extreme difficulty in breathing and swallowing, were said to have obtained great relief, apparently owing to a reduction in size of the mediastinal tumour mass. A similar improvement was found in some cases with multiple pulmonary metastases and there was x-ray evidence of a diminution or disappearance of nodules. In a group with pulmonary and pleural metastases with massive pleural effusion, there was reduction or disappearance of the effusion following serum treatment. In the gastric carcinoma group there was considerable relief of symptoms and a suggestion of increased survival in those patients who received the full course of serum.

These results are surprising and promising. They are surprising because they appear to be at least as good as anything produced experimentally in the serum therapy of spontaneous or induced animal tumours (except the virus tumours). The results are also surprising in that they were obtained with such an unrefined preparation. The horse serum would almost certainly contain antibodies to the normal plasma and tissue proteins, and there was no attempt to remove them. These may have caused some of the adverse reactions. The results are promising because they were obtained in such unfavourable conditions—namely, in advanced cases. The anti-serum preparation can be greatly improved, especially by the use of certain fractions of the cancer cells, as was recently reported in this *Journal* by J. G. Makari.² However, this may be looking too far ahead, since there is no good evidence in the report that immunity plays any part. No patients were injected with normal horse serum, and in the absence of such controls it is reasonable to speculate whether the effect may be due simply to the injection of heterologous serum. R. Schrek,³ for example, has recently reported that normal rabbit serum is far more toxic to human leukaemic lymphocytes than to normal lymphocytes *in vitro*.

Whether the effect is an immune one or not there can be little doubt that some palliation was achieved, and this may be capable of improvement by further research. If the effect is found to be one of immunity, this would be of great theoretical importance, since the whole rationale of immune cancer therapy depends on the existence of specific cancer antigens. Evidence for such an antigen or antigens, discussed in these columns recently,⁴ has been forthcoming from several countries in the last two or three years, though few would regard the case as established. The final proof, or certainly the general acceptance, of this idea will probably come only when primary tumours are removed or inhibited through such an agency. It is salutary, therefore, to remember that so far the results of such attempts have been disappointing, and that the present effect may not get further than palliation.

¹ Murray, G., *Canad. med. Ass. J.*, 1958, 79, 249.

² Makari, J. G., *Brit. med. J.*, 1958, 2, 358.

³ Schrek, R., *Nature (Lond.)*, 1958, 182, 724.

⁴ *Brit. med. J.*, 1958, 1, 878.

INHERITANCE OF RHEUMATOID ARTHRITIS

Though rheumatoid arthritis sometimes affects more than one member of a family, this disease is fairly common if all grades of severity are considered, and to the casual observer the distribution might seem to be one of chance. The great majority of patients with rheumatoid arthritis are the sole sufferers of their immediate kindred. However, all studies which have compared the incidence of the disease in relatives of patients suffering from it with the incidence of it in control groups variously chosen have agreed that there is a familial tendency: in five separate studies, between twice and five times more rheumatoid arthritis was found in the relatives of patients than in those of the controls.

A new weapon for the more detailed analysis of such a tendency has been in our hands since 1948: the Rose-Waaler test depends upon a factor in rheumatoid sera which agglutinates particles such as erythrocytes coated with gamma globulin. It is nearly specific for rheumatoid arthritis sera and is found to be positive in about 60–70% of adults with that disease. With this addition to clinical and radiological assessment J. S. Lawrence and J. Ball¹ have recently re-evaluated the familial distribution of "rheumatoid arthritis" in a series of relatives of patients with rheumatoid arthritis, comparing them with an equal number of randomly chosen controls from the general population matched for age and sex. Clinical assessment showed severe, moderate, and minimal rheumatoid arthritis (three of the five grades chosen) to occur in 16 out of 183 relatives but in only 4 out of 183 controls; radiological assessment showed specific changes in 12 relatives and in 6 controls; serological assessment showed a positive Rose-Waaler titre in 13% as against 5% in controls. On the American Rheumatism Association's grading of rheumatoid arthritis, minimal, moderate, or severe changes were found in 14 relatives and 9 controls.

These figures agree in general with previous ones; though the incidence of rheumatoid arthritis in relatives is small, it is about two to four times as great as in controls. More detailed analysis disclosed that families of patients with rheumatoid arthritis but with a negative Rose-Waaler test had no more radiological or serological evidence of rheumatoid arthritis than the controls but did show more clinical rheumatoid arthritis (8% as against 2%). This discrepancy might perhaps be due to the lower proportion of older people in the sero-negative group. It is well known that both radiological and serological changes increase with age, and it is likely that the relatives of patients with sero-negative rheumatoid arthritis would be younger than those of patients with sero-positive rheumatoid arthritis and would also have less serological change themselves.

On the assumption that by the age of 65 all who are liable to develop this serological change will have done so, the authors calculate that the gene responsible for it occurs in one in three of the population. How this serological change is related to the changes in the connective tissues of the joints remains completely un-

known, but it was found that morning stiffness was more frequent than in the control population only in the sero-positive persons with rheumatoid arthritis and not in those with a negative Rose-Waaler test. In such ways studies of the population, besides their intrinsic interest, serve also to indicate further fields of useful inquiry.

MARFAN'S SYNDROME

Eponymous titles are, in general, to be deprecated, but there are some disease syndromes which are so well known that their eponym has passed into current usage, and indeed sometimes the use of the name is often easier than the descriptive title. One example of this is Marfan's syndrome. In his original paper Marfan¹ reported the case of a girl aged 5 years with spider fingers and skeletal deformities, and he called the condition "dolichostenomelia." Achard² first suggested the name "arachnodactyly." Ophthalmic abnormalities have long been recognized as being closely associated with the bony deformities, and cardiac lesions are also common. This triad of arachnodactyly, dislocation of the lens, and congenital morbus cordis constitutes Marfan's syndrome, but there are many variations which have loosely been included under this title, although Marfan did not describe them.

Though the condition is rare, it is easily recognizable on sight, even in early childhood. The long thin fingers and toes, the hypermobility of the joints, the pigeon or funnel chest, and the dislocated lenses and marked myopia (necessitating very thick glasses) make an unforgettable picture. The heart lesion, which is usually acyanotic, has generally been considered as predominantly a septal defect, but R. K. Piper and E. Irvine-Jones³ found that aortic abnormalities were commoner, particularly medial sclerosis, and this has been confirmed by further necropsies. As a dissecting aneurysm is a likely sequel to such a lesion, sudden death is no rarity. Because of the incidence of "formes frustes" of the syndrome some authors^{4,5} have suggested that unexplained aortic aneurysms should lead to a search in the family for other congenital anomalies, even if there are no overt signs of Marfan's syndrome.

Almost every system has been affected in association with arachnodactyly, and the various abnormalities have been surveyed by C. C. Booth and colleagues.⁶ The latest study, by M. A. Lynas,⁷ has emphasized the genetic aspects. She investigated all the families in Ulster which were known to have any members suffering from the condition, either in its complete form or as "formes frustes," and found 13 families with a total of 31 affected subjects in several generations. The complete clinical syndrome was present in 11 of the 20 patients she examined. The genetic studies suggested that the disease was inherited as a dominant trait acting irregularly. There was no consanguinity in any of the families

¹ Marfan, A. B., *Bull. Soc. méd. Hôp. Paris*, 1896, 13, 220.

² Achard, C., *ibid.*, 1902, 19, 834.

³ Piper, R. K., and Irvine-Jones, E., *Amer. J. Dis. Child.*, 1926, 31, 832.

⁴ Tobin, J. R., Bay, E. B., and Humphreys, E. M., *Arch. Intern. Med.*, 1947, 80, 475.

⁵ Whittaker, S. R. F., and Sheehan, J. D., *Lancet*, 1954, 2, 791.

⁶ Booth, C. C., Loughridge, L. W., and Turner, M. D., *Brit. med. J.*, 1957, 2, 80.

⁷ Lynas, M. A., *Ann. hum. Genet.*, 1958, 22, 289.

¹ Lawrence, J. S., and Ball, J., *Ann. rheum. Dis.*, 1958, 17, 160

studied. Yet despite all the cases now recorded, and the work involved in their investigation, the aetiology of Marfan's syndrome remains unexplained.

PULMONARY TUBERCULOSIS AND PEPTIC ULCER

Pulmonary tuberculosis occurs more frequently in patients, especially men, after partial gastrectomy than in the general population.¹⁻⁴ This finding has been confirmed by J. A. Balint in a recent survey of mortality in a follow-up of 2,413 patients after gastrectomy.⁵ The higher incidence of tuberculosis in men than in women after gastrectomy is due to the fact that the majority of men have this operation before they reach the most dangerous age for phthisis (55-65 years), while women have already passed what is for them the most dangerous age (20-30 years) before the operation.

Some workers have claimed that pulmonary tuberculosis is more prevalent among patients with peptic ulcer not treated by operation,^{6,7} but others have disagreed with this view.⁸⁻¹⁰ Balint in his survey examined the incidence of tuberculosis among 1,886 patients with peptic ulcer seen at the Central Middlesex Hospital during 1953-5 inclusive, and found no significant difference between this and the incidence in all other out-patients seen during the same period. However, his patients were new cases of peptic ulcer and therefore mainly of recent onset.

The increased incidence of tuberculosis after partial gastrectomy has been most commonly attributed to malnutrition,¹¹⁻¹⁴ yet there is much evidence that nutrition after gastrectomy is not usually severely impaired.^{5,15-17} Furthermore, it has been shown that tuberculosis is just as likely to develop in patients whose partial gastrectomy is a success as in patients with bad results.^{1,18} D. M. Kissen¹⁹ has recently suggested that the increased prevalence of tuberculosis among patients with peptic ulcer has a psychological origin. While many doctors would agree that emotional disturbances often lead to recrudescence of ulcer symptoms, there is still much doubt about their significance in the aetiology of peptic ulceration. Other factors are known to be of importance in determining the increased incidence of tuberculosis in ulcer subjects. One of these is social class. W. R. S. Doll and colleagues²⁰ have shown that gastric ulcer is much more common in social class V than in social

classes I and II. Tuberculosis is also more common in the lower social classes. Again, C. R. Lowe²¹ has shown that there are an excessive number of heavy smokers among adult patients with pulmonary tuberculosis, while Doll and colleagues²² have shown that peptic ulcer is more common in smokers than non-smokers. Thus smoking may be another important factor in the development of tuberculosis in patients with peptic ulcer.

Firm evidence of an increased incidence of pulmonary tuberculosis among patients with peptic ulcer is at present lacking, except that the incidence after partial gastrectomy is undoubtedly higher. Balint has calculated that cases of tuberculosis arising after partial gastrectomy may account for 5-10% of all new notifications of pulmonary tuberculosis in men. The explanation for this increased incidence appears to lie in the social class of the patients (mainly social class V), their heavy cigarette smoking, the age at which the operation is performed, and the slight malnutrition following partial gastrectomy.

AFTER DINNER

The medical schools are beginning the new session. Notable men make edifying speeches. And everyone dines. Usually the dinners are good, and also the wines. Everyone eats too much on these occasions. Surfeit is the rule. A medley of middle-aged men—with a few ancients around—sit uncomfortably with starched shirtfronts and become flushed and even purple as the evening wears on; and all this at the end of a long day in the operating theatre or consulting-room. For those who have to join the circus of presidents of the square dozen of metropolitan medical societies, dining out can become quite a habit between the autumn of one year and the spring of the next. And they all have to pay the same price for this hazardous privilege—making or listening to speeches. No one likes it—neither the speaker nor the listener. It is an intolerable infliction on all. There may be three or at the most four medical men in London, for example, who can make a speech that entertains. The rest conscientiously grind out their little stories or attempt displays of cleverness. Then comes the climax of after-dinner futility—the toast to the guests. The proposer, plainly, has met the most distinguished of them for the first time that evening; but he bravely hints at familiarity with their past, hoping he has not by error got hold of the wrong entry in *Who's Who*. On one memorable and even funny occasion the proposer brought a prompter with him in case he missed his cues. After-dinner speakers are mostly as dull as dish-water. It is not their fault. Surgeons have been taught to take life seriously, and physicians to look knowing and grave. Apart from their intrinsic demerits, after-dinner speeches prevent the diners moving round to meet old friends over the port. They all get stuck in their places next to and opposite the same old faces. If there must be speeches after dinner there should be two only—one for and one against, the choice of subject being open to the first speaker—and a time limit of seven minutes each.

Drug Treatment of Disease

ASTHMA

BY

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The main advances in the symptomatic treatment of asthma lie in the use of corticoid substances and their derivatives. The older bronchodilators, however, remain the drugs of choice in cases of mild or moderate severity. Their effectiveness in some cases has been improved by modification in their structure, in their physical state, or by the combined use of more than one preparation, so that side-effects have been reduced or the rate of absorption modified. The use of the following preparations in asthma will be discussed:

- (1) Bronchodilators: (a) Sympathomimetic drugs.
(b) Xanthine derivatives.
(c) Miscellaneous.
- (2) Corticoid preparations and corticotrophin.
- (3) Sedatives.

Sympathomimetic Drugs

These include adrenaline, isoprenaline, methoxyphenamine, and ephedrine. Ephedrine (30 mg.) and methoxyphenamine (100 mg.) are given by mouth and may be used in the treatment or prophylaxis of mild attacks. They are also useful in emphysematous patients with bronchospasm. Though they are less potent than isoprenaline or adrenaline, their action persists for a longer time. Isoprenaline can be prescribed sublingually in doses of 10-20 mg. or as an aerosol means of pressure from an oxygen cylinder or electric motor may be continued for 15-30 minutes in exceptional circumstances. Adrenaline hydrochloride (1:1,000) 0.5-1.0 ml. or bitartrate (1:2,000) 1-2 ml. are given subcutaneously in severe attacks. Repeated doses of 0.05-0.1 ml. every 1-2 minutes may be given in status asthmaticus up to a total dose of 3.5-5 mg. of the adrenaline salt, unless there is relief of symptoms or evidence of hyperadrenalinism before the maximum dose is reached.

The side-effects of these drugs are mainly cardiovascular. Ephedrine, adrenaline, and isoprenaline are all cardiac stimulants and may cause extrasystoles or over-action of the myocardium, with unpleasant subjective sensations. Ephedrine is also a central stimulant and may make patients feel so tense and excitable that they are unwilling to continue taking it; for the same reason it may prevent sleep if administered at night. It is remarkable that this effect is rarely observed in children, who can usually tolerate ephedrine in doses of 8-15 mg. ($\frac{1}{4}$ - $\frac{1}{2}$ gr.) up to 5 years and 15-30 mg. ($\frac{1}{4}$ - $\frac{1}{2}$ gr.) after this age when it is given at bedtime, without any disturbances of sleep habit. Its prolonged action makes it a particularly valuable nocturnal prophylactic. The following linctus is often beneficial for children, and is suitable for a child aged 5 years:

R. Tinct. camph. co.	minims 5 (0.3 ml.)
Oxymel scillae	minims 15 (0.9 ml.)
Ephedrin.	gr. $\frac{1}{4}$ (16 mg.)
Pot. iodid.	gr. $\frac{1}{4}$ (100 mg.)
Aqua chloroform	to 1 dr. (3.5 ml.)

One drachm to be taken before going to bed.

Methoxyphenamine ("orthoxine") is an analogue of ephedrine but produces considerably fewer cardiovascular or central nervous side-effects. When given to 7 patients who were unable to tolerate ephedrine, no side-effects were experienced in 6; and, of 24 patients who were asked to compare the effects of the two preparations, 15 preferred orthoxine (100 mg.) and 3 ephedrine (30 mg.). The broncho-

dilator effects of the two preparations were judged to be approximately equal.

The side-effects of ephedrine may be reduced by prescribing it with phenobarbitone 30 mg. ($\frac{1}{2}$ gr.) or sodium amytal 50 mg. ($\frac{1}{2}$ gr.). Its action can be further prolonged by giving it in the form of a resin ephedrine complex, so that the ephedrine is liberated slowly by ion exchange as it passes down the alimentary tract. It has been shown that the active part of a combination of this type is in fact absorbed steadily into the blood stream over a period of 6-8 hours. The action of adrenaline can be prolonged by injecting a combination of adrenaline in an emulsion of nut oil ("hyperduraline"). Although these modifications of adrenaline and ephedrine may make them more effective under certain circumstances, the unmodified preparations are adequate for most patients and considerably cheaper.

Xanthine Derivatives

These consist of theophylline and caffeine. The former is the more effective and may be given orally, intravenously, or intramuscularly. Oral theophylline exerts a relatively weak bronchodilator action when given alone in the usual dose of 200 mg. (3 gr.). In severe asthma or in status asthmaticus, intravenous aminophylline (theophylline with ethylenediamine) 250-500 mg. should always be given if adrenaline has not been effective; it may cause dramatic relief in such patients. Rectal suppositories (250 mg.) are sometimes useful, especially at night. Side-effects are due to gastric irritation, especially when taken orally, and to cardiac stimulation (rarely with ventricular fibrillation) when injected intravenously. Administration by rectal suppository, though inelegant, seldom gives rise to unpleasant symptoms.

Various means have been adopted to avoid the irritating effects of theophylline on the gastric mucosa, of which the most obvious is to prescribe it after food. A combination with choline (choline theophyllinate) which increases its stability and is highly soluble appears to be the most effective; it is available in tablets of 100 and 200 mg. A preparation in which theophylline and aluminium hydroxide are given together is also well tolerated. The cardiac side-effects of intravenous aminophylline can easily be overcome by slow administration, and in status asthmaticus it may be given in a saline drip up to a total dose of 3 g. in 24 hours. The inconvenience of intravenous administration can be avoided by intramuscular injection, but this is painful because of the acid reaction of aminophylline. Modification of theophylline by replacing the hydrogen-containing amine with a hydroxy-propyl chain, diprophyllyne ("neutraphylline"), renders it neutral in reaction and relatively painless. The effect produced is somewhat slower than after intravenous administration. Caffeine is not administered alone for its bronchodilator action, but the *National Formulary* preparation, caffeine iodide elixir, is sometimes of value when bronchial infection is associated with asthma.

Although it is generally regarded as bad practice to prescribe more than one drug at a time, the effect of a combination of sympathomimetic and xanthine substances may be superior to that of either drug alone. The further addition of a sedative not only reduces the side-effects of ephedrine but may help to relieve nervous tension. Clearly, however, to be effective these drugs should be given in adequate quantities—that is, theophylline 130-200 mg.,

¹ Thorn, P. A., Brookes, V. S., and Waterhouse, J. A. H., *Brit. med. J.*, 1956, 1, 603.

² Frisch, A., and Brück, E., *Wien. med. Wschr.*, 1955, 105, 375.

³ Rosner, K., *Z. Tuberk.*, 1953, 102, 13.

⁴ Pulvertaft, C. N., *Lancet*, 1952, 1, 225.

⁵ Balint, J. A., *Gastroenterologia (Basel)*, 1958, 90, 65.

⁶ Von Jaksch, *J. prakt. Heilk. (Prague)*, 1844, 3, 1.

⁷ Sturtevant, M., and Shapiro, L. L., *Arch. Intern. Med.*, 1931, 48, 1198.

⁸ Brinton, W., *Diseases of the Stomach*, 1859, Churchill, London.

⁹ Collinson, H., and Stewart, M. J., *Brit. J. Surg.*, 1928, 15, 626.

¹⁰ Emery, E. S., Jr., and Monroe, R. T., *Arch. intern. Med.*, 1929, 43, 846.

¹¹ Isorni, Fabre, Le Moniet, Baussan, and Langeard, *Rev. Tuberc. (Paris)*, 1948, 12, 393.

¹² Brout, G., Marche, J., Brochen, G., and Bourven, A., *Paris med.*, 1951, 41, 64.

¹³ Pearson, R. S. B., *Postgrad. med. J.*, 1954, 30, 159.

¹⁴ Demole, M., and Rentchnick, P., *Gastroenterologia (Basel)*, 1955, 84, 17.

¹⁵ Santy, P., and Mallet-Guy, P., *Presse med.*, 1939, 47, 1.

¹⁶ Wells, C., and Welbourn, R., *Brit. med. J.*, 1951, 1, 546.

¹⁷ Baron, A., *ibid.*, 1954, 2, 69.

¹⁸ Steel, S. J., and Johnston, R. N., *Brit. J. Tuberc.*, 1956, 50, 233.

¹⁹ Kissen, D. M., *Health Bull. (Edinb.)*, 1958, 16, 44.

²⁰ Doll, W. R. S., Jones, F. A., and Buckatzsch, M. M., *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, 1951, N. 1, 276.

²¹ Lowe, C. R., *Brit. med. J.*, 1956, 2, 1081.

²² Doll, W. R. S., Jones, F. A., and Pygott, F., *Lancet*, 1958, 1, 657.

ephedrine 20–30 mg., and phenobarbitone 20–30 mg. The addition of a keratin coating will delay absorption of the active principles and makes such preparations particularly valuable in preventing nocturnal attacks.

Other Bronchodilators

The belladonna alkaloids and the nitrites, both pharmacological bronchodilators, are of no significant value in the treatment of asthma. Stramonium is sometimes given in the form of mist. pot. iod. and stramonium (N.F.) $\frac{1}{4}$ fl. oz. (14 ml.) three times a day. Kheilin, a smooth-muscle relaxant with irritant effects on the alimentary tract, has no advantage over better-known preparations. The antihistamines, though highly effective in many cases of hay-fever and urticaria, are disappointing in asthma. The sedative side-effects of promethazine and diphenhydramine, combined with their antihistaminic action, may render them effective in the nocturnal asthma of children, and in Great Britain their use in asthma is almost limited to this type of case. Diphenhydramine may be prescribed as an elixir as follows:

B. Diphenhydramine ..	0.08 g.
Chloroform ..	0.1 ml.
Lemon flavouring ..	0.12 ml.
Liq. ext. liquorice ..	0.3 ml.
Soln. of bordeaux B ..	(B.P.C., 1949) 0.08 ml.
Soln. burnt sugar ..	(B.P.C.) 0.1 ml.
Syrup ..	to 28.5 ml.
4 ml. to be taken at bedtime.	

Corticoids

Corticoid preparations are highly effective in asthma. They are, however, merely symptomatic remedies and in no sense to be regarded as a "cure." While there is little objection to their use for short periods as a means of helping a patient through an exacerbation, their continuous exhibition, though justified in some cases, has certain serious disadvantages and should be avoided unless the patient's way of life is disorganized by his asthma.

Corticoids should be given only under the closest supervision and in exceptional circumstances if a patient has a history of peptic ulcer or pulmonary tuberculosis. Haematemesis from an ulcer, or perforation, with masked symptoms, are not uncommon even with short courses of treatment. The author is aware of three fatal cases and has seen others who survived. Reactivation of quiescent pulmonary tuberculosis may also occur. In diabetes, corticoids should be employed with circumspection and the dose of insulin may need adjustment. Signs of heart failure should also be regarded as a contraindication to the administration of cortisone and hydrocortisone; prednisolone or prednisone, which do not cause excessive retention of sodium and fluid, are relatively safe in this respect.

Intermittent Therapy

My own practice is to supply patients who are subject to intermittent severe attacks of asthma which may lead to status asthmaticus with an emergency supply of 20 tablets of prednisolone (5 mg.) or cortisone (25 mg.), and instructions to take these if their asthma fails to respond to the bronchodilator drugs they habitually use. The course of treatment is as follows:

Prednisolone 5 mg. or cortisone 25 mg.	
Days 1 and 2 ..	1 tablet four times a day.
Days 3 and 4 ..	1 tablet twice a day.
Days 5 and 6 ..	1 tablet twice a day.
Days 7 and 8 ..	1 tablet at night.

This is effective in controlling exacerbations in a high proportion of cases, but patients with more severe attacks may need a larger initial dose—say, $7\frac{1}{2}$ mg. four times a day for the first two days, thus prolonging the treatment to a period of ten days. Short courses of this type, even if repeated every month or so, are preferable to continuous or long-term treatment.

In status asthmaticus an initial daily dose of 60 mg. of prednisolone or 300 mg. of hydrocortisone should be given in divided doses on the first day. An initial administration of hydrocortisone hemisuccinate (100 mg.) intravenously is valuable in severe cases: this may be repeated after 3–4 hours if necessary. It must be remembered that immediate relief is not always obtained; corticoids do not act directly as bronchodilators, and improvement may not take place for 48 hours or more. Bronchodilator drugs such as adrenaline and aminophylline must therefore be given in the usual way until relief is evident. Death from asthma can still take place on full doses of corticoid substances. It is also important to remember that if bronchial infection is present antibiotics should be given in full doses.

Long-term Treatment

The long-term treatment of severely disabled asthmatics should be undertaken only after complete hospital investigation has been carried out with trial periods on corticoids and dummy tablets. It is important to bear in mind that patients who have been on even small doses of corticoids for more than a few weeks will have complete suppression of their suprarenal activity, and recovery of function will develop only slowly after the administration of corticoids has ceased. This means that under conditions of unusual physical or mental stress—for example, following surgery or during infection—such patients are unable to produce the additional secretion of corticoids which takes place under natural conditions when their output may be increased four or five times above the normal value. Inability to do this may lead to shock and sudden death, if additional corticoid substances are not provided on the day of and for some days after operation. Every patient on long-term corticoids will be well advised to carry a card stating the nature of the corticoid being used and the dose prescribed, with instructions to increase this by three or four times for 2–3 days in the event of emergency surgery, with gradual decrease to the usual maintenance dose over the next week.

.....Hospital	
CORTICOID THERAPY	
Name.....	Hospital No.....
Address	
.....	
This patient is taking regularly. It is important that the dose should not be decreased suddenly because the activity of her own suprarenal cortex is almost certainly depressed. In the event of any surgical emergency, the dose should be increased considerably for 48–96 hours after operation and then gradually reduced to the basic level.	
Signed	Date.....

In the same way during respiratory infection the dose of cortisone may need to be increased and antibiotics should be used at the same time.

If these precautions are kept in mind cortisone or prednisolone in small doses can transform the life of a severely incapacitated patient. In a number of cases under my care, a dose of 5 or 10 mg. of prednisolone has enabled them to carry out their occupation with only occasional loss of time from asthma over a period of two years or more, whereas previously they had required repeated admission to hospital in status asthmaticus and were disabled between attacks. Other cases may require 100 mg. of cortisone or 20 mg. of prednisolone to obtain reasonable relief, but side-effects will be proportionately increased. In some cases the effect of the preparation appears to diminish after a few months. Prednisolone has the advantage that salt is retained only to a small extent, and the tendency to put on weight is much less than with cortisone.

ORAL PENICILLIN IN GENERAL PRACTICE

BY

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Oral penicillin preparations have been in use for nine years, and yet the value of this method of giving the antibiotic is still the subject of considerable controversy. The reason for this may lie in the fact that oral penicillin therapy is almost exclusively administered by general practitioners rather than by hospital specialists. The former encounter innumerable obstacles in making public their observations, and hence there are few reports on the clinical use of oral penicillin. The paper by Chapple *et al.* (1956) is a notable exception to this.

On the other hand, from our hospitals have emanated a number of reports on the blood levels achieved with different oral penicillin preparations administered to healthy volunteers (Fairbrother and Daber, 1954; Laurance and Alder, 1954; Holborow *et al.*, 1956; Henry *et al.*, 1957; to mention but a few). The scarcity of reports on blood levels in ill patients is remarkable. In any case, blood levels are not necessarily related to therapeutic effect (*Brit. med. J.*, 1953). An article on the use of penicillin in sore throat included the statement that intramuscular penicillin rather than oral antibiotics was commonly used in practice for this complaint (Brumfit and Slater, 1957). In subsequent correspondence I suggested that, on the contrary, oral penicillin was probably used far more in general practice than penicillin by injection (Wheatley, 1957). Through the co-operation of the research committee and members of the Northern Home Counties Faculty of the C.G.P., I have now had an opportunity to verify this statement and to collect further information on the subject from those most intimately concerned with it.

Objects of the Investigation

The objects were to find out how much general practitioners use oral penicillin, for what purposes they use it, and in what form and dosage. It is difficult to assess objectively the merits of this form of treatment, yet I feel that after this length of time general practitioners are unlikely to go on using oral preparations if in fact they are useless.

The faculty consists of some 180 members and associates distributed throughout the four counties—Middlesex, Hertfordshire, Bedfordshire, and Essex. Therefore all types of practice ranging from rural Essex to suburban Middlesex are included in the area, which constitutes a fairly representative cross-section of the country as a whole. These doctors were all circulated with a questionnaire asking the following questions:

1. Do you use oral penicillin? Yes/No.
2. Do you use it for Adults/Children/Both?
3. For which of the following infections do you use it therapeutically? Tonsillitis. Acute otitis media. Pneumonia. Acute bronchitis. Any others? (please state which).
4. Do you use oral penicillin combined with a sulphonamide, and if so, for what infections?
5. What preparation(s) do you use?
6. What is your dosage regime?

	(a) Dose	(b) Interval Between Doses	(c) Average Length of Treatment
Adult ..	 units or mg.	 hours	 days
Children 0–5 ..	 units or mg.	 hours	 days

When once corticoid treatment has been instituted for some months, the problem of weaning the patient becomes a difficult one. After such treatment it can be taken that the suprarenal cortex will cease to function. Heavy stimulation with corticotrophin in such cases will produce a temporary rise in corticosteroid output, but even this may lead to exhaustion of the cortex, with symptoms of acute Addison's disease. Abrupt termination of treatment will often lead to severe status asthmaticus, and all patients should be warned of this. Reduction of the maintenance dose when it has been given for six months must be very gradual—say, $2\frac{1}{2}$ mg. of prednisolone every 2–3 weeks. In many cases the patient must be prepared to continue on maintenance corticoid therapy for life. For this reason it is obviously a form of treatment rarely advisable for children, who will, however, tolerate short courses well.

Long-acting corticotrophin given intramuscularly is an alternative form of treatment which is not complicated by suprarenal suppression. It has the disadvantage that it must be given by injection and that obesity like that in Cushing's disease, with increase of several stones in weight, often develops. In rare cases sensitization to the animal proteins which are present as an impurity may occur, with production of anaphylactic shock. Death from anaphylaxis, however, usually follows only intravenous administration of corticotrophin. 20–40 units of corticotrophin may be given daily or on alternate days with benefit, and many cases have been kept relatively free from attacks in this way.

Sedatives

The well-recognized fact that emotional factors play an important part in asthma suggests that sedative drugs may be useful. There is some evidence that sodium amytal or phenobarbitone in small regular doses may help the nervous asthmatic, but their main value appears to be in combating side-effects of sympathomimetic agents. In status asthmaticus paraldehyde 5 ml. intramuscularly, or 2–4 dr. (7–14 ml.) by mouth remains the safest and most effective sedative for use at night. Morphine is contraindicated because of its depressing action on the respiratory centre. Pethidine, though a less effective sedative, is a mild bronchodilator with some depressing effect on respiration; its total effect is to reduce the tidal volume in the majority of cases. It is, however, reasonable to give it in association with nalorphine (4 mg.) when discomfort is great and other treatment has failed.

Conclusion

In conclusion it may be said that drug therapy, though valuable in asthma, should never be used as an excuse for avoiding the careful investigation of the important precipitating factors in each case, nor should the use of drugs replace measures to improve the general health. The recognition of allergic sensitization, emotional stress, or infection, and their treatment, are always of primary importance, and may lead to long-lasting relief that drugs cannot achieve. In particular the use of corticoids as the first choice of treatment cannot be deprecated too strongly.

The wise administration of bronchodilators is a useful accessory to other forms of treatment. They help to give the patient confidence in relieving symptoms, and may help to break an "asthma habit." Sometimes, because of our ignorance of the underlying pathogenesis, they may provide the only effective treatment available. In the same way corticoids may be used to prevent attacks of status asthmaticus or to control them when they have developed, and in a few cases may convert a disabled, unhappy patient into a relatively normal person capable of carrying out a full day's work.

It must be remembered that the objective in treating asthma to-day is to teach the patient to control and live with his disease. To do this intelligently he must be taken into the doctor's confidence and given some explanation of the rationale of the treatment recommended.

7. Do you consider that oral penicillin as given by you for the infections stated is: (a) Better than, (b) comparable to, (c) worse than penicillin by injection.
8. Will you kindly record over a 20-day period the number of cases for which you prescribe sustained penicillin treatment: (a) orally, (b) by injection.

N.B.—By "oral penicillin" is meant penicillin to be swallowed in the form of tablets, capsules, or mixtures. This does not include penicillin lozenges or other forms of local medication.

Participants were asked to return the forms, whether or not they were oral-penicillin enthusiasts.

Eighty-five (47%) doctors agreed to take part in the investigation and sent in completed questionnaires, with the following results.

Use of Oral Penicillin

Eighty doctors (94%) replied that they used oral penicillin, against five who replied that they did not. Of the 80 doctors using it, 66 (82%) used it for both adults and children and 14 for children only. The number of patients treated orally and parenterally over a 20-day period were summated with the following totals: oral, 1,043 (73%); injections, 379 (27%). So that, for every two cases treated with penicillin by injection, five cases were treated orally.

The number of cases treated with penicillin over this period varied enormously from practice to practice. Thus one doctor treated the staggering total of 92 cases orally and 12 by injection, an average of five cases a day. At the other extreme one doctor treated only one case by injection during the period. Most replies, however, fell in the proportion shown by the total number of cases, with an average of 17 treated during the period. This amounts to almost one case a day, so it is apparent that a considerable amount of penicillin is used in general practice. It must also be pointed out that the survey was conducted during the month of May, which was a fairly slack period, and the figures would doubtless be higher for the winter months.

Infections Treated with Oral Penicillin

The four infections named in the questionnaire were correctly chosen as those for which oral penicillin was most often used, with furunculosis and boils coming very close to them. These and other conditions noted by the participants are shown below. The percentage of doctors treating each condition with oral penicillin is also shown:

Tonsillitis	91%
Acute otitis media	88%
Acute bronchitis	69%
Pneumonia	47%
Furunculosis and boils	44%
Finger infections	20%
Carbuncles, dental sepsis, acute sinusitis, scarlet fever, cellulitis (each)	6-10%
Upper respiratory infections, impetigo, phlebitis, mastitis, erysipelas, cervical adenitis, P.U.O., Vincent's angina (each)	3-5%
Urinary infections, bronchiectasis, acute pleurisy, acute conjunctivitis, acute laryngitis, vaginitis, Bartholinitis (each)	1%

Fifteen doctors volunteered the information that they used an initial "loading" dose of parenteral penicillin in the treatment of pneumonia or other infections if they were severe.

With regard to the use of oral penicillin combined with a sulphonamide, 17 (21%) doctors replied that they used this combination whereas 63 (79%) did not. Those using the combination did so for the following conditions:

Pneumonia	8 (47%)
If penicillin alone fails	5 (29%)
Acute bronchitis, acute otitis media (each)	5 (29%)
Boils and carbuncles	2 (11%)
Acute sinusitis, puerperal pyrexia, and chronic bronchitis (each)	1 (6%)

Choice of Preparation

Some doctors replied that they used more than one of the main varieties of oral penicillin, while some used one kind

for children and another for adults. As a result the figures shown below do not represent percentages of the total numbers replying, but the proportionate figures for the different preparations:

	Children	Adults
Penicillin V (phenoxymethyl-penicillin)	52 (65%)	60 (75%)
Benzathine penicillin	29 (36%)	8 (10%)
Penicillin G (benzylpenicillin)	16 (20%)	11 (14%)
Penicillin + probenecid	5 (6%)	3 (4%)
Penicillin V + sulphonamide combination	2 (2%)	3 (4%)
Benzathine penicillin + sulphonamide combination	1 (1%)	1 (1%)
Penicillin G + sulphonamide combination	3 (4%)	3 (4%)

It is seen, therefore, that penicillin V is "sweeping the field," since more doctors used this than they did all the other preparations put together. Three-quarters of the participants used penicillin V for adults, although for children benzathine penicillin still remained fairly popular. This is doubtless due to the fact that penicillin V was first introduced in the form of tablets and capsules, whereas the palatability and stability of benzathine penicillin mixtures had been established before the introduction of the former.

There is no clinical evidence that penicillin V is any more effective than penicillin G in twice the dosage. Certainly the latter, even in twice the dosage, remains less expensive than penicillin V, although the price of this preparation may fall with continued usage. Nevertheless it is obvious from this investigation that penicillin V is almost completely ousting penicillin G for oral therapy. Undoubtedly this is due to the fact that penicillin V is more acceptable to the profession owing to reports of higher and more consistent blood levels after its administration. However, as has already been pointed out, these reports have been mainly on healthy volunteers. There remains a need for a therapeutic trial in ill patients.

With regard to penicillin and sulphonamide combined preparations, it is apparent from the previous section that this form of therapy is not particularly popular. Of those using it, 47% made use of the proprietary combinations available, although it might be thought that the dose of penicillin in these is somewhat on the low side.

Dosage Schedules

The only distinction which need be made between the different preparations is between penicillin V and the others. Since approximately twice as much penicillin V is absorbed as either benzathine penicillin or penicillin G, lower dosage schedules would be expected for the former. Therefore various dosage schedules were tabulated for penicillin V and the others, with the numbers of doctors using each scheme.

The most important results from these tables can be summarized thus: *For children*: 66% of doctors used penicillin V in a dosage of 60 mg. three to six hourly, while 65% used the other preparations in a dosage of 125-187 mg. three to six hourly, which is two to three times the dose of penicillin V. Only 5-6% used an eight-hourly scheme for either preparation. *For adults*: 61% of doctors used penicillin V in a dosage of 125 mg. three to six hourly, which is precisely double the most popular dosage scheme for children. Only 4% used an eight-hourly schedule for penicillin V, and the numbers for the other preparations were too small for analysis.

With regard to duration of treatment, the following results were obtained:

	Children	Adults
3 days	6	4
4-5 "	53 (78%)	47 (78%)
6-7 "	7	7
10 "	2	2

In other words, 78% of doctors favoured treatment for four to five days, without distinction between children and adults.

Impressions of the Effectiveness of Oral Penicillin

The results were as follows:

Better than penicillin by injection	1	(75%)
Comparable to " " " "	59	
Worse than " " " "	20	(25%)

Of the 25% who considered oral penicillin to be less effective than penicillin by injection, one doctor stated that he was giving up using it orally. Of the others, several added their reasons for continuing to use it, the main one being dislike of giving injections to children. One doctor stated that he was allergic to injection solutions and so could not use them.

It is interesting to compare the dosage schedules used by those doctors who considered oral penicillin to be less effective than penicillin by injection. We can assume that an adequate dose of penicillin V is 60-125 mg. three to six hourly (the smaller dose corresponding to the shorter interval) for children, with double these doses for adults. For other penicillin preparations the doses are double those for penicillin V. We can also assume that at least four to five days' treatment is required for the simpler infections. By these criteria, eight out of these 20 doctors (40%) were using inadequate dosage, which might account for inferior results.

It is also instructive to see whether these 20 doctors were "practising what they preached," by noting whether they treated more cases by injection than by mouth. The results are illuminating: more by injection than orally, 6; more orally than by injection, 8; question not completed, 6. Of those treating more cases orally, the proportion of oral to injection recorded by three of them was very high—namely, 29:2, 92:12, and 7:0. The reason for this apparent anomaly is probably summed up in the words of one of these doctors: "Oral penicillin is only slightly less effective than intramuscular penicillin, a disadvantage greatly outweighed by its greater convenience, particularly with children."

Conclusions and Summary

The Northern Home Counties Faculty of the C.G.P. has some 180 members distributed in all types of practice. Of these, 85 (47%) agreed to answer a questionnaire on the use of oral penicillin in general practice.

It was found that oral penicillin was used by 92% of these doctors, of whom 82% used it for both children and adults and the remainder for children alone. The total proportion of cases treated orally to those by injection over a 20-day period in May was 5 to 2. It would seem likely that these results, coming from such varied practices as they do, are representative of national custom. This being so, it may well be that more penicillin is now given by mouth in this country than by injection.

Of the infections commonly treated with oral penicillin, tonsillitis (91%) and acute otitis media (88%) came first, with acute bronchitis (69%), pneumonia (47%), and minor boils (44%) next. Finger infections accounted for 20% and a large number of other miscellaneous conditions fell into the 1-10% range. These results reflect the common penicillin-sensitive infections met with in general practice, with the exception of severe deep-seated infections, such as carbuncles, which are probably best treated with penicillin by injection.

With regard to the preparations used, it is apparent that penicillin V (75% for adults, 65% for children) is "sweeping the field," although benzathine penicillin in its palatable liquid form still retains a place in the treatment of children (36%). Combined penicillin and sulphonamide therapy would not appear to be particu-

larly popular, only 21% of the participants using it. The indications were for serious infections such as pneumonia or other infections which had failed to respond to penicillin alone.

Dosage schedules used by the participants showed very wide variations. However, 66% of doctors used penicillin V in a dosage of 60 mg. three- to six-hourly for children of 0-5 years and 61% used double this dose for adults. The dose used for other preparations was two to three times the above for adults, the numbers being too small to analyse for children. This would seem to reflect fairly accurately the difference between the amount of penicillin V absorbed from the gastrointestinal tract and that absorbed from other penicillin salts. 78% of the participants favoured four to five days' treatment for the infections listed.

One doctor thought that oral penicillin was better than penicillin by injection; 75% of the participants found the two forms comparable. Of the 25% finding oral medication not as good as injection, 10% were probably using inadequate dosage. More of these doctors continued to use oral rather than injected penicillin, despite their impressions of the relative efficiency of the two methods. This is probably because they found oral penicillin to be effective enough to allow its advantages to overcome any slightly diminished therapeutic effect. However, it is apparent that the majority of general practitioners taking part in this survey were completely satisfied with the effectiveness of oral penicillin therapy.

This investigation could not have been undertaken without the co-operation of the following doctors who took part in it: G. S. Adams, M. S. Adams, E. Anthony, C. D. Baker, D. M. Baker, G. O. Barber, L. J. Blay, W. N. Booth, O. B. Brears, H. M. Brunt, R. B. Chalmers, D. S. Chowdhary, J. R. C. Clarke, M. B. Clynne, G. H. R. Curnock, J. A. Currie, D. Craddock, J. R. Dennis, H. B. Dykes, G. W. Everett, R. A. Fisher, E. D. Fox, R. P. Gammie, J. Z. Garson, J. C. Graves, J. D. Granger, D. Gregory, R. A. Haes, A. A. Hamza, B. H. du Heaume, J. E. Heggart, R. N. Herson, E. R. Herst, S. F. Hewitson, F. N. Hicks, H. Jarvis, J. D. S. Knight, M. Latner, R. Lawson, A. J. Levine, I. M. Librach, C. R. Lynn, G. McDonnell, J. H. Macpherson, G. Melotte, P. J. Mitchell, J. R. Mortimer, T. M. Moylett, P. D. Mulken, H. M. Murray, B. E. H. Neal, J. O. Newman, N. G. Nicholson, N. O. Patterson, N. L. Paros, J. T. Pemberton, A. G. Philip, P. B. Poole, S. M. Pruss, B. S. Quinn, W. Radcliffe, D. A. G. Reid, C. J. P. Seccombe, I. M. Segal, F. S. Shepherd, F. S. W. Shute, S. G. A. Shute, B. C. Slater, R. N. C. Smith, W. J. Smith, G. E. Spear, J. D. Swan, V. W. Symonds, J. L. Tasker, M. E. Thorn, J. Totton, J. C. Turner, P. de B. Turtle, P. A. Walford, M. A. Weller, D. Wheatley, G. B. Whitaker, M. Williams, D. G. Wilson, G. C. L. Woodroffe.

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The Excerpta Medica Foundation, Amsterdam, announces the publication of a new monthly abstracting journal, devoted to rehabilitation. This forms Section XIX of the *Excerpta Medica* series. Its cost of production is aided by a grant from the Department of Health, Education, and Welfare of the U.S. Public Health Service. Annual subscription is \$15.

self that a definite danger to life or health exists, and should whenever possible have his opinion corroborated by at least one other practitioner. The effect of the operation must be fully explained to the patient, whose written consent should be obtained; if the patient is married, it would also be wise to explain the position to the spouse with a view to obtaining his or her consent.

However trivial or unjustified a practitioner may consider a complaint to an executive council, he is strongly advised, in the Society's report, to attend the Medical Service Committee hearing. "We know of instances when the practitioner has failed to attend, with the result that the evidence of the complainant, in the absence of the practitioner's rebutting evidence or explanation, has been accepted by the Committee."

NEW ACADEMIC YEAR

WELSH NATIONAL SCHOOL OF MEDICINE

The inaugural address for the new academic year at the Welsh National School of Medicine was given by Professor G. I. STRACHAN, emeritus professor of obstetrics in the School, at Cardiff on October 8. He reviewed some aspects of past professional life, and traced the factors—partly in the nature of the doctor's work and partly due to increasing Government control—that have led to its modification.

The Profession of Medicine

In the early nineteen-hundreds ours was a free profession, said Professor Strachan. The patient chose his own doctor and changed him when he thought fit, while an account for professional services was rendered from time to time. A doctor assumed a partner or an assistant at will, and on retirement or death the goodwill of his practice was sold to an appropriate successor. The doctor-patient relationship of mutual regard and trust was then an important feature of British medicine.

In 1911 the National Health Insurance Act was introduced. This required the wage earner and also his employer to contribute a weekly sum, and for this the former was entitled to receive appropriate medical treatment from the doctor of his choice. The Act was opposed by the British Medical Association, as it implied Government interference between patient and doctor. But only the wage earner was provided for; his family was not included under the benefits, neither were specialist or maternity services. For these reasons Government interference was not marked and a substantial degree of private practice persisted.

But in 1943 at the request of the Government Sir William Beveridge presented his report on national insurance as an integral part of the Welfare State. This established a comprehensive national health service which embraced everyone, rich and poor, and which provided for every kind of investigation and treatment—general, consultative, or hospital—together with all necessary drugs and appliances. These provisions were embodied in a Bill which became an Act of Parliament on July 4, 1948, the appointed day. The National Health Service represented a great upheaval in medical life and practice. The new Service was contributory, and, as it was taken advantage of by about 96% of the population, the Government now stood in a commanding position between doctor and patient. The doctor had now to look to the Government for all or almost all of his remuneration; he could not practise under the Service or take a partner or assistant without Government permission, while on death or retirement his successor was appointed by a committee. The Government took over all the public hospitals and became responsible for their maintenance. The honorary status of consultants ceased, and they were now remunerated on a sessional basis and at an annual salary. Rich and poor now sought hospital treatment, so that out-patient attendances rose sharply while waiting-lists became correspondingly congested. In general practice the "free" aspect of the Service stimulated patients literally

to storm the surgeries of their doctors, often for the most trifling of complaints.

One result of the National Health Service had been a degree of deterioration in the doctor-patient relationship as shown by unreasonable demands on the doctor's services and for particular remedies, by a tendency to lodge complaints against the doctor before the executive council, and by a grave increase in litigation. The effect of this had been to cause reference to hospital of minor cases, often unnecessarily, while hospital officers now tended to carry out their work under conditions of uncertainty and apprehension. Again, prescribing was to some extent supervised, and, while great latitude was allowed in this respect, undue prescribing of the more expensive drugs might result in a heavy fine if it was considered that a less expensive drug would have been equally effective.

Medical life had altered materially in the last half-century. The doctor's responsibilities had increased while his status had to some extent decreased; he was more open to criticism, and his choice of place to practise in might be restricted. On the other hand he had better facilities for diagnosis and treatment and he was still held in regard. The material rewards in medicine had never been great, and the main reward must always be in work well done. In spite of altered conditions a medical man could still lead a full and happy life.

CHARING CROSS HOSPITAL

The importance of maintaining private practice was stressed by Sir HARTLEY SHAWCROSS, Q.C., when he gave the inaugural address at the opening-day ceremony of Charing Cross Hospital Medical School on October 2.

Value of Private Practice

Sir HARTLEY said he had been impressed by the great changes which had taken place in the position of the medical practitioner in the last thirty years. His prospects to-day were much more encouraging. "It is sometimes said that the National Health Service is a danger to the integrity and independence of doctors," he said, "and of course there are doctrinaire people who would like to abolish private practice and to do away with pay beds, just as they would like to abolish the public schools in an effort to reduce us all to a rather dull and drab equality. These are dangers which will be guarded against. I believe that the possibility of private practice and the existence of the independent schools is something which it is vital to maintain against the encroaching power of the almighty State. It is most important that the medical profession and the teachers should not become the slaves of a bureaucracy or the pawns of politics."

In the last thirty years the concept of social service had become so widely recognized that the medical practitioner could to-day call on the assistance of many ancillary services. The medical profession was the most satisfying of all, offering the greatest prize of all. Indeed, Sir Hartley had himself contemplated a medical career in his youth and had visited one of the London teaching hospitals with this in mind before turning to the law. Referring to the decision to rebuild the hospital in Fulham, Sir Hartley recalled that when Charing Cross Hospital was established 100 years ago it had dealt with the sick poor in a very crowded area. Since then there had been a great move of population. Fulham was now the centre of a thickly populated area, but it was near enough to the centre of London and the University to offer the facilities of the other scientific studies at London University.

In his annual report the dean of the medical school, Professor W. J. HAMILTON, said that in August last year the board of governors had been asked by the Ministry of Health whether they would be prepared to build the new Charing Cross Hospital and Medical School on the site of the present Fulham Hospital, incorporating in the new hospital Fulham Maternity Hospital, the West London Hospital, and the present Charing Cross Hospital. They had

agreed, and in July the Minister of Health had given final approval. "The board are convinced," he said, "that with the good will and co-operation of all concerned, the new hospital and medical school will constitute a landmark not only of local pride but also of national and indeed international significance. Assurances have been given to the Ministry that an adequate hospital service can be provided for the Fulham area and that the staffs of the Fulham Hospital, Fulham Maternity Hospital, and West London Hospital will be welcomed to the new Charing Cross staff without the slightest detriment to their existing contracts and conditions of service." It was the intention of the board of governors that, when the building of the new hospital was completed, the residents of Fulham would have a fully comprehensive medical service backed by all the resources of a modern teaching hospital. The general practitioners of the Fulham district would have the opportunity of becoming closely associated with the hospital by taking advantage of the facilities available to them for x-ray and pathological examinations.

The prizes were then presented by Lady SHAWCROSS, and the appointment of Dr. N. F. MORRIS as professor of obstetrics and gynaecology was announced.

ROYAL FREE HOSPITAL

At the Royal Free Hospital School of Medicine prize-giving, held at the Senate House of London University on October 3, the inaugural address for the new session was delivered by Professor DOROTHY RUSSELL. Her subject was "Belief and Unbelief." After presenting the prizes and congratulating the winners, Professor RUSSELL emphasized that those who had not distinguished themselves academically knew perfectly well that in future life many non-prize-winners made extraordinarily successful doctors. This was where the important factor of personality came in. There were many who knew of the brilliant scholar who tragically failed to gain some coveted post which would seem well within his grasp, because for some reason he was felt to be uncongenial to the small, closed society which formed a hospital staff. Hence, in the medical profession particularly, academic prowess was not enough. It was necessary also to learn to be a good colleague and to be recognized as such.

A Spirit of Scientific Inquiry

She hoped that, in the student's training, account had been taken of the concept of integration, which implied a synoptic view of the preclinical and clinical years. This was easy to state in so many words, but peculiarly difficult when it came to teaching; and in most medical schools only a beginning had been made to the dovetailing of clinical and preclinical studies so as to do away with the usually abrupt transition from one to the other. Self-education was another most important ingredient in the clinical term of undergraduate experience. It should take the student whenever possible to the post-mortem room. However distasteful it might be to witness this form of demonstration on a subject who had been seen in the wards, it was the sole means of reaching the truth, or, at least, the closest approximation to the truth. This form of diagnosis stamped itself upon the student's memory and he had it as part of his background of experience for all time.

Professor Russell advised students who would take their share in the advance of medical science to be ready to challenge the printed word if it did not agree with their own observations. They should be most reluctant to accept dogmatic teaching, however attractive it might seem. This was an era in which the art of medicine was constantly being encroached upon by the advance of scientific knowledge into the wards. They should, above all, observe objectively in every way possible what they found in their patients and maintain a cautious attitude towards all unsubstantiated statements, however plausible; and they should be humble enough to admit uncertainty when every justifiable investi-

(Continued at foot of next column)

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Delta-Stab Injection (Boots Pure Drug Co. Ltd.).—This preparation consists of prednisolone acetate 25 mg. per ml., put up in a sterile aqueous suspension for intra-articular injection. It is used for its anti-inflammatory effect in various forms of arthritis, particularly rheumatoid. Its efficacy compared with hydrocortisone acetate, given as an intra-articular injection, is difficult to evaluate. Milligram for milligram it is certainly no less effective, but it has not the 4 or 5 to 1 superiority seen with the oral preparations of prednisolone, and dosage by the intra-articular route is therefore much the same as with hydrocortisone acetate. Before injecting these hormones it is essential to be certain that secondary bacterial infection has not been superimposed on an inflamed rheumatoid joint.

N.H.S. basic price: 5 ml., 30s.

Epidexa (Thomas Kerfoot and Co. Ltd.).—This is a mixture of a chlorocresol with a quaternary ammonium salt intended for use as an antimycotic and bactericide. It is available as a liquid, a cream, or a powder. Although reports of clinical trials of this particular preparation do not seem to have appeared, one may well expect that it will possess antiseptic properties *in vitro* and presumably in clinical use. It is intended by the makers chiefly for fungus infections of the skin but also for bacterial infection.

In recent years many antiseptic preparations have been put forward for the treatment of ringworm infections of the skin. Their number and variety are some indication of their relative inefficiency in spite of their being most efficient when tested *in vitro*. This seems to indicate that fungicide preparations fail not because they do not kill the fungus but because they fail to penetrate, or because they are in some way inactivated on or in the skin. For this reason many dermatologists have little faith remaining in the production and trial of fresh fungicides, and it often seems that Whitfield's ointment has yet to be surpassed.

With these reservations one may comment that epidexa is well formulated. Dichlorocresol is known to have a definite, though not excessive, potentiality of sensitizing the skin, and for this reason should be used circumspectly. It might thus be unwise to apply to the apparently normal skin for a long period as prophylaxis against athlete's foot, since the risk of sensitization increases with long duration of contact.

N.H.S. basic price: liquid, 2 oz., 7s. 7d.; cream, 25 g., 8s. 6d.; powder, 25 g., 5s. 5d.

(Continued from preceding column)

gation had proved fruitless. It was worth devoting as much thought as possible to novel methods of tackling clinical problems. Medical students had been known to make interesting and substantial additions to medical knowledge by this very technique of devising new methods of interpreting abnormalities seen in their patients.

The dean, Dr. KATHARINE LLOYD-WILLIAMS, described the school's continuous growth since its foundation in a private house in Hunter Street in 1874. It was now one of the four largest medical schools in London. In its 84 years of history it had been the first to do many things, and it might well be the first of the teaching hospitals to go in for a completely new modern hospital designed and equipped for medicine to-day. This had been a "pipe dream" for some years, but on the new 15-acre site at Lawn Road, Hampstead, there was the chance to plan a new teaching hospital and school, the first of its kind in the country to be designed specifically for the purpose. There was the same determination to make a success of this as had been shown many years ago by the founders, and the future could be looked forward to with confidence.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

R.M.B.F. Christmas Gifts Appeal

SIR,—Every autumn an appeal is made to members of the medical profession for contributions to the Christmas Gifts Fund organized by the Royal Medical Benevolent Fund.

To receive a gift at Christmastime is a joy to everyone, but particularly to those who are lonely or in need. To none is a gift more welcome than to those who have fallen on hard times. Our beneficiaries include colleagues who have met with misfortune, and widows and children who are often in desperate need when their breadwinner has been taken before he was able to make provision for them. A gift at Christmas will enable them to enjoy some of the traditional good cheer of the season.

I ask your readers once again to give generously. Contributions marked "Christmas Gifts" should be sent to the Secretary, Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15.—I am, etc.,

HENRY TIDY,
President,
Royal Medical Benevolent Fund.

Premonition of Death

SIR,—The mystery of premonition of death, of which Dr. Arnold B. Cowan gives such a good example (*Journal*, September 27, p. 797), has interested me since I first came across it in 1949. At the time I was working in a large Arab refugee camp in Jordan. Amongst my many patients was a youth of 16, whom I knew well, who was suffering from pulmonary tuberculosis. We were able to confirm radiologically that the condition was not far advanced and clinically his condition did not give cause for undue anxiety, though facilities for treatment were unfortunately very limited. There were two noteworthy features about this boy—firstly, he was simple-minded and was regarded in fact as something of a joke by his friends and relations; secondly, he was a very devout Moslem. His father, a sheikh, had formerly been a man of some wealth, but the son had always eschewed material possessions and all he had earned had been given away to the poor.

Some weeks later, when he seemed physically no worse, rising very early in the morning he walked from end to end of the huge camp (in which dwelt some 17,000 people) bidding farewell to all he met and blessing them. He then walked about five miles (8 km.) to Jericho, where he had relatives, and repeated his action. Returning to his tent at the camp, where his father sat cross-legged upon the ground, he kissed him and invoked the blessing of Allah upon him; he then lay down with his head in his father's lap and died instantly. Later the boy came to be revered as something of a saint or *welee*.

I hope the Gradgrinds will not try to rationalize these things. Let us recognize that there are still imponderables behind both the jargon and the stupendous achievements of present-day medicine.—I am, etc.,

Southborough, Kent.

A. CAMERON.

SIR,—As a doctor's wife I am a regular reader of the *Journal*, and was very impressed by Dr. Arnold B. Cowan's letter on premonition of death (*Journal*, September 27, p. 797), because a similar thing happened to my own mother. She was dying of bronchitis and summoned the family round her because she would die that night. I did my best to dispel this idea and said I would see her the next morning. She replied, "You won't. I shall die soon after midnight to-night." She was perfectly lucid, said good-bye to all of

us, and asked numerous questions regarding outstanding matters. She died at 12.40 a.m. that night. It is conceivable that one might know one was going to die, but how do such people know when?—I am, etc.,

Gravesend, Kent.

MADLINE ALLEN.

Rational Use of Drugs

SIR,—On September 6 (p. 632) you publicized a preparation called "codelprone" in your "authoritative notes" on "To-day's Drugs." Your comment did not in fact go beyond the manufacturer's advertised claims for this mixture of prednisolone, meprobamate, and aluminium hydroxide. Where is the "up-to-date, informed, and expert commentary" (*Journal*, May 3) that we were promised? This is surely just the sort of mixture that should be condemned, a mixture of a drug of proved usefulness, the dose of which is critical, with a drug (meprobamate) which, though widely used, has still to find its place in therapeutics. The trouble with all such mixed tablets is, as has often been pointed out, that the dose of one constituent cannot be altered without also altering that of the others. If there is need for more "spasmolytic action" a larger dose of prednisolone must necessarily be given.

I write as one who is trying to teach the rational use of drugs to medical students and who had hoped that your series "To-day's Drugs" was going to be an innovation that could be recommended to them as a source of critical opinion. My hopes have been largely dashed, although I do not wish to imply that all your reports have been as uncritical as this one. On a number of previous occasions you have cautiously commented in an unfavourable way on polypharmaceutical preparations which are considerably less objectionable than codelprone.

To avoid misunderstanding I would say that I have collaborated in the past and am collaborating now with drug firms in the testing of new drugs, and I recognize the valuable part drug firms play in promoting effective therapy.

If your notes were to become really authoritative, criticism, or lack of mention, would prevent bad preparations from achieving the success which is a tribute to advertising skill rather than to therapeutic efficacy, while favourable comment might lead to your columns being quoted in the advertisements instead of the advertisements being quoted in your columns.—I am, etc.,

London, W.C.1.

D. R. LAURENCE.

Contradictory Statements

SIR,—I should like to draw attention to the following quotations. In the *British Medical Journal* of June 14 an advertisement facing p. 1414 states, "promptly and safely effective, Diamox makes predictable diuresis a matter of routine." (Their italics.) The *British National Formulary* 1957 (alternative edition) at p. 95 states: "Acetazolamide (Diamox) has proved to be of little value as a diuretic, since its effects are both unpredictable and relatively feeble."—I am, etc.,

Wellington, New Zealand.

R. G. PARK.

Myocardial Disease of Obscure Aetiology

SIR,—Your brief report of Dr. W. W. Bridgen's paper on "Myocardial Disease of Obscure Aetiology" delivered at the Annual Meeting of the B.M.A. in Birmingham, and Professor W. Melville Arnott's comments on the incidence in the Union of South Africa (*Journal*, July 26, p. 234), prompt us to record our experience in Durban. As a preliminary to a full study of the obscure myocardiopathies, we have analysed the case histories of 100 consecutive African patients admitted with congestive cardiac failure to one medical unit, as well as the results of post-mortem examinations of 225 consecutive cases dying from congestive failure. In both series the cause was undetermined in approximately 19%, the frequency of this group being

second only to those cases with rheumatic heart disease and subacute bacterial endocarditis taken together (see table).

	Clinical Material (%)	Necropsy Material (%)
Rheumatic heart disease and subacute bacterial endocarditis	30	27.4
Hypertensive heart disease	18	8.4
Tuberculous pericarditis and constrictive pericarditis	11	12.0
Syphilitic aortitis	8	12.0
Degenerative heart disease	4	4.0
Cor pulmonale	3	15.1
Miscellaneous	7	2.6
Unknown aetiology	19	18.5

Professor Arnott, whom we have consulted, would like to add that his comment regarding the probable incidence of these cases (50%) refers to Africa as a whole, particularly tropical Africa, and not to the Union alone.—We are, etc.,

E. B. ADAMS.

J. WAINWRIGHT.

Durban, South Africa.

Convulsions Complicating Anuria

SIR,—Mr. T. F. Redman and Dr. F. M. Parsons (*Journal*, September 13, p. 669) have drawn attention to the super-vention of epileptiform fits on the 17th day of an anuric episode and seek an explanation for its occurrence. One pertinent fact emerges. On the 12th day the patient had administered to her 100 g. of "zeo-carb. 225/Na." On that day she showed a negative balance of water amounting to 370 ml., but thereafter presumably water retention occurred in daily amounts of up to 1,300 ml. for the next four days, when convulsions supervened. Accompanying this retention was a marked fall in the plasma concentration of potassium and of sodium (the latter commencing to rise, however, on the 14th day, reaching approximately normal levels on the 17th). The blood pressure rose steeply on the 17th day—the day that fits supervened.

The exhibition of salt by Dieckmann¹ in the form of intravenous normal saline in a patient in early anuria produced comparable effects, since subsequent to its administration oedema, hypertension, and fits developed. This clinical experience has a counterpart in Hamburger's experimental work,² in which by varying the concentration of the extracellular fluid convulsions were precipitated. Seventeen days of anuria may plausibly have heightened the irritability of the cerebral cells. In this connexion it may be worth considering Goldblatt's recent suggestion³ that under certain circumstances a disturbance of the fluid and electrolyte balance, by some mechanism not yet understood, produces hypertension. In the case described by Mr. Redman and Dr. Parsons the rise in blood pressure was sufficiently marked to be regarded as possibly productive of hypertensive encephalopathy, which Byrom⁴ has demonstrated can result from the accompanying cerebral vascular spasm.—I am, etc.,

JOHN SOPHIAN.

Worthing.

REFERENCES

- 1 Dieckmann, W. J., *Toxaemias of Pregnancy*, 1952, 2nd ed., p. 347.
- 2 Hamburger, J., *Journées Thérapeutiques de Paris*, 1951, p. 164.
- 3 Goldblatt, H., *Circulation*, 1958, 17, 645.
- 4 Byrom, F. B., *Lancet*, 1954, 2, 201.

Lichen Planus of the Mouth

SIR,—We were interested in Dr. W. W. Gunther's letter (*Journal*, August 2, p. 327) following our paper on "Lichen Planus of the Mouth" (*Journal*, April 26, p. 983), drawing attention to psoriasis involving the buccal mucous membrane. One of the cases we reported also had cutaneous psoriasis and Dr. Gunther wondered whether the mouth lesions in this case were psoriasis. In point of fact this patient did at one time have numerous cutaneous papules of lichen planus in addition to her long-standing typical psoriasis, and the buccal mucous membrane showed the white dots and streaks so typical of lichen planus.

Since our report another of the patients has developed an epithelioma. This case had previously had cutaneous lichen planus, but for 10 years the condition had been confined to the mouth. The epithelioma occurred on the side of the tongue at a site where there was a persistent patch of lichen planus. We have also recently seen another case, not included in the reported series, presenting with an epithelioma on the inner aspect of the cheek, in whom typical lichen planus streaks and spots were present, up to the edge of the neoplasm and also on the opposite cheek and on the lower lip. Neither case had been taking arsenic. We have therefore seen an epithelioma develop in association with lichen planus of the mouth in four patients.—We are, etc.,

R. P. WARIN.

H. S. M. CRABB.

A. I. DARLING.

Bristol.

Road Safety

SIR,—Your correspondent Mr. J. K. Stuart Bell (*Journal*, August 23, p. 512) called attention to the many years' delay in legislation regarding tuberculosis. This is now being stamped out.

I would like to point out another flagrant instance of apathy—that regarding road accidents. These are still increasing and are now the main hazard to life in young men. For instance, in the age group 15–25 there are about 10 times as many deaths from road accidents as from all forms of tuberculosis. And yet one of the main causes of these deaths—drinking in drivers and pedestrians—has been known for years and can be dealt with by legislation. From a local survey of fatal road accidents, already reported in your columns,¹ and since reinforced by similar reviews by the Road Research Laboratory,² half the deaths on the road from late accidents, and 10% of all road deaths, are associated with drinking. A speed limit was legalized years ago, and we now need an alcohol limit—a sort of Plimsoll safety-line of alcohol in the system. This will be increasingly necessary as newer and faster roads are built, if we are to avoid the alarming death rates abroad (double ours) in countries where such roads are in being.—I am, etc.,

N. I. SPRIGGS.

Leicester.

REFERENCES

- 1 Spriggs, N. I., *Brit. med. J.*, 1957, 1, 1008.
- 2 *Road Research*, 1957, 1958, p. 38. H.M.S.O., London.

SIR,—The fitting of splash flaps to all road vehicles is a safety measure which has become urgent owing to the higher speed of modern traffic. Stones thrown up by the rear wheels of fast-moving traffic can shatter windcreens and lamps, and damage the paintwork of following vehicles, which are also plastered with mud. Windcreens shattered in this way may be the reason for some unexplained fatal road accidents.

The flaps, fitted behind the front wheels, protect the undersurface of the car from much mud, and those fitted behind the rear wheels provide greater safety, and a cleaner trip, for the cars following behind. Such flaps are compulsory in Sweden for all vehicles, and in Norway for vans and lorries, I understand. The flaps are made in attractive designs carrying the car emblem or name, and some incorporate reflectors on the rear wheel flaps. Should we not follow Sweden's example and have them as a compulsory fitting for road vehicles?—I am, etc.,

Denham, Bucks

J. MYLES BICKERTON.

Contraception by Inhibition of Ovulation

SIR,—May I reply to some of the points in the letters by Dr. L. M. Franklin (*Journal*, September 20, p. 743) and Dr. G. R. Venning (*Journal*, September 27, p. 796)? I do not wish to do any more than to draw attention to the possibility that substances such as "enavid" may cause foetal abnormalities. It is common experience that substances and methods which have been in use for many years and which have initially been reported on favourably may eventually be condemned as dangerous. Deep x-ra-

therapy had become well established before Murphy¹ drew attention to the danger to the foetus in pregnant women. It is only very recently that the possible hazards of much smaller doses of irradiation have been appreciated. When studies of new drugs are carried out, there is a tendency to concentrate on the effect on the adult recipient, whilst the possibility of foetal damage may receive little attention. Indeed, resources and opportunities are seldom available to enable lesser abnormalities of the central nervous system such as might result from a disturbance of hormonal balance during pregnancy to be detected. This is particularly so in "underdeveloped countries."

Dr. Venning's contention that the taking of tablets would be discontinued with the onset of pregnancy is hardly valid. The women in the trial were taking 20 tablets during each menstrual cycle, beginning on the 5th day. If a woman were to become pregnant, she would not know this until the end of the cycle at the earliest, in practice often later. There is therefore a considerable risk that the contraceptive tablets would be taken during the critical organo-genetic period of foetal development. Dr. Venning also argues that "natural" substances such as progesterone are less likely to be harmful than "poisons" such as aminopterin. Such a distinction appears a trifle old-fashioned, since it is now known that substances such as aminopterin exert their effect by causing an imbalance of the normal metabolites. Moreover, Millen and Woollam² have shown "natural" substances such as vitamin A and cortisone can be markedly teratogenic in excess, whilst Duraiswami³ has shown a similar action in the case of insulin.

Dr. Franklin is, of course, correct in stating that there is a need to be able to control the size of the family in underdeveloped countries, as also in the more developed countries. There are, however, many neo-Malthusians who over-emphasize this aspect of the difficulties of backward countries and neglect the importance of economic factors.—I am, etc.,

London, S.W.17.

BRIAN H. KIRMAN.

REFERENCES

- ¹ Murphy, D. P., *Amer. J. Obstet. Gynec.*, 1929, 18, 179.
- ² Millen, J. W., and Woollam, D. H. M., *Brit. med. J.*, 1957, 2, 196.
- ³ Duraiswami, P. K., *J. Bone Jt Surg.*, 1952, 34B, 646.

Why Are Medical Journals So Dull?

SIR.—I have thought a good deal about Dr. Richard Asher's brilliant article on the subject of medical journals (*Journal*, August 23, p. 502) and have now come to the conclusion that the proportion of its substance capable of undergoing full-scale scientific analysis without refutation is unlikely to be high enough to be of statistical significance; he would probably prefer me to say that a good deal of it is piffle.

A letter cannot, of course, be expected to cover the whole train of reasoning which has led me to this regrettable conclusion, but you may have room for one or two points. First, all journals such as yours must contain a proportion of scientific matter: this, to be of any value to scientists, must be expressed with the greatest possible precision. Hence the necessity for the scientist to write "sucrose" rather than "sugar" when he means sucrose, and "gustation" rather than the obvious alternative suggested by Dr. Asher, "taste," which has, in my dictionary, ten meanings as a noun alone. Again, Dr. Asher has brilliantly exhibited the art of making a statement which has no meaning in such a way that it sounds witty, wise, and incontrovertible. I refer of course to the remark that "ten men cannot write an article any more than ten men can drive a motor-car." It is surely at least equally true to say that one man can no more write an article than he can play a string quartet.

I do agree, however, with the general idea that too many comparatively useless articles are written, especially in specialist journals, and venture to suggest a very simple solution to this problem. If publications are to be considered when medical appointments especially as consultants are made, or when merit awards are allotted, it should

be the duty of the assessors to read the publications and to be prepared to bar a man as readily for inflicting dozens of turgid and unreadable papers on his professional colleagues as (and this seems to be the usual policy at present) for being modest enough to publish nothing except accounts of isolated peculiar or interesting incidents, until his experience really justifies it. This would immediately kill the idea that publication is a tedious hurdle that every doctor must surmount, like dissecting a dogfish.

In the matter of presentation, Dr. Asher is a past master of clinical description, and one of the few medical men writing to-day who can provide his readers with the maximum interest and entertainment which can be extracted from his subject; but a really fancy presentation, such as he used so successfully in his "A Woman with the Stiff Man Syndrome" (*Journal*, February 1, p. 265), is necessary only when the substance of the article is of no importance, just as a really fancy label is most useful to a wine merchant in helping him to sell poor stuff.

Briefly, Sir, my feeling in this matter is that certain types of scientific articles are, by their very nature, bound to be dull to anyone not specially versed in the branches of science under discussion; but they are, some of them, very good, and their authors considerably summarize them at the end, and you quite rightly give them pride of place in the *Journal*, reserving space later on for comment of all kinds, and for "General Articles and News," to which Dr. Asher has made such a characteristically outstanding contribution. Piffle it may be, but it was beautifully written.—I am, etc.,

Colchester.

J. N. FELL.

SIR.—I read Dr. Richard Asher's article "Why Are Medical Journals So Dull?" (*Journal*, August 23, p. 502) with great interest. In it he quite rightly places the blame for the low standard of articles fairly and squarely on the shoulders of the contributors, but I would suggest that at least part of the fault lies with the journals themselves. Dr. Asher correctly states that articles of a standard which would be rejected by the lay press are often tolerated. The real remedy lies in the hands of the editorial staff, who must bear the ultimate responsibility for the appearance and content of any journal. The situation would be greatly improved if they raised their standards, even at the risk of cutting a swathe through the copious crop of journals medical science sponsors. Indeed, in these days when there is scant leisure for reading, both a diminished frequency of publication and a decrease in the number of periodicals would surely be appreciated.

These remarks are not meant to imply that journals should publish only articles with exceptional literary merit, but that those which do appear should be informative and well written. To-day few articles are considered complete without statistics. As these are not always informative, let alone true to the facts which they are supposed to represent, they could in many cases be disposed of with beneficial results. As Mark Twain wrote: "There are three kinds of lies: lies, damned lies, and statistics." Finally, there is more scope for articles which stimulate ideas on the practical problems which occur in everyday medicine, and they are after all what most readers have to face.—I am, etc.,

Oxted, Surrey.

PAUL K. BUXTON.

Medical Education

SIR.—Your account of the conference of the Association for the Study of Medical Education (*Journal*, October 4, p. 851) prompts two comments. Professor G. A. G. Mitchell's remarks about failure rates might well be combined with Dr. J. R. Ellis's upon the Swedish approach: if we examine students after a period suitable to the more able, we shall have a high failure rate; if we allow a period of instruction appropriate to the less able, the brighter students will be encouraged in indolence.

Of multiple-choice questionnaires, the virtues are obvious and the vices too little regarded. As Sir George Pickering

so pertinently remarked, the form of examinations may determine the students' attitude to their studies. The short answer suggests a premium on factual knowledge, even where in fact the question is designed to test mental abilities. Further, the objectivity of marking suggests a spurious accuracy in assessment which no one claims for the essay question—spurious because it is very hard to be sure that in fact the skills needed to answer such questions are accurately related to the qualities sought in an industrious medical student. We have in this department a growing body of parallel tests upon students by essay question and multiple-choice questionnaire, which we hope in time to analyse; quite notable discrepancies arise at times, which, in combination with our knowledge of our students, suggest that our questionnaires, at any rate, are no panacea to the problems of examination.—I am, etc.,

Department of Physiology,
Manchester University.

J. N. MILLS.

SIR.—It is probably unfair to judge the value of the first conference of the Association for the Study of Medical Education on the necessarily short report in the *Journal* (October 4, p. 851). Even so, there seems reason to infer that the participants were all living in a Cloud-cuckoo-land. Thus, Sir George Pickering is reported as intimating that "medical faculties were interested not in training the student's mind but rather in his familiarity with the subject and its practical handling." And further on, "While it was nonsense to suppose that the subject-matter of an arts course was inherently more suitable for sharpening the wits than that of a science course, it was true that science faculties, including medicine, were smothering their students with technological detail." Reflection shows that, the more diagnostically and therapeutically efficient medicine becomes, the less it remains a "learned" profession. This is academically sad, but—let it not be forgotten—the State pays the piper of medical education and the State wants competent doctors, not reflective minds capable of "collecting facts, verifying them, arranging them, drawing conclusions, and testing... conclusions." Let us be honest with ourselves and ask how many persons on the *Medical Register* would be of greater value to themselves or to the community if they did possess these methodological powers. Indeed, Dr. J. N. Morris's surgeon, called on to deal with a crushed foot, was no better at the job because he was "surprised to find that in many factories there was a kind of collusion between management and labour to ignore safety measures." Sir Russell Brain's antithesis of "safe doctors" and "good doctors" is too vague to be significant: a good doctor must be a safe doctor because the doctor's job is an essentially practical one.

Dr. J. Z. Bowers, dean of the Medical School of Wisconsin, seems to have played an outstanding part in the only reform possible in these busy days: "the preparation of students for medical school had been broadened, the attitude being that science requirements should be held to a minimum... and that students should be encouraged to diversify their educational process." Here would appear to be a possibility of enabling the doctor to be an educated member of the community, not *qua* medical practitioner, but as a rounded human being.—I am, etc.,

London, W.1.

A. PINEY.

SIR.—By omitting half of one of the statements I made at the recent conference of the Association for the Study of Medical Education (*Journal*, October 4, p. 853) and removing my remarks from their context your report gives a wrong impression. My point was simply that if students are to be taught in the best clinical tradition, by example and experience, about certain aspects of social medicine this will need to be done in people's homes and in the community as well as in the teaching hospital. Such aspects have to do with the education of individuals and families—on smoking, for example, with the earlier detection of disease, the familial

repercussions of chronic disease, the continuing care of the chronic sick and the functions of multiple social services, the prevention of admission to hospital, etc. These things are important; and for them to be dealt with on a reality basis will mean extending our teaching outside the hospital. The principle of this is accepted by most medical schools and notably by the Universities of Edinburgh and Manchester.—I am, etc.,

London, E.1.

J. N. MORRIS.

Posture and Blood Pressure in Pregnancy

SIR.—I was very interested to read the letter from Drs. P. R. Boucher and Margaret J. Turpin (*Journal*, September 13, p. 693). During the last month I have been treating two pregnant women who had some increase in blood pressure warranting bed rest. Both had only a moderate fall in blood pressure during this time, and it was only after much deliberation that I allowed them up. In both, the following day, there was a considerable fall to normal levels when the blood pressure was recorded in the sitting position. Both these patients, however, had had rauwolfia, and I assumed that the postural factor had been potentiated by this treatment. I wonder if, in view of the possible toxæmia, the reported case had had hypotensive therapy.

Certainly the effect cannot be explained by pressure of the gravid uterus on the great vessels in the lying position, since although the effect is immediate it is maintained, and pressure on both vessels would be more effective in obstructing the flow in the vena cava and give rise to oedema of the legs instead of the relief obtained. Is it possible that the effect could be explained in terms of vasomotor instability causing postural hypotension in individuals with a tendency to this even before they have to cope with the increased circulating volume of pregnancy?

Like Drs. Boucher and Turpin, I am somewhat at a loss to know which figure to regard as the significant one.—I am, etc.,

Harrow-on-the-Hill,
Middlesex.

K. D. PHILLIPS.

Phenylketonuria

SIR.—I think your annotation on the treatment of phenylketonuria (*Journal*, September 20, p. 736) is a trifle pessimistic. There is still a lot to be learnt about the correct management of patients with this disease. It already seems likely that even with an early start some patients do not improve very much on intelligence and others at the same age do. This is not unlike the situation in cretinism, for, even if thyroid extract given in satisfactory dosage is started early, excellent physical results may be achieved without necessarily raising the mental age high enough for ordinary schooling. (Yet one of the late Dr. F. A. Cockayne's cretins won a scholarship in her "teens"!)

Unless a trial is made with a phenylalanine-low diet, it is at present difficult to tell what the response will be. At any rate in young subjects this seems the proper course, although, recently starting treatment late in a girl of nearly 7 years, we think we have pushed her up into the educationally subnormal level. You state: "It seems unfortunately to be the case that by the time phenylpyruvic amentia is established a low-phenylalanine diet is likely to raise a child's mental rating only from idiot to imbecile level, hardly a very gratifying achievement." A child seen since our last paper was completed refutes this. A boy aged 9 months had been attending the Hospital for Sick Children for eczema, and was referred to me for backwardness. My colleague, Mr. Stephen Coates, using the Griffiths scale, made his G.Q. intelligence level only 30 with a wide scatter (that is, almost an idiot). The child was in hospital for six weeks coming under control, and since then has been at home continuously. Six months after discharge his G.Q. was 55 and now at the age of nearly 2½ years it has reached 64, with some indication of levelling out at this point. He will be able to go to an E.S.N. school.

Even if the intelligence level is not satisfactorily raised, the affected children on a phenylalanine-low diet become less restless, more manageable, eczema (if present) improves, and fits (if present) may cease. Thus, when we have proposed stopping the diet to some patients they have begged to be allowed to continue. I feel that if such discouragement as your annotation expresses had been applied to the treatment of cretinism when thyroid extract was first introduced the effect might have been to deny certain cretins a relatively normal life. Ought we not to go on trying a little longer with the phenylketonurics? There is even a faint indication from American sources that tolerance to phenylalanine is acquired and that in some instances perhaps the diet may be discarded when the child reaches the "teenage."—I am, etc.,

London, W.C.1.

ALAN MONCRIEFF.

REFERENCE

¹ Woolf, L. I., Griffiths, R., Moncrieff, A., Coates, S., and Dillstone, F., *Arch. Dis. Childh.*, 1958, 33, 31.

Depressive States

SIR,—Dr. Robert Thompson (*Journal*, August 23, p. 510) asks "what can one give" to depressive cases if E.C.T. is withheld? The answer is the amphetamine group, the dose being dependent upon the patient and the preparation. Amphetamine sulphate is about one half as effective as desoxyephedrine or methylamphetamine.^{1,2}

In a comparison of the two treatments in recurring attacks of depression in the same patients, I found³ that, in 20 cases who were treated in 58 attacks, improvement occurred in different attacks with either E.C.T. or methylamphetamine in 14 cases; with E.C.T. but not with methylamphetamine in one case and with the reverse in three cases. Two cases showed no benefit from either treatment. One case treated in each of nine attacks showed improvement with E.C.T. in five attacks and with methylamphetamine in four.⁴ Subsequently he kept the preparation with him, warding off the attacks as they came. Comparison of mild cases treated by myself with E.C.T., 30 cases, or methylamphetamine, 42 cases, gave similar improvement rates of about 80% with each treatment,⁵ the oral methylamphetamine being used in doses of from 1.25 to 60 mg. daily, the larger quantities being divided into three doses before 1 p.m.⁶ Monro and Conitzer⁷ treating depressives in a mental hospital and not exceeding one half of my maximum dosage of methylamphetamine, found 34.5% improvement in 34 cases, but 78.1% in 200 cases with E.C.T. No marked improvements, and double the rate of slight improvements as with E.C.T., were obtained with this low dosage of methylamphetamine and with mental hospital patients.

A summary of the literature showed that of 1,616 cases, of all types of depression, marked improvement occurred in 63.9% with E.C.T. and in 33% with methylamphetamine.⁴ No improvement was seen in 8.7% treated with E.C.T. and in 23.4% with methylamphetamine. Somewhat similar results were found in involutional, manic, and anxiety depression, but reactive depression gave 53.3% marked improvement with methylamphetamine, and only 34.7% with E.C.T.

Although Dr. Gerald Garmany (*Journal*, August 9, p. 341) and Dr. Robert Thompson feel that no types but only degrees of depression exist, I have treated, with improvement, a patient whose constant level of depression was improved with ethisterone, but whose sudden attacks of more severe type were abolished by amphetamine. This one patient shows two types of depression relieved by different methods. In view of the distressing amnesia and other risks associated with E.C.T., I would like to suggest strongly again that, except in severe or suicidal cases, amphetamine should be tried initially, as marked improvement may be obtained with this treatment without resorting to the more inconvenient and serious electric convulsive therapy.—I am, etc.,

Clevedon, Somerset.

G. DE M. RUDOLF.

REFERENCES

- ¹ Golla, F. L., Blackburn, J. M., and Graham, S., *J. ment. Sci.*, 1940, 86, 48.
- ² Cuthbertson, D. P., and Knox, J. A. C., *J. Physiol. (Lond.)*, 1947, 106, 42.
- ³ Rudolf, G. de M., *Practitioner*, 1955, 174, 180.
- ⁴ *J. ment. Sci.*, 1956, 102, 358.
- ⁵ *Lancet*, 1955, 1, 1178.
- ⁶ *J. ment. Sci.*, 1949, 95, 920.
- ⁷ Monro, A. B., and Conitzer, H., *ibid.*, 1950, 96, 1037.

Iatrogenic Disease in Childhood

SIR,—I was pleased to read the report of Dr. A. White Franklin's address "Iatrogenic Disease in Childhood" (*Journal*, August 30, p. 559) because it draws attention to some undesirable features of our present medical practice. The child who undergoes a tonsillectomy or circumcision which might well have been omitted, or the child subjected to repeated painful procedures for some mild self-limiting disease, does not quickly forget. But the worst procedure of all was never mentioned—that is, the injection of radioactive materials into the body. What gives us the impression that "there's no real harm in it" when at the same time luminous watches and the shoe-fitting fluoroscopes are under suspicion as potential dangers? Is it not believed that there is no threshold for some of the harmful effects of ionizing radiations?—I am, etc.,

Aylesbury, Bucks.

J. VACCARO.

Psychiatric Illness Among Asian Students

SIR,—Like Dr. M. N. Pai (*Journal*, September 13, p. 689), we have seen a number of Asian students with mental illness in the department of psychiatry of Manchester University. I am surprised he does not mention obsessional neurosis. The illness often takes the form of paralysing doubt which stifles any form of original thinking and brings the patient's work to a standstill. It occurs in men of basically insecure character—anankastic in Schneider's classification¹—and its development is favoured by the cultural, social, and sexual problems posed by Western society. The change from their own community, with its rules of endogamy and fixed social-religious order, to an open society with freer relationships between the sexes seems to be responsible. Many have distinct feelings of inferiority and hostility towards English people. A satisfactory doctor-patient relationship in psychotherapy is thereby prejudiced, and a notoriously intractable illness is rendered even more difficult to treat.—I am, etc.,

Manchester, 13.

LINTON GRIMSHAW.

REFERENCE

¹ Schneider, K., *Psychopathic Personalities*, 1958, translated by M. W. Hamilton, London.

Buzzers for Bed-wetters

SIR,—I wish to support the plea of Dr. D. Saklatvala (*Journal*, September 13, p. 690) for more humane means of treating bed-wetting. Since the great proportion of cases are psychoneurotic in origin, more investigation into the treatment of the underlying mental condition should be made. Waking the child up with buzzers will further exacerbate any emotional difficulties, since the child will be less able to cope with them through lack of sleep, and may lay the foundations for further hysterical or other phenomena.

Dr. Saklatvala's letter also gives a clue to the aberration responsible; the child has an aversion to water. This will give him a feeling of being short of something vitally necessary for life; his body will store up water during the day; and, when his subconscious control is relaxed in sleep, water will flood out of the tissues and be excreted into the bladder. The fears of the daytime will lead to an undue relaxation at night owing to exhaustion, and bed-wetting will result. This is exacerbated and perpetuated by starving the child of fluids at night.

I have never been disappointed in the general improvement in health and cure of this trouble after telling the parents to load the child with pints of fluid at all times during the day. It is difficult to persuade the parents to co-operate, but it can be done.—I am, etc.,

Reading.

G. H. GILFORD.

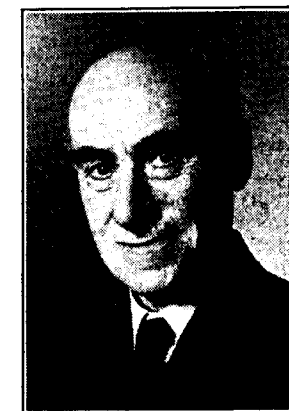
SIR,—I hasten to reassure Dr. P. Saklatvala (*Journal*, September 13, p. 690) that he is mistaken in assuming that "subtle unkindness" is implied in the management of nocturnal enuresis by a buzzer technique. Rather, orthodox

Obituary

D. N. NABARRO, M.D., F.R.C.P.

Dr. David Nabarro, consulting pathologist, to the Hospital for Sick Children, Great Ormond Street, London, died at his home in London on October 3. He was 84 years of age.

David Nunes Nabarro was born in London on February 27, 1874, and was educated at Owen's School in the City. He entered University College, London, with an Andrews scholarship, and from there went on to University College Hospital to receive his clinical training. He qualified M.R.C.S., L.R.C.P. in 1897, having previously taken the London B.Sc. in 1893 at the age of 19. He then obtained the London M.B. in 1898, having gained the Fuller exhibition in pathological anatomy and pathology, and proceeded to the M.D. in the following year, winning a gold medal for his thesis and the Clothworkers' Company's exhibition. Elected a Member of the Royal College of Physicians of London in 1901, the year in which he took the D.P.H. of the English Royal Colleges, he became a Fellow of the College in 1917. After holding the appointments of demonstrator of physiology and histology at University College and house-physician at University College Hospital, a period as a ship surgeon followed. He then returned to London and was assistant professor of pathology and lecturer in bacteriology at University College from 1899 to 1910. In 1900 he was elected a Fellow of the College, and at the time of his death was senior Fellow jointly with Professor M. W. Travers. In 1901–2 he was pathologist to the Evelina Hospital for Sick Children. Appointed a member of the Royal Society's commission on sleeping sickness in Uganda in 1903, he was the joint author, with Sir David Bruce, of the first, fourth, and fifth reports. With Sir David Bruce and Dr. Aldo Castellani he discovered the cause and mode of transmission of the disease. In 1907 he translated and edited Laveran and Mesnil's book, *Trypanosomes and Trypanosomiasis*. He was awarded scientific grants by the British Medical Association in 1905 and 1906 to help him conduct an "investigation of butter and butter substitutes for the presence or absence of the *B. tuberculosis*."



After a brief period as pathologist to the West Riding Asylum, Wakefield, Dr. Nabarro returned to London in 1912 and was appointed clinical pathologist to the Hospital for Sick Children, subsequently becoming director of the pathological department and medical officer in charge of the venereal diseases department. He retired in 1939. During his many years at the hospital he conducted an investigation of Sonne dysentery, following his work at Wakefield; he initiated the first children's venereal diseases clinic in 1917; and he started the biochemistry department in 1923. Other work at the hospital included the preparation of measles serum and its utilization, and the treatment of infantile general paralysis of the insane. For some 20 years from 1904 he was scientific assistant in pathology in the University of London.

He wrote many articles for the medical and scientific journals. Before he qualified in medicine he contributed an article to this *Journal*, jointly with Dr. (later, Sir) Leonard Hill, on the exchange of blood gases in brain and muscle in

management based upon fluid restriction, the exhibition of drugs which have side-effects, and arbitrary lifting at times when there is no conscious or unconscious desire to micturate seems not only "unkind" but calculated to perpetuate the disability by conditioning.

It is apparently not generally realized that the buzzer method of management does not train the child to awaken in response to impulses centrally received from the bladder but the diametric opposite—namely, to sleep continent and undisturbed throughout the night. Further, no fluid restrictions are placed upon the child either during or after treatment. Mowrer and Mowrer,¹ in reviewing a large series of enuretics treated by a "buzzer-like" method, stated that "personality changes when they occurred have universally been in a favourable direction." I am not aware of any published refutations of this observation. Finally, I wonder whether Dr. Saklatvala still persists with his plea for "more patience and less drama" when dealing with enuretics in the age group of 14–21 years.—I am, etc.,

J. L. SKINNER.

Ilkeston.

REFERENCE

¹ Mowrer, G. H., and Mowrer, W. M., *Amer. J. Orthopsychiat.*, 1938, 8, 436.

Miners' Nystagmus

SIR,—I was interested in your leading article (*Journal*, September 20, p. 732) because in America, where lighting in mines is good and the central helmet lamp is universally used, the general opinion in 1948 was that no problem existed. As you say of this country, "miners' nystagmus has certainly decreased since the introduction of better illumination in mines."

Regarding a few other points: (1) That sufferers from the disease are less emotionally stable than those without, is surely to be expected. Bad lighting increases anxiety and stress, and the unstable show the symptoms first. (2) In the years 1930–3 the importance of working was paramount: none could afford sickness. They were driven by want. The number affected therefore decreased. (3) In the last world war men became exhausted, safety precautions were sometimes neglected and overlooked, and danger suspected in the dark is worse than danger seen. Money was abundant and work not imperative. The numbers therefore increased. (4) Every man has his breaking point and even a little stress endured for a lifetime may ultimately produce symptoms. It is worth considering that where a defect is socially acceptable and widely known there is apt to be hysterical contagion.—I am, etc.,

M. E. M. HERFORD.

Farnham Royal.

Mind the Zip

SIR,—A boy of 8 was brought to the casualty department with his foreskin caught in the zip fastener of his trousers. An attempt to release the foreskin by moving the slide of the zip only resulted in jamming the zip more tightly into the zip. Efforts to dismantle the zip were unsuccessful until it was found that, by cutting it across with scissors just below the place where it emerged from the slide, the slide could be removed quite easily, releasing the imprisoned foreskin.—I am, etc.,

D. L. HADLEY.

Portsmouth.

POINTS FROM LETTERS

Thoracic Outlet

Dr. M. B. LEITCH (Carlisle, Lanarkshire) writes: The term "Thoracic Outlet Compression Syndrome" used in the article by Professor C. G. Roh and Mr. A. Standeven (*Journal*, September 20, p. 709) is surely a misnomer. Is not the "outlet" of the thorax generally considered to be at the lower end: the upper end is the inlet. This may seem a trivial point, but it is one which leads to confusion when a patient is sent for x-ray examination of the thoracic "outlet."

states of rest and activity. At the age of 80 he produced a book entitled *Congenital Syphilis*, which ranks as a classic. He was a founder-member and a past-president of the Medical Society for the Study of Venereal Diseases; a past-president of the Association of Clinical Pathologists and the London Jewish Hospital Medical Society; an honorary member of the British Paediatric Association; and a corresponding member of the Société de Pathologie Exotique of Paris. He was also the senior member of the Pathological Society of Great Britain and Ireland. A member of the British Medical Association for nearly 60 years, he served as a vice-president of the Section of Pathology and Bacteriology when the Association held its Annual Meeting at Manchester in 1929. His hobbies were gardening and philately, in which he was an acknowledged expert on the stamps of the Falkland Dependencies. He married Miss Florence Nora Webster in 1914 and had one son and one daughter.

We are indebted to Mr. T. TWISTINGTON HIGGINS for the following appreciation: The death of David Nabarro removes from Great Ormond Street a familiar and universally beloved figure, and from British paediatrics a pioneer whose name will long be held in honoured memory. To his many friends his passing, even at a ripe old age, brings a deep sense of personal loss, for he was a most lovable character whose sprightly companionship endured. For me his friendship has been a treasured privilege for wellnigh half a century. Nabarro came to the Hospital for Sick Children in 1912 to concentrate on child pathology, which then included the growing science of bacteriology and was soon to incorporate biochemistry. His credentials were brilliant, his experience extensive, varied, and picturesque. The highest professional appointments were clearly within his scope, yet the potentialities of paediatric pathology lured him and at Great Ormond Street he found his *métier*. In accommodation which was far from palatial and on a salary which was certainly not princely, he built up a department unrivalled in its day and a reputation which will not fade.

Nabarro was extremely accurate in all his work; any report franked "D.N." was utterly reliable. Tireless in his devotion, the little white-coated figure, bristling with the armamentarium of his specialty and bustling around usually at the double, became a familiar feature of the wards; and the well-ordered "lab" in the bowels of the ancient building was the Mecca to which all problems could be taken with the certainty of a warm welcome and wise informed guidance. Colleagues trusted him implicitly, children loved him instinctively. In his gentle and wonderfully skilful hands even the dreaded needle lost its terrors. How much is owed in this respect alone to the standards of technique set by Nabarro! An early ploy was the institution of the clinic for syphilitic children which he ran himself. He did his own serology, and the weekly "Wassermann night" was an event which tended to disrupt the residents' evening meal—especially if things went wrong. The increasing lateness of the hour of his departure for home was a measure of the rapid expansion of the clinic's clientele. Congenital syphilis became for Nabarro an absorbing interest by no means confined to its clinical and serological fascination, but also in its sociological and humanitarian bearing. Many a mother tasted the milk of his human kindness. His book, based on a wealth of experience, now happily unrepeatable, will remain a gold-mine of reference.

But David Nabarro was no one-track man. His interests were many, his mind cultured. Widely travelled, an accomplished linguist and littérateur, and a lover of classical music, he was a delightful companion on a country walk or as host at his own table. No one could be a more stimulating and loyal friend. His home life was entirely happy, and he and his wife were rewarded deservedly in the achievements of their children. All who knew him best will share the sincerest sympathy for them at this time. Few men carry with them to the Great Beyond a richer harvest of the things that matter than David Nunes Nabarro.

B. E. S. writes: David Nabarro's death severs one of the last links with the great masters of Great Ormond Street in the early part of this century. During the years he worked at the hospital he saw many generations of young doctors pass through their training and a number graduate to the staff and become his colleagues. He was beloved by all, because his warm character, enthusiasm, and understanding eventually attracted everyone, even those who at first thought him rather an odd little figure as he scurried down the underground passages of the old hospital, for all the world like the White Rabbit in *Alice in Wonderland*. But Nab was always ready to help and advise young housemen and other members of the staff with wisdom, based on long experience, yet great enough to have visions of the future. The hospital will always be grateful to his energy and perspicacity, which gave birth to the pathological department under his guidance as its first director. Apart from routine work he had many interests. Research into the spread and prevention of dysentery, the supply of pure milk, and many other activities occupied his time, but he became best known to the outside world through his studies of congenital syphilis. This culminated in his *magnum opus*, which, like that of Verdi, appeared towards the end of his life. For years he had run a clinic dealing with this disease and was in charge of a ward tucked away so far from the rest of the hospital that the loneliness of the night nurses presented quite a problem. As a young man he was a member of the commission which went to Uganda to study trypanosomiasis, and it is probably true that he never received the recognition due to him for the discoveries made at that time. But he was modest, retiring, and not one to fight for his own rights, although always ready to champion those of others. He was a good example of a little man with a great heart. His old hospital and the pathological world will undoubtedly miss that familiar figure, and his many friends will always have their pleasant memories and smilingly venerate his name.

MARIE C. STOPES, D.Sc., Ph.D.

Marie Carmichael Stopes, D.Sc., Ph.D., noted for her pioneer work as an advocate of contraceptive practices in married life, died on October 2, aged 78. Marie Stopes's early books, published immediately after the first world war, discussed contraceptive techniques and the physical aspects of marriage with a candour unknown in those days, and her views and manner of expressing them were the cause of strong protest. Her books achieved an enormous circulation among ordinary people, to whose needs they appealed and for whom they were largely written. She started birth-control clinics in London, Leeds, and Aberdeen, and others inspired by her work also founded clinics. These eventually became united under the Family Planning Association.

Marie Stopes was by training a botanist. She gained the gold medal in junior and senior botany at University College, London, and took her B.Sc. and later her D.Sc. She graduated Ph.D. at Munich. In 1904 she became the first woman to be appointed to the scientific staff of Manchester University. In 1907 she went to Japan and during a year and a half at Tokyo University explored the country for fossils. She returned to Manchester as a lecturer in fossil botany. She was a fellow and sometime lecturer in palaeobotany at University College, London.

We are indebted to Mr. ALECK BOURNE for the following appreciation:

Dr. Marie Stopes had lived for more than 30 years before she devoted her energies to the propagation of knowledge of the control of conception. Though she was not a member of the medical profession she has contributed indirectly to the medical problems of pregnancy and labour complicated by certain associated diseases. At the University of London she graduated as a Doctor of Science with first-

class honours and a gold medal. Her chief interests during her earlier years were the study of the fossils of plants, which gained her election to the Geological and Linnean Societies and a reputation far beyond this country. Dr. Stopes worked first in London, then in Munich, where she took the Ph.D., and in Berlin, Japan, and Manchester, where she was appointed to a lectureship in palaeobotany, on which, by her scientific papers, she became a recognized authority. The unfortunate experience of her first marriage, annulled on account of its physical failure, turned her attention to the problems of marriage and thus to the prevention of contraception by the use of an obturator by the woman. Though other contraceptive methods had been practised for many years, her missionary zeal in publicizing her technique excited the massive opposition of orthodoxy, partly on religious grounds and perhaps more by her defiance of popular disapproval of public discussion of intimate sexual details. But Marie Stopes became a passionate pioneer and therefore a rebel against the established prejudices of the time.

Unlike the reformer in the fable by R. L. S. who "preached under the tree at noonday and was buried at dusk," she escaped the usual fate of a pioneer and pursued her mission with the courage that flourishes on antagonism. In 1918 she published her first book, *Married Love*, which dealt more with the difficulties of some marriages than with contraception, and later in the same year a forthright appeal for "birth control" in *Wise Parenthood*. She exposed the strain caused by the unwanted child, a yet further addition to a family already worried by economic difficulties, which could be avoided by the voluntary spacing of the children, whereby each birth would be welcomed. *Married Love* commanded an instant and enormous success because it was an entirely new presentation of some of the problems of difficult marriages and written in simple unscientific language which ordinary people could understand. In 1921 Dr. Stopes and her second husband devoted their own resources and the royalties accruing from her books to opening the "Mothers' Clinic for Constructive Birth-Control" in North London. This was the first clinic of its kind to be established in this country and probably the world. Other clinics rapidly followed, until now there is no large town without its consultative centre. Following her example other independent enthusiasts set up their own clinics which were united under the "Family Planning Association," but Dr. Stopes was a dominating personality who could not accept co-operation with other organizations in which she played no part. Nevertheless the association, inspired by her work, has developed into a national institution which now gives advice and practical help not only to women who desire to limit their families but also to those who are distressed by infertility. Slowly but with increasing conviction the whole world is coming to realize that, unless the growth of its population, now increasing at an alarming geometrical rate, can be controlled, it will, within measurable time, outstrip available food supplies, and by its national pressures, especially in Asia and Africa, ultimately lead to wars of expansion in relatively empty countries.

Dr. Stopes, far beyond her original mission, has led the way to a hoped-for solution of these world problems by focusing attention on the control of excessive births and, indirectly, stimulating research on the techniques of contraception. Though not strictly a disciple of Malthus, for she was concerned with the individual woman and family, her emphasis on the necessary control of conception may, and probably will, make it possible in future years to limit the population of the world to an optimum figure.

CHARLES M. FRIER, M.B., C.M.

Dr. Charles Frier, a Fellow of the British Medical Association, and well known at Headquarters as a representative at the Annual Representative Meeting over a very long period, died at his home at Grantham on September 24. He was 87 years of age.

Charles Matthew Frier was born on January 15, 1871, and was educated at Edinburgh University, where he graduated M.B., C.M. in 1892. After graduation he held the appointments of assistant house-surgeon at the Coventry and Warwickshire Hospital, house-surgeon at the Royal Surrey County Hospital, Guildford, and resident medical and surgical officer at Jaffray Hospital, a branch of the Birmingham General Hospital. A period as a ship surgeon followed before, in 1896, he settled in general practice at Grantham, where he remained for the rest of his life. For many years he was also surgeon to the Grantham and District Hospital. In the affairs of the British Medical Association Dr. Frier had an outstanding record. A member for fifty-nine years, he was first elected the representative of his Division at the Annual Representative Meeting in 1913, and from that year until 1953 was returned in a similar capacity on thirty-six occasions. He became the first president of the Lincolnshire Branch when it was formed in 1932, and previously he had been chairman and honorary secretary of the Kesteven Division. Earlier this year he was admitted to the newly established Roll of Fellows of the B.M.A. in recognition of his long service to the Association. He had also been a member of the Conference of Local Medical and Panel Committees for many years since its inauguration. He served on the Kesteven Executive Council for some time, and was honorary secretary of the Lincoln (Kesteven) Local Medical Committee until 1954. Dr. Frier was a popular member of the medical fraternity in Grantham and district, and in course of time came to be regarded as the friend of all and as one from whom guidance and help was to be had for the asking. He will be very much missed by his colleagues, his friends, and his former patients.

K. V. TRUBSHAW, M.B., F.R.C.S.Ed.

Mr. K. V. Trubshaw, for many years honorary surgeon to Chester Royal Infirmary, died on September 15, at Dolgellau, Merionethshire, where he had been living in retirement. He was 81 years of age.

Kenneth Vincent Trubshaw was born on December 22, 1876, the son of Dr. Alfred Trubshaw, and was educated at Epsom College. Receiving his clinical training at Guy's Hospital, he graduated M.B., B.S. from London University in 1901. He was elected F.R.C.S.Ed. in 1918. After graduation he held the appointments of house-physician to Sir Frederick Taylor and clinical assistant and house-surgeon to Sir Arbuthnot Lane at Guy's Hospital. Following a period as a ship surgeon, he joined his father in 1904 in general practice at Mold, Flintshire, where he remained until 1919. During the first world war he could not be released for military service, and conducted three men's practices single-handed. During this time he was in charge of Leeswood Hall military orthopaedic hospital, where he came into close contact with the late Sir Robert Jones and Dame Agnes Hunt. From 1919 to 1930 he was honorary surgeon on the staff of Chester Royal Infirmary. After leaving Chester he went to live at Dolgellau, and was appointed consultant surgeon to the local hospital, which received the benefit of his skilled service almost daily until 1939, when he was succeeded by Lieutenant-Colonel H. Bodley Scott, who outlived him by only five days.

R. W. E. and H. D. O. write: In the passing of Mr. K. V. Trubshaw the profession has lost a specialist who possessed an all-round knowledge of every branch of medicine—a rarity in this age of "watertight compartments." His experience in general practice served him well later as a surgeon. He was never in a hurry and his approach to a patient was always calm and modest, and so he gained the complete confidence of all concerned. His extreme care and consideration of every surgical problem gave him a clear concept of treatment and a high efficiency as an operator. He possessed a boundless energy. A keen athlete and sportsman, he had distinguished himself as a cricketer and Rugby player in his earlier years and continued to play tennis with vigour to the age of 65. When not engaged with

his professional work, he enjoyed occupying himself in his workshop and garden. A skilled mechanic, his handling of all sorts of tools and instruments was exceptionally dexterous. He was a very loyal colleague and maintained the highest traditions of the medical profession. He is survived by his wife and three daughters, who nursed him with loving and tender care during his last illness, and to them we extend our sympathy.

H. BODLEY SCOTT, O.B.E., F.R.C.S.Ed.

Lieutenant-Colonel H. Bodley Scott, formerly professor of surgery in the University of Rangoon, died at his home at Dolgellau, Merionethshire, on September 20. He was 75 years of age.

Herbert Bodley Scott was born on December 14, 1882. He received his medical training at St. Bartholomew's Hospital, and qualified M.R.C.S., L.R.C.P. in 1904. He was elected F.R.C.S.Ed. in 1923. After qualification he held the appointment of assistant house-surgeon at Salisbury Infirmary. In 1907 he entered the Indian Medical Service, in which he served for over 30 years, retiring with the rank of lieutenant-colonel in 1939. He was appointed O.B.E. in 1921 for services rendered during the operations in Waziristan. He is survived by his only daughter, to whom our sympathy is extended. Mrs. Bodley Scott died in 1956, and his only son was killed in 1940 while on active service in the second world war.

R. W. E. and H. D. O. write: Lieutenant-Colonel H. Bodley Scott from the start of his career took an active interest in surgery, and his success in this field led eventually to his appointment to the chair of surgery in Rangoon University, where he was held in high esteem both by his colleagues and by his students. He served throughout the first world war with an Indian cavalry regiment in Egypt and Mesopotamia. After his retirement from the I.M.S. he went to live at Dolgellau, and was appointed consultant surgeon on the staff of the local hospital, succeeding Mr. K. V. Trubshaw, who died only five days before he did. At the hospital he willingly gave his services and proved himself to be a first-class surgeon. Somewhat reserved and most discreet, he was courteous in his dealings with patients and staff. His military career had made him a man of action and few words, and to the end he led a busy life, keeping himself fully occupied in various pursuits around his country home.

W. H. LASLETT, M.C., M.B., Ch.B.

Dr. W. H. Laslett, who was in general practice at Farnworth, near Bolton, for over 40 years, died at his home there on September 6 after a long illness. He was 69 years of age.

William Henry Laslett was born on January 30, 1889, the son of Dr. T. G. Laslett, and was educated at Hutton School and at the Victoria University of Manchester, where he graduated M.B., Ch.B. in 1911. After graduation he held the appointment of house-surgeon at Rochdale Infirmary and St. Mary's Hospital, Manchester, before joining his father in general practice at Farnworth. After the outbreak of the first world war in 1914 he volunteered for service and was drafted to the South Staffordshire Regiment, and was mentioned in dispatches while in Gallipoli. Later, when a captain in the R.A.M.C. attached to the Royal West Surrey Regiment in France, he was awarded the Military Cross in 1918. At the end of the war he rejoined his father in practice. The extra work during the last severe influenza epidemic in all probability aggravated his illness. He was a very reserved man, hating publicity. He was a vice-president of the local amateur dramatic society and was also interested in chess, photography, and sport. Our sympathies go out to his widow and two daughters, and to his son, who is carrying on the practice.—J. F. S.

Sir BENNETT HANCE, K.C.M.G., K.C.I.E., O.B.E. M.D., F.R.C.S.Ed

H. H. E. writes: I would like to add a few words to the excellent obituary of Sir Bennett Hance which appeared in the *Journal* of September 20 (p. 745). Before the first world war, at Guy's Hospital, he was a popular, colourful personality, very much the leader in his "firm." We met again after the war on the North-West Frontier of India, where he was a civil surgeon and I was still on the military side. We collaborated in all the surgery there, and he was a stimulating person to work with, full of ideas and anxious to try new treatments. In addition to being civil surgeon he was superintendent of the local jail. At midnight in the middle of the hot weather he rang up and asked me to go with him to the jail, where rumour stated that irregular practices were being carried out. We found nothing, but the fact that the superintendent could visit the jail at that time of night certainly shook the staff and kept them on their toes. "J. B." (as he was called) told us once that when working in Vienna on one of his study leaves he had been psycho-analysed by Freud. I wonder if that experience had anything to do with his poise and zest? His innumerable kindnesses to young officers and others, both British and Indian, will never be known by other than the recipients—none of them could do anything to repay his kindness—but I am sure all retain happy memories of a delightful personality.

Medico-Legal

TRAUMA AND SARCOMA

On July 4 William Nunn, aged 49, a cowman, died in the Ipswich and East Suffolk Hospital from a metastasizing fibrosarcoma of his right femur. Four years previously he had been violently kicked by a cow just above his right knee, and at the inquest into his death, held by the Ipswich coroner, medical evidence was offered as to the relevance of this accident to the development of the sarcoma.

Kicked by a Cow

On a morning in October, 1954, Nunn was assisting the head cowman at Capel Hall Farm, Trimley St. Martin, where a herd of 65 cows was being tuberculin-tested in the milking parlour. Nunn walked up to the left side of one of the last animals to be tested, in order to remove a chain from a post near the cow's hind legs and attach it to another post. As he was fastening the chain the cow lashed out and gave him a very violent kick just above his right knee-cap so that he was knocked against the wall. He hobbled about until lunch-time, but left work then and did not return for some days. When he came back, the head cowman said Nunn showed him a "terrific bruise" just above his knee. Subsequently Nunn complained to him of pain in his knee after heavy work and in the second year sometimes of pain in the groin; occasionally his knee swelled up. Nunn's wife said they called in the doctor the day the accident occurred, but, despite treatment with a lotion, the knee remained always uncomfortable. Because of this and a recent increasing swelling around the knee he was sent in January, 1957, to an orthopaedic surgeon at the Ipswich and East Suffolk Hospital. There was then a swelling involving the lower part of the shaft of the right femur. On biopsy sarcoma was diagnosed and the leg was amputated through the upper part of the femur. Pathological examination of the femur showed a spherical tumour at its lower end 5 in. (12.7 cm.) in diameter, with the appearances of a fibrosarcoma. There were pathological fractures in the bone, but the exact site of origin of the tumour could not be determined.

Nunn made a good recovery from his operation, but by October secondary deposits were apparent in his chest. In February, 1958, a lump appeared in his right groin. He

was seen by the radiotherapist, but, as there were no symptoms, he was not given x-ray treatment. By June a large secondary deposit in the right lung was pressing on the mediastinum and he had palliative radiotherapy. He died on July 4.

Medical Opinion

At the inquest the orthopaedic surgeon, the radiotherapist, and the pathologist concerned in the case all gave their views on the possible relationship of the kick to the development of the fibrosarcoma. The surgeon said it was a fairly uncommon tumour. He had not seen many similar cases, but the lower end of the femur was the commoner site for the tumour. He knew of one recent case where injury and infection had preceded the growth, but it was impossible to say definitely whether the kick had caused Nunn's growth; equally it was impossible to deny that it might have done so. However, his own view was that it was more than a coincidence that the tumour had developed at the site of the kick. It had been a severe blow, and so far as could be seen the tumour had arisen at the exact site.

The radiotherapist said that, while medical opinion held generally that a causal connexion between trauma and tumour development was strongly improbable, it could not be excluded in a particular case. The pathologist thought most of the evidence was against such an association. There did occur, however, occasional cases in which a sarcoma appeared a few months or years after an injury to the bone at the particular site. This might be a chance association, but there were cases—though rare—in which the relation to injury appeared well established.

A verdict of accidental death was recorded.

Vital Statistics

Poliomyelitis Vaccine

By October 3 last 17.5 million doses of poliomyelitis vaccine had been distributed in Great Britain since the programme started in 1956. Of these, 5.7m. were British, and 11.8m. Salk-type. Up to the end of August 5.8m. children and adults in priority groups had received two doses of vaccine, and the number of doses then held in stock by local authorities was 3.2m. The Ministry of Health is recommending parents to avoid delay by accepting whatever vaccine is available locally.

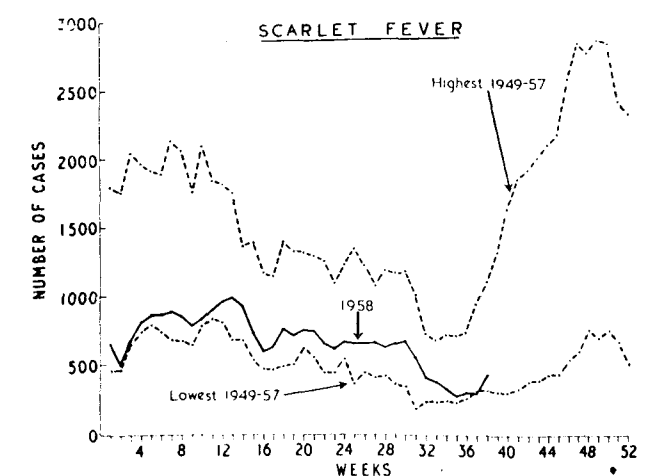
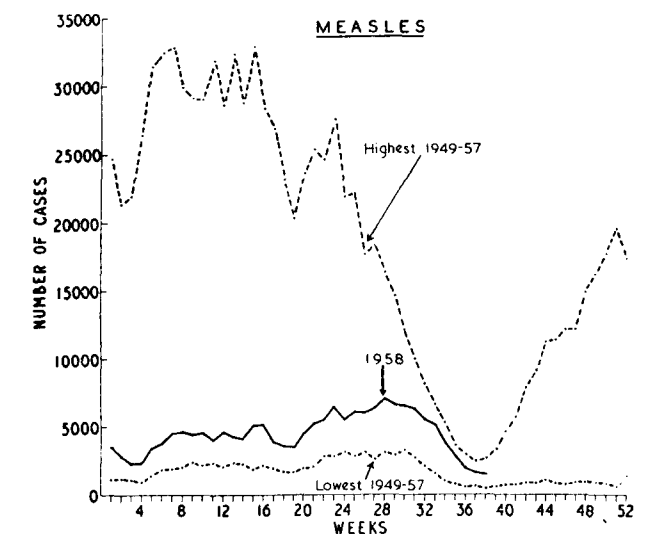
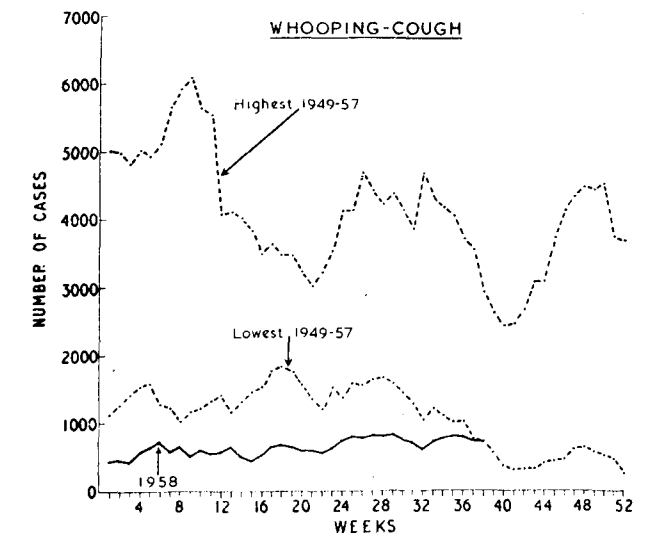
Scotland in Second Quarter

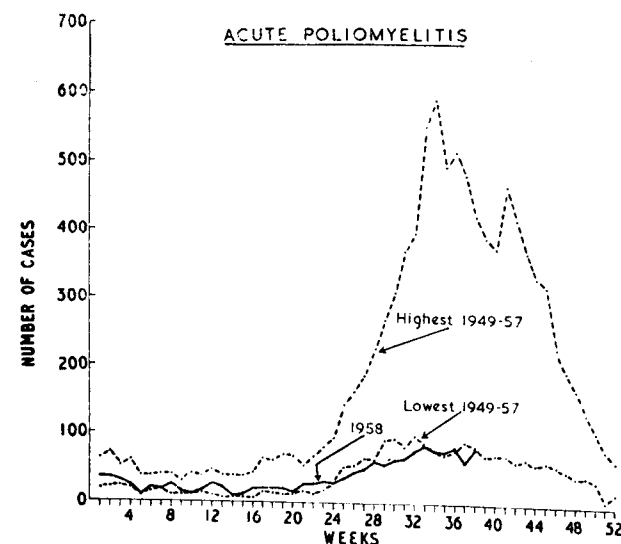
The birth rate in Scotland during the second quarter of 1958 was 19.9 per 1,000 of the population, and was 0.4 above the rate for the preceding second quarter. The infant mortality rate was 27 per 1,000 registered live births, which was the same as in the corresponding quarter of 1957. The neonatal mortality rate was 19 per 1,000 live births, and was 1 below the rate for the preceding second quarter. The crude death rate was 11.8 per 1,000 of the population; this was 0.6 higher than in the second quarter of 1957 and 0.4 above the average of the corresponding quarters of the five previous years.

The mortality from bronchitis and pneumonia was high, with death rates of 34 and 37 per 100,000 of the population, respectively, compared with the average rate for the five previous years of 30 in each case. The number of deaths from tuberculosis was 118 for the respiratory system and 16 for other forms. Compared with the preceding second quarter these deaths were 20 fewer for respiratory tuberculosis and 1 more for other forms of tuberculosis. The 43 deaths attributed to the principal epidemic diseases included 36 from influenza, 6 from meningococcal infections, and 1 from measles. Deaths from violence numbered 667. Of these, 137 were due to road transport accidents. These deaths were 27 and 11, respectively, more than in the corresponding quarter of 1957.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus -----, the figures for 1958 thus ————. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Week Ending September 27

The largest fluctuations in the notifications of infectious diseases in England and Wales during the week ending September 27 were increases of 151 for measles, from 1,470 to 1,621, 109 for scarlet fever, from 434 to 543, 23 for dysentery, from 410 to 433, and decreases of 47 for whooping-cough, from 718 to 671, 22 for food-poisoning, from 369 to 347, and 21 for acute pneumonia, from 175 to 154.

The largest rise in the incidence of measles was 39 in Gloucestershire, from 38 to 77. A small rise in the incidence of scarlet fever was recorded throughout the country; the only large rise was 42 in Lancashire, from 53 to 95. The only fluctuation of note in the local trends of whooping-cough was a fall of 25 in Sussex, from 40 to 15. Two cases of diphtheria were notified, being the same number as in the preceding week.

The notifications of acute poliomyelitis numbered 95, and these were 6 more for paralytic and 10 more for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 16 (Leeds C.B. 4, Rothwell U.D. 3, Bradford C.B. 2), Lancashire 14 (Manchester C.B. 6, Preston C.B. 2), London 10 (Bethnal Green 2, Stepney 2), and Devonshire 6 (Plymouth C.B. 6).

The largest centres of dysentery were Yorkshire West Riding 84 (Leeds C.B. 26, Barnsley C.B. 16), Lancashire 65 (Liverpool C.B. 16, Kirkby U.D. 13), London 64 (Islington 12, Deptford 10), and Warwickshire 34 (Coventry C.B. 20, Birmingham C.B. 12).

Fewer in Mental Hospitals

The number of patients in mental hospitals in England and Wales again fell in 1957, according to the Annual Report to the Board of Control (H.M.S.O., 9d.). There were 2,518 fewer than twelve months before, and at 146,962 the total was the lowest since 1949. But the rate of admission continues to increase. Last year admissions numbered 88,943 (45% readmissions), compared with 83,994 in 1956 and 55,856 in 1950. While voluntary admissions increased, admissions under certificate were fewer. In 1956, 78% of the admissions to designated mental hospitals were voluntary and 20% were under certificate. During 1957, voluntary admissions increased to 83%, and certified cases fell to 16%. Of the 82,778 patients discharged, 19,643 were listed as recovered, 54,054 were relieved, and 8,822 showed no improvement.

The number of student nurses in mental hospitals (excluding mental deficiency hospitals) continued to increase during the year, but a serious shortage of nursing staff remained. Whole-time staff numbered 20,903 and part-time staff 7,176 at the end of September, 1957, as compared with 20,358 and 6,937 a year earlier.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending September 20 (No. 38) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	2	0	2	0	3	3	0	5	0	
Dysentery	410	63	169	12		174	22	100	6	4
Encephalitis, acute	5	0		0		1	0		0	
Enteric fever:										
Typhoid	6	3	1	1	1	6	0	1	0	0
Paratyphoid	5	3	1(B)	1	3(B)	19	0	0	0	0
Food-poisoning	369	41	21	1		240	18	10	0	
Infective enteritis or diarrhoea under 2 years				14	44				10	31
Measles*	1,470	100	26	8	37	1,044	28	15	25	18
Meningococcal infection	9	2	8	0		30	2	6	1	
Ophthalmia neonatorum	17	3	2	0		26	0	3	0	
Pneumonia†	175	11	90	0	1	702	15	266	3	
Poliomyelitis, acute:										
Paralytic	48	2		1	10	113	7		7	6
Non-paralytic	31	1				85	4			
Puerperal fever‡	226	40	12	1		248	41	5	1	
Scarlet fever	434	24	61	26	17	321	28	60	28	18
Tuberculosis:										
Respiratory	458	44	62	17		522	47	83	11	
Non-respiratory	62	6	14	4		51	4	10	5	
Whooping-cough	718	36	69	47	10	724	46	45	2	5

DEATHS	1958					1957				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	1	0	0	0	0	0
Dysentery	0	0		0		0		0	0	
Encephalitis, acute		0			0	0				
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	6	1	0	0	0	0	0	0	0	0
Influenza	3	0	0	0	0	2	5	0	0	0
Measles		0	0	0	0	0	0	0	0	0
Meningococcal infection		1	0			0	1			
Pneumonia	304	19	4	7	9	21	19	13	2	
Poliomyelitis, acute	1	0	1	0	0	2		0	0	
Scarlet fever		0	0	0	0	1	0	0	0	
Tuberculosis:										
Respiratory	46	3	4	1	2	6	3	1	4	
Non-respiratory		1	1	0	0	0	1	0	1	
Whooping-cough	2	0	0	1	0	0	0	0	0	
Deaths 0-1 year	288	33	21	3	9	24	25	7	13	
Deaths (excluding stillbirths)	7,889	621	443	89	130	683	579	104	126	
LIVE BIRTHS	13,725	1,178	969	204	353	12,011	890	224	369	
STILLBIRTHS	331	33	18			15	19			

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

Medical News

Insurance for Private G.P. Treatment.—The Fellowship for Freedom in Medicine has persuaded the British United Provident Association to launch an insurance scheme to help cover the cost of private treatment by general practitioners. Details of the scheme, which will come into operation on January 1, are due to be announced next month. While there already exist several excellent schemes for providing cover against the costs of treatment in a hospital or nursing-home and of specialist advice and investigation—such as those of B.U.P.A. itself, the London Association for Hospital Services (Hospital Service Plan), and the Western Provident Association—this is the first insurance scheme to offer cover in Britain against the cost of private treatment by a general practitioner. The new cover will be an option restricted to those already insured under B.U.P.A.'s standard scheme (for private beds, specialist fees, etc.), whereby for an additional rate a subscriber may obtain cover for himself and his dependants for attendance by a private general practitioner and for minor operations; as yet, the cost of drugs is not able to be included. The basic annual rates for a single subscriber (with additional rates for dependants) are on two scales: Scale A is £2 10s., allowing a payment of 12s. 6d. towards the G.P.'s fee; Scale B £4 15s., allowing a payment of 20s. Further information may be obtained from the B.U.P.A. offices at Provident House, 24-27, Essex Street, London, W.C.2, early in November. In the Channel Islands the Western Provident Association has a special scheme which includes insurance cover for private practitioners' fees, and it appears that this company is now thinking of following B.U.P.A.'s lead and offering a scheme applicable to Britain.

Restrictive Practices.—On October 6, at its first hearing, the Restrictive Practices Court began the examination of an agreement between all members of the Chemists' Federation. The main restriction before the Court was one whose principal purpose, according to the Federation, is to restrict the sale to the public of proprietary medicines to retail chemists and pharmacists. This, the Federation submitted, is not contrary to the public interest. The hearing arose from a reference by the registrar of restrictive trading agreements, under section 20 of the Restrictive Trade Practices Act, 1956 (*The Times*, October 7).

Middlesex Hospital.—Details of the new Middlesex Hospital Medical School were given by the dean, Professor B. W. WINDEYER, at the school's annual dinner at the Savoy Hotel on October 3. He announced that the school council had decided to name the residential college after Lord Astor and to call the large lecture theatre the Edward Lewis theatre. The latter is included in the first phase, now under construction. The dean said it would accommodate 180 and would be available for undergraduate meetings; it would have a fully equipped stage. The second-phase building was planned to give maximum flexibility for changes that might be necessary in the light of changing demands of teaching and research. It would complete the premedical and preclinical departments, and would also provide an improvement in school amenities and accommodation for the student health service. The third stage would be the residential college for 150 students.

King's College Hospital.—The annual dinner of past and present students of King's College Hospital was held at the Savoy Hotel on October 4. Dr. SYDNEY THOMSON presided over a large gathering. Dr. K. E. D. DAUNCEY proposed the toast of the Medical School and paid a tribute to the work of the dean, Dr. V. F. HALL, who gave a good report on the school. Sir CECIL WAKELEY proposed the toast of the chairman and Dr. THOMSON replied. On October 1 new medical and surgical units were inaugurated at the school. Dr. CLIFFORD HOYLE has been appointed part-time director of the medical unit, and Mr. HAROLD EDWARDS part-time director of the surgical unit.

Accidents to B.M.A. Members.—Details of the special accident insurance scheme available to B.M.A. members are given at p. 11 of the advertisements. The scheme was first announced at this year's Representative Meeting, and was welcomed in this *Journal* as "a new and most valuable practical benefit of membership of the B.M.A." (*Journal*, July 19, p. 150).

Symposium on Response to Injury.—Immediately following the Fourth International Congress of Biochemistry (*Journal*, September 20, p. 738), an international symposium on the biochemical response to injury was held under Dr. D. P. CUTHBERTSON's chairmanship at Semmering, in Austria, from September 7 to 12. It was attended by 24 research workers from nine countries, and the proceedings are to be published by Blackwell Scientific Publications Ltd. The symposium was organized by the Council for International Organizations of Medical Sciences with assistance from the Wellcome Trust and the International Union of Biochemistry.

New Medical Films.—Films recently released by pharmaceutical houses include "Simplified Urine Analysis," sponsored by Messrs. Ames Company (London) and introduced at its first showing on October 2 at the Royal Society of Medicine by Sir CECIL WAKELEY; "Management of Twins in Pregnancy and Labour" and "Routine Use of Ergometrine in the Third Stage of Labour," produced by the Wellcome Foundation's film unit and introduced at their first showing on October 8 by Professor W. C. W. NIXON; and "Prostatectomy under 'Fluothane,'" released by Imperial Chemical Industries Ltd. All these films are 16 mm. with colour and sound. Further details may be obtained from the sponsoring firms.

General Nursing Council.—Among those appointed by the Minister of Health to the General Nursing Council for England and Wales for the next five years are the following: Mr. P. H. CONSTABLE, secretary and house governor, St. George's Hospital, London; Dr. ALEXANDER WALK, physician superintendent, Cane Hill Hospital, Coulsdon; Dr. JOHN DOUGLAS, M.O.H. of Bradford; and Mr. BASIL HUME, formerly senior surgeon, St. Bartholomew's Hospital, London.

International Scientific Unions.—The Royal Society's delegation to the eighth general assembly of the International Council of Scientific Unions in Washington, October 2-6, was led by Sir RUDOLPH PETERS and included Professor A. V. HILL. The council is concerned with plans for the International Geophysical Year, future Antarctic research, and space research.

Polar Medal.—Colonel R. A. SMART, R.A.M.C., leader and medical officer of the Royal Society Antarctic Expedition for the International Geophysical Year, has been awarded a polar medal.

COMING EVENTS

Nurses and Midwives Conference.—Annual conference and the London Nursing Exhibition, October 13-17 at the Seymour Hall, London.

Annual Service for Doctors, Nurses, and Allied Professions.—Sunday, October 19, at 3 p.m. at Trinity Presbyterian Church, Unthank Road, Norwich. The preacher will be the LORD BISHOP OF NORWICH.

Leeds University, Faculty of Medicine.—The BISHOP OF BRADFORD will give the inaugural lecture at 3 p.m. on October 20. His subject will be "The Wholeness of Man."

Abortion Law Reform Association.—Public meeting, 7.15 p.m. on October 22 at Caxton Hall, Westminster, on "Our New Bill." Details from the secretary, 18, Wyatt Park Road, London, S.W.2.

27th General Hospital.—Annual reunion dinner at the Eccleston Hotel, London, S.W.1, October 25, at 7.15 p.m. Tickets (25s. inclusive) may be obtained from Mr. G. PUDNEY, 161, Silverleigh Road, Thornton Heath, Surrey.

Recent Advances in Cancer.—Week-end symposium for junior consultants, S.H.M.O.s, and senior registrars, October 25 and 26 at the Royal Marsden Hospital. Further details from the department of clinical studies, Royal Marsden Hospital, Fulham Road, London, S.W.3.

Faculty of Radiologists.—Provincial meeting in Sheffield on October 25. Details from Captain T. W. BARNARD, "Broom Cross," Tree Root Walk, Sheffield, 10.

Thomas Vicary Lecture.—Sir JOHN MCNEE will lecture on October 30 at 5 p.m. at the Royal College of Surgeons of England on "Barber-Surgeons in Great Britain and Ireland."

Association of Anaesthetists of Great Britain and Ireland.—Annual meeting, October 30 to November 1 in Southport. Further details from the honorary secretary, 47, Lincoln's Inn Fields, London, W.C.2.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lecture: marked ●. Application should be made first to the institution concerned.

Monday, October 13

BRISTOL YOUNG DOCTORS GROUP.—At Board Room, Bristol Royal Infirmary, 8 p.m., discussion: G.P. Trainee Scheme.
EDINBURGH UNIVERSITY.—At Anatomy Lecture Theatre, University New Buildings, 5 p.m., Inaugural Lecture by Professor W. L. M. Perry: Pharmacology and Practice of Medicine.
● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Queen Charlotte's Hospital, 4.30 p.m., guest lecture by Professor Chassard Moir: Some Thoughts on the Technique of Caesarean Section.
LONDON UNIVERSITY.—At Physiology Lecture Theatre, St. Bartholomew's Hospital Medical College, 5.30 p.m., special university lecture in physiology by Professor W. F. Hamilton, Ph.D. (Georgia): Measurements of the Cardiac Output.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. F. B. Cockett: Post-thrombotic Syndrome of the Leg; 6.30 p.m., Mr. Clive Butler: Carcinoma of the Colon.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—5 p.m., Bengué Memorial Award Lecture by Dr. B. G. B. Lucas: Artificial Aids in the Control of the Circulation (illustrated).

Tuesday, October 14

HEATHERWOOD ORTHOPAEDIC HOSPITAL.—2.30 p.m., Professor G. Perkins: Radiodiagnosis of Bone Diseases.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. H. O'Meara: Sweat Production and Anomalies.
● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—(1) At Hammersmith Hospital, 2 p.m., guest lecture by Colonel P. H. Addison: Legal Hazards in Obstetrics and Gynaecology. (2) At Hammersmith Hospital, 3 p.m., guest lecture by Professor C. V. Harrison: Obstetric Anuria.
LONDON UNIVERSITY.—At Physiology Lecture Theatre, St. Bartholomew's Hospital Medical College, 5.30 p.m., special university lecture in physiology by Professor W. F. Hamilton, Ph.D. (Georgia): Regulation of the Cardiac Output.
MANCHESTER MEDICAL SOCIETY.—(1) At Large Anatomy Theatre, Medical School, Manchester University, 4 for 4.30 p.m., University Lecture on the History of Medicine by Professor W. I. C. Morris: John and William Hunter, and their Polemics. (2) SECTION OF SURGERY.—At Staff House, Manchester University, 7.45 for 8 p.m., Presidential Address by Mr. H. T. Cox: Dumping Syndrome.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. H. C. Edwards: Disorders of the Jejunum-Ileum; 6.30 p.m., Mr. W. P. Cleland: Surgical Treatment of Acquired Valvular Disease of the Heart.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Disease in Pregnancy.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. T. Rowland Hill: neurological demonstration.

Wednesday, October 15

BRITISH ASSOCIATION OF SPORT AND MEDICINE.—At Charing Cross Hospital Medical School, 5.30 p.m., Mr. Frank Law and Mr. M. J. Roper-Hall: Vision in Sport.
COLLEGE OF GENERAL PRACTITIONERS: NORTHERN HOME COUNTIES FACULTY.—At Lecture Theatre, St. Bartholomew's Hospital Medical College, 9 p.m., second annual Pfizer Lecture by Dr. E. F. Scowen: Some Difficulties in Prescribing.
EUGENICS SOCIETY.—At Royal Society, Burlington House, W., 5.30 p.m., Dr. Christopher Tietze: Human Fertility—Statistical Considerations.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Histology of Normal Skin.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. A. B. Paterson: Development and Detection of Tuberculin Sensitivity.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. A. H. Harkness: Non-gonococcal Urethritis.
LIVERPOOL UNIVERSITY: FACULTY OF MEDICINE.—At Large Lecture Theatre, New Medical School, Ashton Street, 5.15 p.m., Professor I. F. S. Mackay (Jamaica): Measurement of Arterial and Venous Valvular Incompetence.
LONDON UNIVERSITY.—At Physiology Lecture Theatre, St. Bartholomew's Hospital Medical College, 5.30 p.m., special university lecture in physiology by Professor W. F. Hamilton, Ph.D. (Georgia): Experimental Congestive Failure of the Circulation.
MANCHESTER MEDICAL SOCIETY.—At New Union Buildings, Oxford Road, 8.15 to 11 p.m., reception for Fellows and friends.
● MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 7 for 7.30 p.m., annual dinner, 8.45 p.m., Address by Dr. T. F. Fox (Editor, *The Lancet*): Rewards and Follies.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., guest lecture by Dr. D. J. Bell: Carbohydrate Metabolism.
ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—3.30 p.m., Mr. C. P. Wilson: Diverticula of the Pharynx.

● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. Sol. M. Cohen: Place of Sympathectomy procedures; 6.30 p.m., Mr. John Charnley: Fractures of the Femur.
WILKESDEN GENERAL HOSPITAL MEDICAL SOCIETY.—At Department of Physical Medicine, 8.45 p.m., Professor C. G. Rob: Arterial Reconstruction and its Effect on General Medicine.

Thursday, October 16

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At Beveridge Hall, Senate House, 5.30 p.m., Sir Edward Salisbury, F.R.S.: Influence of Botany on Health and Disease.
HONYMAN GILLESPIE LECTURES.—At Anatomy Theatre, University New Buildings, Teviot Place, Edinburgh, 5 p.m., Dr. D. V. Hubble: Auto-immunizing Thyroiditis.
HYPNOTHERAPY GROUP.—At Royal Society of Medicine, 8 p.m., Dr. Lindsay Neustatter: Homosexuality.
LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Royal Free Hospital School of Medicine, 8 p.m., Dr. Jean Mackintosh: Future of Medical Women in the Public Health Service.
NORTH-WESTERN THORACIC SOCIETY.—At Clinical Science Buildings, Manchester, 5 p.m., Presidential Address by Dr. Robert Coope: Sundry and Manifest Changes.
ROYAL ANTHROPOLOGICAL INSTITUTE, 21, Bedford Square, London, W.C., 5.30 p.m., Dr. H. Lehmann: Abnormal Haemoglobins.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. H. R. T. Wolfe: Testicular Tumours; 6.30 p.m., Mr. Ashton Miller: Diverticula of the Bladder.
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., 1st Manson Oration by Sir Philip Manson-Bahr: The March of Tropical Medicine During the Last Fifty Years.

Friday, October 17

BRITISH INSTITUTE OF RADIOLOGY: Radiobiology Meeting, 2 to 4 p.m., papers by Dr. J. R. Munson, Miss T. Alper, Dr. N. E. Gillies, Dr. S. R. Pele, and Dr. W. B. Looney (U.S.A.): 4.15 to 5.30 p.m., papers by Dame Janet Vaughan and Dr. Maureen Owen and Mr. D. M. Taylor.
EDINBURGH UNIVERSITY.—At Anatomy Lecture Theatre, University New Buildings, 5 p.m., Inaugural Lecture by Professor J. I. P. James: Evolution of Orthopaedic Surgery.
● INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. G. B. Mitchell-Hogg: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. E. H. Hudson: clinical demonstration.
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., clinical discussion for general practitioners by Mr. N. Asherson: Deafness.
KENT AND CANTERBURY HOSPITAL.—8 p.m., clinical meeting.
LEICESTER CHRISTIAN MEDICAL ASSOCIATION.—At Leicester Royal Infirmary, 8.45 p.m., Mr. S. G. Browne (Congo Belge): Sunshine and Shadow in the African Equatorial Forest.
MANCHESTER MEDICAL SOCIETY: SECTION OF ANAESTHETICS.—At Clinical Sciences Building, York Place, 4.30 for 5 p.m., joint meeting with North of England Society of Obstetricians and Gynaecologists. Dr. A. Mackenzie, Dr. E. G. Rees Jones, Dr. H. E. Pooler, Dr. Trevor Johnson, Mr. O. Vaughan Jones, and Professor T. N. A. Jellicote: Anaesthesia in Obstetrics.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., guest lecture by Professor G. Hadfield: Hormonal Control of Normal Mammary Glands.
● ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.15 p.m., Mr. G. C. Knight: Cervical Disk Lesions; 6.30 p.m., Mr. Ralph Shacknan: Non-tuberculous Urinary Infections.
ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At Royal Faculty of Physicians and Surgeons of Glasgow, 8.30 p.m., joint meeting with Medico-Chirurgical Society of Edinburgh, discussion: Relative Importance of the Scientific and the Clinical in Medical Training. Openers, Professor M. Woodruff, Mr. Robert Mailer, and Dr. J. D. S. Cameron.

Saturday, October 18

BIOCHEMICAL SOCIETY.—At Chemistry Lecture Theatre, Royal College of Science, 2 p.m., 376th meeting.
SOUTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At Preston Hall Chest Hospital, Maidstone, 10.30 for 11 a.m., Mr. R. H. F. Brain: Oesophageal Disease and the Lung; Dr. G. R. W. N. Luntz: Diabetes and Tuberculosis; Dr. E. R. Jones and Dr. A. Golciewski: Demonstration of Pulmonary Function Tests; 2.30 p.m., annual general meeting.

Sunday, October 19

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—10.15 a.m. to 12.30 p.m., seminar, Mr. A. Radcliffe: Common E.N.T. Conditions.
MANCHESTER UNIVERSITY: FACULTY OF MEDICINE AND NORTH-WEST ENGLAND FACULTY: COLLEGE OF GENERAL PRACTITIONERS.—At Theatre 1, Clinical Sciences Building, York Place, 11 a.m., demonstration by Dr. J. F. Wilkinson: Blood Disorders.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Emson.—On September 7, 1958, at the University Hospital, Saskatoon, Canada, to Mary, (formerly Lewis) and Dr. Harry E. Emson, a daughter—Susan.

DEATHS

Howlett.—On September 16, 1958, at his home, Wimbledon, London, S.W., Michael Joseph Howlett, M.B., B.Ch.
Jones.—On September 19, 1958, the result of a road accident, Pauline Miriam Jones, M.B., B.Chir., of 16, Elmleigh Road, Weston-super-Mare, Somerset.
Keeling.—On September 20, 1958, at 12, Clevedon Road, Tilehurst, Reading, Berks, George Sydney Keeling, M.D., formerly of Attleborough, Norfolk, aged 85.
Oltway.—On September 19, 1958, at Londonderry, Alexander Loftus Oltway, M.B., B.Ch., D.P.H., Lieutenant-Colonel, R.A.M.C. (retired).
Rae.—On September 17, 1958, at Fownhope, Bromsrove, Worcs, Arthur Joseph Rae, M.R.C.S., I.R.C.P., aged 79.
Richard.—On September 15, 1958, in London, Kurt Simon Richard, M.R.C.S., I.R.C.P., of Welwyn Garden City, Herts.
Timms.—On September 15, 1958, at the Royal Falmouth Hospital, Hastings, Charles Gordon Timms, O.B.E., M.C., I.R.C.P.S.E.d., L.R.F.P.S.
Trubshaw.—On September 15, 1958, at Cusfaw, Llanfyllid, Dolgellau, Merioneth, Kenneth Vincent Trubshaw, M.B., F.R.C.S.E.d., aged 81.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Maternal Virus Infections and Congenital Heart Disease

Q.—What is the present view on the relationship between the incidence of congenital heart disease and maternal virus infections during pregnancy?

A.—It is generally accepted that there is a direct association between rubella and congenital cardiac malformations. In two British series^{1,2} the number of children with congenital heart disease was 3 in 11 when the mother contracted rubella in the first month of pregnancy, and 1 in 18 for the next two months of pregnancy. The cardiac malformations that occur particularly are patent ductus arteriosus (often with pulmonary stenosis) and ventricular septal defect. Rubella, however, probably accounts for only about 2% of all cases of congenital heart disease. No other maternal virus diseases have been definitely shown to be responsible for congenital cardiac malformations.

REFERENCES

- Hill, A. B., Doll, R., Galloway, T. McL., and Hughes, J. P. W., *Brit. J. prev. soc. Med.*, 1958, 12, 1.
- Brown, C. M., and Nathan, B. J., *Lancet*, 1954, 1, 975.

"Nivembin" for Amoebiasis

Q.—What is the value of nivembin (chloroquine sulphate and di-iodohydroxyquinoline) in the treatment of amoebiasis?

A.—Chloroquine is a good drug for the treatment of hepatic amoebiasis, a condition which occurs in acute form in association with amoebic dysentery and, in more chronic form, associated with abscess formation after an interval which may be prolonged, following an alimentary amoebic infection. In the latter case, however, an intensive course of chloroquine or emetine would be required probably together with aspiration of pus from the liver. Nivembin would not be a satisfactory drug for the treatment of such cases.

Di-iodohydroxyquinoline is of moderate usefulness in the treatment of patients passing cysts as the result of a sub-acute or chronic infection with *Entamoeba histolytica*. The relapse rate following such treatment is higher than that which follows the use of some other amoebicides. It therefore follows that nivembin has but limited application, for its di-iodohydroxyquinoline fraction is of very little value in acute amoebic dysentery in which the liver may be acutely infected and therefore apt to be benefited by the chloroquine constituent of the compound. On the other hand, in patients suffering primarily from amoebic abscess of the liver more chloroquine is required than can properly be given in the form of nivembin. The compound is another example of a blunderbuss remedy which aims to do two things, neither of which it does adequately.

Treatment of Chronic Prostatitis

Q.—What is the treatment for chronic prostatitis when no organisms have been isolated and the patient has had no chemotherapy?

A.—Treatment depends largely on the type of chronic prostatitis which is present. If it is a catarrhal chronic prostatitis, with a diffusely enlarged and uniformly boggy gland in which the prostatic secretion contains only a moderate number of pus cells, it is essential to prevent pelvic congestion and overaction of the prostate gland. Prostatic massage at fortnightly intervals combined with one of the long-acting sulphonamide drugs should clear up the chronic catarrh. Should massage be unsuccessful short-wave

diathermy or rectal diathermy may succeed. If the purulent type of prostatitis is present, in which the gland is irregular with alternating areas of induration and boggy, there will be numerous pus cells in the prostatic secretion. Prostatic massage at weekly intervals will drain the acini of pus, and the number of pus cells in the secretion will indicate the efficacy of the treatment. The seminal vesicles must be included in the massage, as they are invariably involved in the infection. Any organisms which may be cultured from the secretion must be typed for sensitivity and the appropriate antibiotics prescribed. If this type remains resistant to massage, diathermy may be tried, failing which a minimal perurethral resection to open up occluded prostatic ducts has proved successful in very resistant cases. It would be advisable to make sure that prostatic calculi are not maintaining infection. A radiograph of the pelvis would exclude calculi, while a urethral stricture, which may also initiate and maintain prostatic infection, should be excluded by urethrogram. If the infection has been present for some time and has become "burnt out," scar tissue replacing the inflammatory process, the sclerotic type of chronic prostatitis results. The gland is small and hard, the prostatic urethra is narrowed, and the bladder neck obstructed. In these cases a perurethral resection is indicated.

Life of the Tapeworm

Q.—What is the duration of life of a tapeworm if no treatment is given or if successive treatments fail?

A.—Tapeworms in general have long lives, and instances have been known in which untreated worms have lived for 15 to 16 years. No evidence is available on whether a worm's life is shortened by repeated treatment which fails to expel it from the host, but there is no reason to suppose that it is.

Fantus Test

Q.—What is the Fantus test for estimating urinary chloride excretion?

A.—Fantus's test is performed as follows. Using a dropping pipette, place 10 drops of approximately neutral urine and 1 drop of 20% potassium chromate in a test-tube. Wash the pipette out thoroughly with distilled water. Take into the pipette 2.9% silver nitrate and add dropwise to the urine while shaking. Count the number of drops needed to change the colour to brick red. This number expresses in grammes the content of sodium chloride per litre of urine. Physiological variations in urinary pH are not important, but strongly alkaline urine due to, e.g., cystitis should be approximately neutralized with acetic acid before use.

REFERENCES

- Fantus, B., *J. Amer. med. Ass.*, 1936, 107, 14.
- Harrison, G., *Chemical Methods in Clinical Medicine*, 1957, 4th ed., chap. 15, p. 310. Churchill, London.

Undulant Fever

Q.—What is the treatment for undulant fever?

A.—Brucellosis or undulant fever has been successfully treated by sulphonamides, streptomycin, the tetracyclines, chloramphenicol, erythromycin, and novobiocin, but relapses are apt to follow treatment. Whereas extracellular brucella organisms are readily destroyed by antibiotics, intracellular organisms develop a satisfactory *modus vivendi*, finding a suitable medium for multiplication and protection against lethal phagocytosis and against antibiotics. This successful intracellular parasitism accounts for persistence and relapses of the infection despite treatment. Increased therapeutic success depends upon the future development of chemotherapeutic agents which penetrate the host cell easily and without injury or by some method of dislodging organisms from their intracellular position.

Initially, tetracycline should be given in doses of 2 g. daily for two weeks. Relapses, as they occur, may be controlled by further courses or by giving streptomycin in daily intramuscular doses of 2 g. together with tetracycline.

Alternatively, novobiocin may be used in daily oral doses of 2 g. for two weeks. In view of the numerous antibiotics now available for ringing the changes, it is often overlooked that brucellosis is a self-limiting disease and that most patients are free from the infection within a few months. Some continue to have symptoms during convalescence and need firm reassurance rather than further chemotherapy, unless a recurrence of fever heralds a relapse. This should be treated along the lines outlined above.

Occult Blood in Urine

Q.—What are the relative merits of a chemical test for the presence of occult blood in the urine, such as the "occultest" tablets made by Ames and Co., and routine microscopic examination of deposit as a screening check on each urine specimen?

A.—The tests for blood in urine were compared by Caplan and Discombe.¹ They record that the o-tolidine test, such as used in occultest tablets, will detect 5×10^4 cells per ml., equivalent to 0.15 mg. haemoglobin per 100 ml. urine; this figure has been confirmed by other workers. Routine microscopic examination of a centrifuged deposit will detect between 10^3 and 10^4 cells per ml. according to the details of the technique: if 12.5 ml. urine is centrifuged, 12 ml. removed, the cells resuspended in the residual 0.5 ml. and examined in a Fuchs-Rosenthal chamber, red blood cells will be detected when not more than 1,000 per ml. are present. If a drop of the deposit is placed between ordinary slide and coverglass the limiting frequency will be ten times greater—i.e., about 10,000 per ml.

REFERENCE

- ¹ Caplan H., and Discombe, G., *Brit. med. J.*, 1951, 2, 774.

NOTES AND COMMENTS

Treatment for Roundworms.—Dr. L. G. GOODWIN (Wellcome Laboratories of Tropical Medicine, London, N.W.1) writes: I raised the point on toxæmia and fluid balance ("Notes and Comments," August 16, p. 462) because too little attention has been given to this aspect of treatment. In territories such as the west coast of Ceylon, where roundworm infection is heavy, it is not at all uncommon for children to be admitted to hospital with "toxæmia" and convulsions caused by *Ascaris* without the classical signs of intestinal obstruction. Attention to fluid balance and a dose of piperazine (which narcotizes the worms and does not stimulate them) is often sufficient to bring about recovery. I recently saw two cases treated in this way by Dr. Stanley de Silva at the Lady Ridgeway Hospital in Colombo. The patients are usually pitiable, ill-nourished children who are very poor surgical risks. Sappenfield, Swartzwelder, and Miller¹ reported the successful use of piperazine given by intestinal tube in cases of partial intestinal obstruction caused by roundworms. Roundworms produce an evil-smelling secretion which can be smelt in the breath of heavily infected persons. Rashes and other sensitization phenomena are not uncommon in infected people in the tropics; many laboratory workers who handle the worms for any length of time become allergic to constituents of *Ascaris*. It is likely that some (though not all) cases of tropical eosinophilia are associated with *Ascaris* infection. It seems to me that *Ascaris* toxæmia requires more study, and it would be of value to have the views of physicians working in areas of heavy roundworm endemicity.

REFERENCE

- ¹ Sappenfield, R. W., Swartzwelder, C., and Miller, J. H., *Amer. J. trop. Med. Hyg.*, 1957, 6, 383.

OUR EXPERT replies: Dr. Goodwin is shifting his ground and raising issues which bear little relation to the original question ("Any Questions?" July 26, p. 260) or to his first comments on the answer given to that question. He then stated: "Small children are sometimes admitted to hospitals in the tropics with toxæmia, vomiting, and convulsions caused by massive *Ascaris* infections. These patients are often severely dehydrated. . . ." He now implies that attention to fluid balance is not uncommonly necessary even in the absence of vomiting or massive infections. Unless some degree of intestinal obstruction is present, however, it is very rare for children suffering only from ascariasis to be dehydrated. At all large hospitals in areas in which the infection is endemic many thousands of children will be encountered in whom a heavy *Ascaris* infection is present yet in whom no dehydration or manifest signs of toxæmia are found, and the vast majority can be

treated without more attention to fluid balance than is given to patients in general. Indeed, Dr. Goodwin indicates that factors other than ascariasis are probably playing some part in the production of the children's condition, for he mentions their pitiable, ill-nourished state. He also states that they constitute poor surgical risks. This implies that surgery has to be considered in such cases, and this implication accords ill with the contention that dehydration is the result of a non-massive infection in the absence of some degree of intestinal obstruction. The causal relationship between convulsions and toxæmia resulting from ascariasis which Dr. Goodwin assumes is doubted by very many workers in this field. Larval forms of the worm may occasionally reach the brain during their migratory phase, and consequently give rise to an epileptiform attack, but toxæmia produced by worms resident in the intestine cannot be accepted as a proved cause of convulsions. The cause of a convulsion may require detailed elucidation, and it is quite unjustifiable to implicate an *Ascaris* infection merely because such an infection happens to be present.

Brucella Abortus in Milk.—Dr. H. R. E. WALLIS (Bath) writes: Dr. J. M. Ross ("Notes and Comments," September 20, p. 754) clarifies the position from the point of view of the medical officer of health, but I should like to contest his statement that "the evidence suggests that most current cases of undulant fever are not due to ingestion of infected milk but to contact with infected material from occupational or other circumstances." This may be true in America, where many cases occur in people who handle meat, where better care is taken of milk than in this country, and where most of the published work appears. Reports in this country are few and far between, but during the past 20 years two milk-borne epidemics have been reported.^{1,2} Barrett and Rickards³ recorded 25 cases, of which 11 had no direct contact with infection, and in the other 14 milk may have been responsible. Davies⁴ reported 11 cases, of which seven were considered to be due to drinking raw milk, and in my own series⁵ of 10 cases in children there was only one who might have derived his infection from direct contact. Lastly, Dalrymple-Champneys,⁶ in his masterly review, considered 907 patients and found that only 123 had been specially exposed to direct contact with infected material, and in only 34 of these did he consider that was the probable mode of infection. This may seem an unimportant point, but it does serve to emphasize that raw milk is not safe even if it has a nice label saying "Tuberculin-tested" and a gold top to the bottle.

REFERENCES

- ¹ Elkington, G. W., Wilson, G. S., Taylor, J., and Fulton, F., *Brit. med. J.*, 1940, 1, 477.
² Cruickshank, J. C., and Stevenson, G. A., *ibid.*, 1942, 1, 522.
³ Barrett, G. M., and Rickards, A. G., *Quart. J. Med.*, 1953, 22, 23.
⁴ Davies, J. E., *Brit. med. J.*, 1957, 2, 1082.
⁵ Wallis, H. R. E., *ibid.*, 1957, 1, 617.
⁶ Dalrymple-Champneys, W., *Lancet*, 1950, 1, 429, 477.

Correction.—Professor L. F. LARIONOV (Institute of Experimental Pathology and Therapy of Cancer, Moscow) writes to say that the four patients he described as being active and well after 9–10 years of maintenance chemotherapy (*Journal*, July 19, p. 160) were suffering from Hodgkin's disease, not leukaemia as stated in our report.

Collected Articles from the "British Medical Journal"

The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

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EFFECT OF SMALL DOSES OF ALCOHOL ON A SKILL RESEMBLING DRIVING

BY

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Since the drinking of alcohol in one form or another is so common a characteristic of the social life of man in a variety of cultures, it would seem important that as much as possible should be known both of its physiological effects and of its effects on behaviour. In fact, at the present time, very little precise information is available, in spite of an extensive literature on the subject. This literature has been reviewed, more or less comprehensively, periodically since the early part of this century (Fisk, 1917; Darrow, 1929; Emerson, 1933; M.R.C. Alcohol Investigation Committee, 1938; Jellinek and McFarland, 1940; Drew, 1950).

The most striking feature to emerge from any such review is the marked lack of agreement between authors, amounting in many instances to direct contradiction of one another. This is especially true of the effects of smaller doses. Perhaps not surprisingly, doses of intoxicating strength have generally resulted in deterioration in efficiency in almost all aspects of behaviour tested. For doses below this level, however, the picture is not clear.

Some authors have reported deterioration in performance however small the dose, some have failed to find any effects, while several have shown actual improvements following doses of the order of one single whisky.

In part these discrepant findings reflect the unreliability of many of the results in this field, but in part they arise from the complexity of the effects of alcohol.

For moderate and intoxicating levels it has been established that the effect of alcohol is related to its concentration in the blood, and that the blood alcohol concentration obtained from a given ingested dose depends both on the body weight of the recipient and on the rate at which the alcohol is absorbed into the blood (Winton and Bayliss, 1948). The rate of absorption, in turn, has been found to be dependent on the amount, type, and the dilution of alcohol, the contents of the stomach, and the drinking habits of the individual (Goldberg, 1951).

Previous reports further suggest that, apart from a slowly developed tolerance to alcohol from repeated exposure to it over a number of years, known as habituation, there is also a more rapid adaptation to each dose consumed, so that it has a greater effect when the blood alcohol level is rising than when it is falling (Mellanby, 1919; Miles, 1924; Goldberg, 1951; Eggleston, 1955).

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†Working with Medical Research Council grants.

The nature of the task used is also important. Goldberg (1943) has shown that some tasks are more readily impaired by a given dose than are others. Familiar tasks, too, deteriorate less than ones that are unfamiliar (Jellinek and McFarland, 1940). The method of measuring change in performance is often of great importance. The additional stimulation provided by a new task frequently enables the subject to compensate, for a short time, for conditions which have produced an overall reduction in his efficiency. For this reason, short interpolated tests may fail altogether to measure this deterioration and may show normal or even above normal efficiency (Drew, 1942). Reasonably long-lasting tests seem necessary unless the deficiency is a gross one. Welford (1951) has stressed the importance, for the analysis of skilled behaviour, of measuring different aspects of performance, since relatively gross measures may obscure changes in the way in which different actions are integrated in the final performance.

The wide individual variations in performance in response to alcohol remaining when the above factors are taken into account have been attributed to temperamental differences, and especially to those differences related to extraversion-introversion.

Differences along this dimension have been noted in other contexts. Extraverts have been shown to be relatively less concerned with accuracy of performance (Himmelweit, 1946), to deteriorate more rapidly during continuous work (Broadbent, 1956; Eysenck, 1957a), and to be less consistent in performance (Venables, 1956). It has, furthermore, often been noticed, when giving depressant drugs to psychiatric patients, that a given dose has a greater effect on patients with hysterical disorders than on anxiety and depressive patients. A theory postulating a greater amount of cortical control for introverts and a greater susceptibility of extraverts to depressant drugs due to the reduction of cortical control was first put forward by McDougall (1929) and has recently been extended by Eysenck (1957b). Experimental confirmation of the greater susceptibility of extraverts to the depressant action of amylobarbitone sodium has been published by Shagass (1954, 1956).

The aims of this experiment were to investigate the effect of small doses of alcohol on a complex skill, resembling driving; to relate any changes found to the level of blood alcohol; to see whether individual differences in response to alcohol could be explained in terms

spondence of the rise and fall through time of blood alcohol and tracking error is shown in Fig. 3. In this figure, tracking error scores are expressed as the mean score for each driving period. Blood alcohol concentrations have therefore been expressed in the same way. The rise and fall of urine alcohol, expressed similarly, have been included. The

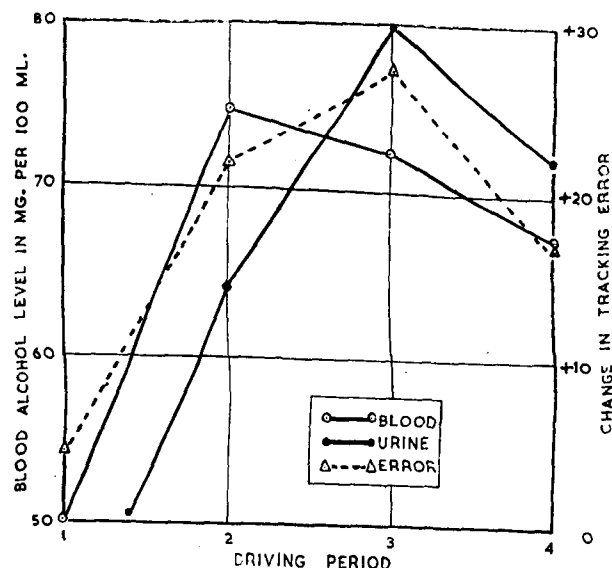


FIG. 3.—Rise and fall of blood alcohol, error score, and urine alcohol with time after drinking. (Urine alcohol levels reduced by one-fifth.) Each point is mean of 40 subjects.

figure for urine alcohol has been reduced by one-fifth (in view of the ratio of 1.252:1) to enable it to be presented on the same scale. Although only the largest dose has been plotted, the data for the other doses follow the same pattern.

It can be seen that urine alcohol reaches a maximum about 20 minutes later than blood alcohol. The error curve looks as though its peak would occur somewhere between the two. The calculation of lag correlations confirms this. Maximum correlations are obtained when error scores are correlated with blood values some 10 minutes earlier, and with urine values some 10 minutes later. From this it would appear that maximum error slightly lags in time behind the maximum blood alcohol and slightly precedes maximum urine alcohol.

Product-moment correlation of the rise and fall of blood alcohol and the rise and fall of error is positive and significant. The mean correlation of the four paired values, calculated separately for each individual, is $r = +0.271$, with p lying between 0.01 and 0.02. The size of this correlation, though significant, seems small. It will be seen from Fig. 3 that there is a time lag between the two variables with an inverted relationship in periods 2-3. This, and the clustering of points in the second, third, and fourth driving periods, probably have reduced the size of the correlation. When blood alcohol values at five-minute intervals, obtained by interpolation from the individual curves, are correlated with the five-minute error scores, allowing a much smaller lag than the 20-minute scores, the correlation rises to $r = +0.89$. Because the test ends before blood alcohol has dropped very markedly, it is not possible from these scores to say whether error scores recover more quickly than blood alcohol levels, though inspection of Fig. 3 shows that the slope of error scores in the last half hour is steeper than for blood alcohol. The frequency of kerb-bumping rises steeply to a maximum, for each dose, with blood alcohol, and falls almost equally steeply after the maximum has been passed.

In an attempt to interpret the increased error with increased blood alcohol, records were sampled for mean position on the road surface, amount of swing about this position, and consistency of behaviour on corners. Significant differences were found. Without alcohol, subjects tended to drive on the left-hand side of the road, to remain

on that side for relatively long periods—that is, with relatively little “wobble”—and rapidly to correct swings to the right by moving back to the left once more. The effect of alcohol appears to be to produce a shift of the mean driving line from the left towards the crown of the road ($p < 0.01$). With increasing dosage there is an increasing swing or “wobble” about this new, more central position ($p < 0.01$), together with a tendency to tolerate swings to the right but rapidly to correct swings to the left ($p < 0.01$). There was, furthermore, greater variability in the positioning of the car in negotiating a corner ($p < 0.01$).

Effect of Alcohol on Speed

In this experiment there were no clear-cut group effects on speed of driving. Mean driving speeds are insignificantly different for all doses. Variability in speed around a mean shows a tendency to rise and fall through time with blood alcohol rise and fall, but this again is not significant. It is possible that the large effect of practice on speed is camouflaging any alcohol effect for the group. Changes in speed of driving after alcohol were found to be closely related to personality characteristics. These are discussed below.

Effect of Alcohol on Steering-wheel Movement

Like error, steering-wheel movement increases progressively as blood alcohol increases. The regression of amount of change of steering-wheel movement on blood alcohol is shown in Fig. 4. This regression is linear and is highly significant ($p < 0.001$). There is also a decrease in the consistency of steering-wheel movement after alcohol ($p < 0.01$). The decrease in consistency appears to be due to a greater variability in the timing of responses to a corner.

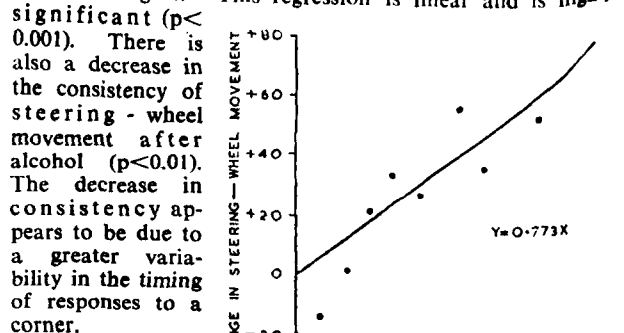


FIG. 4.—Regression of steering-wheel movement on blood alcohol level. Each point is mean of 80 paired values.

As might be expected, the amount of steering-wheel movement is related to the amount of tracking error made. The relationship is U-shaped, such that there is an optimum amount of movement for controlling the car, both less and more movement resulting in increased error. Following alcohol there is an increasing tendency to make either too little or too much movement in negotiating a particular corner, though the predominant effect is to make too much.

B. Individual Differences in Response to Alcohol

Although the latin square design used makes comparison of the performances of individuals difficult, certain features nevertheless emerge. There is undoubtedly a considerable range of individual variation in response to alcohol. This is summarized in Table II, which gives the number of subjects changing their score after alcohol by varying

TABLE II.—Number of Subjects Showing Different Percentage Change in Scores After Alcohol (Dose 4)

Measure	Percentage Change of Score													
	Decrease							Increase						
	-50	-40	-30	-20	-10	+10	+20	+30	+40	+50	+60	+70		
Error	1	0	2	2	5	10	12	4	2	2	—	—		
Steering-wheel movement	—	—	—	3	5	12	13	3	3	—	—	—		
Time	—	—	4	5	11	13	5	2	—	—	—	—	1	

amounts. The changes are expressed as percentage change from their own no-alcohol score. Tracking error shows a wide scatter. Though the distribution is fairly heavily skewed towards increased error after alcohol, 10 of the 40 subjects show reduced error, one as much as 50% reduction. This subject, however, showed also one of the largest reductions in speed, and achieved a high degree of accuracy by driving extremely slowly. Time scores, on the other hand, are distributed fairly normally around the “no change” position.

An attempt has been made to relate these individual differences in response to alcohol to various personal characteristics. No relationship was found between response to alcohol and differences in initial level of skill, previous driving experience, age, sex, or drinking habits. The subjects varied widely in their initial level of skill and in previous driving experience, so the lack of relationship between these variables and alcohol effect may be stated with some confidence. The range of drinking habits, however, was small, so that the comparison was between the few individuals who drank once or twice a week and those who drank very

shown in the effect of alcohol on speed of driving. The extraverts showed very little change of speed after alcohol, but the introverts changed considerably. The nearer the introvert end of the scale they were, the more speed changed. They subdivided, however, into two distinct groups, one of which speeded up very considerably, and the other slowed down. It has not so far been possible to relate this to any personal characteristics. Fig. 6 shows the regression of change of speed on extraversion-introversion as measured by the Bernreuter Neurotic Inventory. This regression is linear and is significant at the 5% level. Comparing those scoring more than 50 on the Bernreuter with those scoring less than this in terms of whether they change speed by more or less than 8 units gives a χ^2 significant at better than 0.01. It would appear that personality characteristics—at least those of the extravert-introvert dimension—are related to the effects of alcohol.

DISCUSSION

It is now generally agreed that a relationship exists between the concentration of alcohol in the blood and the appearance of clinical signs of intoxication. The definition of intoxication based on clinical evidence is, however, a variable one.

Liljestrand (1940) gives evidence of a considerable variation in diagnoses made by different clinicians on people who all had blood alcohol concentrations between 100 and 150 mg. per 100 ml. Moreover, the range of blood alcohol concentrations at which people are judged intoxicated is very wide. Goldberg (1951) has shown that the level at which 50% of people are judged clinically to be intoxicated varies with the legal definition in different countries. In America it has been defined by the National Safety Council as 150 mg. per 100 ml., in Sweden it is 100-120 mg. per 100 ml., and in Denmark and Norway 80 mg. per 100 ml.

The level of alcohol in the blood at which people are diagnosed clinically to be intoxicated, besides being variable, tends to be high in comparison with the concentrations used here. This is not surprising, since an estimate of impaired behaviour is made in the absence of any criterion of normal behaviour for that individual, so that the impairment must be obvious before it is detected, and since it is known that people can compensate for their reduced efficiency over the short periods of time during which they are examined. It does not follow, however, that, because no impairment is found in clinical tests, more complex skills, like driving, will also be unaffected.

The present study shows that performance begins to deteriorate with very low blood alcohol concentrations, certainly of the order of 20-30 mg. per 100 ml., and that the deterioration is progressive and linearly related to blood alcohol level. There is, in this study, no evidence of a threshold effect.

The impairment of performance was shown most clearly in the operation of the controls. As the aim of the task was primarily to track, it is perhaps not surprising that in attempting to retain a level of accuracy the operation of the steering-wheel should be most affected. Efficiency in using the steering-wheel is indicated by the amount of tracking error which results. With practice the amount of steering-wheel movement made goes down without a reduction in the accuracy of tracking, whereas after alcohol tracking error increases despite an increase in steering-wheel movement. This suggests that timing of the steering-wheel movements required to negotiate a corner supports this view. The importance of timing of control movements in a

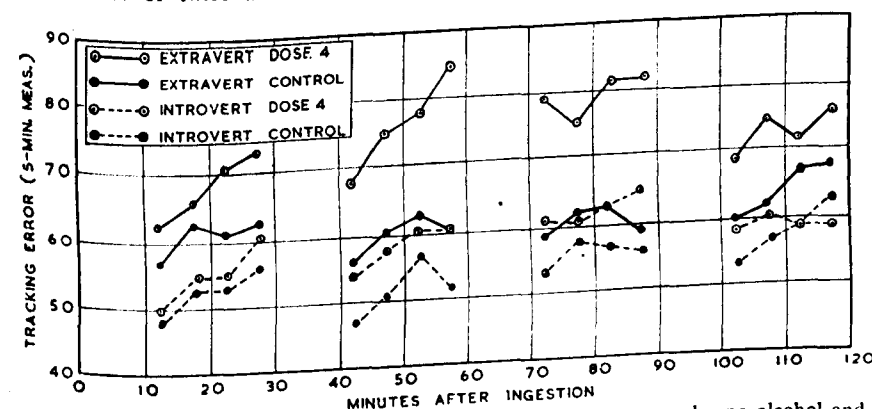


FIG. 5.—Comparison of the tracking error of extraverts and introverts under no alcohol and dose 4 conditions. Extraverts $n=7$; introverts $n=9$.

rarely. The range was therefore too small to draw conclusions on the lack of relationship.

Scores obtained, for 35 subjects, on the extraversion scale of the Maudsley Personality Inventory were well distributed. The mean was 10.24 (sigma 4.53) as compared with the standard norm of 10.94 (sigma 4.74). Performance scores were compared for a group of subjects scoring high in extraversion and a group scoring low. Fig. 5 shows the mean differences in tracking performance between the resulting seven extraverts and nine introverts. The extravert group made more error ($p < 0.05$), were less consistent in car positioning ($p < 0.05$), and showed a bigger increase in error during each period of driving ($p < 0.01$). The effect of alcohol on error was greater for the extravert group ($p < 0.05$), the extraverts having an average increase of 23% and the introverts of 6%.

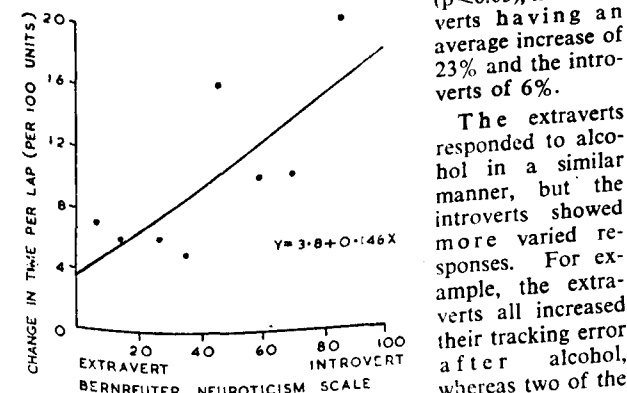


FIG. 6.—Regression of change of speed after alcohol on extravert-introvert score. Each point plotted is mean of five subjects.

complex skill has been stressed previously by Bartlett (1943), and adverse conditions such as fatigue have been shown to have a marked effect on timing (Drew, 1942; Russell Davis, 1948).

The work of Cohen *et al.* (1958) is interesting additional evidence. While the task used in this present study reasonably reflects the tracking aspect of driving, it is almost completely free of hazard and risk-taking. These authors have shown that an amount of alcohol not much larger than the biggest dose used in this experiment produced a significant increase in the hazards in which drivers became involved. From the two studies it is reasonable to assume that not only will drivers become involved in greater hazards with this amount of alcohol but they will be less efficient in dealing with them.

It is suggested, furthermore, that the results reported here show that the level of alcohol in the blood is a good indicator of the extent of impairment of performance. It may be pointed out that the blood alcohol levels reported by Cohen *et al.* (1958) seem surprisingly low. Assuming their drivers to weigh rather more than 11 stone (70 kg.), on average, their two doses correspond fairly closely to the smallest and biggest used here. Their blood samples, however, would appear to have been taken almost two hours after subjects began to drink. If this is so, the blood alcohol levels correspond very closely to those found here. They report a concentration of 4 mg. and 58 mg. per 100 ml. for the two doses. At two hours comparable figures in this experiment were 6 mg. and 62 mg. per 100 ml.

While this in no way affects the conclusions reached by these authors about the effect of such doses on performance, it does affect their discussion about "safe" levels of blood alcohol. At the time of the tests the blood alcohol levels in their drivers would almost certainly be at least 10-20 mg. per 100 ml. higher than those reported. Even so, their experiments, and these, suggest a marked impairment of performance on such tasks with blood alcohol levels of 60 to 80 mg. per 100 ml.

In view of the known difficulty of clinical estimates of impairment in such situations, and of the individual's capacity, if he is capable of realizing that he is under test, to compensate temporarily for loss of efficiency, estimation of blood alcohol level would seem the most direct way of assessing impairment. Estimation of the alcohol excreted in urine and in breath allows a close approximation to blood alcohol. In these experiments, urine alcohol agreed very closely with blood alcohol. Breath analysis, which has enormous administrative advantages over both blood and urine analysis, can, from these results, given a suitable instrument, also give a very close approximation.

It would seem fairly clear, from these results, that the efficiency with which a task like driving is performed is likely to decrease progressively as blood alcohol rises. At some point the loss of efficiency is likely to be large enough to constitute a danger in a practical driving situation. As this experiment has been carried out in a laboratory, necessarily free of the hazards and many of the motivating features of a real-life situation, it is not possible, from these results, to say at what level of blood alcohol the increased risk of accident would become unacceptable. Some evidence on this is available from the experience of the U.S.A., Denmark, Norway, and Sweden, where rather different cut-off levels are used.

Individual differences in response to alcohol appear to be related, at least in part, to personality characteristics, especially those of extraversion-introversion. Eysenck (1953) has collected the evidence for the existence of this dimension of personality and has postulated (Eysenck, 1957a) that extraverts would be more susceptible to the effects of depressant drugs like alcohol. The extraverts in this experiment behaved as a group, and tend to confirm Eysenck's hypothesis. The introverts do not behave as a group. It is of interest that all the scales used agreed on the extravert end but did not agree on the introverts. It is possible that the almost bimodal effect noted on change of speed for introverts

reflects the intrusion of some other personality characteristic not tested in this experiment. The test which showed this bimodal effect most clearly was the Bernreuter, which uses a more "neurotic" criterion of introversion than the Maudsley.

In this experiment extraverts appear not to be bothered by the extra stress imposed by alcohol. They drive at much the same speed as before, make very little additional corrective movements, but make much greater error, are less consistent, and deteriorate more rapidly during 20-minute driving periods. Introverts, on the other hand, appear to be striving to compensate for the alcohol effect, and to be anxious to demonstrate their efficiency. They over-react to the situation, make more corrective movements of the steering-wheel, and change their speed markedly. Some slow right down, presumably in an attempt to achieve accuracy, though they do not necessarily do so, while others appear to be attempting to demonstrate how quickly they can drive, again not always with a proportionate loss of efficiency.

SUMMARY

An experiment has been carried out to investigate the effects of small doses of alcohol on a complex skill.

Four alcohol doses and a placebo dose were used. The peak blood alcohol concentrations from the doses were approximately 20, 40, 60, and 80 mg./100 ml. of blood.

Urine and breath analyses were compared with direct blood analysis. Urine alcohol peaked later and higher than blood, but breath alcohol followed blood alcohol in time. The ratio of urine alcohol to blood alcohol was 1.252:1.

Three kinds of breath-testing apparatus were used. Best results were obtained from the "breathalyser." The others either showed high constant errors or were unreliable. The results from the breathalyser were good enough to warrant its consideration from a practical point of view.

Mean error showed an increase with increase in blood alcohol, amounting to about 16% deterioration with a blood alcohol concentration of some 80 mg./100 ml. Part at least of the increase in error is to be explained by a significant tendency for subjects to move towards the right-hand side of the road after alcohol and also by less consistent positioning. Error scores and control movement scores also showed a variation in time, rising and falling in a way similar to that of blood alcohol.

Mean speed showed no significant change, but marked individual differences in speed after alcohol were found.

Control movements, as measured by steering-wheel movement, showed significant increases and a significant reduction in consistency.

Age, sex, previous driving experience, and previous drinking habits, within the limits available, showed no relation to individual differences in response to alcohol.

Personality ratings, especially those relating to extraversion-introversion, showed a definite relation to behaviour changes. Extraverts did not change either speed or control movements very much, though they were less consistent in control movements, but showed large increases in error. Introverts changed speed considerably, though it is not possible to differentiate between those who slowed down and those who speeded up. Control movements also increased, but were relatively consistent. Error may or may not increase, but the mean error score was significantly less than that for extraverts.

APPENDIX

Average Scores For Various Aspects of the Tracking Task, After Each Alcohol Dose

Performance Variable	Dose 0	Dose 1	Dose 2	Dose 3	Dose 4
Tracking error	227	230	235	246	246
Kerb bumpings	209	255	350	260	359
Inconsistency in tracking	4.82	5.08	5.63	5.78	5.53
Time per lap	403	390	386	393	398
Steering-wheel movement	674	673	690	708	764
Inconsistency in steering-wheel movement	3.61	3.51	3.61	4.03	4.15

We should like to express our thanks to the Medical Research Council, who supported this work; also to the Director and his staff at the Road Research Laboratory of the Department of Scientific and Industrial Research, who provided us with accommodation, subjects, and much of the apparatus, and who were unfailing in their help and advice. We are indebted to Mr. E. B. Parkes, the Director of the S.W. Forensic Science Laboratory, and to Mr. K. Jones, of that laboratory, for their help in the analysis of body fluids carried out by Mrs. A. Myers.

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The World Health Organization has published its eighth annual volume of vital statistics of various countries for the year 1955 (699 pp., £3). The number of subjects has been increased in order to make possible a more thorough analysis of the factors influencing public health. In some 700 pages the report includes, in addition to the subjects usually covered, detailed specific death rates, by sex and by age, for the main sites of malignant neoplasms (lungs, digestive organs, breast and genital organs, lymphatic and haematopoietic tissues). It also presents for the first time a type of information previously unobtainable—namely, the distribution of cases of communicable disease by sex and by age. Among some other statistics not previously included are the numbers of health personnel in various countries, hospital establishments, and numbers vaccinated against certain communicable diseases in 1955.

SIMPLE CLINICAL HEARING-TESTS FOR VERY YOUNG OR MENTALLY RETARDED CHILDREN

BY

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In the course of an inquiry into problems of deaf and partially deaf children in mental deficiency hospitals and occupation centres carried out during 1955, it became apparent that there was need for a series of graded clinical hearing-tests, suitable for routine application by medical officers and psychologists concerned with official ascertainment of handicapped children, which could be repeated at intervals by different examiners and recorded in some standard fashion. Originally, with the intention of obtaining results as precise as possible, some form of instrumental testing was envisaged, and numerous trials were laboriously carried out with drums, whistles, pitch-pipes, tuning-forks, and, in a few cases, with pure-tone audiometers; but it was soon obvious that the difficulties of routine testing of mentally handicapped children with what were, to them, completely meaningless sounds were insurmountable. Since, in any case, the aim was primarily to obtain reliable information concerning the child's capacity to hear with comprehension in everyday situations, it became clear that the tests should be based on his reactions to familiar homely sounds and particularly to "live" speech. It is hoped to give in detail elsewhere the reasons for employing each individual item in the present series.

This paper is intended only to describe the general principles underlying the tests, the materials used, the procedure which was eventually decided upon, and the responses which may be expected. In order to establish comparative developmental standards, it was found necessary to keep checking the performance of mentally handicapped children against that of young normal children attending day nurseries and infant schools, and in the process it was discovered that in these groups, also, the tests could usefully be employed for sorting out children with difficulties of hearing and speech. The tests can be carried out in any quiet room, and the material required is easily obtainable. They are simple enough in content to be readily grasped by young children, but when correctly applied provide clear-cut evidence regarding capacity for auditory discrimination. Since it is essential for adequate assessment to observe how the child responds, the tests should be carried out personally by the medical examiner (or psychologist) or in his presence. They are not intended at this stage for large-scale application by ancillary personnel. Suitable techniques are already available for this purpose (Ewing, 1957).

Categories of Hearing-tests

The hearing-tests for children at present in use fall into two broad categories: (1) those which are designed as preliminary screening devices, first to sort out as quickly and effectively as possible children whose speech and hearing is below the normal for their age and who therefore require further investigation, and then to provide a means of recording results for future reference; and (2) those more precise diagnostic procedures which seek to define more accurately the nature and extent of the speech and hearing disability.

Considerable research has been carried out in Britain on both types of test, notably by the Ewings and their team of workers (Ewing, 1930, 1957; Ewing and Ewing, 1944, 1947), Fry and Kerridge (1939), Dix and Hallpike (1947, 1952), Whetnall (1952, 1956a, 1956b), Fry and Whetnall (1954), Fisch (1955), Dawson *et al.* (1956), and Thomson (1956).

Although I derived much useful information from the published reports then available, few of the tests in use were found to be suited to my purpose owing to the limited intelligence and restricted experience of the children whose needs prompted my own investigations. Statistical evaluation of the tests here described is not possible or desirable. The mental age levels given are approximate, and, although in practice the series provides a considerable amount of information concerning developmental progress, it is not designed for use as an intelligence scale. The terms "pass" and "fail" are not employed. The child is judged to respond or not to respond according to the level of performance which might reasonably be expected at his age. It need hardly be stressed that any child showing deviations from the broad pattern of speech and hearing behaviour appropriate to his chronological age should be referred for expert opinion and full diagnostic testing immediately. Children do not grow out of deafness, but they do most assuredly grow into dumbness if they are not given expert auditory training in the critical early years. The sooner the young child with impaired hearing is provided with a suitable hearing-aid and his parents are given guidance regarding his daily management the better his chance of normal development.

Much research is in progress regarding the auditory behaviour and testing of young babies under 6 months, including neonates (Graham, 1957; Ewing, 1957; Whetnall, 1958; Ballantyne, 1958). These procedures demand much training and experience. Since their application to mentally handicapped children has not yet been investigated, it is not proposed to discuss them here. The present tests are intended for use with children with mental ages between 6 months and 7 years. To date (March, 1958) they have been personally applied with 192 mentally handicapped children aged 2-16 years, and with 537 normal children between 6 months and 7 years distributed as follows: under 2 years, 107; 2-4 years, 179; 5+ years, 251.

Response to Spoken Language

In order to test whether a child possesses hearing over the range of sound cycles which are essential for speech discrimination, it is necessary to satisfy oneself that he can respond to spoken language. His reaction to other meaningful sounds possessing similar characteristics in pitch, intensity, and duration may provide valuable supporting evidence regarding the child's auditory acuity and his ability to interpret the world of sound in which he lives; but until he has given unmistakable evidence first that he *hears*, later that he can *imitate*, and eventually that he can *correctly use* the individual phonetic units of speech, it is not possible to be certain that his auditory discrimination is normal.

From 6 months onwards the child's own spontaneous vocalizations provide a useful clue to his capacity for hearing and using spoken language. They should therefore be carefully observed and recorded at the time of examination. The mother's description of his speech and hearing habits should be reported separately. Even when accurate pure-tone testing becomes possible a clinical speech test should always be given (Sheridan, 1948). Hearing for pure tones and hearing for speech, although closely related, are not identical. This is particularly true of young children. The pure-tone audiogram provides valuable information regarding the severity of hearing loss, the sound cycles involved, and the possible location of the blockage in the auditory relay system between the meatus and the cerebral cortex, but it cannot show how the individual child interprets what he does hear. Some children with poor auditory discrimina-

tion and gross speech defects show perfectly normal audiograms, while other children showing loss for pure tones function as normally hearing individuals. While it is therefore desirable to apply and compare results of both tests whenever possible, the first essential is to discover the child's ability to hear and use spoken language or, as Fisch (1957) aptly terms it, his capacity for auditory communication.

The tests are grouped in series as follows:

- Baby tests: (a) 6-14 months: Voice and noise-making objects
(b) 15-18 months: " " " "
(c) 19-23 months: Five-toy test
2 years old: Six-toy test and first cube test
3-4 years: Seven-toy test and second cube test
5-7 years: Picture vocabulary tests and third cube test

The materials required are:

Babies.—(a) and (b) soft high-pitched rattle; squares of new tissue paper (e.g., toilet paper); small handbell; china or pottery cup with wide brim; metal spoon. (c) Ball, golf size, plastic type which will not break windows; baby doll 2-3 in. (5-7.5 cm.); motor-car 2 in. (5 cm.); 1-in. (2.5-cm.) wooden cube, different colour from motor-car.

2-4 Years.—Child's spoon, fork, and knife (blunt); baby doll 4-5 in. (10-12.5 cm.); motor-car 3-4 in. (7.5-10 cm.); train or plane 3-4 in. (7.5-10 cm.); ship 3-4 in. (7.5-10 cm.); eight 1-in. (2.5-cm.) wooden cubes, two each of blue, yellow, green, red.

5-7 Years.—Four cards of special pictures; one card decorated with coloured squares; lists of selected words and sentences.

In application three general rules must be observed. (1) The room should be quiet and homely, and the mother or other familiar adult should remain with the child throughout. (2) The tests are based on fundamental psychological and acoustic principles, so that, although it is permissible to vary the spoken "carrier phrases" and in some instances the order of application, the materials used may not be varied and the tests themselves must be applied with strict attention to detail or they will cease to give valid results. (3) The record should state clearly the test used, the distance, the results obtained, and a note regarding the child's own vocalization or speech.

Babies Aged 6-14 Months

Babies over 6 months are comparatively easy to test, those between 9 and 12 months particularly so. At this stage of development the child is eagerly seeking through vision, hearing, and manipulation to explore and find meaning in the world around him. He has already learned to associate certain sounds with human beings and the interesting events they initiate, but his experience is still so incomplete and his ability to discriminate between foreground and background noise so rudimentary that he cannot yet take the significance of any sound within his area of attention for granted, but is impelled to support his uncertain powers of auditory recognition and localization with visual verification. Hence his response to a meaningful sound in his environment is to turn immediately to look for the person or object originating it. This localizing reaction probably plays a necessary part in the child's stereoscopic and stereophonic learning, and thus in the building up of his concepts of space and possibly of time. Whatever the reason, the response is so constant at this age that it is almost automatic and can usefully be pressed into service in testing.

It is necessary to remember that the infant's world is very small and only gradually expands. Although he has vague impressions of an outer space, his span of selective visual and auditory attention is at first fragmentary in time, and in space no larger than the circle bounded by his mother's arms. His sphere of continual awareness later widens to cot and play-pen size, and only at about 18 to 20 months reaches full room size. For this reason soft, varied, meaningful sounds close to the infant are much more likely to evoke a response than loud featureless sounds further away. The examiner (E) should stand well to the side of

the child (C), but outside his immediate range of vision. To ensure the most consistent results the sound stimulus should be given on a level with the ear. Sounds below this horizontal plane seem to be less easy to hear, and above it less easy still. Sounds immediately behind or above the head, particularly when they are in the middle line, appear to be difficult to distinguish and, before 3 or 4 years, impossible to locate. Ewing (1957) has recorded similar findings.

Babies of 6 and 7 months are usually very outgoing and friendly, but after this the near approach of strangers is apt to be unwelcome and acceptance must be won. The examiner should not make boisterous frontal overtures to the child, but should allow himself to be seen moving about at a respectful distance and heard conversing with the mother. The child's reactions to the mother's voice are instructive, particularly when she is addressing herself directly to him.

E should first ask by what name the child is known at home. C may sit on his mother's knee facing outwards, or in his cot or pram within touching distance of her. C's position must not be closer than 4 ft. (120 cm.) to any wall. In all the tests it is essential that E does not stand where his movements or his shadow are visible to C. Similarly, reflections in a shiny surface, light touches, vibrations, currents of air, and even perfumed cosmetics may provide unsuspected clues to an observant child who has learned, of necessity, to make use of them. If an assistant is available E should sit in front of C observing his reactions while the assistant applies the stimuli under his direction. If E is alone he must wait until C's attention is visually attracted straight ahead (but not too deeply engaged) before he begins the test.

The sounds are given at distances from 1½ ft. (45 cm.) (at 6 months) to 3 ft. (90 cm.) (at 9 months upwards) in



The child's attention is immediately drawn by the sound of the spoon stroked round brim of cup. (Aged 8 months.)

the following order—voice, rattle, spoon against cup, tissue paper, handbell. The speech sounds are delivered at quiet conversational level. They consist of the low-frequency vowel OO, repeated two to four times (for example, "Oo-oo John; Oo-oo"), and the high-pitched consonant sounds "tit-tit-tit," "ps-ps-ps," "pth-pth-pth," repeated rapidly three to six times. The remaining sounds are given for one to two seconds. The rattle is shaken softly, the tissue paper is rustled quietly, the handbell is tinkled very gently, and the spoon is merely stroked round the inside brim of the cup (see photographs), unless for any reason a sharp tapping sound is needed, when the spoon can be struck briskly against the side.

With normal children of 9 months upwards the first application of the stimulus usually provokes instant turning, often with a delighted smile (E should respond to the smile), and when the same sound is repeated immediately afterwards on the other side of his head C will promptly locate it in the new position. Younger babies may be slower to react. If the first stimulus evokes no response E should wait for two seconds and then repeat it. E should then wait a further two seconds, as C may still turn slowly and deliberately although the sound has ceased. This delayed response is apt to occur also in retarded older children. It is as if there is a definite time-lag between the reception of the sound in the primary auditory area, its recognition in the audio-psycho area, and the initiation of the motor impulse. Probably for a similar reason a baby who has not responded to the single application of a sound on one side of his head will often locate it promptly and correctly when it is repeated immediately afterwards on the opposite side; but I prefer to apply a double (or occasionally treble) stimulus to one ear, since absence or delay in response provides additional information. If no response is elicited to the second (or third) repetition of the sound the stimulus should then be changed or the child will become bored and withdraw from the situation.

I have been interested to note that the cup and spoon and rattle seem to evoke the most consistent responses in young babies, perhaps because these sounds carry a concrete "near-by" meaning—that is, food and manipulative play; while the paper and handbell appear to be more interesting to the older babies whose sphere of memory and attention is expanding. After response to the handbell has been evoked it should be presented to the child, since his use of it as a plaything provides further useful information regarding his ability to comprehend its function and his willingness to make and enjoy sound (Gesell, 1925).

If the child shows a clear-cut response to any three out of these five sounds there is good reason for the assumption that he possesses enough hearing to learn to speak, but it must be remembered that the tests are not fine enough to distinguish partial deafness, particularly high-tone loss, with any degree of certainty. If the child does not respond in the expected fashion to these sounds on both sides, the tests should be reapplied as soon as possible within the following month. If the result of this second test is still uncertain expert opinion should be sought without further delay.

Speech.—From about 4 months onwards the child laughs aloud and vocalizes freely, particularly when his mother talks to him, at first in single sounds such as "ba, ka, goo," etc., and later from 7 or 8 months in a tuneful repetitive babble of the "dad-dad, bab-bab, mam-mam" variety. By 10-12 months most normal babies show by their behaviour that they understand several words used in familiar context, and their mothers may report that they can say one or two words, but these are rarely intelligible to outsiders. At 14 months many children have acquired two to six recognizable words, but others, equally intelligent, have not. By this time babbling has progressed to a more complicated jabbering, which possesses all the cadences of ordinary speech without its phonetic discipline. This the child practises with great enthusiasm when alone

(Sheridan, 1945). Any report of decrease in vocalization from the babbling stage onwards, or the most tentative suggestion on the mother's part that the child's cry is unusually monotonous, or that he seems inattentive to sound, should be treated with the utmost respect.

15–23 Months

Children within this age group are often very difficult to test and the examination calls for much patience and experience. In fact, if the response to the first test is uncertain and if there is any reason to doubt that the child's hearing is normal, it would be wise not to delay until a second test can be carried out, but to refer him immediately for diagnostic investigation. At this age the child is usually very active in crawling or running about, and, since to restrain him would defeat the possibility of reasonable assessment, it is often necessary to follow him round the floor. By this time he usually possesses enough auditory experience to recognize and interpret the sounds used in the baby tests described above without needing to verify them visually. He may concede one brief glance, but frequently does not offer the slightest sign that he has heard. At the same time he may not yet be sufficiently advanced to be able to co-operate in the simplest form of toy test described below. In these circumstances the child's own spontaneous vocalizations may provide the most useful indication of his ability to hear speech. Indeed, E's imitations of C's own vocalized sounds may be the best way of provoking him to stop, listen, and turn to look.

The child between 15 and 18 months should first be addressed by name and invited to join E in play. If he does not respond to these spoken overtures the baby tests at 3-6 ft. (90-180 cm.) may be tried, E remembering that it will be necessary to vary them frequently, as the immediate repetition of a sound which has just evoked response on one side will seldom, at this age, arouse equal interest on the other. The rustling of the paper wrapping of a packet of sweets followed by the spoken invitation "Come and get one," and the presentation of the bell accompanied by the definite instruction "You ring it; ring it with the other hand," are useful extensions of the baby tests at this age. Commands are more likely to produce results than mere friendly suggestions.

With children over 18 months a beginning may be made with the simplest form of toy test—that is, “the five-toy test.” The objects used are *cup*, *ball*, *miniature motor-car*, *plastic baby doll*, and *toy brick*—that is, coloured inch (2.5 cm.) cube which should be a different colour from the motor-car. C is placed sitting or standing by a small table with E facing him at 2–3 ft. (60–90 cm.)—that is, conversational distance. E presents the objects slowly in the following order, saying, “Here is a *cup*” (the responsive child will delightedly echo “*tup*”). “Here is a *ball*—and a motor-car.” Then presenting the doll E says, “What’s this ?”, waits for C to say “*dolly*” or “*baby*,” and thereafter uses C’s own word. If C does not speak E says, “A *dolly*—and here is a *brick*” (the word “*brick*” is acoustically essential and must not be altered). Then, holding out his hand flat (*not* suggestively cupped), E says in this order, “Give me the *ball*, please. Thank you. Give me the *brick*, please . . . the *car* . . . the *dolly*—Good.” If the child does this correctly E hands the *cup* to the mother and says, “Now I am going over there and you’re going to give the things to Mummy when I tell you,” and retreating to 6 ft. (1.8 m.) says, “Give Mummy the *ball*,” then, slowly retreating to 10 ft. (3 m.), “Give Mummy the *brick* . . . the *car* . . . the *dolly*”; then, finally, “Put the things in the *cup* and bring them to me.” Many normal children of this age find it difficult to maintain rapport at 10 ft. (3 m.). If E feels that he has dropped out of C’s world at 10 ft. (3 m.), he should return to 6 ft. (1.8 m.), noting this in the case

If the child does not give the correct toy when requested, E should wait a moment without speaking, as another

delayed response may be operating. C may even lift the incorrect toy, then put it down and hand the correct one. If C gives an incorrect toy E should put it down gently and repeat, "The ball, please." If C still hands the incorrect toy E puts it down again saying, "No, I want the ball, please." If the child persists in giving the incorrect toy or goes on handing the other toys without waiting for the command, E accepts them; then, giving the cup to the mother, holds out the toys to C, saying, "Give these to Mummy." While C is doing this E retreats to 6 ft. (1.8 m.), saying, "Good; now put the things in the cup and bring them to me." While C's attention is momentarily engaged in filling the cup the vocalized sounds "ps-ps" or "tit-tit," the high-pitched rattle, or the rustle of paper usually provoke the turning response.

Speech.—By 18 months most children have acquired 6 to 12 recognizable words. The child continues to jabber to himself while he is playing or in his cot, but as his vocabulary grows this jabbering begins to include an increasing number of distinguishable words. By 2 years the hearing child can verbally communicate his toilet needs, ask to be taken for a walk, and demand what he wants at table. He is usually putting two or three words together to form simple sentences. His understanding of spoken language, which is related to familiar objects, activities, and emotional states in his daily life, continues to improve rapidly and is far in advance of his ability to use speech. At this age he is physically restless and vocally demanding, incessantly provoking his mother to give verbal reply to his loudly expressed claims on her attention. After 20 months persistent tendency to tug at his mother's garments and point silently with his finger when he wants anything is very significant and should be carefully followed up.

2 Years

The testing of children of this age group is easier again, and the six-toy test is applicable. C is invited to a small table with E sitting facing him as before. The toys are briskly presented in this order: Here's a cup—what's this? (spoon) and this (ball, car, doll), and here is a brick. "Give me the *ball*, please, the *brick*, the *car*, the *doll*; thank you. . . . Look, I'll put the *spoon* in the cup. Now you put the other things in when I tell you." E retreats to 6 ft. (1.8 m.) and, hiding his mouth lightly with a card so that the child is unable to see his lips, continues, "Put the *ball* in the cup. Put the *brick* in the cup, the *car*, the *doll*. Good. . . . Now, when I say so, you take them out again." E retreats to 10 ft. (3 m.) and says, "Take out the *spoon*, the *brick*, the *doll*, the *car*. What's left in the cup?" This is an advanced language concept. The outgoing child usually picks out the ball promptly, saying delightedly, "Ball." The reserved child leans forward and looks into the cup without speaking. The dull child looks at E uncomprehendingly. To reassure him E says, "Take out the ball." A quiet conversational voice is used throughout. I seldom use whispered speech for children under 4 or 5 years, and only then for special reasons and with previous notice. Whispered speech is an unnatural form of communication for young children who are accustomed to hearing voiced speech at "mother-distance"—that is, at high decibel intensity. It not only tends to confuse them, but sometimes provokes anxiety and even tears, thus jeopardizing rapport or destroying it irretrievably.

In order to make sure that the child has no high-tone loss, however, it is desirable to test his hearing for voiceless consonants. The following simple test, the first cube test, can be used from about 2½ years onwards. E places the cup and six coloured inch (2.5 cm.) cubes before C, saying, "Now we're going to play another game. See these bricks. When I say, 'In, in, in,' I want you to put a brick in the cup. It will get quieter and quieter, like this (demonstrating). You try." E gradually drops out the vowel and sounds only the consonant—"In, in, n, n, n. Good. Now I'm going over there, and when I say, 'Lift, lift,' I want you

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to lift a brick out of the cup and put it on the table. It will get quieter and quieter like this" (demonstrating). E moves to 10 ft. (3 m.) from C's right ear. "Ready? Lift, lift, if, if, -f, -th (th voiceless as in 'thin'). Good." E then repeats the test for the left ear. C should not be allowed to lip-read. The sounds must be delivered at irregular intervals in order to prevent automatic performance. In practice this will be found exceedingly simple, as it is possible to monitor the child's movements visually to a split second. If C lifts the brick before the signal, E says, in playful admonishment, "I didn't say anything. Put it back. Listen." The children greatly enjoy this game, and it is a very sensitive test.

Speech.—If C's own speech has not been completely demonstrated by this time it may be necessary to engage him in some simple conversation, or, if he is capable of it, he may be asked to point to and name objects or pictures. The following simple "doll" vocabulary list provides a useful rapid test for most of the common vowels and consonants. *Doll, shoe, nose, frock, arm, feet, hair, hand, mouth, eyes, teeth.* Although at this age the normal child's phonetic usage still shows numerous infantile substitutions, his speech is adequate for most domestic occasions. Self-talk during play still continues and will probably do so until about 3½ years. Although not yet capable of sustained conversation the child can now put words together to form more complicated sentences, and is beginning to engage in spontaneous verbal interchange with other children of his own age, as well as with adults. Any child whose speech development during the first three years does not progress in this way, but remains arrested at the jabbering stage, should be referred for expert examination whether or not he appears to hear normally. He may be generally retarded or he may be a case of developmental aphasia, but he may also be suffering from high-tone deafness, so that, although he can fully appreciate the cadences and vowel sounds of ordinary speech, he cannot discriminate, and therefore cannot imitate the difficult high-frequency consonants. Denied the ability to communicate, he may express his frustration in violent temper tantrums, or in despair take refuge in silence or social withdrawal. This type of deafness is likely to be permanent. These children, unhelped, run a real risk of being wrongly diagnosed as maladjusted, psychotic, or mentally defective (Sheridan, 1944; Minski, 1957).

3 and 4 Years

The seven-toy test is easily applicable from 3 years onwards and can be used until the child is able to cope with the more comprehensive picture vocabulary test. It has shown itself capable of holding the interest of mentally handicapped children up to 16 years and, if necessary, of normal children up to 7 or 8 years. The seven objects are a child's *spoon, fork, and knife, doll, car, train* (or plane), and *ship*. A slightly larger doll and car at this age are advisable as they are easier to handle (and harder to put in the mouth), but the smaller ones can still be used. Sitting opposite C at the table, E places the toys before him from C's right to left, in the following order—car, train, fork, spoon, knife, doll, ship. E asks C to name the objects as they are placed. If C says "engine" or "boat," E replies, "Yes, a train" or "ship." If C does not speak E says the name clearly, asking the child to repeat it before he passes to the next object, checking him again at the end of the line. If C speaks readily but shows momentary confusion between knife and fork, E should go back to these at the end of the line. If the child still shows the slightest doubt it is wise to discard the test rather than modify it and to give the six-toy test instead. If C knows all the objects, E says, "Show me" (or if C is sufficiently advanced, "point to") "the *spoon, the doll, the fork, the car, the knife, the train, the ship, the spoon, the car, the ship*." It is essential that the words should be called in this order. E then retreats to 10 ft. (3 m.) and, covering his mouth, repeats the list in the same order.

(It will be obvious to those experienced in psychological testing of children that this simple performance provides E with a good deal more information than C's ability to discriminate the phonetic units which compose the seven words involved: for instance, his use of his right and left hands, his interest, speed, manipulative skill, and his actions which demonstrate "definition by use.")

In order to test the hearing for high frequencies E may repeat the test in a whisper at 10 ft. (3 m.), having first warned C what to expect. A more sensitive test is the following—that is, the second cube test. E places on the table before C the cup containing eight coloured inch (2.5 cm.) cubes with the instruction: “Whenever I say a little sound, oo, sh, t, anything—I want you to take out a brick and put it on the table, like this” (demonstrating): “Oo—ee. . . . Now you go on: sh, t, s, p, f, th. Good. Now I’m going over there,” etc. Each ear is tested separately at 10 ft. (3 m.) as before. This is not only a more sensitive test than the “In, lift” one, but it is also more difficult, particularly for retarded children, because it includes the two plosives *t* and *p* as well as the continuants *sh*, *s*, *f*, and *th*, thus involving appreciation of duration as well as of pitch. If the child does not respond to the first delivery of *t* or *p* E should repeat the sound once. If response is still absent E should proceed to the next continuant, adding a further *th* at the end to compensate, so that the child is unaware of his lack of success. The case record should be noted accordingly. It will be obvious that the “placing” of these consonants by the speaker is important. In order to keep the sounds at their highest pitch, the short vowel “i” should be imagined as preceding each consonant—for example, (i)sh, (i)p, (i)th. It is essential to avoid “per” and “ter.”

Speech.—The child of 3 years is capable of sustained conversation. His speech is usually completely intelligible, although it still shows a number of infantile substitutions and omissions, the majority of which gradually disappear before 5 years. About 3½ years self-talk during play tends to merge into a sort of running commentary of passing events, interspersed with questions, more or less vaguely addressed to the adults and children in his vicinity, to which he expects his hearers to pay at least intermittent attention. About 4 years comments become less frequent but more pertinent, while his questions become more persistent, so that he is incessantly asking, "How? When? Why?" Any deviation from this broad developmental pattern occurring in children of 3 and 4 years is likely to be of serious significance and requires urgent investigation.

5-7 Years

It is usually quicker and more convenient to use a picture vocabulary test at this stage. Those who have tried to design similar tests in the past will know that their preparation involves considerable labour. The words used must be monosyllables, preferably nouns capable of pictorial illustration, and within the experience and language capacity of very young children. M. Reed kindly provided me with a set of the admirable pictures he designed for use in the audiology unit, Gray's Inn Road (Whetnall, 1952), but they proved too difficult for the mentally handicapped children. It was therefore necessary to compile new sets of words and pictures. Six lists of 12 words were prepared. Four of these lists contain an assortment of vowels and consonants in common use. The fifth list contains pairs of words which have similar vowels but different consonants, and the sixth list is composed of words in which the high-pitched vowels *ee* and *i* are combined with high-frequency consonants. Pictures to illustrate three of the lists (given below) were prepared by a children's artist. They were then carefully arranged on the page to prevent guessing from juxtaposition.

The clinical value of spoken vocabulary tests is high. Some children are able and willing to cover the distal ear and repeat a list of words spoken at 10 ft. (3 m.) into the proximal ear, without further aid. If an assistant is available to sit by the child and check his responses, this test,

combined with the third cube test described below, provides a very convenient and rapid method of screening the everyday hearing of normal 5-year-old school entrants. It is noteworthy, however, that even the most intelligent of the 5-year-olds appear to enjoy the test and give a better performance when the pictures are presented, as if, like the babies, they still feel the need to reinforce their hearing of words by visual verification when they are isolated from context.

Since it is the speech sounds in the highest frequency ranges which usually provide the greatest difficulty, the quickest way to discover if the child has any impairment of hearing is to present the sheet representing the sixth list and ask him to point to the pictures. At first the whole 12 pictures in this set were used, but later six (seat, feet, ship, fish, pig, chick) with a two-word check were found to be sufficient. In any case of doubt the longer lists should be given. As before, E starts by sitting opposite C at 3 ft. (90 cm.) asking him to identify the pictures in turn. If C says "chair" or "bird," E replies, "yes, a seat"; or "chick." If C stumbles over any word he should be taken back at the end to this picture. If he still shows any hesitation, the vocabulary test should be discarded and the toy test presented instead. If C identifies all the pictures correctly, E retires to 10 ft. (3 m.) and, with his mouth hidden as before, delivers the list in the order given below.

In order to check discrimination for high-frequency consonants, a *third* variation of the *cube test* was evolved. C is given the cup containing eight cubes as before, two each of green, red, yellow, and blue. Beside the cup on the table is placed a card measuring approximately 8 by 12 in. (20 by 25 cm.) decorated with 12 brightly coloured squares, three each of the same four colours. C is told to stand sideways with one ear towards E and to cover the distal ear firmly with the palm of his hand, placing the fingers in the nape of the neck. He is then instructed to take out a brick as before and "put it on its own colour." This procedure not only adds to the interest of the test, it also acts as a visual distraction. Children of this age are quick to interpret any raising of the eyebrows or least movement of the head which E makes in delivering the sounds. If C shows the slightest lack of comprehension or confidence, the coloured card should be removed and the easier second cube test given instead. A fair indication of the child's probable school-room hearing for continuous speech, allowing for the quieter conditions of the examination, may be obtained by asking him to repeat a few of the sentences below, delivered in a quiet voice with mouth hidden at twice the distance of his seat from the teacher's desk.

Speech.—The spoken language of the normal 5-year-old is fluent and correct. A number of children, particularly boys, still show minor consonant substitutions, principally confusions of *th* and *f*, which are usually the last phonetic units to be differentiated, but occasionally of *s* and *t*, or of the *r*, *l*, *w*, *y* group. These minor immaturities of speech normally clear up before the age of 7 years. If they persist, audiometric assessment and speech therapy become imperative.

Specimen Vocabulary Lists

PICTURE TESTS

General: Shoe, horse, cart, seat, cup, frock, cat, bike, face, chick, fish, ship.
Vowels: House, coat, pin, book, cart, boy, horse, cat, pen, bike, cot, bear.
High Frequencies: Tree, chick, feet, leaf, fish, key, ship, teeth, pig, seat, dish, wheel.

SENTENCES

The father caught a bus. The baby slept in a cot.
The girl ate all the sweets. The boy has three big sisters.
The postman rang the bell. The driver stopped the train.
The teacher made a picture book. The wind blew away the nurse's cap.
The kitten climbed the Christmas tree. The new dog liked to sleep in chairs.

Summary

A series of simple clinical auditory screening tests which have been found useful in the preliminary assessment of the everyday hearing of very young or mentally handicapped children is described. The material required (common household objects—toys and pictures) is listed. A brief summary of normal speech development during the preschool years is given.

The work described in this report would not have been possible without the generous help of many colleagues and friends in hospitals, public health departments, and schools. It is impossible to name them all individually, but I wish particularly to acknowledge my debt to the consultants and members of the staff of the Cell Barnes Hospital, Great Ormond Street Hospital for Sick Children, and the audiology unit of the Royal National Throat, Nose and Ear Hospital who allowed me to work in the wards or observe in clinics; also to the Medical Officer of Health of London, Manchester, Cardiff, and Cornwall County Councils, who granted me facilities to try out the tests in day nurseries, occupation centres, and infant schools. Mr. M. R. Sheridan made helpful suggestions.

Arrangements are being made for distribution of the material described in this paper through the agency of the National Foundation for Educational Research, 79, Wimpole Street, W.1.

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The results of successive surveys of smoking habits show that a person's replies are fairly consistent with each other. This is one of the conclusions reported in *Research Papers No. 2* on "The Reliability of Statements about Smoking Habits," by G. F. Todd and J. T. Laws, issued by the Tobacco Manufacturers' Standing Committee. Successive inquiries showed that replies given in the course of interviews during 1946-9 overstated the amount smoked by about 11%, and in the years 1952-7 understated it by about 13%. A possible explanation for this given is that the earlier figures, although intended to refer to packeted cigarettes, referred also to hand-rolled cigarettes owing to ambiguity in the questions. After 1950 the report states that the figures suggest that informants had an inherent tendency to understate their consumption slightly. "On the other hand, since in most tables in the papers informants are classified into broad groups consisting of non-smokers of cigarettes and of smokers of 0-4, 5-14, 15-24, and 25 or more cigarettes a day, the percentage of smokers, particularly in view of the proportion smoking 10 or 20 cigarettes a day, likely to be classified wrongly even with a 15% error is negligible. For instance, if those who said they smoked 20 cigarettes a day in fact smoked 23 cigarettes day, they would still be placed in the same consumption category." An analysis of other figures showed, according to the report, that the number of cigarettes stated to have been smoked on the day before an interview can reasonably be recorded as the number likely to be normally smoked at that time.

PRESENT PLACE IN OBSTETRICS FOR FOETAL PHONOCARDIOGRAPHY AND ELECTROCARDIOGRAPHY WITH THE NEWER TECHNIQUES OF FOETAL ELECTROENCEPHALOGRAPHY AND MOVEMENT-RECORDING

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Foetal heart rate, rhythm, and waveform can be studied by phonocardiography and electrocardiography from the maternal abdominal surface. The present value of these instrumental observations in relation to foetal welfare and clinical obstetric practice is reviewed and the basic design features of the instruments employed for the survey are given.

The subject is divided into: (1) conditions determining the choice between the two methods of foetal heart recording; (2) recording techniques and description of the quantities measured; (3) principal applications; (4) details of apparatus; (5) examples of typical recordings and their interpretation; (6) other instrumental observations on the foetus; and (7) discussion of foetal distress and its treatment.

Choice of Method

Phonocardiography is the most suitable method for recording heart rate and rhythm and for estimating the systolic and diastolic time intervals. It is always practicable when the heart is audible with a stethoscope; it is impossible when the heart is inaudible to an experienced obstetrician or midwife listening in a quiet room. In some instances an active heart can be recorded when it has not been heard with certainty because of acoustic masking by uterine souffles, maternal heart sounds, or other foetal heart beats in a multiple pregnancy. In certain cases of severe foetal distress the heart sounds may be so uncharacteristic that they are not recognized as such, and then phonocardiography is helpful.

Electrocardiography has its field of usefulness when the heart cannot be heard. The technique is also possible, of course, in other cases, but it is then less convenient than using the phonocardiograph. Electrocardiography is possible in all patients from 16 weeks' gestation to term, with a few exceptions between 30 and 34 weeks, when some foetuses are totally covered with vernix caseosa, an electrical insulator (Wimmer, 1954).

Recording Techniques and Quantities Measured

Phonocardiography

The microphone must be firmly applied at the point on the abdomen where the heart can best be heard; it may need to be repositioned if the foetus moves.

Phonocardiography is not unduly disturbed by extraneous noises, but is very severely affected by the mother's speech or movement and by intestinal disturbances. While the recording is in progress, therefore, the patient is asked to lie still and quiet.

In our particular studies we have used devices which register the intensity of the first and second heart sounds and their time relationships, and we have paid little attention to the acoustic quality of the sounds—that is, to the

waveform. Many murmurs which are heard from the foetus disappear with the circulatory changes that occur at birth. The presence of high frequencies in the sounds depends not only on their production in the heart but also on the foetal position and the volume of surrounding maternal tissue and liquor amnii. Consequently, muffled sounds are not necessarily indicative of reduced cardiac output. Attempts to relate cardiac performance to sound levels must take account of relative movements between foetus and microphone, even for short-time changes in a particular patient. This we assumed to be too difficult, and limited our studies principally to time relationships. The measurement of systolic and diastolic times is of sufficient clinical value to justify phonocardiography in the labour ward, even if the more elaborate problems of sound analysis are omitted.



FIG. 1.—Foetal electrocardiograph in use.

Electrocardiography (Figs. 1 and 2)

The electrodes are formed by the two feet of a small metal box containing the pre-amplifier. These should rest firmly on the linea alba—for vertex presentations, one just above or below the umbilicus, and the other just above the pubic-hair line. A metal belt for the indifferent electrode is placed around the patient's waist between fundus and heart. Good contact is made under the belt and under the electrodes with "Cambridge" electrode jelly. The bladder should be empty. Other electrode positions are satisfactory but more influenced by maternal heart and muscle potentials.

Interference can be prevented when it arises from extraneous sources, but the recordings are disturbed by movements of the patient and by potential changes arising in organs other than the foetal heart. For this reason records of P and T waves are difficult to distinguish with certainty, but the QRS complex can be recorded faithfully in amplitude and duration. Maternal heart waveforms are usually also registered, but, since a maternal heart beat only occasionally coincides with a foetal one, the record is little impaired.

When clinical requirements necessitate a full foetal E.C.G. with P and T waves (for example, in cases of severe foetal distress or before caesarean section in a suspected cardiac abnormality), then intrauterine electrodes should be passed through the cervical canal, preferably after rupturing the membranes, and their positions, if necessary, ascertained by radiography.

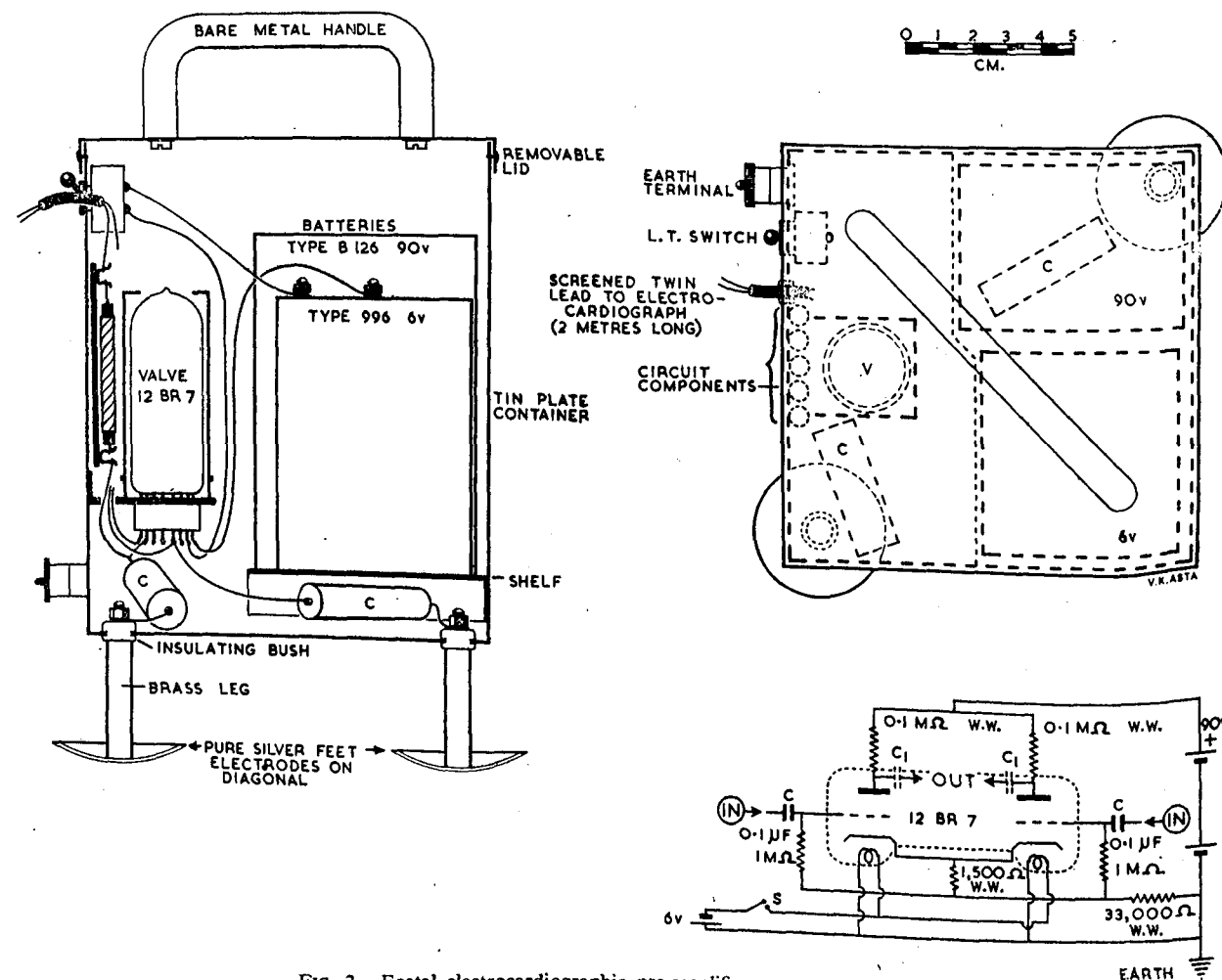
Applications

The principal uses of phonocardiography are: (1) to monitor the foetal heart in a sleeping or overanxious patient; (2) to check regularity of rhythm, and rate after version (success or failure), after surgical induction of labour, during oxytocin therapy, during the induction of anaesthesia, and during forceps application and traction; and (3) diagnosis of foetal distress.

With the aid of phonocardiography the effects of administering oxygen, taking pressure off the presenting part, relaxing the uterus, pressing upon the placental site, and inducing regular uterine contractions with oxytocin (to improve the foetal circulation) can be followed speedily. Measurement of the systolic and diastolic times by recording both heart

sounds enables a failing myocardium, or pulmonary stenosis, to be distinguished from impeded venous return, for the former lengthens the systolic time and the latter the diastolic time (Palmrich, 1951, 1952a, 1953).

Pressing the presenting part into the pelvis in patients with placenta praevia will slow the heart by lengthening



was delivered by caesarean section about an hour later. Unfortunately it was too severely injured by "intra-partum asphyxial changes" to survive for more than an hour. Occasional cases such as this illustrate that electrical diagnostic measures need to be backed up by quick decisions and prompt surgical service.

Foetal Distress in Pregnancy.—In one case irregularities of the foetal heart were recorded three weeks before the expected date of delivery. Braxton Hicks contractions and manual pressure on the abdominal surface produced marked slowing of the foetal heart. The QRS complex and the systolic times were normal, but the long diastolic times showed some impediment to foetal venous return. The effect was intermittent. The patient was advised to avoid tight clothes or pressure on the abdomen, and a frequent watch was kept on the heart until labour began at term. On delivery the cord was found to be twisted around the leg and compressed each time the knee was flexed.

Slowing of Heart Rate During Contractions.—In an example in early labour the heart was slowed by an increase in diastolic time only, demonstrating impaired venous return (Fig. 6).

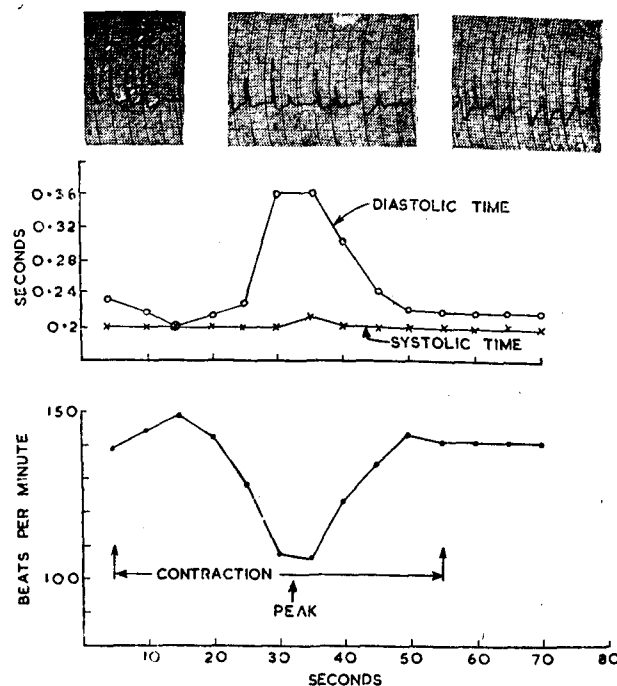


Fig. 6.—Slowing of heart during uterine contractions due to increase in diastolic time; impaired foetal venous return.

Electrocardiography

Forceps Delivery.—Fig. 7 shows changes in the foetal heart rate during forceps extraction. Such recordings can be used at the time to warn the surgeon of the effects on the foetus of the application of the forceps and traction.

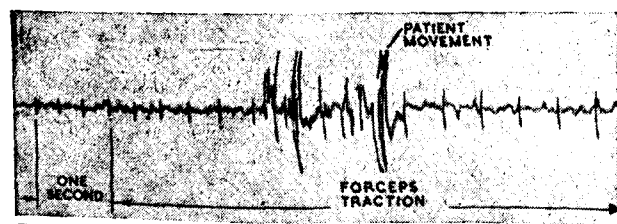


Fig. 7.—Electrocardiogram during forceps delivery. Note slowing of heart rate.

Diagnosis of Twins.—This was a suspected case of hydatidiform mole (18 weeks' gestation). The E.C.G. (Fig. 8A), however, gave a clear recording for twins, which were, in fact, aborted a week later.

Threatened Abortion.—Difficulty had been found in hearing the foetal heart with a stethoscope at 20 weeks' gestation. The E.C.G. (Fig. 8B) confirmed foetal life; the heart rate is within the normal range.

Moribund Foetus.—We have had cases in which the foetal heart was heard feebly until 15 minutes before delivery and then the foetus was born with slight signs of maceration.

Fig. 9 is an example of a foetal E.C.G. taken three days after the heart was last heard. On delivery by caesarean section one hour after the recording, the foetus was severely macerated, but the heart tissue was still normal. Clearly, the E.C.G. must not be accepted as evidence of foetal viability if the heart cannot be heard when, by reason of the length of gestation, it should be audible with a stethoscope. It is only fair to point out, however, that all cases in which this phenomenon has been observed have had a very abnormal heart rate—that is, above 300 beats per minute. The case recorded in Fig. 9

had at one time a rate of 700 beats per minute, and this was slowed to 350 before the section by administering digoxin to the mother. Another patient had a rate of 300 beats per minute. Presumably, in such extreme cases the heart is maintained in fibrillation nourished by blood circulated by the action of the uterine contractions on the placental-heart flow. The heart muscle fibrillates, with a high-speed circus movement, and has no substantial effect on the circulation. There is a state of morbid hypotension leading to peripheral maceration. N. J. Brown (1957, personal communication) states that in macerated foetuses he has occasionally found live blood cells in the heart and placenta when other organs were in an advanced state of decomposition.

After Termination of Pregnancy by Hysterotomy.—In two cases the entire conceptus was put into normal saline immediately after removal and the E.C.G. recorded until the foetus died. One was allowed to cool, while the other was oxygenated and maintained at constant temperature. Both cooling and oxygen lack reduced the heart rates.

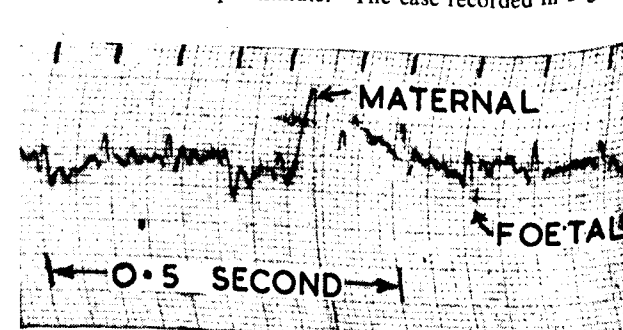


Fig. 8.—Electrocardiograms (electrodes on maternal abdomen) demonstrate foetal life. (A) Twin pregnancy in case of suspected hydatidiform mole, 18 weeks' gestation. (B) Case of threatened abortion at 20 weeks' gestation.

Fig. 9.—Foetal electrocardiogram three days after heart became inaudible and one hour before delivery of a severely macerated foetus.

Other Instrumental Observations on the Foetus

Recording of Foetal Movement

During the recordings of uterine contractions by abdominal tocodynamometry the slowly changing curve of uterine action is often disturbed by kicks and bodily foetal

movements causing sharp changes of pressure. Whether the foetus is attempting reflexly to remove the tocodynamometer, to jerk its way to a different presentation, or just exhibiting *joie-de-vivre*, is not clear, but the frequency of movements varies from perhaps 30 in half an hour to none at all. Some foetuses respond to finger pressure or flicks on the abdominal surface by kicking or moving, while others appear oblivious.

These findings have not been related to the condition of the baby at birth, but various theories concerning the possible loss of consciousness of the foetus during labour have been advanced; principally anoxia, analgesics, or compressive forces are blamed. Here we draw attention to the possible value of this investigation as a means of anticipating neonatal asphyxia, or

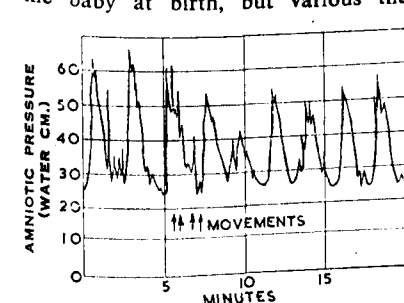


Fig. 10.—Recording of contractions showing foetal movements superimposed.

the need for additional care in searching for an unexpected onset of foetal distress.

Fig. 10 is an example of a tracing of uterine action during labour, which shows how readily foetal movements are recorded.

Foetal Electroencephalography

During foetal electrocardiography employing abdominal electrodes various potential variations are recorded in addition to those expected to arise from the heart. These are due to activity in the maternal bladder and other visceral organs, to arterial pulsation synchronous with the maternal heart and, it is thought, to the foetal brain. With vaginal electrodes there is an increase in the non-cardiac waveforms, and the recordings in some respects are not unlike electroencephalograms.

To investigate this, a portable two-channel Ediswan recorder (having a time-constant of 1 second) was borrowed. A few recordings were done, of which Fig. 11 is an example,

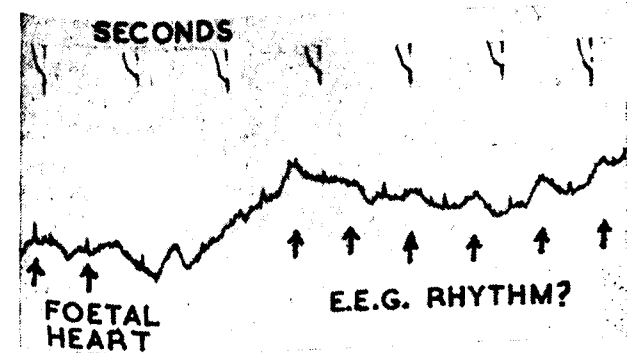


Fig. 11.—Presumed foetal electroencephalogram taken with intra-vaginal electrodes.

using pure silver, chlorided vaginal electrodes placed in the fornices. These recordings have been variously interpreted by experts in this country and France as 100% artifacts, doubtful, and undoubted evidence of gross anoxia. The subject has received more attention from Bernstein and Borkowski (1955, 1956).

Until the interpretation of the electroencephalogram of the newborn is well documented in relation to anoxia, head moulding, maturity, foetal movements *in utero*, and other factors, work on the foetus must be limited to improvements in technique and the collection of data for research analysis.

Foetal Distress

Clinical opinion holds that if an irregular heart improves with oxygen therapy prompt delivery is desirable, even necessary, because this is a sign of impaired oxygen transfer following placental separation or damage, and is unlikely to be relieved by relaxing pressure on the cord or placenta. This is a good working rule, but pressure on the cord or placenta can slow the heart, and, so long as the systolic time and the duration of the QRS complex remain normal, relaxation of uterine tone or repositioning of the foetus may relieve the distress; if the distress is severe, as in the case illustrated in Fig. 5, there is little time for these manoeuvres. If, however, the distress is slight and the uterine contractions are less frequent than one every five minutes, a weak oxytocin infusion will start a regular uterine rhythm, reduce the tone, and, by improving placental-foetal circulation, may relieve the foetal distress.

It would appear very probable that the first sign of anoxia is acceleration of the foetal heart, which can be slowed with oxygen; later there may be a dramatic slowing of the heart, and in such cases oxygen therapy will accelerate it. The first sign of impaired circulation caused by compression of the cord or placenta is undoubtedly a slowing of the foetal heart. Infection or pyrexia must also be considered as possible causes of a fast foetal heart. Hence the factors underlying a heart of abnormal rate need instrumental diagnostic tests. Thick meconium is an adverse prognostic sign, and its presence or absence ought to be determined in every case of foetal distress. For cases showing intermittent foetal heart irregularities, with slight distress, at the end of pregnancy, immediate delivery is not necessary. Such conditions, however, may suddenly become worse or better, and frequent monitoring of the heart is desirable, especially when the membranes rupture or labour begins.

Summary

Techniques for foetal phonocardiography, electrocardiography, electroencephalography, and movement-recording are described.

The fields of usefulness of the two methods of cardiology are defined, and the possible value of foetal electroencephalography and movement recording is discussed briefly.

Typical recordings are reproduced and discussed.

Observations on moribund foetuses increase our understanding of one manner of foetal death, and emphasize the danger of regarding the foetal electrocardiogram as conclusive evidence of foetal viability.

The differential diagnosis of foetal myocardial failure from impaired foetal venous return in cases of foetal distress is demonstrated.

Acknowledgments for financial assistance in this work are gratefully rendered to the Board of Governors of University College Hospital, to the Trustees of the Rockefeller Fund of University College Hospital Medical School, and to the Nuffield Foundation, who have supported this work in the years 1950 to 1958. Thanks are also due to Professor W. C. W. Nixon, who organized and encouraged the programme, and to the staff and students of the obstetric unit who have helped with the recordings and called our attention to cases suitable for studying the usefulness and limitations of these recording techniques.

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ADULT CHRONIC BRONCHITIS— CONTINUOUS ANTIBIOTIC THERAPY

BY

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The use of the broad-spectrum antibiotic in the treatment of chronic bronchitis has occasioned considerable interest in the recent past (*Lancet*, 1955; *B.M.J.*, 1957). Several trials employing drugs of this kind in the management of chronic or recurrent pulmonary infection have been carried out to determine the results which immediately follow such a prolonged course of treatment (Helm *et al.*, 1954, 1956; May and Oswald, 1956; Moyes and Kershaw, 1957). We have also reported our experience in such a controlled trial employing a double-blind technique using oxytetracycline (Edwards *et al.*, 1957). The antibiotic was used alone, or in combination with other agents, in the domiciliary management of patients with chronic bronchitis, and was given continuously during six winter months in 1955-6. We here describe the further progress of these patients to show the duration of the benefit which followed such a course of treatment, and to determine the frequency with which these courses require to be repeated.

In the original oxytetracycline trial, 66 patients were allotted to various treatment schedules by random selection, and of these 53 completed the six-months course of treatment. In the oxytetracycline series of 29 patients, 21 were improved and 8 showed no improvement. In the control group of 24 patients who completed the course of treatment, 7 were improved and 17 showed no real change. This represents a significant degree of improvement in the oxytetracycline-treated group as compared with the control series. In order to assess the fate of these patients, follow-up studies for a further period of 12 months were carried out on the 29 oxytetracycline-treated patients (Series 1) and 13 selected patients of the 24 controls (Series 2).

Further Follow-up

Series 1

Of the 29 oxytetracycline-treated patients who were to be followed up, those alternately numbered on the Trial Register continued therapy with oxytetracycline with or without a sulphonamide as in the first trial. The other alternate patients were now treated with blank control material exactly similar in appearance to the active substances which they had previously received. Thus the 29 patients were divided into group A and group B. Group A consisted of 14 patients who continued with the antibacterial substances for a total of 18 months' continuous therapy. Group B consisted of 15 patients who, after the initial six months' oxytetracycline treatment, continued under observation as controls on blank material for a further 12 months. When patients relapsed they were removed from the trial so that other antibiotic therapy could be given as required. All the patients followed up were seen monthly for review and assessment in accordance with the method we have described elsewhere.

The results of the assessments at the end of each six-monthly review period are shown in Table I. Each assess-

ment refers to the patient's condition at the end of the review period compared with that obtaining at the start of that period. No patient in group A on continuous therapy was known to have relapsed during any of the observation periods lasting through two winters and one summer from November, 1955, to April, 1957, and some patients even continued to improve during each observation period. In Group B, after six months' active therapy during the first winter followed by dummy control therapy for a further year, 7 patients relapsed during the period April to November, 1956, and another 4 relapsed in the succeeding winter. During the total period of follow-up, three patients were lost to the trial—namely, two who defaulted in the second six months of observation, although both were known to be well, and one who died from so-called "heart failure," no other information being available. These patients were all in group A, and have been shown as "exclusions." Comparison of the patients' conditions at the end of 18 months' observation with their condition at first entry into the trial in November, 1955, shows that all of the 11 remaining in group A on continuous therapy were improved, while there were no known relapses. In group B only 2 out of 15 patients were improved after 18 months' observation, but 11 had relapsed.

Series 2

From the 24 patients in the control group of the original trial who completed the first six months' observation, 13 had previously been selected for continued observation for another purpose. These 13 patients, who comprise Series 2, were treated continuously for a second period of six months from April to November, 1956, with the various agents (excluding oxytetracycline) used in the original investigation. On the anniversary of their entry into the trial, 6 of these patients chosen at random were given in addition oxytetracycline (group C), whilst the other 7 (group D) continued treatment as before. Apart from this change, groups C and D were comparable. These two groups were then observed for a further period of six months from November, 1956, to April, 1957.

Both groups had reacted in a similar fashion by the end of the first 12 months of observation. When the condition of these patients was assessed at the end of the second six-months review period and compared with the condition at the end of the original trial (Table II), 3 of the 6 in group C, and 3 of the 7 in group D, had relapsed, whilst none in either group showed any improvement. When the assessment was made at the end of the third six-months observation period and compared with the condition at the end of the previous review, 4 of the 6 patients in group C now receiving oxytetracycline were improved and 2 showed no real change. In group D, however, 3 patients had again relapsed, whilst the remaining 4 showed no real change. Comparing the situation at the end of this 18 months' observation with the condition at first entry to the trial, the relapse rate in those bronchitics not receiving oxytetracycline is considerably greater than in the treated group. In group C 4 patients were improved, whilst in group D none was improved and 4 were worse.

Time of Relapse

No patient in group A was known to have relapsed, but three patients have been excluded from further follow-up for reasons already stated. Of the 7 patients in group B who relapsed in the period April–November, 1956, one relapsed one month after stopping treatment, 4 after five months in September, and two in October, 1956, in the sixth month of the period. Of the 4 relapses in the next six months two occurred in November and one each in December and January. In group C 3 patients relapsed in the period April to November, 1956—one in August and the other two in October. Similarly, of the 3 relapses in group D, one also took place in August and two in October. Of the 3 further relapses in group D in the succeeding period,

one occurred in December and two in the following January. No patient in group C relapsed in the final six-months observation period while receiving oxytetracycline.

The time relationship of the total relapses in all of the groups is shown in Table III, where the exclusion of three patients from group A has been assumed to be due to relapses. This accounts for a loss or possible relapse rate of about 20%. In group B no relapses occurred whilst the patients were treated with oxytetracycline, but within six months of stopping the antibiotic about half of them had relapsed. Of those who remained under further observation, another 50% relapsed during the last half-yearly review period, making a total relapse rate of about 75% during the whole period of 18 months' observation. Of those patients treated without oxytetracycline (groups C and D), about one-third relapsed during the first six months' observation, whilst about a half relapsed in the second six months' review period. The group C patients were then

treated with oxytetracycline, and the relapse rate was reduced to zero, whilst in group D, whose treatment continued without oxytetracycline, a relapse rate of about 50% was maintained.

Over the whole 18-months period the relapse rate in group A appeared to be nil, although it is possible it may have been in the order of 20%; in group B it was 73%; in group C 83%, and in group D, after 18 months' observation without antibiotic therapy, all patients had suffered one or more severe exacerbations, producing a summated relapse rate of 114%.

Discussion

It has been shown that continuous oxytetracycline therapy throughout the six winter months produces statistically significant improvement in chronic bronchitis during the period of its use (Edwards *et al.*, 1957), and when given continuously for 12 to 18 months the improvement rate apparently

TABLE I.—The Results in Series 1 at End of Each Six-monthly Period as Compared with the Condition at End of Previous Period, and at End of 18 Months' Observation as Compared with the Start

Series 1 Treatment Groups	No. of Patients	Assessment Gradings	Assessment at End of Each 6 Months' Observation Period as Compared with Assessment at End of Previous Period			Assessment at April, 1957, as Compared with Condition at First Entry in Nov., 1955
			First Period: Nov., 1955, to April, 1956	Second Period: April, 1956, to Nov., 1956	Third Period: Nov., 1956, to April, 1957	
Group A: 18 months' continuous oxytetracycline therapy from Nov., 1955, to April, 1957	14	Improved No change Relapsed or worse Exclusions	11 3 — —	2 9 3 —	5 6 — —	11 — — 3
Group B: 6 months' oxytetracycline therapy (Nov., 1955–April, 1956), followed by 12 months' blank control therapy (April, 1956–April, 1957)	15	Improved No change Relapsed or worse Exclusions	10 5 — —	8 7 — —	4 4 — —	2 2 11 —

Note: All patients marked "Exclusion" or "Relapsed or Worse" are excluded from the subsequent assessments.

TABLE II.—Results in Series 2 at End of Each Six-monthly Period as Compared with Condition at End of Previous Period, and at End of 18 Months' Observation as Compared with the Start

Series 2 Treatment Groups	No. of Patients	Assessment Gradings	Assessment at End of Each 6 Months' Observation Period as Compared with Assessment at End of Previous Period			Assessment at April, 1957, as Compared with Condition at First Entry in Nov., 1955
			First Period: Nov., 1955, to April, 1956	Second Period: April, 1956, to Nov., 1956	Third Period: Nov., 1956, to April, 1957	
Group C: 12 months' continuous control therapy (Nov., 1955–Nov., 1956) followed by 6 months oxy- tetracycline (Nov., 1956, to April, 1957)	6	Improved No change Relapsed or worse Exclusions	1 3 2 —	— 3 3 —	4 2 — —	4 2 — —
Group D: 18 months' continuous control therapy without oxytetracy- cline from Nov., 1955, to April, 1957	7	Improved No change Relapsed or worse Exclusions	2 3 2 —	4 3 — —	4 3 — —	3 4 — —

TABLE III.—Showing Frequency and Periodicity of Bronchitis Relapses in Series 1 and 2

Observation Period	Series 1. Group A				Series 1. Group B				Series 2. Group C				Series 2. Group D			
	Nos. at Risk	Drug Regime	Nos. Relapsed	%	Nos. at Risk	Drug Regime	Nos. Relapsed	%	Nos. at Risk	Drug Regime	Nos. Relapsed	%	Nos. at Risk	Drug Regime	Nos. Relapsed	%
Nov., '55–April, '56	14	T	Nil	0%	15	T	Nil	0%	6	C	2	33%	7	C	2	29%
May, '56	14	T	2*	—	15	C	1	—	6	C	Nil	—	7	C	Nil	—
Aug., '56	12	T	Nil	—	14	C	4	—	6	C	Nil	—	7	C	Nil	—
Sept., '56	12	T	1*	—	10	C	2	—	6	C	2	—	7	C	2	—
Oct., '56	11	T	Nil	—	—	—	—	—	—	—	—	—	—	—	—	—
April, '56–Nov., '56	14	T	3*	21%	15	C	7	47%	6	C	3	50%	7	C	3	43%
Nov., '56	11	T	Nil	—	8	C	2	—	6	T	Nil	—	7	C	Nil	—
Dec., '56	11	T	Nil	—	5	C	1	—	6	T	Nil	—	7	C	2	—
Jan., '57	11	T	Nil	—	4	C	Nil	—	6	T	Nil	—	7	C	Nil	—
April, '57	11	T	Nil	—	—	—	—	—	—	—	—	—	—	—	—	—
Nov., '56–April, '57	11	T	Nil	0%	8	C	4	50%	6	T	Nil	0%	7	C	3	43%
April, '56–April, '57	14	T	3*	21%	15	C	11	73%	6	C & T	3	50%	7	C	6	86%
Nov., '55–April, '57	14	T	3*	21%	15	T & C	11	73%	6	C & T	5	83%	7	C	8	114%

* = Exclusions. T = Treatment with oxytetracycline. C = Treatment excluding oxytetracycline.

increases. Conversely, continuous drug therapy prevents relapse in bronchitis, and the longer the duration of therapy the more effective the preventive measure against relapse appears to be. It would seem that relapse in chronic bronchitis during the summer and autumn months is considerably reduced, if not entirely prevented, by continuous antibiotic therapy. Without such continued treatment about half of the bronchitics during a six-monthly review period may be expected to relapse, and this seems to occur irrespective of whether antibiotics were used continuously in the previous season or not. Once a severe exacerbation occurs, many bronchitics are often appreciably disabled for a long period unless the relapse is intensively treated with antibiotics. These appear to be adequately suppressive in controlling the effects of bronchial infection.

The suppressive action of oxytetracycline is apparently effective only during the period of its administration, and does not seem to prevent or even delay the appearance of relapse following its withdrawal. The relapse rates during six winter months from November to April in patients treated without antibiotics are but little different from those occurring in the months from April to November. However, 80% of all relapses observed in the four treatment groups appeared between September and February. This may well be related to the climatic and atmospheric changes associated with the onset of autumn, particularly in highly industrialized communities.

It would thus seem reasonable to initiate a six-months course of continuous broad-spectrum antibiotic therapy when the first significant relapse occurs. Since most of these relapses occur in the autumn and winter, such a course of treatment may well overcome the relapse itself and also prevent further deterioration during the winter months, when most bronchitics are mainly at risk. Also it may be anticipated that no further continuous antibiotic therapy may be required for about six months after completing this course of treatment. It would therefore seem that only one period of continuous prolonged treatment with oxytetracycline in a dosage of 0.5-1 g. daily for about six months—the actual duration depending on the time of starting the treatment—may be required to prevent incapacitating exacerbations and maintain many bronchitics in effective and useful employment throughout the whole year.

Comment has already been made concerning the expense of prolonged therapy with the tetracycline group of drugs for a period of six months. If a course of antibiotic treatment is started at the time of the first major relapse and continued for six to seven months, as may be required, the total cost to the National Health Service would be about £45-£55, and would be occasioned but once in each year. The arguments already adduced for suggesting that such a course of treatment with a seemingly expensive drug may in fact be an economy when other aspects of national expenditure—such as National Insurance benefit, the cost of a hospital bed, etc.—are considered, now have added significance.

No untoward difficulties or complications occurred in those patients on prolonged antibiotics; toxicity was minimal, significant drug resistance was not observed, and the development of bronchial or intestinal oxytetracycline-resistant coagulase-positive staphylococci and of monilia did not materially differ in any of the treated or control groups.

Summary

The results of an 18-months follow-up of 42 patients with chronic bronchitis, when treated with or without oxytetracycline for periods of varying duration, are presented.

Continuous and prolonged antibiotic therapy for one year or more not only prevents relapse in chronic bronchitis but increases the rate of improvement the longer the therapy is maintained.

Acute exacerbations of chronic bronchitis assume major proportions during the autumn and winter, particularly between September and February, when 80% of relapses tend to occur.

It is suggested that continuous therapy with oxytetracycline for one period of about six months in each year, to include the period of maximum relapse, may prevent exacerbations and maintain most bronchitics in effective and useful employment.

We acknowledge with thanks the considerable clinical assistance in the management and review of these patients we have received from Dr. A. R. Buckley, late senior registrar to the Leeds Chest Clinic. We are also grateful to Dr. G. B. Ludlam, of the Public Health Laboratory Service, and to Dr. H. T. Levi, of St. James's Hospital, Leeds, for the routine laboratory investigations they carried out. We are indebted to Messrs. May and Baker, Ltd., and Messrs. Pfizer, Ltd., for the generous supplies of "sulphatriad" and "terramycin SF" respectively, and the appropriate dummy controls. Part of the expenses involved in this work were defrayed by a grant from a Joint Research Fund administered by the British Tuberculosis Association in conjunction with the Association of Industrial Medical Officers.

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CARBON DIOXIDE POISONING

REPORT OF EIGHT CASES, WITH TWO DEATHS

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Although rarely reported, carbon dioxide poisoning is probably not so infrequent an occurrence. McNally (1937) states that it is one of the most commonly occurring of all gases, and is often the cause of death of persons entering caves, wells, and other low-lying or confined spaces. Smith and Cook (1948), on the other hand, state that death from carbon dioxide poisoning is very rare, and that cases so reported are nearly always due to other gases, such as carbon disulphide.

Deaths due to carbon dioxide poisoning are included in the rubric E894 of the *International Classification of Diseases, Injuries, and Causes of Death*, "Accidental Poisoning by Other Specified Gases and Vapours," and in 1955 17 males and one female died from this cause in England and Wales. These figures include deaths due to gases other than carbon dioxide, and it is not known how many of them were caused by carbon dioxide poisoning.

The following cases are reported to illustrate the occurrence of carbon dioxide poisoning as a hazard in the handling of ships' cargoes.

Early in March, 1956, a liner arrived at Penang with a cargo of onions. The particular hold had been loaded six days previously, and contained 5,000 bags of onions and a quantity of "jaggery" (a crude brown sugar obtained from the sap of palm trees). It was full to within 9 ft. (2.7 m.) of the deck. At about 1 p.m. the ship was boarded by labourers, who removed the hatch covers and opened the hatch. One entered the hold and collapsed as he was standing on the onions. Another went in to help him and also collapsed. Then the ship's doctor was sent for; he went

into the hold, followed by one of the ship's officers, and assisted him to lift the unconscious man who had first entered the hold. As he was doing so the doctor collapsed, and the ship's officer carried the man out. One of the ship's crew then went into the hold to assist, but he collapsed. Another ship's officer then entered with breathing apparatus, and brought out the doctor and the other unconscious men. The four men who had collapsed were then taken to hospital, where it was found that two of them were dead.

Four other labourers who had also entered the hold for short periods developed minor symptoms and were taken to hospital.

Estimates of the length of time that the men were lying in the hold varied considerably, but it seems that the doctor was lying there unconscious for about five minutes, and the others for variable periods up to about 15 minutes.

The first patient was admitted to hospital about an hour and a quarter after he had gone into the hold. On admission he was deeply comatose and having continuous convulsions. Breathing was stertorous, the pupils were non-reactive, the conjunctivae were injected, but there was no cyanosis. The pulse rate was 156 a minute, and the blood pressure 160/100 mm. Hg. He was immediately given continuous oxygen, and an injection of nikethamide was administered and, after about an hour, paraldehyde by injection to control the convulsions.

Spasms passed off after two hours, and the patient recovered consciousness about seven hours after admission. He was able to get up two days later, but complained of giddiness, which passed off after three days. He was discharged eight days after admission. Spectroscopic examination of his blood the day after admission showed no abnormal pigment.

The doctor was admitted about one and a half hours after he entered the hold. He was conscious on admission, but gave a history of loss of consciousness for about half an hour. He complained of headache and aching in the joints. The pulse rate was 100 and the blood pressure 114/80 mm. Hg. The conjunctivae were injected, but there was no cyanosis. He recovered rapidly and was discharged four days later.

The remaining four patients were admitted later in the day. They all stated that when they entered the hold they became giddy, and three of them complained also of pains in the legs and of pain and dryness of the throat. Only one showed any injection of the conjunctivae, and none showed cyanosis. They were all discharged after one or two days.

Post-mortem Examinations.—The bodies of the two men who died were brought to the mortuary and kept in the cold overnight. At the urgent request of the relatives, only an external examination was performed. Neither body had any sign of injury, but both showed marked injection of the conjunctivae, and cyanosis of the finger- and toe-nail beds and of the buccal mucosa. Death was certified as being due to carbon dioxide poisoning.

Analysis

An analysis of the gases present in the hold was carried out by the senior chemist about an hour and a half after the hold had been opened. He obtained an appreciable reaction for carbon dioxide in the hold, particularly beneath the deck; and on examining other holds in the ship, as yet unopened, he obtained a strong reaction. No other poisonous gases were detected. For three months following this accident, the department of chemistry carried out inspection on all ships carrying onions for unloading at Penang. Nineteen ships were inspected, and carbon dioxide was found in significant amounts in one instance, in which it appeared that the onions had come from the same source as those held responsible for the incident.

Later, experiments were carried out, using onions from the ship, and it was found that the atmosphere in a sealed

flask containing $\frac{1}{3}$ v/v of onions contained over 30% carbon dioxide after five days. It was not possible to give an accurate estimate of the quantity of carbon dioxide present in the hold, as a good deal had been dispersed by the time tests were made.

Discussion

The toxic action of carbon dioxide is twofold. By dilution of the air it reduces the oxygen tension, thus acting as a simple asphyxiant, and it also has a chemical action as a respiratory stimulant and narcotic. There is, however, a great deal of difference of opinion over what concentration of carbon dioxide will be fatal. Jacobs (1941) states that 25% of carbon dioxide is required for several hours to produce death, and cites an incident in Brooklyn in 1936 when several workers were asphyxiated in the hold of a ship in which solid carbon dioxide was used as a refrigerant. Owen (1935) gives a concentration of 10% as sufficient, or even 5% if the oxygen tension is lowered, but makes no mention of the time of exposure before death occurs. He describes an incident in which 13 men were poisoned in the hold of a ship which contained bags of grain of various sorts. Elkins (1950) mentions 10% as an intolerable concentration, and states that at higher levels coma and death result. He suggests that carbon dioxide acts primarily as a narcotic at very high concentrations. Peterson *et al.* (1923) give figures similar to those of Elkins.

Anselmo *et al.* (1951) describe an incident in which five persons were overcome with carbon dioxide in a well 4.75 metres deep. Two died, but in these cases carbon dioxide was not the immediate or the only cause of death. Analysis of the air in the well later showed a concentration of 12.5% carbon dioxide and 10.5% oxygen at a level of 1 metre above the surface of the water. In this case it is clear that the decreased oxygen tension would have some effect.

Although it was not possible to give any figure of the concentration of the carbon dioxide present in the hold in the incident described, it seems likely, from the rapidity of onset of unconsciousness and the speed with which death followed in the two cases, that the concentration of carbon dioxide must have been in the region of 25-30%, and this figure is supported by the subsequent experiments. Indeed, it is possible that at the lower levels, only a foot or so above the cargo, the concentration may have been somewhat higher, owing to the density of carbon dioxide in relation to the atmosphere. Elkins (1950) states that in order to reduce the oxygen tension to a fatal degree the vapour content must be about 50%. It is possible that the concentration of carbon dioxide at lower levels may have been of this order.

The symptoms displayed by these men accord well with descriptions given elsewhere. Owens describes symptoms of headache, giddiness, tinnitus, and loss of muscular power. He suggests that carbon dioxide has primarily a narcotic action, and mentions convulsions as being sometimes present. The symptoms described by Smith and Cook (1948) are similar; and the cases described by Anselmo *et al.* (1951) also gave symptoms of mental excitement and later giddiness, weakness, and headache.

The doctor subsequently described his experiences, and said that when he entered the hold he was aware that the atmosphere seemed to make breathing difficult, and that there was a fairly pungent smell. He had no pain or any warning signs, but became unconscious very rapidly.

Summary

An incident is described in which eight persons were poisoned by carbon dioxide. The mode of action of carbon dioxide as a poison, its rate of action, and the symptoms are discussed.

My thanks are due to Dr. R. A. Pallister, senior physician, General Hospital, Penang, for clinical details of the patients; to Mr. S. A. Baron, senior chemist, Penang, for details of the

investigations carried out by the department of chemistry; and to H.M. Coroner, Penang, for permission to see the report on the inquest.

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TRIAL OF DEQUALINIUM FOR SKIN INFECTIONS

BY

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Despite the many preparations now available for the treatment of infective skin conditions, none are universally acceptable. The older agents, particularly the heavy metals, will occasionally irritate or cause sensitization, and the dyes—though effective and still widely used—are cosmetically unattractive. Sulphonamides and penicillin, used locally on the skin, are particularly apt to sensitize, and on this account are avoided by dermatologists.

Although the modern polyvalent or "wide-spectrum" antibiotics are very efficient and rarely irritant, their dangerous influence on the adaptable staphylococcus raises new problems. The skin infections may be improved at the price of increasing the cadre of existing staphylococci and of subjecting the patient to a subsequent, and more serious, attack by the resistant strain thus created.

Antibiotics that are not generally used parenterally—such as neomycin, framycetin, tyrothricin—have been preferred for local applications. Even so, resistant strains are already developing to some of these and may well become more prevalent. This potential danger of outrunning the future supply of antibiotics suitable for skin treatment, and to which the staphylococcus remains sensitive, justifies the search for suitable alternatives. There are sufficient grounds, therefore, for assessing any new synthetic bacteriostatic agent which seems likely to fulfil the necessary criteria. Many such synthetic chemicals are widely used by surgeons for the sterilization of wounds, burns, grafts, and other abraded surfaces, but in these instances the problem of epidermal sensitivity is not of great importance and they are not all suitable for use on the skin itself.

The qualities required of such a preparation are: (1) freedom from irritant action, (2) a low rate of sensitization, (3) a wide range of bactericidal or bacterio-

static activity, (4) ease of application and cosmetic acceptability, and (5) cheapness. Monilicidal or fungicidal activity would be an additional advantage.

We have recently carried out a preliminary clinical investigation of a new preparation claimed to have a wide spectrum of activity against pyococcal organisms, *Candida albicans*, and some fungi. This substance, dequalinium (decamethylene bis-(4-aminoquinolalidium) chloride), is marketed by Allen and Hanburys Ltd. as "dequadin."

The wide antibacterial activity of dequalinium *in vitro* was reported by Babbs *et al.* (1956), who found that it inhibited the growth of all of 21 species of pathogenic bacteria tested, including Gram-positive, Gram-negative, penicillin-resistant, and acid-fast bacteria; and some fungi. In a concentration of 100 µg. per ml. at 20° C. it destroyed within one hour 99.99% of organisms in a suspension of *Staphylococcus aureus*. Its activity was not inhibited by serum.

The local antiseptic action was demonstrated by injecting dequalinium solutions intraperitoneally into mice half an hour after lethal doses of bacterial suspensions had been injected into the same site. When streptococci were used, a dose of 0.9 mg. of dequalinium per kg. of body weight protected all mice from death, and when staphylococci were used 4 mg. per kg. was fully effective.

Clinical reports of the use of dequalinium for its local antibacterial action have been published by Trotter (1956) and by Fowler and Jones (1957). The former used dequalinium chloride in gelatin sponge as a bacteriostatic and haemostatic dressing after dental extractions in over 900 patients, and found it effective in counteracting and preventing sepsis and promoting healing. Fowler and Jones used a powder containing dequalinium chloride 0.1% as a wound dressing in veterinary practice. The powder was applied topically to accidental and surgical wounds in over 100 animals and was effective in controlling infections due to the common bacterial contaminants occurring in infected wounds in animals.

Clinical Investigations

We have used dequalinium on 241 patients suffering from various skin conditions. Of these, seven defaulted, and 234 clinical trials were completed on the remaining 234, 20 of whom suffered from two separate conditions or took part in two separate trials. The preparations used were dequalinium cream, containing 0.4% dequalinium chloride, and dequalinium paint (propylene glycol base) containing 0.5% dequalinium chloride. Dequalinium lozenges were used in a few cases.

In order to satisfy ourselves of the absence of toxic or irritant effects on the human skin, we first used these preparations on 12 patients with acute or extensive epidermal damage—eczematous, bullous, and ecchymatous. No adverse effects were encountered after a minimum of two weeks' treatment, and it was therefore considered justifiable to continue with a full trial. The trial was conducted in three parts.

Range of Activity

First, we applied dequalinium to a wide variety of skin diseases in order to determine its range of activity. The results are shown in Table I.

124 trials were carried out, the preparation being used for a period of two weeks in most cases and from four to six weeks in paronychia and *Trichophyton rubrum* infections. Cure, or considerable improvement, resulted in 43

TABLE I.—Response of Various Conditions to Dequalinium

Diagnosis	Improved	Not Improved	Worsened
Pyococcal conditions:			
Impetigo	16	1	0
Folliculitis	5	3	0
Neonatal staphylococcal infection	22	2	2
	43	6	2
Mixed infective conditions of various types:			
Intertrigo	10	4	0
Angular cheilitis	2	1	0
Paronychia (chronic)	8	0	0
Infectious eczematoid dermatitis and infected eczema	7	3	0
	27	8	0
Tinea infections:			
Tinea cruris and T. pedis	6	1	0
Cattle ringworm	1	1	1*
Trichophyton rubrum infections	1	2	0
	8	4	1
Other conditions:			
Stomatitis (aphthous, erythema multiforme, etc.)	4	4	0
Eczema (not infected)	3	6	2*
Non-infective ulcers and non-infective bullae	3	2	1
	10	12	3

* Sensitization reactions.

out of 51 trials in staphylococcal skin infections of various sorts, usually within a week. Good results were also obtained in conditions of mixed aetiology in which staphylococcal or monilial infections played an important part. A small number of ringworm lesions were treated, and in 8 out of 13 cases these cleared or improved. It is accepted, of course, that cattle ringworm in particular tends to remit spontaneously. Various conditions not primarily due to infective causes responded indifferently.

Therapeutic Effects

In order to establish that the therapeutic effects obtained were due to the active agent itself and not merely to the

TABLE II.—Comparison of Dequalinium With Inert Base

Diagnosis	More Effective	No. Difference Between Dequalinium and Base	Base More Effective
Infective conditions (e.g., impetigo, folliculitis)	12	3	1
Mixed conditions (e.g., intertrigo, infected eczema)	5	2	0
Non-infective conditions (e.g., acne, psoriasis, eczema)	3	8	2

TABLE III.—Comparison of Dequalinium With Standard Treatment

Diagnosis	Better than Standard Treatment	Same as Standard Treatment	Inferior to Standard Treatment
A. Conditions in which dequalinium was as effective as, or more effective than, standard remedies			
Staphylococcal impetigo	8	7	1
Boils and folliculitis	1	2	2
Infected eczema and otitis externa	13	6	5
Angular cheilitis	2	0	1
Intertrigo	7	3	1
Chronic paronychia	5	3	0
	36	21	10
B. Conditions in which dequalinium was less effective than standard remedies			
Gravitational ulcers	3	4	5
Eczema	0	2	4
"Pustular bacterid"	0	0	3
	3	6	12

base or to spontaneous resolution, a second series of 36 patients were treated with both substances—that is, base and the base with dequalinium incorporated. Whenever possible, opposite sides were treated at random. Where this was not practicable the preparations were each used consecutively for a minimum period of five to seven days. The active preparation and the base were labelled and dispensed by the pharmacist or ward sister and applied "blind." The results are shown in Table II.

In addition, six cases of "idiopathic" black hairy tongue were treated (see below). There was a significant difference in the activity of the two preparations.

Table II shows that the preparations containing dequalinium, when used in conditions where infection was present, were more effective than the bases alone.

Finally, dequalinium cream or lotion was used in comparison with preparations normally used by us—for example, dyes, neomycin ointments, hydrocortisone, etc. The two preparations were again allocated to sides at random, wherever possible. Where similar lesions could not be treated concurrently, however, the preparations were used consecutively. The results are given in Table III.

Comment

In conditions of pyococcal origin the results were the equivalent of those obtained with antibiotics and dyes, but a particularly gratifying effect was noticed in cases of secondarily infected eczema and infective eczematoid dermatitis around the ears and in the body folds. On the hairy areas, the beard, and scalp the paint was especially useful.

We have not yet had enough experience of the routine treatment of dequalinium in ringworm infections to assess its comparative effect against standard remedies; further trials are proceeding.

A small group of six patients with idiopathic black hairy tongues were treated. They had all had much previous treatment and had suffered from the complaint for more than six months. A variety of organisms and yeasts had been cultured from the mouths. These were probably of secondary significance only. In two cases where dequalinium paint was applied thrice daily, there was no difference between it and the base; in four cases the patients noticed an improvement in the appearance and taste while using dequalinium, but in only two of these did complete clearance take place. The four patients still affected were then given dequalinium lozenges in addition; one of these improved. The condition is subject to curious irregular remissions, and no firm conclusions can yet be drawn.

Bacteriology

As this was primarily a clinical trial bacteriological results are not discussed in any detail. If the clinical efficacy of dequalinium is confirmed, properly controlled bacteriological trials should be conducted separately. There are certain material difficulties inherent in a combined assessment, particularly in skin infections. For instance, the *in vitro* behaviour of the staphylococcus under controlled conditions is frequently different from that *in vivo*; the effective local concentration of a bacteriostatic depends upon tissue exudates and immunological mechanisms, and the problem of superinfection change of staphylococcal type in hospital material must be allowed for. We did not attempt, therefore, to control the results of treatment bacteriologically. But routine swabs were taken from the skin before and during treatment in a number of cases, and it may be of interest to mention the results of these.

From the affected area of skin 65 swabs were taken before treatment. Routine cultures grew no organisms, or commensals only, in 14 cases. A coagulase-positive staphylococcus was grown in 27 cases. In 15 of these the culture was sterile at the end of the first week of treatment, and, in a further 3 cases each, at the end of two and four weeks respectively. In the remaining 6 cases a staphylococcus was

still present. In 10 cases of leg ulcers, various Gram-negative organisms were grown, and these cleared in only four cases. Beta-haemolytic streptococci were cultured in an insufficient number of cases to merit comment.

From these routine bacteriological findings it seems likely that, at any rate so far as the staphylococcus is concerned, the clinical improvement obtained in most cases is reflected in the results of routine cultures from the skin.

Findings

In general we found dequalinium to be non-irritant even when applied to mucous membranes and the skin of infants. However, three cases of allergic sensitization were encountered. One of these was to the base and two to the active ingredient. The latter showed positive patch tests to the active cream and no reaction to the bases applied alone. This figure of 1.2% is low enough to be acceptable in practice, but occasional cases of sensitization will probably arise, as with other antibiotic and antiseptic agents.

Our findings may be listed as follows.

1. *Impetigo*.—Dequalinium is a clean and useful agent in this condition, and it has the great advantage of not creating antibiotic-resistant strains of staphylococci. The paint is particularly valuable in impetigo of hairy areas.

2. *Staphylococcal Neonatal Infection*.—Dequalinium constitutes an effective and most useful application in all forms of neonatal sepsis.

3. *Intertrigo*.—This condition, in which monilial or pyococcal infection is an important factor, responds well to dequalinium. (It was also very effective in a case of monilial balanitis.)

4. *Paronychia*.—Chronic paronychia of pyogenic or monilial origin responded well. (In all cases advice about keeping the fingers dry was given in addition to treatment with dequalinium.)

5. It may be used with safety and success in conditions in which infection is present together with eczematous changes in the skin. It has no specific value in non-infective conditions, but the cream appears to be soothing and is pleasant to use. It may have some value as a prophylactic in such conditions as acute cheilopompholyx, eczematized ringworm of the feet, and eczema of the scalp, all of which are particularly prone to secondary infection.

Summary

A new antibacterial agent, dequalinium, has been used on 241 patients suffering from various skin conditions. In the form both of cream and of paint it was used alone, in comparison with the inert bases, and in comparison against standard routine measures of treatment.

Dequalinium was found to be of considerable value in pyococcal infections of the skin, notably impetigo and neonatal staphylococcal infections. It was also of considerable value in skin conditions in which pyococcal or monilial infection played a predominant part. It also appeared to be of value in tinea infections in a relatively small number of patients.

Non-infective conditions did not respond, but were not made worse.

Dequalinium appeared to be as effective as antibiotic preparations and dyes and is pleasant to use, colourless, and relatively cheap. No irritant or toxic properties were observed, and it can be used on the mucous membranes and on the skins of infants. However, three cases of sensitization occurred, an incidence of 1.2%. In one of these the base was responsible.

We believe dequalinium to be a useful valuable preparation against pyococcal and monilial infections of

the skin, and one that represents a welcome addition to dermatological therapy.

ADDENDUM.—Since writing this paper we have been supplied with a quantity of dequalinium cream containing 0.5% prednisolone. Some 37 cases of atopic eczema, pruritus ani et vulvi, intertrigo, and neurodermatitis have been treated with this preparation. This prednisolone-dequalinium mixture showed a superior effect to the plain dequalinium cream, when used in these states, where itching and reflex rubbing are very pronounced. There were no failures in this short series, nor was any sensitization seen.

We are grateful to Drs. G. R. Boyes and L. L. Banks for their help; to Messrs. Allen and Hanburys Ltd. for supplies of dequadin cream and paint; and to Dr. C. L. Greenbury for his interest and advice.

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SIZE OF THE ADRENALS IN JAMAICANS

BY

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Not only does the pattern of disease in Jamaica differ from that encountered in Europe but the response of the Jamaican to shock is poor. Because a difference in endocrine make-up may be concerned, the weight of the adrenal glands in the Jamaican was compared with that of the European.

Variations in total adrenal gland weight may be due to cortex or medulla or both, and for this reason the weight of both components was estimated in 10 glands covering the full range of gland weights. In 20 more glands the cortical thickness was measured.

Materials and Methods

The adrenal glands from 105 (67 male and 38 female) adult Jamaicans of all racial groups were examined. The glands, obtained from routine necropsies, included material from 10 male cases of sudden and usually violent death.

The glands were dissected clean of fat and connective tissue, blotted dry with filter paper, and immediately weighed in grammes to two places of decimals on an analytical balance before fixation in 10% formol-saline solution. Ten of the glands, covering the whole range of weights, were selected and the cortical and medullary masses estimated by a modification of the methods of Swinyard (1940) and Allbrook (1956). Frozen sections were cut at intervals of 2 mm. and the unstained sections projected at eight diameters enlargement on to photographic paper. The photographic enlargements were cut out and the cortical and medullary components weighed separately to give a ratio. From this ratio and the weight of the whole gland the cortical and medullary weights were calculated.

In 20 more glands the thickness of the cortex was measured by means of a micrometer eyepiece. Each gland was divided by three parallel cuts made lengthwise. Frozen sections were cut from three of the surfaces and four different fields measured on each section, giving 12 measurements of cortical thickness in each gland.

Observations

The average weight of the paired adrenal glands from 105 adult Jamaicans was 8.58 g. (4.55 to 14.14 g.). The average of the 67 males was 8.78 g. (4.55 to 13.94 g.) and of the 38 females 8.22 g. (5.08 to 14.14 g.). In the 10 male cases of sudden and usually violent death the average paired adrenal gland weight was 7.33 g. (5.40 to 10.38 g.).

The average paired adrenal gland weight of 46 normotensive males was 8.59 g. (4.55 to 13.82 g.), of 21 hypertensive males 9.21 g. (4.58 to 13.94 g.), of 22 normotensive females 8.10 g. (5.13 to 14.14 g.), and of 16 hypertensive females 8.39 g. (5.08 to 13.35 g.). The paired adrenal gland weight was independent of the body weight (Fig. 1).

The cortical weight, but not the medullary weight, was directly proportional to the adrenal weight (Fig. 2). The average cortical thickness as measured in 20 glands was 1.13 mm. (0.85 to 1.80 mm.).

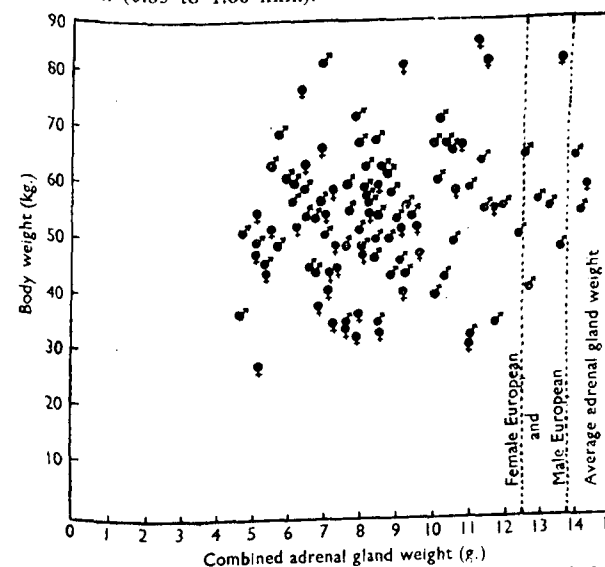


FIG. 1.—Combined adrenal gland weight in Jamaicans is independent of the body weight, and in most instances is less than the European average combined adrenal gland weight.

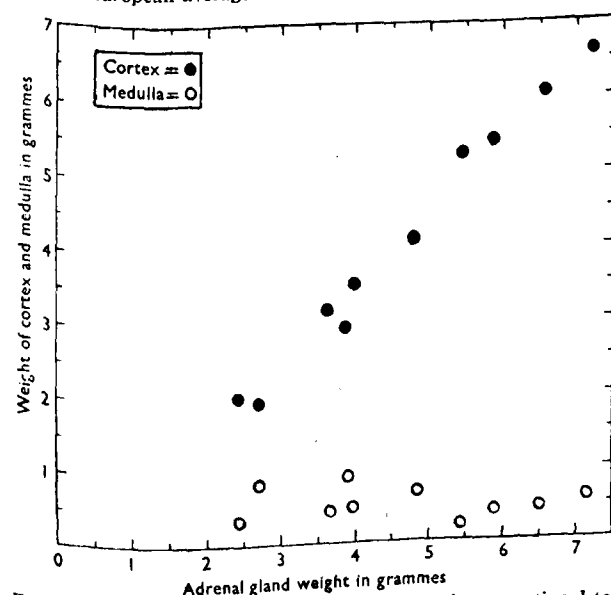


FIG. 2.—Cortical but not the medullary weight is proportional to the total adrenal gland weight.

Discussion

The average combined adrenal weight in the Jamaican male (8.78 g.) was less than that in the European male (13.82 g.) (see Table) and the difference was statistically

significant (observed difference was 15.0 times the standard error). In the Jamaican female it was 8.22 g. and in the European female 12.66 g., and the difference was also statistically significant (observed difference was 11.16 times the standard error).

Average Combined Adrenal Gland Weights in Europeans and Jamaicans

	No.	Average Combined Adrenal Gland Weight	σ
European males (Roessle and Roulet, 1932)	328	13.82 g.	± 2.80
European females (Roessle and Roulet, 1932)	277	12.66 g.	± 2.90
Jamaican males	67	8.78 g.	± 2.43
Jamaican females	38	8.22 g.	± 2.18

Since the cortical but not the medullary weight was directly proportional to the adrenal weight (Fig. 2), the smaller adrenals in the Jamaican are almost certainly due to a reduction in the all-important cortical mass. This was not an unexpected finding, since the majority of Jamaicans are of African or mixed African and Caucasian descent, and Swinyard (1940) and Allbrook (1956) have demonstrated a smaller cortical mass in the African than in the Caucasian.

Further evidence of a reduced cortical mass in the Jamaican was obtained by measuring the cortical thickness. Only one report of cortical thickness for purposes of comparison could be found. Goldzieher (1946) gives figures of 2.1 to 2.5 mm. These measurements were made presumably on glands from subjects of Caucasian descent. In our material the average cortical width in 20 glands was only 1.13 mm. (0.85 to 1.80 mm.).

No general agreement exists on whether the adrenal glands in the male are heavier than in the female. Roessle and Roulet (1932), in a large series, found that they were, but Swinyard (1940), in a small series, found the adrenal glands in the female were larger in both the white and negro races. Goldzieher (1946) thought the male glands were larger, but Dawson (1956) found no difference. In the present series the slight increase in the male as compared with the female average was statistically inconclusive.

Enlargement of the adrenal glands has been described in a number of conditions, including hypertension (Dawson, 1956). In Jamaican hypertensive cases the average adrenal weight was higher than in the normotensive cases (9.21 g. to 8.59 g. in the male and 8.39 g. to 8.10 g. in the female), although the difference was statistically inconclusive. These values are far below the corresponding figures given for European hypertensive cases by Dawson (1956).

Biochemists investigating steroid metabolism have noticed that the endocrine pattern of Africans differs from that of Europeans. Barnicot and Wolffson (1952) report that the mean 24-hour urinary 17-ketosteroid excretion in Africans is about half that of Europeans and that this finding applies to Africans living in London as well as to those in Nigeria. Friedmann (1954) has found a similar low excretion in Southern India. It has not yet been possible to estimate steroid excretion in Jamaica, but Thorn tests carried out on 18 patients taken at random from the surgical wards suggest a functional adrenocortical deficiency (Keating and A. Bras, 1957, unpublished data). Circulatory insufficiency during and after surgery which responds to cortisone treatment is fairly common here (Keating, 1956), and it would appear that an inadequate adrenocortical reserve may well be usual in Jamaican coloured patients.

What part a small adrenal cortical mass plays in the different pattern of disease in the Jamaican as compared with the European can only be a matter of conjecture, since so many variables are involved. Nevertheless it is of interest that in Jamaica a high proportion of renal as opposed to essential hypertension is encountered, that myocardial infarction is relatively rare, and that polyarteritis nodosa is practically unknown. Also, a different or rather exaggerated response

to injury is suggested by the frequency of keloids and by a curious dissociation between peptic ulceration, which is common enough, and perforation, which is unusual.

Summary

The adrenal glands in Jamaicans are smaller than in Europeans.

This reduction in size is probably due to a reduced cortical mass.

It is suggested that this reduced cortical mass is concerned in the poor response to shock reported in Jamaicans and others of African descent. It may also play some part in the different pattern of disease encountered in Jamaica.

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CONVERSION TESTING OF SCHOOLCHILDREN AFTER B.C.G. VACCINATION

BY

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In the absence of a specific test to measure resistance after B.C.G. vaccination, tuberculin conversion is generally accepted as the criterion of successful vaccination. The consistently high level of conversion produced by the Danish fresh B.C.G. in this country has raised the question whether testing after vaccination is necessary. The nurse, who may be exposed to repeated and heavy tuberculous infection, can legitimately expect a conversion test to confirm the success of her vaccination; this applies equally to other contacts. But where mass vaccination is given to individuals not at special risk there is not the same necessity for individual testing, provided that a vaccine is used which is known consistently to produce a satisfactory conversion rate.

In 1954 the medical officers of health of the nine local health authorities in the Oxford Region* organized a joint scheme for recording and analysing the results of the vaccination of 13-year-old schoolchildren; the object of the scheme was to find out whether the conversion rate was high enough to warrant dispensing with the conversion test in schoolchildren.

*Dr. T. Anderson (Oxfordshire County Council), Dr. G. F. Bramley (Gloucestershire County Council), Dr. E. C. H. Huddy (Berkshire County Council), Dr. E. Hughes (Reading County Borough Council), Dr. C. D. L. Lycett (Wiltshire County Council), Dr. C. G. Payton (Northampton County Borough Council), Dr. C. M. Smith (Northamptonshire County Council), Dr. G. W. H. Townsend (Buckinghamshire County Council), Dr. J. F. Warin (Oxford County Borough Council).

Standardization of Procedure

Only non-contact schoolchildren were included in the scheme; contacts were referred to the appropriate chest physician. One test only was used for prevaccination- and conversion-testing; in five areas the single test was a Mantoux 10 T.U., and in the other four it was the Heaf test. Tuberculin-testing and vaccination was carried out at the appropriate school or clinic.

At the first session the child was given either a Mantoux 10 T.U. or a Heaf test on the left forearm; the standard preparations of P.P.D. issued by the Ministry for each test were used. The second session was held two to four days later, when the test was read; the criterion for a positive Mantoux was 6 mm. of induration and over. Negative reactors were vaccinated intracutaneously with 0.1 ml. Danish fresh vaccine (0.75 mg./ml.). The third session was held not earlier than four weeks after vaccination, and the test used at the first session was repeated on the right forearm. The fourth session was held two to four days later, when the test was read and the vaccination reaction inspected.

The results were recorded on a special card which was coded at the Regional Records Department and punched on Powers-Samas cards. Only those record cards which showed that this standard procedure had been followed throughout were classified as valid for statistical analysis.

School Year, 1954-5

This year was spent in getting the scheme started. School medical officers were learning the technique of vaccination, while the medical officers of health were enlisting the aid of headmasters and obtaining consent from parents. Seven of the areas began vaccinating during the year, but two did not start until the following school year. Buckinghamshire County Council was unable to carry out conversion testing throughout, owing to staff shortages; figures from this area have therefore been omitted. The results for 1954-5 from the six areas are given in Table I, but in view of the many growing pains the results from this year are excluded from the final analysis.

TABLE I.—Vaccination Results for the School Year 1954-5

	Mantoux 10 T.U.	Heaf Test
Number of B.C.G. vaccinations	2,610	634
.. validly tested for conversion	2,387	632
.. of positive reactors	2,139	624
.. of negative reactors	248	8
Conversion rate	89.6%	98.7%

School Year 1955-6

This year saw the scheme in full operation, and it was hoped to reach a conclusion by the end of the summer term. Unfortunately the Ministry reported that the P.P.D. issued for Mantoux testing had been found to be substandard; this defect was observed in the autumn of 1955 and was rectified in April, 1956. The P.P.D. for the Heaf test was not affected. In consequence, although the Heaf test conversion rate of 98.1% was reliable, the Mantoux conversion rate of 94.7% had to be regarded as unreliable; it was therefore decided to continue the scheme for a further year. The results for 1955-6 are given in Table II.

TABLE II.—Vaccination Results for the School Year 1955-6

	Mantoux 10 T.U.	Heaf Test
Number of B.C.G. vaccinations	5,352	3,034
.. validly tested for conversion	4,756	2,869
.. of positive reactors	4,504	2,814
.. of negative reactors	252	55
Conversion rate	94.7%	98.1%

School Year 1956-7

No further troubles occurred during this year. Forty different batches of vaccine were used and valid conversion

tests were done on 10,422 schoolchildren. The results for 1956-7 are given in Table III.

TABLE III.—Vaccination Results for the School Year 1956-7

	Mantoux 10 T.U.	Heaf Test
Number of B.C.G. vaccinations	6,917	4,867
.. validly tested for conversion	5,676	4,746
.. of positive reactors	5,471	4,647
.. of negative reactors	205	99
Conversion rate	96.4%	97.9%

Discussion

It is generally held that a conversion rate of 95% to a Mantoux 10 T.U. is adequate. The Medical Research Council's current tuberculosis vaccines clinical trial found that a conversion rate of 85.8% to a Mantoux 3 T.U. P.P.D. produced protection.¹ The Tuberculosis Research Office of the World Health Organization gives figures showing the correlation between the Mantoux 3 T.U. and 10 T.U. after vaccination. In a group of 262 vaccinated persons, 235 were positive (6 mm. and over) to a Mantoux 3 T.U.; all except one of the negative reactors were given a Mantoux 10 T.U., and a further 23 became positive.² This suggests that 10 T.U. will discover about 10% more positive reactors after vaccination than 3 T.U. If a conversion rate of 85.8% to 3 T.U. produces protection a conversion rate of 94.4% (85.8+10%) to 10 T.U. should theoretically be adequate. This line of reasoning is admittedly tenuous, but it does give some grounds for accepting 95% as the criterion of satisfactory conversion to a Mantoux 10 T.U.

As the conversion rate to a Mantoux 10 T.U. was 96.4% and to a Heaf test 97.9% using 40 different batches of vaccine, it was decided that the conversion testing of non-contact 13-year-old schoolchildren is unnecessary.

Summary

A trial was carried out in the local health authority areas of the Oxford Region to determine whether conversion-testing after B.C.G. vaccination of non-contact 13-year-old schoolchildren is necessary.

The conversion rate of 5,676 children to a Mantoux 10 T.U. P.P.D. was 96.4%.

The conversion rate of 4,746 children to a Heaf test P.P.D. was 97.9%.

Conversion-testing of non-contact 13-year-old children is unnecessary.

I should like to thank the Medical Research Council for grants made to me, the Oxford Regional Hospital Board for the facilities they afforded me, and the Regional Records Department for coding and analysing the results.

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² Guld, J., *Bull. Wild Hlth Org.*, 1957, 17, 230.

POSTSCRIPT.—The conclusion reached by this trial was accepted by the Ministry and has been incorporated in Memo 322/BCG (Revised 1958). The introduction of Glaxo freeze-dried B.C.G. has created a new problem, as it is desirable that laboratory control should be supplemented by clinical control on a sample of each batch. The Ministry has therefore requested the personnel of this trial to form a B.C.G. Control Centre at Oxford for this purpose. The Control Centre will make clinical observations on the conversion rate and the local reactions to vaccination.

The United States Council on Library Resources has awarded a grant of \$73,800 to the National Library of Medicine, Washington, for the purpose of setting up and administering a research project on methods of improving bibliographical services through the use of mechanical equipment. The aim is to improve the efficiency of publication of comprehensive periodical indexes in broad subject fields. If successful, the methods will be used to produce the *Current List of Medical Literature*.

TUBERCULOUS MENINGITIS FOLLOWING B.C.G. VACCINATION

BY

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It is well recognized that B.C.G. vaccination may frequently be followed by complications due to the strain of organism in the vaccine. Such complications are usually limited to adenitis with or without supuration and ulceration (Ministry of Health, 1958). In a few instances of tuberculosis developing after B.C.G. vaccine administration, it is the resulting immune process that has been overwhelmed by subsequent infection with virulent strains of mycobacteria. Miliary and meningeal forms of tuberculosis following B.C.G. vaccination are thought to be rare. This report is concerned with the development of tuberculous meningitis in a baby nine months after B.C.G. vaccination.

Case History

The patient was a baby girl of 11 months whose parents were known to suffer from pulmonary tuberculosis. She did not react to tuberculin, and on June 29, 1956, was given B.C.G. vaccine. When retested eight weeks later the tuberculin reaction had converted, giving an area of induration of 9 mm. and erythema of 12 mm. with O.T. 1:1,000. On April 1, 1957, over nine months after receiving B.C.G. vaccine, the baby was admitted to the meningitis unit, King's Cross Hospital. She had become ill eight days previously with listlessness, anorexia, vomiting, and insomnia. Loss of weight had been noticed, and immediately prior to admission the baby had become rigid.

On examination she was pale, irritable, slightly dehydrated, and had a high-pitched meningeal cry. Abnormal clinical findings were confined to the central nervous system. Signs of meningeal irritation were present with a moderate degree of cervical rigidity and Kernig's sign. The baby when disturbed was extremely irritable. There was no motor or sensory loss and cranial nerves were intact. Examination of optic fundi showed no papilloedema, and choroidal tubercles were not seen. Cerebrospinal fluid: pressure increased; cells, 230 per c.mm. (polymorphs 40%, lymphocytes 60%); protein, 180 mg. per 100 ml.; sugar, 7 mg. per 100 ml.; microscopic examination of the spider-web clot showed scanty acid-fast bacilli. Lung fields were normal on x-ray examination. Mantoux reaction: positive with dilution of 1:10,000 O.T. Blood leucocyte count, 17,000 per c.mm. (polymorphs 80%).

Treatment and Progress

Streptomycin, 0.05 g., was given intrathecally daily for seven days and 0.5 g. intramuscularly daily for 28 days. Isoniazid, 0.1 g., and para-aminosalicylic acid (P.A.S.), 2.5 g., were given daily by the oral route for a period of six months. The child's condition improved steadily and her temperature fell to within normal limits after one week. Signs of meningeal irritation disappeared. The cerebrospinal fluid examinations indicated a gradual return to normal levels. After four months the cell count was fewer than 10 cells per c.mm., and after six months the protein was less than 40 mg. per 100 ml. and the sugar content more than 45 mg. per 100 ml. No complications developed, and the baby was discharged from hospital in February, 1958, 10 months after admission. At the time of discharge she appeared to have made a complete recovery and was attempting speech and almost walking unaided.

Epidemiology

Some years before, in another area, the mother was found to have pulmonary tuberculosis and had two 90-day courses of streptomycin and P.A.S. Later, in August, 1952, typical acid-fast bacilli were demonstrated in sputum specimens on two occasions, but no further specimens have yielded acid-fast bacilli. The sensitivity patterns of the strain are not known, since the organism was not grown on culture. The father also was found to have a pulmonary lesion believed to be inactive, though it was still being observed at three-monthly intervals. The only other member of the family in the home, a brother of 19 years, had a lung cavity demonstrated radiologically in 1956, but at no time have acid-fast bacilli been observed or isolated from sputum specimens. The appearance of this lesion is improving on combined streptomycin and isoniazid therapy.

The source of infection of the child is not known for certain. A possible sequence of events is that the brother may have been infected from the mother, and he, in turn, may have infected his sister, since he had probably the most active disease in the family at the time of the baby's infection. Until the patient became ill, the family of four resided in a caravan which, however commodious in itself, was a "single apartment." Since three members of the family had evidence of tuberculosis the ready transference of infection is understandable.

Bacteriology

Isolation.—Paired Löwenstein-Jensen slopes inoculated with spider-web clot and deposit from two specimens of cerebrospinal fluid yielded innumerable discrete colonies after 26 days' incubation. Although it was noted at the time that the colonies tended to appear less craggy and dry than the typical human variety, they were not considered to be bovine in origin.

Sensitivity Pattern.—The strain was sensitive to 10 µg. of streptomycin per ml., 0.2 µg. of P.A.S. per ml., and 0.2 µg. of isoniazid per ml.

Virulence: Catalase Test.—The method used differed from that recommended by Middlebrook *et al.* (1954) in that individual colonies were selected and transferred to tubes containing equal quantities of 20-volume H₂O₂ and 10% "tween 80" solution. Control tubes containing a comparable inoculum of the H₃₇Rv variety of *Mycobacterium tuberculosis* and a selection of recently isolated strains including atypical mycobacteria allowed of a comparison of the enzyme activity to be made. The time of appearance and the amount of oxygen liberated, shown by the bubbles at the surface with the strain under investigation, were similar to that of H₃₇Rv and recently isolated virulent strains.

Animal Inoculation.—Various weighed inocula, 0.1–0.5 mg. of the test strain, were injected intraperitoneally and intramuscularly into four guinea-pigs. Examination at necropsy six to eight weeks later showed progressive generalized tuberculosis. Typical acid-fast bacilli were demonstrated in the spleen, liver, and lung, and, in addition, after intramuscular inoculation caseous lymph nodes were observed in inguinal, lumbar, and tracheo-bronchial sites. Typical cultures were isolated from such lesions. Following intravenous injection the strain did not produce progressive tuberculosis in a rabbit.

Summary

A case of tuberculous meningitis is described occurring in an 11-months-old baby who had been given B.C.G. vaccine nine months previously. The infecting organism was shown to be a virulent strain of *Mycobacterium tuberculosis* of the human variety.

Our thanks are due to Dr. W. H. Findlay, area chest physician, Perth, for details of the medical history of the family.

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HYPOPROTEINAEMIA AFTER PARTIAL GASTRECTOMY CORRECTED BY GLUTEN-FREE DIET

BY

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The nutritional disturbances following partial (Polya) gastrectomy are usually produced by defective absorption of iron, fat, and the vitamin-B complex (Wollaeger, Comfort, and Weir, 1946; Welbourn, Hughes, and Wells, 1951; Wells and MacPhee, 1954), and although nitrogen absorption is sometimes impaired, this rarely produces hypoproteinaemia (Wollaeger *et al.*, 1946). The deficiency of iron and vitamins may be corrected by giving large doses of these substances either by mouth or parenterally, but in order to correct serious deficiency states the Polya may have to be converted to a Billroth I gastrectomy, in which the blind loop is undone (Bruce, 1955).

It has been established that in most cases of idiopathic steatorrhoea the defective fat absorption is induced by gluten, and that after removal of gluten from the diet fat absorption returns to normal (French, Hawkins, and Smith, 1957). In addition it has been shown that a gluten-free diet corrects the associated faulty absorption of vitamins, minerals (French *et al.*, 1957), and nitrogen (McIver, 1952; Forshaw, 1957). There would appear to be no reason to expect that gluten could be responsible for the malabsorption following partial gastrectomy, and there have been no reports of the trial of a gluten-free diet in such cases.

The purpose of the present report is to describe the beneficial effect of a gluten-free diet in a patient in whom a low plasma albumin level producing oedema followed a partial gastrectomy; and to emphasize that severe impairment of nitrogen absorption may rarely occur without any apparent disturbance of fat and iron absorption.

Case Report

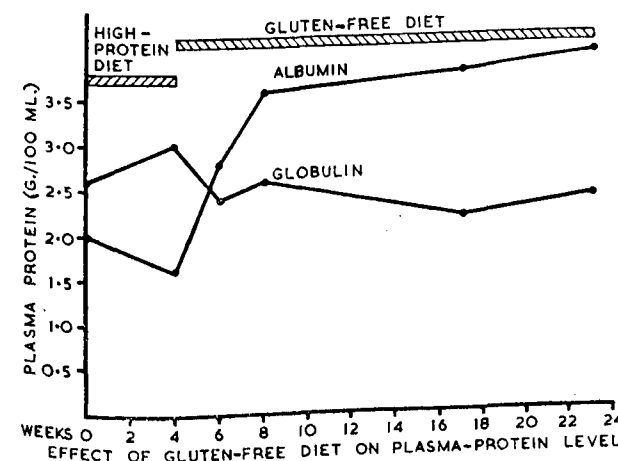
A man aged 47 was admitted to hospital in October, 1957. He had had a Polya gastrectomy for a duodenal ulcer five years previously. Following the operation he developed attacks of sweating and flushing of the face immediately after food, but otherwise his condition had been satisfactory for four years; he then developed diarrhoea and continued to pass between four and eight pale loose motions daily. During the past three months his mouth and tongue had been sore, and three weeks before admission he developed swelling of both feet and legs and a rash on the legs and abdomen. He thought that he had lost a small amount of weight since the partial gastrectomy, but his weight at the time of operation had not been recorded. There was no history of any significant previous illnesses.

On examination severe glossitis, cheilosis, and angular stomatitis were present. Both feet and legs were moderately swollen, and there was a patchy excoriated erythematous rash on the legs and abdomen. There were no abnormal neurological signs. His weight was 7 st. 2 lb. (45.4 kg.).

Investigations.—Radiographs of the chest and long bones were normal. Radiological examination of the gastrointestinal tract showed that the stoma functioned normally and there was no evidence of stomal ulceration; there was no flocculation of barium in the small intestine, and the barium had been completely evacuated from the bowel

within 24 hours. Barium-enema radiographs showed no evidence of a fistula between the colon and the stomach or small intestine. The blood picture was normal: haemoglobin, 13 g. per 100 ml.; plasma proteins, 4.6 g. (albumin 2 g., globulin 2.6 g.; electrophoresis of globulin, normal); serum calcium, 8.1 mg.; serum sodium, 345 mg.; serum potassium, 18 mg.; serum iron, 105 µg.; serum bilirubin, 0.4 mg.; serum alkaline phosphatase, 8 King-Armstrong units; serum amylase, 120 units; and thymol turbidity, 2 units per 100 ml. Urea clearance test was 60% of average normal and urine normal. The glucose-tolerance curve showed a rise of the blood-sugar level to 180 mg. per 100 ml. half an hour after 50 g. of glucose and then a fall to 40 mg. per 100 ml. one hour later. Faeces contained no undigested muscle fibres; faecal fat content, 11.5 g. per 100 g. of dried faeces. A fat-balance test over seven days showed 91% fat-absorption.

Treatment and Progress.—Ascorbic acid, 500 mg., thiamine, 250 mg., nicotinamide, 160 mg., riboflavin, 4 mg., and pyridoxine, 50 mg. ("parenterovite"), were given daily intramuscularly for seven days, and subsequently vitamin-B complex was given by mouth for six weeks. The changes in the mouth and tongue rapidly improved, completely clearing up within three weeks of starting treatment. Treatment with a high-protein diet was given for one month, but during this time the oedema of the feet and legs persisted and the plasma protein level fell to 4.6 g. per 100 ml. (albumin, 1.6 g.; globulin, 3 g.) (see Chart). At this time his



weight was 6 st. 13 lb. (44 kg.). On November 20, 1957, a treatment was started with a gluten-free diet. Within a month the oedema had completely cleared up, he had gained 7 lb. (3.2 kg.) in weight, and the plasma proteins had risen to 6.2 g. per 100 ml. (albumin, 3.6 g.; globulin, 2.6 g.).

On April 2, 1958, the improvement was maintained, and the plasma proteins were 6.4 g. per 100 ml. (albumin, 4 g.; globulin, 2.4 g.). He was feeling well and the mouth and tongue were normal. He still had slight sweating and flushing of the face immediately after food, and was passing three or four motions daily.

On July 9 he attended hospital complaining that the rash and swelling of the legs had returned a month previously, and he admitted that during the previous two months he had not been keeping strictly to the gluten-free diet. On examination there was oedema of both legs and the plasma protein level was 5.2 g. per 100 ml. (albumin 2.7 g., globulin 2.5 g.). He agreed to keep strictly to the gluten-free diet, and when seen on August 20 the oedema of the legs had cleared up and the albumin level had risen to 3.2 g. per 100 ml.

Discussion

Following both total and partial (Polya) gastrectomy the absorption of nitrogen is rarely impaired sufficiently to pro-

duce hypoproteinaemia. Blake and Rechnitzer (1953) found that the plasma protein level was invariably normal in nine patients at an interval between nine months and three years after total gastrectomy, and Welbourn *et al.* (1951) found that the plasma protein level was below 5.5 g. per 100 ml. in only one out of seven patients following a Polya gastrectomy, and this patient did not have oedema. Wollaeger *et al.* (1946) have shown, however, that after partial gastrectomy there is occasionally a slight excess of nitrogen in the faeces, and in one of their patients who developed hypoproteinaemia and oedema the nitrogen excess was considerable. Furthermore, they noted that excess faecal nitrogen did not tend to occur more often in those patients who lost the most fat in their stools.

The factors which have been thought to be responsible for the absorptive disorders following gastric operations are as follows: (1) impairment of the mechanism which stimulates the flow of pancreatic secretions and bile; (2) imperfect mixing of the food with digestive ferments owing to the shunting of the gastric contents away from the duodenum; (3) intestinal hurry: Wells and Welbourn (1951) decreased the amount of fat excreted in the faeces by slowing the rate of peristalsis with ganglion-blocking drugs; and (4) growth of bacterial flora in the stagnant loop may compete with the host for vitamins and damage the intestinal mucosa (Witts, 1955). Baird and Dodge (1957), however, found slight abnormalities in the jejunal mucosa in only 8 out of 31 patients following partial gastrectomy, and they conclude that the impaired absorption of fat and iron following partial gastrectomy cannot regularly be attributed to structural alteration in the jejunal mucosa. Most probably the relative importance of these aetiological factors varies considerably, thus accounting for the variation in the relative degree of absorption of fat, nitrogen, vitamins, and minerals in different cases.

In the case described here the correction of the low plasma albumin level by a gluten-free diet was unexpected, but the explanation that the impaired nitrogen absorption was primarily induced by gluten and unrelated to the partial gastrectomy seems too coincidental to be readily accepted. It will be necessary, however, to try the effect of a gluten-free diet on a number of such cases before a conclusion can be reached. If it is assumed that the impaired nitrogen absorption was produced by the partial gastrectomy, then the mechanism by which gluten contributes towards the absorptive disorder remains to be discussed. French *et al.* (1957) have suggested two possible explanations for the mechanism of defective absorption in cases of idiopathic steatorrhoea. Firstly, that gluten may produce an allergic reaction in the intestinal mucosa resulting in an increased secretion of mucus which delays absorption. Secondly, that there may be a failure to digest gluten which may lead to the development of toxic substances by intestinal bacteria. Although there is no evidence as yet to support either of these explanations, it is tentatively suggested that partial gastrectomy may occasionally produce a disturbance of gluten digestion, thus leading to the production of toxic substances capable of damaging the jejunal mucosa.

Summary

A case is described in which severe impairment of nitrogen absorption following a partial (Polya) gastrectomy was corrected by a gluten-free diet. The impaired nitrogen absorption produced a selective fall in the plasma albumin level, the globulin level remaining within normal limits.

Severe impairment of nitrogen absorption occurs only rarely after partial gastrectomy, and the nutritional disturbances are more usually produced by impaired absorption of iron, fat, and the vitamin-B complex. In the present case, although there were clinical manifesta-

tions of riboflavine and nicotinamide deficiency, there was no anaemia, and fat absorption was only slightly impaired.

My thanks are due to Dr. E. N. Chamberlain for permission to publish this case.

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Medical Memorandum

Arthropathy due to Gastric Carcinoma

Certain gastro-intestinal diseases are recognized causes of arthropathy or of finger-clubbing; for instance, ulcerative colitis (Schlicke and Bergen, 1940), steatorrhoea (Bennett *et al.*, 1932), and amoebic or bacillary dysentery (Rappaport *et al.*, 1951). Arthropathy may also be the presenting symptom in carcinoma of the bronchus (Berg, 1949; Holmes *et al.*, 1950; Ellman, 1953), but carcinoma of the alimentary tract associated with arthropathy is very rare, although finger-clubbing has been described in cases of carcinoma of the small bowel and colon (Mendlowitz, 1942) and of the stomach (Willemse, 1922).

There is no report of gastric carcinoma causing arthropathy, and so a case with this association is worthy of record.

CASE REPORT

A single woman aged 64 had had periodic blood-stained vomits for 10 months, and for five months she noticed that food seemed to "stick" at about mid-sternal level, though she was able to eat solids normally. She had lost a few pounds in weight. For four months she had had pains in her knees, ankles, wrists, and small joints of the fingers. The pains in the fingers were so bad that she could not make a fist or grip with either hand, and had been taking 8 or 10 aspirin tablets daily.

Examination showed her to be well nourished, with moderate pallor. There was grade 1 finger-clubbing. The proximal interphalangeal joints and metacarpophalangeal joints of both hands were swollen and tender, and movements were limited in these joints. The wrists, ankles, and knees were not swollen, but movements were painful, and the ankles were tender. The dorsum of each hand appeared swollen. There was no bony tenderness.

Investigations.—Hb, 7.7 g./100 ml. (52%); M.C.H.C., 26%; M.C.V., 71 cubic microns; P.C.V., 30%; W.B.C., 11,200/c.mm.; E.S.R., 29 mm. fall in one hour (Wintrobe). C-reactive protein, +++; Rose's test (D.A.T.), 1 in 8. Serum proteins, total 5.8 g./100 ml. (albumin, 3.6 g.). Barium-meal examination showed a new growth of the cardiac end of the stomach close to the oesophageal opening.

Mr. D. Ioan-Jones removed the carcinoma, a well-differentiated adenocarcinoma with one lymph node involved. The joint pains disappeared two days after operation, and the swollen joints became normal within three weeks. Five weeks after operation the C-reactive protein was +; Rose's test (D.A.T.), 1 in 2.

DISCUSSION

Pathogenesis.—The mechanism of a carcinomatous arthropathy is not clear. Removal of the primary tumour is known to relieve arthropathy at once (Clagett *et al.*, 1952;

Ellman, 1953), and simple section of the vagi, which is thought to abolish a "neural reflex," has also caused instant relief of arthropathy (Flavell, 1956). The vagi were cut at gastrectomy in the present case, and so the prompt relief of her joint pains could have been due either to interruption of a vagal reflex arc or to removal of the gastric carcinoma. Our patient showed no signs to support two other hypotheses—"dyspituitarism" (Fried, 1943), and "toxic absorption" (Wooler, 1948) due to delayed gastric emptying (Preble, 1898; Dennig, 1901), and so the pathogenesis of her arthropathy cannot be defined.

Incidence and Sex.—Arthropathy is said to occur in 50% of cases of pleural tumours (Clagett *et al.*, 1952), but it has not been reported in carcinoma of the stomach, although Willemse (1922) described two cases with marked finger-clubbing and solitary gastric cancers. Analysis of the case records of the last 200 patients with a proved gastric carcinoma at this hospital has shown that not one had joint pains, only four had finger-clubbing, and two of these four had chronic lung disease more than likely to cause such finger-clubbing. The patient described above is a female, whereas osteoarthropathy associated with intrathoracic neoplasms (Bamberger-Marie syndrome) is much commoner in males (Gall *et al.*, 1951; Shapiro, 1956).

Joints Involved.—The joints which are involved most often in an arthropathy associated with carcinoma are the ankles, knees, wrists, and interphalangeal joints. Only these joints were affected in our patient, and the distribution of her arthropathy could well have been mistaken for early rheumatoid arthritis. Craig (1937), Berg (1949), and Frank (1952), have all stressed that rheumatoid arthritis may be confused with arthropathy due to carcinoma, especially when the primary tumour itself causes no symptoms.

Investigations.—Many workers stress that the E.S.R. is very high in patients with arthropathy due to carcinoma; for instance, Hansen (1952) and Holmes *et al.* (1950) report values of 70–120 mm. fall in one hour. This is not always the case, however, as Pattison *et al.* (1951) report values of 23–32 mm., which accord with the E.S.R. of 29 mm. (Wintrobe) in our patient. It is interesting to note that in our patient the Rose test (D.A.T.) titre fell from 1:8 to 1:2 after operation, and as 1:16 is the lowest significant titre for rheumatoid arthritis (Kellgren, 1957), this test might be useful in differentiating from the arthropathy due to carcinoma. A fever, often reaching 101 to 102° F. (38.3 to 38.9° C.) (Fischl, 1950), and a normocytic anaemia (Temple and Jaspin, 1948) may occur in pulmonary osteoarthropathy, but our case had different features: a low-grade fever, to 99° F. (37.2° C.) only, and a hypochromic anaemia due to blood loss.

I thank Dr. William Phillips and Mr. D. Ioan-Jones for permission to publish this case report, and Dr. Phillips for his constant help and encouragement.

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Reviews

RENAL DISEASE

The Kidney. An Outline of Normal and Abnormal Structure and Function. By H. E. de Wardener, M.B.E., M.D., F.R.C.P. (Pp. 338+viii; illustrated. 45s.) London: J. and A. Churchill, Ltd. 1958.

The enduring impression which this book will leave in the minds of those who know something about renal disease will be one of gratitude to the author for having had the will be one of gratitude to the author for having had the courage to write a monograph on this most difficult of all subjects. There is probably no branch of medicine in which the scatter of knowledge is so great, so obvious is the contrast between the tremendous advances in our understanding of renal function in health and disease on the one hand, and our almost complete ignorance of the causation and rational treatment of most types of renal disease on the other.

On the whole de Wardener has overcome the difficulties with as much success as could be expected. His chapters on renal structure and function are clear and instructive and will appeal to the intelligent reader, and he avoids the temptation of over-simplifying and thus bringing his material down to the level found in most textbooks of medicine. With the difficult question of classification he is rather less successful. Wisely he tries to avoid the unnecessary and irrational complications of classification brought about by successive authors on renal disease, and prefers to describe syndromes of renal disease as they are found in practice. This treatment of the subject, sensible though it may be in some respects in the present state of our ignorance, tends to leave the reader with a fair impression of kidney disease as it may present itself at a certain stage of its development, but fails to give him as good a picture of renal disease observed over a period of years. Admittedly the information can be found in the book, and to those who already have long experience of renal disorders there is no difficulty; but it is rather like using a somewhat complicated map which is of more value to one who already knows the district than to one who has never been there before.

The book is intended primarily for students, and, though they will find much valuable material in it, one wonders whether the end-result will not be to confuse rather than to enlighten all but the best of them; but, as the less intelligent ones probably never read monographs, this may not matter very much, and the book can be strongly recommended to anyone who has a working experience of kidney disease and wants to get up to date with new knowledge.

ROBERT PLATT.

HORMONAL RESEARCH

Biochemical Contributions to Endocrinology: Experiments in Hormonal Research. By Sir Charles Dodds, M.V.O. (Pp. 76; illustrated. 18s.) Stanford, California: Stanford University Press. London: Oxford University Press. 1957.

The book is based on the Lane Medical Lectures of 1956 at Stanford University. It largely covers the researches of Sir Charles Dodds and his colleagues in the Courtauld Institute of Biochemistry, Middlesex Hospital, during more than thirty years. The development of highly active artificial oestrogens, of which the first was diethylstilboestrol (now more commonly known as stilboestrol), was a most striking contribution of Dodds and his colleagues, and in the chapters on the relation of chemical structure to oestrogenic activity he discusses how these developments came about. The account of the investigations which led from the first purely synthetic substance with oestrogenic activity, capable of inducing a full oestrus response in the ovariectomized rat in a dose of about 100 mg., to substances about a million times as active, is a most interesting and illuminating one. The agricultural application of synthetic oestrogens, discussed in a chapter of the book, is an outcome of wide importance of these investigations, while

another is the use of stilboestrol in the treatment of carcinoma of the prostate. The pituitary gland and the control of gastric secretion, still a matter of discussion, the lack of simple relationship between the metabolic rate and the symptoms of myxoedema, the production of simpler substances with some of the activities of morphine, are other subjects touched upon in this interesting volume. The final chapter deals with the discovery of aldosterone at the Middlesex Hospital Medical School by Drs. Simpson and Tait. The full significance of this very important discovery is not yet finally elucidated, but it is certain that aldosterone will not remain the only or main representative of such a highly oxygenated naturally occurring steroid with biologically important properties. The researches of Sir Charles Dodds and his colleagues in the field of endocrinology have indeed been most fruitful, and this account of the master mind behind them is of outstanding interest.

F. G. YOUNG.

PHYSICS FOR ANAESTHETISTS

Physics for the Anaesthetist: Including a Section on Explosions. By Sir Robert Macintosh, D.M., F.R.C.S.E., F.F.A., R.C.S., William W. Mushin, M.A., M.B., B.S., F.F.A., R.C.S., and H. G. Epstein, M.A., Ph.D., F.F.A., R.C.S. Illustrated by Miss M. McLarty and Miss M. Beck. Second edition. (Pp. 443+xii. 60s.) Oxford: Blackwell Scientific Publications. 1958.

Before 1946 the knowledge of physics possessed by the average anaesthetist was distinctly sketchy, being based on hazy recollections of his First M.B. lectures. Attempts to remedy the deficiency were frustrated by the dearth of books dealing in simple language with the special problems which concerned him. One result was that many ingenious modifications of apparatus (and the anaesthetist is a notorious individualist) failed for lack of appreciation of some fundamental physical law.

When *Physics for the Anaesthetist* first appeared it was an immediate success and became the recognized textbook on the subject. The authors adopted the principle of using short and clear description supplemented by specially drawn diagrams which eliminated irrelevant factors while remaining essentially accurate. Some of the diagrams were in colour. This technique caused raised eyebrows among some of the pure physicists but has proved to be admirably suited for its purpose, and many a successful candidate for the F.F.A. R.C.S. has cause to thank the authors for it. The book has been out of print for five years and an up-to-date edition is most welcome. Dr. H. G. Epstein has joined the two original authors in revising and adding to the text. The main alteration is a section of over 130 pages on explosions, which are dealt with in exhaustive fashion. The dangers of induced currents from surgical diathermy are mentioned, but the risk of burns and explosions from secondary earths might be emphasized with advantage in future editions. The subjects of reducing valves and the flow of fluids have also been dealt with in much more detailed fashion than in the first edition. A list of conversion factors and some biographical notes on leading physicists add to the completeness and interest of this excellent book, which can be recommended without reserve.

C. LANGTON HEWER.

MEDICAL DISCOVERY

Modern Medical Discoveries. By J. G. Thwaites, M.B., B.S. (Pp. 234+xii; illustrated. 30s.) London: Routledge and Kegan Paul Ltd. 1958.

In the U.S.A. at the present time much concern is expressed about the difficulty of recruiting scientists. Great resources are available for buildings and equipment, but there are not always the men to use them. The reasons for this are complex, but there has been a tendency for politicians and educationists to treat education as a means of securing social conformity or equality rather than of promoting intellectual competition. Samuel Smiles and his doctrine of self-help are out of fashion and the modern shibboleth is "together-

ness." Nevertheless, a change is occurring, as it is realized that the struggle for survival will be hard in this overcrowded century and we shall need the best scientists we can produce. One way to get them is to make young people interested in science, to show them what the scientific life is like, and to encourage them to take it up.

Dr. Thwaites has written his book on modern medical discoveries for just this purpose and just this audience. It is addressed to readers of 16 to 18, but it will be of interest to intelligent people of all ages. It can be particularly recommended for non-medical graduates and technical assistants in medical laboratories as an introduction to medical research. It begins with three chapters on infectious diseases, their causes, prevention, and treatment. Then follow chapters on cancer, hormones, and blood, and three chapters on various aspects of radiology and ionizing radiations. Finally Dr. Thwaites deals with anaesthesia and surgery.

The author of a book of this kind must steer a course between over-simplification or dramatization on the one hand, and on the other so many reservations and qualifications that the book becomes dull and unreadable. Dr. Thwaites's writing is both vivid and accurate and his range of knowledge is wide. The chapter on radiation hazards is particularly well balanced and informed. Of course, the reviewer can always dot a few "i's." Ludwik Gross's work on virus in mammalian leukaemia and neoplasia is a good deal more convincing and exciting than Gye's, though it does not get us far in therapy, as it seems to suggest that most of us inherit and carry latent cancer viruses. The book is well illustrated. One hopes that it will be so successful that it will be possible to reduce the price of future editions.

L. J. WITTS.

MENTAL DEFICIENCY

Mental Deficiency. By L. T. Hilliard, M.A., M.B., D.P.M., and Brian H. Kirman, M.D., D.P.M. With the Assistance of Four Contributors. (Pp. 517+xvi; illustrated. 60s.) London: J. and A. Churchill Ltd. 1957.

After the 1914 war the Fountain Hospital developed a considerable reputation through the enthusiasm and keen observation of Dr. Brushfield. Since the 1939 war the reputation has been revived by Drs. Hilliard and Kirman, and it is interesting to note the change in the field of research and in the outlook on mental deficiency. We are now in the midst of biochemistry, metabolic syndromes, well-founded genetics, sociology, and psychological researches. Indeed, some psychiatrists may be startled by Dr. Kirman's statement that mental deficiency is hardly a separate branch of clinical medicine, but the prime responsibility of the educationist and sociologist. However, he shows clearly in the rest of his 200 pages that it is really a subject which must be guided and controlled by men of medicine and of psychiatry. Whereas a generation ago there was too much emphasis on genetics as then understood, the present authors seem to have swung too far towards reliance on environmental conditions as causes and on their social improvement as treatment. Indeed, in some of the discussion of what ought to be there is almost a tone of propaganda, which is unexpected in a medical work.

The book is essentially a statement of the Fountain school of thought, and the views of its six authors are well integrated by Dr. Hilliard, who acted as editor besides writing the chapters on administrative and legal procedures. In the nature of mental deficiency there can be no very satisfactory classification, but that used here is logical and useful and the chapters are signed. Psychology and employment are by the psychologists, Drs. Tizard and O'Connor; causation and pathology are covered by Dr. Crome; while Miss Williams deals with education and training from the standpoint of the teacher. The clinical subjects are all set out by Dr. Kirman. All the subjects are presented in a thorough and sensible way, with no more repetition than is inevitable with a multiple authorship. Each chapter has its own extensive list of references, and there is some un-

usually full history of the progress of thought and practice in the subject.

This is a necessary book, and it is a comfort that it is written in such good and easy English, and so well presented by the publishers. Only two small errata were noted for correction in the next edition.

N. H. M. BURKE.

TUMOURS OF BONE

Bone Tumors: General Aspects and an Analysis of 2,276 Cases. By David C. Dahlin, M.D. (Pp. 224+viii; illustrated. 87s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

The topic of bone tumours is encumbered with two difficulties—a somewhat spurious nomenclature, and the fact that few individuals are able to acquire in a lifetime an adequate experience of these rather rare growths. Dr. Dahlin, by adopting without argument the names currently in fashion, does nothing to resolve the first, but he has been able to overcome the second by drawing on the superbly organized resources of the Mayo Clinic. The unique value of his book is that his statistics of sex and age incidence, localization, and other characteristics are based on substantial numbers of cases, each personally reviewed histologically and classified in a uniform and contemporary manner. The heterogeneity that often results from accepting the diagnosis of others, as in compiling reviews of cases from the journals, is thus avoided. The numbers in many of the groups are impressive—109 osteoclastomas, 80 chordomas, 70 reticulum-cell sarcomas, 141 Ewing's tumours, and so on. Osteogenic sarcoma, correctly defined as bone-forming, is identified by the direct formation of neoplastic bone, or histologically identified osteoid, by the proliferating malignant connective-tissue cells; the 469 cases are subdivided into osteoblastic, chondroblastic, and fibroblastic varieties according to the predominant line of differentiation. Bone that appears in a chondrosarcoma is held to result "from the differentiation of chondroid substance," and not directly as in the osteogenic sarcoma with cartilage. The point is arguable, but forms a practical basis for the classification, since it is here shown to have resulted in a marked distinction of characteristics of behaviour.

The excellent illustrations of radiographs, gross specimens, and micro-sections make the book an acceptable atlas which will serve a useful purpose. A few references are given at the end of each section, but there is no discussion of the literature, and the presentation is avowedly dogmatic and brief. Apart from its value as a concise, well-illustrated description of bone tumours, Dr. Dahlin's book is a considerable and original contribution to bone pathology on account of its factual record of a large experience simply, but carefully, analysed.

D. H. COLLINS.

Clinical Biochemistry, by Ivan Maxwell, is intended primarily for medical students, but may also serve as a compact reference book of test procedures for general practitioners. It is written by a former teacher at the University of Melbourne. The seventh edition (389 pages; 75s.) is available in this country from the Cambridge University Press.

Practitioners' Conferences, Vol. 5, edited by Claude E. Forkner (396 pp.; Appleton-Century Crofts, Inc., New York, 1957; \$6.75), continues the series of verbatim reports of conferences held at the New York Hospital-Cornell Medical Center. These conferences have as their object bedside teaching and are intended for physicians, surgeons, general practitioners, and specialists. The present volume reports 14 conferences on a variety of subjects.

In *Eye Surgery*, first published in 1946, Mr. H. B. Stallard provides a full account of the technique of those operations which have an accepted place in current ophthalmic surgery. The third edition, now available from John Wright and Sons, Bristol (899 pp., 671 illustrations; 95s.), has been thoroughly revised and in part rewritten. It contains over 200 pages more than the previous edition; 150 illustrations have been discarded and 275 new ones, many drawn by the author himself, have been added.

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PROGNOSIS AND TREATMENT OF DISSEMINATED SCLEROSIS

Despite the variable clinical course of disseminated sclerosis, it is commonly assumed that all patients sooner or later become severely disabled. That this fact is regrettably true of the majority cannot be denied, but there is some evidence that a more benign form of the disease may exist. As D. McAlpine¹ has pointed out, there are some patients who make a good recovery from an initial attack of the disease, and relapses may then be mild and infrequent or may cease altogether. Of a series of 586 cases observed at the Middlesex Hospital, 13% of those followed for 15 years showed no disability.² L. Alexander and his co-workers³ have confirmed that the disease exists in severe and mild forms, but point out that there is some overlap between the two. They believe that it is possible, five years after the onset, to predict into which of these two groups any individual patient will fall. This assessment is derived from a complex method—first devised by Alexander in 1951⁴—of allotting a numerical score to the various symptoms and physical signs roughly in proportion to the severity and significance of the resulting disability. Alexander claims that when different observers were asked to calculate the score for any single patient the results were remarkably consistent. By making this calculation at frequent intervals it was possible to obtain a graphic representation of the course of the disease. On this scale a score of 0 would be given if there were no symptoms or physical signs, while a totally disabled patient would achieve a figure of approximately

500. It is now suggested⁵ that, if a patient should have a total score of less than 125 after the illness has been in progress for five years, a mild course can be confidently predicted, while if it is over 200 the progress of the disease is likely to be comparatively rapid and the consequent disability severe. Despite the obvious dangers in such a method of assessing disability in a clinically pleomorphic disease—dangers which are even more apparent in simpler indices of severity such as the ten-point scale devised by J. F. Kurtzke⁶—laborious measurements of this type do at least give a degree of objectivity which may be useful in attempts to assess the effect of treatment.

Though there may be some encouragement to sufferers, and to those who care for them, in the knowledge that the disease may sometimes be mild, the discovery of an effective treatment must remain a principal aim of research, since so many patients become crippled at a comparatively early stage. The multiplicity of remedies advocated at one time or another shows how many and varied have been the theories about the aetiology of the disease. Thus numerous bacterial vaccines have been given in the belief that the disease may be infective, as have arsenic and fever therapy.⁶ There is little evidence that these methods have any value, though McAlpine¹ continues to advise arsenotherapy in some cases. Because narrowing or spasm of blood vessels has been suggested as an aetiological factor, histamine⁷ and other vasodilators such as nicotinic acid have been tried. R. M. Brickner⁸ believes that remedies of this type may have some benefit during acute episodes of the disease, but his results have not been confirmed. Many diets have also been devised from time to time, the latest being the low-fat diet of R. L. Swank,⁹ but the rationale of this method is far from convincing. Treatment with liver extracts or vitamin B₁₂ is extensively used in Britain, though there is little reason for prescribing these remedies and they are probably given *faute de mieux* rather than as rational therapy. Isoniazid, which has also been widely used, has been found to have no significant effect upon the course of the disease.¹⁰ Physiotherapy is occasionally very helpful, though it has no direct influence upon the disease process, simply helping to relieve symptoms, as do drugs such as mephenesin, chlorpromazine, and zoxazolamine, which may sometimes reduce spasticity.

Much publicity has been given to the Russian vaccine which A. Shubladze and S. Gaidamovitch¹¹ claimed to be an effective treatment. This vaccine was prepared from the so-called E.H.A. virus isolated from cases of disseminated sclerosis in 1942 by Margulis, Soloviev, and Shubladze. At the begin-

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ning of this year Professor G. W. Dick and his co-workers¹² in Belfast reported that the virus from which the Russian vaccine was made was indistinguishable from rabies virus and that the vaccine might therefore be dangerous. A few weeks ago Professor Shubladze expressed his agreement with the findings of the Belfast workers in a letter¹³ signed also by Professor Dick and published in this *Journal*. As a treatment for disseminated sclerosis this vaccine therefore no longer has any standing.

That disseminated sclerosis might be an allergic reaction of the nervous system to a variety of sensitizing agents was first suggested by L. van Bogaert¹⁴ in 1932. Quite apart from the similarity between histological changes in the nervous system in this disease and those of acute encephalomyelitis, there is now more clinical evidence to support this view, to which an increasing number of workers subscribe.^{2 15 16 17} Certainly there is evidence that relapses may follow non-specific infections, as they may follow fatigue, trauma, or emotional stress.¹ It is therefore not surprising that A.C.T.H., cortisone, and related remedies should have been tried in disseminated sclerosis. Results have been conflicting. G. H. Glaser and H. H. Merritt¹⁸ reported that some of their 33 cases improved, as did T. Fog,¹⁹ but H. G. Miller and J. L. Gibbons²⁰ concluded from their experience in 7 cases with acute neurological episodes that A.C.T.H. had no effect. However, Alexander and his co-workers,³ using their "scoring" method of assessing disability, now believe that A.C.T.H. has a significantly beneficial effect upon the course of the disease. But no similar benefits were seen after treatment with cortisone or prednisone, and the authors suggest that the improvement was due to some adrenal hormone other than cortisone, a view which must be accepted with some reserve. It was also found that weekly blood transfusions reduced the liability to relapse, possibly through some factor in the donor's blood which enabled the patient to resist further encroachments by the disease process. In the absence of adequate controls it is impossible to be certain that these methods have a real place in treatment, but there is an increasing body of opinion which now favours a course of A.C.T.H., cortisone, or prednisone during acute episodes of the disease.

A lack of controls also makes it difficult to assess the findings of H. V. Smith and her co-workers,²¹ who reported that intrathecal injections of purified protein derivative (P.P.D.) of tuberculin might modify the course of the disease. Their observation that Mantoux-positive cases of disseminated sclerosis show a modified reaction in the cerebrospinal fluid when P.P.D. is injected, as if a cortisone-like substance

were being spontaneously produced, is of the greatest interest, but it is difficult to see exactly why treatment with P.P.D. should arrest the disease. Possibly it may act by producing widespread vasodilatation in the central nervous system. It is apparent that this is one of several methods of treatment arising out of recent research work which merit investigation in a series of carefully planned controlled trials. With the lively interest now being taken in disseminated sclerosis the patient with this disease and the doctor who must care for him may now discern a glimmer of hope.

THE DEAF CHILD

The possibility that her child may be born deaf is not one that usually occurs to the mother. Only if she is intimately connected with the problems of deafness, or if she has a fear of a hereditary tendency, is she likely to make observations on her child's reaction to sound. Fortunately only a few children are born with a defect of hearing, probably not more than one per thousand, but even so it is by no means a negligible problem. Deafness alone is serious enough, but it always has accompanying defects of speech and general development if it is not treated at an early stage. Thus the problem of early diagnosis is of fundamental importance.

The detection of deafness is not easy early in a child's life, for in the first few weeks the general behaviour of normal and deaf babies is much the same, but about the age of 4 weeks a normal child first becomes responsive to sounds associated with natural life such as the mother's activities and attentions and the sounds of other children. Later the normal child's response becomes more versatile, though not always predictable, for a given sound may not evoke the same response in all situations.¹⁻³ It is in observing these reactions that the parent is in a privileged position; indeed, many of the young deaf children referred to clinics are first discovered by parents because they noted abnormal responses at these early stages.

Deafness in early childhood may be due to a number of causes which include hereditary factors, prenatal infection, effects of chemotherapy, and mishaps at birth. Collaboration between doctors, parents, and audiologists can assure that, should one of these causes be suspected, adequate investigations can be carried out. In recent years school medical

¹ Gesell, A., et al., *The First Five Years of Life*, 1940, Methuen.

² Lewis, M. M., *Infant Speech*, 1936, Kegan Paul.

³ Valentino, C. W., *The Psychology of Early Childhood*, 1942, Methuen.

⁴ *Educational Guidance and the Deaf Child*, 1957, edited by A. W. G. Ewing, Manchester University Press.

⁵ Ewing, I. R., and Ewing, A. W. G., *Opportunity and the Deaf Child*, 1947, University of London Press.

⁶ *Speech and the Deaf Child*, 1954, Manchester University Press.

⁷ International Congress on the Modern Educational Treatment of Deafness (Proceedings in press), 1958, Manchester.

officers have taken great interest in the subject and more and more clinics are being set up where children suspected of deafness can be tested at ages from under 1 year onwards.⁴ Dr. Mary Sheridan's article at p. 999 of this issue gives clear guidance about simple and effective tests of hearing which can be carried out in any quiet room.

The development of screening programmes, which some local authorities have also introduced, should be a valuable contribution, and adequate screening should dispel unnecessary worries. In such tests, carried out with great patience, observation is made of the child's response to quiet sounds similar to those occurring in normal home life rather than intense sounds which might arouse a fear reaction, with consequent lack of co-operation. Failure to pass screening tests indicates that the child should be referred to a deafness clinic for assessment of the degree of impaired hearing and the future treatment to be given. Here the aetiology and history are considered together with the problems of mental growth and the development of personality. While occasionally deafness may be amenable to medical treatment, in general the parent must be reconciled to deafness as a permanency and guided in the important task of accepting the fact so that he can assist fully in ensuring that the child gets the best treatment. Much is owed to Dr. Irene Ewing and Professor A. W. G. Ewing, of Manchester University, for their pioneering work in this field, and practically every deaf children's clinic in the United Kingdom and the Commonwealth is modelled on, or considerably influenced by, the clinics and procedures developed by them.^{5 6} It is fitting therefore that the recent International Congress on the Educational Treatment of Deafness was held at Manchester and that one of the main subjects for discussion and demonstration was the problem of the young deaf child. It was apparent at this congress that many workers now consider auditory impairment to be a complex defect, and there was some evidence that in many cases of early deafness the central nervous system is defective as a result of trauma or maldevelopment, with or without peripheral defect.⁷ It was stressed at the congress that many deaf children have begun to achieve similar patterns of development to that of a normal child through home training and integration in family life.

The problem of acquired deafness is different. Owing to the initial period of normal hearing the child will already have acquired some speech and understanding, and it is a question of conserving good speech by adequate educational treatment. In all this work the teacher of the deaf plays an important part.

Great developments have taken place in hearing-aids during the last 20 years, and they are of particular importance in assisting the education of pre-school and school children. Reduction in size allows hearing-aids to be used on the youngest children, but they need to be used intelligently if they are to be of greatest assistance. In view of recent opinion that some deafness may be due to central damage without peripheral involvement, it would appear unwise to use intense amplification indiscriminately, whereas, if peripheral deafness is serious, high amplification may be required to stimulate the hearing organ effectively. In the schools, group aids are becoming widely used on a high fidelity system and there is evidence that this extension of the high frequency range, with consequent improvement of consonant articulation, is beneficial to many deaf children. In addition the loop or induction system is now in common use, permitting great freedom of movement, since no wires are connected between the children and the main amplifying system. The modern viewpoint on the educational treatment can thus be seen to exploit the advantages of normal speaking so far as possible, but on occasions deafness is accompanied by additional handicaps such as educational subnormality or functional disability. Here different treatment is necessary and the child may be unable to make progress by a purely oral method, so that finger spelling and greater use of writing have to be introduced.

SEPARATION OF CRANIOPAGUS TWINS

The condition in which Siamese twins are joined by the heads is referred to as craniopagus. It is the most infrequent situation for the union to occur, the incidence having been estimated at 1 in 2-4 million births. Of these the majority are stillborn or die very shortly after birth, and none have so far survived more than a few years, in spite of the fact that many of these children are apparently normal apart from the defect. A preliminary report on another case has recently appeared¹; final separation is not to be attempted before the first birthday.

The site of junction is most frequently parietal, though occipital and frontal cases also occur. The axis of one child relative to the other varies from case to case, and the union may be asymmetrical. The intimacy of fusion differs in degree, so that vascular systems, meninges, and cerebral tissue may or may not be

¹ Franklin, A. W., Tomkinson, J. S., and Williams, E. R., *Lancet*, 1958, 2, 683.

² Lowenberg, K., *Amer. J. Path.*, 1930, 6, 469.

³ Grossman, H. J., Sugar, O., Greeley, P. W., and Sadove, M. S., *J. Amer. med. Ass.*, 1953, 153, 201.

⁴ Voris, H. C., Slaughter, W. B., Christian, J. R., and Cayia, E. R., *J. Neurosurg.*, 1957, 14, 548.

⁵ Baldwin, M., and Dekaban, A., *J. Neurol. Neurosurg. Psychiat.*, 1958, 21, 195.

united. The cause of the anomaly is unknown, but histological studies suggest that the fetuses are separate at an early stage and that union occurs after development is well under way, as though one was grafted on the other.²

Early attempts at separation were usually made after the death of one of the children, and none survived. The first successful attempt was made by O. Sugar in 1952.³ Only one of these children lived, and he is developmentally retarded. The other died a month after operation without regaining consciousness. This was due to lack of duplication of the superior sagittal sinus, which made it necessary to divide much of the venous return from the brain of this child in order to effect its removal. The first operation in which both twins survived was performed by H. C. Voris in 1955.⁴ The dural coverings of the brains were fused but separable, except for a portion of the superior sagittal sinus, which had to be split and covered by gelatin sponge. One child has developed normally, but the other has a prominent, though epithelized, cerebral hernia, and a left hemiparesis. Two years after separation, at the age of 28 months, she could nevertheless sit up unaided and say a few words. The most successful case so far was reported in August this year by M. Baldwin and A. Dekaban.⁵ The children were craniopagus frontalis, the other two cases having been parietalis. One twin had a transient post-operative hemiparesis, but the later development of both was normal at the age of 1 year. So far as is known none of the skull defects has been repaired.

Although joined together, such children have independent personalities and an independent physiology. The electroencephalographic tracings differ. One can be asleep when the other is awake, one hungry when the other is replete. Although other anomalies may occur, the abnormalities are usually confined to the area of fusion. Having determined the degree of perfection of the individuals, the surgeon has then to discover how intimately they are joined, and to plan a means of providing epithelial covering for the defect which results from their separation. Plain radiographs may be difficult to interpret if the children do not lie in the same longitudinal axis, but an idea of the area of union and any cranial deformity elsewhere can be obtained. The greatest hazard to survival is the presence of anomalies of the dural venous sinuses. This is not surprising, since these sinuses develop within the layers of the dura, which may be fused. If there are not two satisfactory channels which can be separated, the venous return from one brain is jeopardized. Arterial union is less likely. Angiography is of assistance in showing separation of the circulations, but has not given conclusive evidence. Sinusography may be impossible owing to maldevelopment of the dural venous sinuses. Radioisotopes have not so far been used, but would appear to offer a possible means of confirming independence of the vascular systems. The electroencephalogram may show independent function of the two brains but does not offer proof that they are not

united. In the case of Baldwin and Dekaban⁵ direct fusion by a core of white matter was present (the E.E.G. was not done pre-operatively). This core was 2 cm. in diameter and contained a lacy network of vessels and one artery, which constituted the only major vessel that had to be divided. Ventriculography does little more than exclude other lesions of the brain, such as hydrocephalus, which was suspected in the less successfully treated twin of Voris and colleagues.⁴ Deformity of the skull and brain, with flattening of the gyri and damage to the cortex, can be produced by pressure of the conjoined heads *in utero*.²

One of the major problems of these operations is to provide skin coverage for the two cranial defects. In the first two successful operations scalp flaps were gradually mobilized in preliminary operations, and their sources were grafted. Baldwin and Dekaban used the interesting technique of free grafts of "reconstituted human dura and skin" from a tissue bank, which were placed on the exposed dura. These provided temporary cover, and grafts of calf embryo skin were applied later. If the dura of the two children cannot be separated to cover the two brains, there is a grave risk of cerebral hernia, cerebrospinal fistula, and meningitis.

INTRACRANIAL NEOPLASMS AND PREGNANCY

Some diseases pose serious problems of management when the sufferer becomes pregnant—for instance, heart disease, diabetes mellitus, and thyrotoxicosis. The effect of pregnancy on chronic disorders of the nervous system has received less attention, though it is recognized that the course of epilepsy and disseminated sclerosis may sometimes be altered, a subject discussed in the Section of Neurology and Neurosurgery at the Annual Meeting of the B.M.A. at Birmingham recently.¹ It now appears that pregnancy may sometimes exacerbate symptoms in patients with intracranial neoplasms. E. R. Bickerstaff, J. M. Small, and I. A. Guest² point out that this is particularly true when the tumour is a meningioma.

These authors report two striking cases in each of which symptoms and signs indicating compression of one oculomotor nerve appeared during pregnancy, but regressed after delivery, only to recur during the course of one or more subsequent pregnancies. In one patient symptoms had been present during each of three pregnancies over sixteen years, with periods of apparent good health in between. Eventually unilateral visual failure appeared, and a sphenoidal wing meningioma was found to be present behind the affected eye. In

¹ *Brit. med. J.*, 1958, 2, 315.

² Bickerstaff, E. R., Small, J. M., and Guest, I. A., *J. Neurol. Neurosurg. Psychiat.*, 1958, 21, 89.

³ Fischer, F., *Z. Augenheilk.*, 1935, 85, 88.

⁴ Hagedoorn, A., *Amer. J. Ophthalm.*, 1937, 20, 690.

⁵ Rand, C. W., and Andler, M., *Arch. Neurol. Psychiat. (Chicago)*, 1950, 63, 1.

⁶ Walsh, F. B., *Clinical Neuro-ophthalmology*, 1947, p. 1161, Baltimore.

⁷ Weyand, R. D., MacCarty, C. S., and Wilson, R. B., *Surg. Clin. N. Amer.*, 1951, 31, 1225.

the second case there had been similar attacks of diplopia, occurring during three pregnancies and sometimes in the premenstrual week, but each time resolving after parturition or during menstruation. Again a sphenoidal wing meningioma was discovered. Although this course of events is not common it has been reported by other workers,³⁻⁷ and, as Small pointed out during the Birmingham symposium, a similar exacerbation of symptoms during pregnancy may occur in patients who have intracranial or intraspinal neurofibromas or angiomas.

A number of possible explanations for this relationship have been offered, among them that hormonal influences are responsible; but, as Bickerstaff and his colleagues suggest, it seems probable that a simple mechanical explanation is the correct one. Excess water is retained in the body during pregnancy and the blood volume is greatly increased. Presumably there is a parallel increase in the fluid content of these slow-growing intracranial tumours, and, because of their close anatomical relationship to the trunks of certain cranial nerves, even a very slight increase in size is sufficient to produce symptoms. R. D. Weyand and his colleagues⁷ removed a meningioma from a pregnant patient and found unusual histological changes in the tumour, changes which were compatible with an increase in fluid content.

It is easy to understand why many patients who develop ptosis or diplopia during successive pregnancies should be regarded as cases of disseminated sclerosis or even myasthenia gravis, but, as Bickerstaff and his colleagues point out, the occurrence of oculomotor defects or unilateral scotomata during the latter half of pregnancy should lead to serious consideration of a diagnosis of sphenoidal wing, parasellar, or suprasellar meningioma. In such a case careful radiological investigation is worth carrying out, and, if necessary, surgical exploration of the area, since these neoplasms are easier to remove in the early stages. If left alone, they may cause irreparable visual loss or hemiplegia resulting from strangulation of the internal carotid artery.

SEX EDUCATION FOR STUDENTS

The demand from medical students for some instruction in dealing with sex problems is the inevitable outcome of the present trend in medicine to treat the patient as a whole. Of necessity this includes an understanding of the sexual development and adjustment of men and women. But the student's demand presents his teachers with some serious problems, for he is asking for a bridge across the gap that lies between his rather scanty factual knowledge of the physiology and anatomy of sex and an understanding of the complex emotional problems of sexual adjustment and maladjustment. The scope of the subject is wide, including as it does the

physical and psychological aspects of coitus, conception and its control, the wide range of sexual behaviour encountered in practice, sexual maladjustments, and their causes and prevention, and the role of the doctor in sex education.

The first problem is who should be selected to teach the student and how he should be selected, what qualifications and experience, if any, he (or she) should have, and what kind of personality. Some decision might have to be taken on which department of the teaching hospital should be responsible for this type of education. Secondly, who shall be taught? Some students are scarcely sufficiently mature and stable to accept the emotional effort entailed in studying a subject of this kind. Not only is the student unaware of the emotional problems involved in marriage, but often ignorant of his own ideas, fantasies, and prejudices about the sexual and marital relationship. If students are to be selected for this teaching it would seem that only self-selection by means of a voluntary system could be acceptable. The drawback to this is the danger that those struggling with their own emotional problems are particularly attracted to the subject, and the resulting strain may precipitate a breakdown. Probably the subject should be included only during the senior years—which leads to the recurring problem of the overloaded curriculum and the proximity of final examinations.

The best method of teaching the subject is likewise debatable. Didactic lectures are valuable in providing a factual background, but do not prove a very successful method of teaching on emotional problems. Though books can be helpful, they are not sufficient in themselves. Perhaps most is learned from hearing patients talk of their anxieties and difficulties, but this is frequently rendered impracticable because the presence of the student inhibits free discussion by the patient. Case discussion groups of an informal nature may be more instructive, and this method has already been tried out at a few medical schools. In one London teaching hospital, as a result of some pilot experiments on these lines, a regular course of four case discussions, of an hour each, is now to be included in the curriculum of the obstetric and gynaecological clerkship, in addition to the voluntary attendance of students at contraceptive and dyspareunia clinics. Instruction is probably best carried out by a member of the staff who can be available to the students for discussion of their own emotional problems. When difficulties are encountered in starting this kind of training, help can be, and indeed is, sought from doctors who have had experience of dealing with marital problems through their work with the Family Planning Association and the Marriage Guidance Council.

As in all new undertakings, the way ahead remains rather obscure as yet, though the response of students to the sex education that has been attempted suggests that they themselves recognize a need for it.¹ No doubt trial and error will play its part in developing sound methods of teaching, so that young men and women will qualify better equipped to understand and help their patients than they sometimes are at present.

¹ *The Teaching of Sexual and Marital Relations to Medical Students. Report of Symposium at Cardiff in November, 1957. British Medical Students' Association, 1958.*

ARE MICROWAVES DANGEROUS?

In the light of past experience it is only proper to inquire into the potential health hazards associated with any innovation. The proposed use of high-intensity electromagnetic microwave radiations in civil and military communications is a case in point. The postal authorities are interested in them because they may offer an economic substitute for public inter-urban telephone links. Such centimetric radiations (i.e., radiations of waves a few centimetres in length) have been used by the Services for communication and other purposes for many years. But the question whether they represent hazards has become more acute only recently because the power fluxes at which the radiations are becoming available are much higher than before.

When non-ionizing electromagnetic energy is absorbed it is dissipated as heat. More specifically, when any tissue is exposed to microwaves its temperature rises. First, therefore, the question may be asked: Is there any part of the body which, on exposure to a given dosage of radiations of a specified wave-length, becomes so overheated that normal physiological cooling mechanisms fail to prevent permanent damage?

Although there is some disagreement on whether the crystalline lens or the testes are more exposed to danger, no one doubts that these two tissues are the most sensitive to temperature, because they cannot be effectively cooled by the blood stream. Consequently much work has been directed to elucidating the mechanism of dissipating microwave energy in these two tissues, largely in dogs and rabbits. An exposure of about 0.1 watt per sq. cm. for a total period of one hour failed to produce a lesion in either tissue in any experiment. Higher dosages can produce damage in the absence of alleviating circumstances: the animal heads are then virtually immobilized and the testes unprotected. It is sometimes said that a dosage of 0.1 watt per sq. cm. is bound to be harmless also when applied for very long periods because this represents the radiant power we receive from the sun on a cloudless day. However, the solar dose contains many types of wavelength, which are either absorbed more superficially or diffused more deeply than are centimetric waves, hence the radiation from the sun does not constitute a specific hazard for these two tissues.

Three instances have been reported in which patients are alleged to have suffered from exposure to high microwave fluxes. Two of the cases^{1,2} are ill-attested and due to unreasonable risks having been taken. The third patient, also exposed to a relatively high intensity, suffered only transient ocular damage. On the other hand, numbers of Service personnel were, at one time or other, exposed to dosages of about 0.01 watt per sq. cm. for prolonged periods of time. No accident occurred. It is therefore of interest that the North Atlantic Treaty Organization has adopted as a safety

limit one-twentieth of this figure—namely, 0.0005 watt per sq. cm. If this value errs it is, commendably, on the cautious side. It would appear, however, that such a limit would require a very extensive “sterilized” zone in front of the aerial system in the case of the high-power transmitters and large aerials now contemplated.

On the other hand, the proposal to use these waves indefinitely in 24-hour beams, as would happen in inter-urban radio links or in radar scanning, raises a problem altogether different. Feeble light intensities, when applied for a short time, may fail to blacken a photographic plate noticeably or to stimulate the eye, but can be successful after a prolonged exposure. The plate and eye are said to be able to summate intensities which for a brief exposure would be sub-threshold. Can temperature-sensitive tissues likewise summate successive sub-threshold microwave exposures? This question cannot be answered yet. There is some indication that, above a certain threshold, partial summation may occur in connexion with the crystalline lens, but that it is not as effective as photographic or visual summation.

What scanty evidence there is indicates that dog testes may summate more efficiently than the lens. Here efficient summation would be taken to mean that, if a given dose produces an effect in a given time, halving the dose would necessitate doubling the time for the same result to be achieved.

Beyond this the evidence is indirect. Glass-blowers used to suffer from cataract (their occupational disease) roughly three times as frequently as the remaining population. In the course of their work they are exposed to power dosages of up to 0.5 watt per sq. cm. This power represents largely light and infra-red radiation: the microwave contents of the energy are negligible. The glass-blowers tended to develop cataract after 10 to 15 years of continuous work. Although their type of cataract is not necessarily the same as that produced by high microwave fluxes, this example illustrates that the possibility of summation cannot be ruled out and that it may act only slowly. But the glass-blowers' 0.5 watt per sq. cm. is much higher than the N.A.T.O. microwave limit of 0.0005 watt per sq. cm.

In short, no hazard from microwaves is known for moderate exposures to fluxes lower than 0.0005 watt per sq. cm. in the absence of all protection. As to exposures extending over years, some risk may exist even with low dosages, but the probable temporal course of the hazard allows time for the requisite experimental investigation of the problem. Reliable answers to the questions it poses can be provided only by producing experimental lesions in man. As this is hardly practicable, the solution of the difficulty lies with electronic designers and engineers. Their task consists in by-passing man or so improving receiver sensitivities that low-power transmission becomes feasible. But, while the position cannot be viewed with complacency, there seems to be, at present, no cause for great alarm.

Drug Treatment of Disease

SEDATIVES AND TRANQUILLIZERS: PART I

BY

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Introduction

In considering the new sedatives and tranquillizers, it is worth remembering that it may take a year or more to learn how to use any one new drug skilfully and selectively; and all one can do is to keep a range of well-proved sedatives in use, and to look among all the new drugs for others likely to fill some of the present treatment gaps. It is certainly unwise to try one new tranquillizer after another in the hope of finding some universally applicable drug. There cannot be one, because of the number and variety of psychological reactions to life's stresses, and because of the different constitutional types of person showing them. These different types of person may all need handling in quite different ways with drugs. In this article advice will be given only on drugs which the writer has himself tried to learn how to use in as practical a manner as possible over the years. This does not mean there are not other similar ones, just as good, which may not happen to have been tried out and tested as thoroughly.

Two most important points about the giving of sedative drugs must be emphasized before discussing any of them in detail. Experiments on animals have shown that different constitutions may need quite different dosages of any drug used. In Pavlov's dogs, for instance, those with “strong excitatory” temperament often needed up to eight times the body-weight dose of sedative required by those with “weak inhibitory” temperament if an induced experimental neurosis was to be satisfactorily treated; until the right dose of any drug was found, the use of sedatives could often worsen rather than improve a neurotic state. It is the same with human beings.

Dosages of sedatives differ very widely in different illnesses and different constitutional types of person. This is shown, for example, in the response of the “strong excitatory” epileptic to a sedative drug such as phenobarbitone. He may thrive on 4–6 gr. (260–400 mg.) a day, given as a maintenance dose to prevent fits and to keep him in active nervous health. But a “weak inhibitory” hysterical patient may fall about and be greatly worsened by being given as little as ½ gr. (32 mg.) of phenobarbitone twice a day. Unless these large individual differences in response to drugs are recognized, the proper use of sedative drugs can be very difficult to learn, and the results obtained with standardized dosages can be most misleading.*

The other general point to mention is the possibility of harmful addiction to all such drugs. Any drug which successfully treats anxiety and tension, especially if it also creates states of euphoria, is likely to have

*This is in fact one of the outstanding faults of most of the double-sampling tests of to-day. Moreover, neuroses and psychoses may get lumped together in such tests, and often more misinformation than information is gained about the skilled use of a drug being tested. As a good example of this, many schizophrenics are now thriving and having their symptoms held at bay with doses of chlorpromazine that may have to be as high as 300–500 mg. a day. On this dosage they are also possibly able to do a full day's work. Every doctor has other neurotic and depressive patients who complain of a marked worsening of their symptoms when more than 25 mg. of the same drug is given three times a day for comparatively short periods.

strong addictive tendencies. In this article it is impossible to go into all the ethical considerations involved, but it is clearly our duty to try to confine ourselves to those drugs that do the least harm and have the least serious side-effects when from time to time they may have to be withdrawn or curtailed. To do this, it is wise to try to adhere, whenever possible, to drugs which, though they combat anxiety and tension, do not also create too much undesirable euphoria. Man's constant search for happiness can make these the hardest to give up.

The Older Sedatives

Bromides.—Before the second world war potassium bromide was one of the most widely prescribed drugs in the *British Pharmacopoeia*. In recent years, however, it has tended to become discredited and to be replaced by the barbiturates. Bromide began to fall into disrepute when the numerous cases of bromide intoxication came to be more generally recognized. Its disuse, however, may now have gone too far. Intoxication rarely occurs, except in the elderly, the arteriosclerotic, and in patients with impaired renal function. Intoxication can practically always be avoided by not prescribing it for these types of patient, and by insisting that the patient taking this medicine should also take adequate salt. There are some strong and chronic tension states in which large amounts of barbiturate are necessary to bring any real sedative relief, and this often causes severe addiction, and even greater tension when attempts are later made to lower the dose of barbiturate or to withdraw the drug. There are patients with reactive depressions and strong body-builds, and those who show explosive outbursts of anger and tension, who can still be helped better by bromide in doses of 20–30 mg. three times a day than by barbiturates. Bromide should certainly not be forgotten by the physician in search of a suitable sedative for some of his patients with chronic tension. It may also be useful in supplementing a smaller daily dose of barbiturate. It is hard to believe that the enormous vogue for the bromides over so many years was without any foundation whatever.

Chloral.—This is another drug which has also had a long innings because of its excellent sleep-producing qualities, but which is now tending to be replaced by the barbiturates. However, with the increasing tendency to barbiturate dependence so often seen at the present time, and because of the craving that can be aroused by too injudicious a use of the short-acting barbiturates, the writer is finding that chloral still has a valuable role as an alternative sedative to the barbiturates, especially to avoid the building up of tolerance to barbiturates so that sedation may be given over long periods of time. Chloral should generally be given in doses of ½–1½ drachms (1.7–5.2 ml.) of the B.P. mixture, and it can sometimes be used to supplement smaller doses of longer-acting barbiturates, each enhancing the effect of the other.

Paraldehyde.—Paraldehyde is now less useful than formerly as a sedative and tranquillizer. It is an exceedingly valuable drug, and still has its limited place in helping to cope with the withdrawal symptoms of the alcoholic, especially in the “strong excitatory” and confused patient. But it is a bad sedative for routine use because of its unpleasant smell and its consequent social drawbacks. It acts quickly, effectively, and safely in an emergency. But where routine administration of paraldehyde has been indicated in the past, the giving of one of the new tranquillizers such as chlor-

¹ Hirsch, F. G., and Parker, J. T., *Arch. Industr. Hyg.*, 1952, 6, 512.

² McLaughlin, J. T., *Calif. Med.*, 1957, 86, 336.

promazine, together with smaller amounts of other sedatives is now often preferable, especially for the elderly. It does, however, still have a real place in the efficient sedation of physically ill and restless patients in hospital. Because it can be obtained freely without prescription, it is not advisable to give it out too liberally in general practice, especially to the alcoholic, the compulsive barbiturate addict, and all the other potential seekers after chemical euphoria and temporary oblivion, in particular the hysterical psychopaths. Doses of 1-4 drachms (3.5-14 ml.) can be safely prescribed by mouth, and it is worth remembering that 2-4 drachms (7-14 ml.) can be injected intramuscularly when necessary in an emergency.

Barbiturates.—The long- and short-acting barbiturates have now become the main standby of physician and psychiatrist alike. And they are often the sedative of choice both for the neurotic and for the normal patient. In general, the barbiturates are much cheaper than the newer tranquillizing drugs. However, the short-acting barbiturates have more addictive dangers than, say, the bromides, and this is possibly because they are often more efficient drugs for the purposes for which they are prescribed. The enormous range of barbiturates, and the number of different preparations of each, make it impossible to learn to use anything like all the possibly valuable ones. A clinician should choose for himself a few selected long-acting and short-acting barbiturates and learn how to use and vary these in his many different types of patient. Barbitone sodium, for instance, still seems to be an excellent long-acting sedative when given in doses of 5-15 gr. (0.32-1 g.) at night. It is often the drug of choice in depressive states, when early waking is much more of a problem than is getting to sleep at night. Long-acting barbiturates also seem to have less addicting and tension-creating qualities on withdrawal than do the shorter-acting ones. Phenobarbitone can be a satisfactory daily sedative for neurotic patients, in doses of $\frac{1}{2}$ gr. (32 mg.) three times a day to 1 gr. (65 mg.) twice a day, and many of the patients who used to be kept on bromides three times a day are now being maintained on this drug.

The short-acting barbiturates, of which sodium amylal and quinalbarbitone are good examples, can be very good indeed in relieving tension during the day and in bringing about sleep at night. The trouble is that they are often too efficient, and it is becoming more and more clear to the writer that short-acting barbiturates, when taken continuously over long periods, can perpetuate states of tension as well as relieve them. Great relief may be obtained for an hour or two after taking these short-acting barbiturates, but tension is soon created again, and further short-acting barbiturates are then demanded. Once the total dosage of amylal has reached 9 gr. (0.6 g.), or of quinalbarbitone 6 gr. (0.4 g.), in the 24 hours a vicious circle of self-perpetuating tension has often been created. The writer has seen some patients who have had one, two, or three modified leucotomies for relief of unbearable tension and who have turned out later to be barbiturate addicts. Their tension has finally subsided or been greatly reduced once this fact has been recognized and their drugs withdrawn or altered. When patients come to doctors complaining of states of chronic persistent tension, or a marked increase in recent tension for which they are demanding short-acting barbiturate medication, it should never be forgotten that addiction to and a previous unwise prescribing of such barbiturates may be the cause rather than the cure.

Despite these objections, the short-acting barbiturates can still be some of the most useful drugs we have at our disposal. They can be especially helpful in patients who have developed recent phobias of going out in the street, travelling by train, going in an aeroplane, or tackling any special new situation because of the anxiety aroused. But they should be used only occasionally and not as a routine in such anxiety-creating situations. Sodium amylal 1-3 gr. (65-200 mg.) or quinalbarbitone $\frac{1}{2}$ -1 $\frac{1}{2}$ gr. (50-100 mg.) may be given one hour before the patient tackles the phobia. Another of the new tranquillizers, meprobamate, also seems to be helping this particular group, and therefore may

be able to replace the short-acting barbiturates in some cases. But the other new tranquillizers, such as chlorpromazine, have not proved at all useful in this particular group of patients, who can often be so difficult to help.

One of the most popular combinations of drugs in recent years has been the giving of small doses of amylal and dexedrine together in the form of "drinamyl." One tablet only is taken in the morning at 8 o'clock and possibly again at lunch-time. The combination is of the greatest value as a tranquillizer in some mild depressive and tension states, but it is of no value in deep depressions, and can make patients with severe anxiety states more anxious. Because of the euphoria it creates this combination is in great demand by the chronic neurotic patients and should be prescribed sparingly. Those patients who benefit most by it should also be advised not to use the drug on at least two days in the week, so as to avoid tolerance to it being established too quickly.

Intravenous Use of Barbiturates.—The sedative value of barbiturates given intravenously can be great in certain psychiatric emergencies. If, following an accident or a shock of some sort, the doctor is called to see somebody who has suddenly lost the use of an arm, or voice, or is showing sudden onset of other hysterical symptoms, the slow intravenous injection of a short-acting barbiturate, such as sodium amylal or pentothal, to a point of relaxation and euphoria, combined with the use of immediate and strong suggestion by the doctor, will often break up and resolve the whole acute hysterical picture, and continued sedation for a few more days may then keep it broken up. In the last war the rapid treatment of acute hysterical reactions by the use of intravenous barbiturates has saved an enormous amount of pensionable chronicity since, and there is still a place for this valuable first-aid method in civilian practice to-day. Once hysterical or acute anxiety reactions are allowed to get fixed for even hours, let alone days, they can become much more difficult to get rid of again later.

(To be concluded)

PRIORY CHURCH OF ST. JOHN OF JERUSALEM

RE-DEDICATION BY ARCHBISHOP OF CANTERBURY

The Priory Church of St. John, Clerkenwell, heavily damaged by a German air raid on the night of May 10-11, 1941, and now restored, at a cost of £80,000, not only as the church of the Order of St. John of Jerusalem but also as the Order's assembly hall, was re-dedicated by the ARCHBISHOP of CANTERBURY, Prelate of the Order, on October 17. The DUKE of GLOUCESTER, Grand Prior of the Order, opened a memorial cloister and garden commemorating those members of the Order of St. John and of the St. John Ambulance Association and Brigade who lost their lives in the 1914-18 and 1939-45 wars. The church's crypt (Fig. 2), which escaped war damage, is one of the finest examples of 12th-century church building in London.

The original church of St. John Baptist was the chapel of the 12th-century Priory of Clerkenwell; it had a choir, which forms the present building, and a round nave larger than that of the Temple church and believed to have been destroyed in Wat Tyler's revolt of 1381—its outline is now traced in the roadway. Just after 1500 Prior Thomas Docwra constructed the large perpendicular windows of the choir and made other improvements, and the present Docwra family have given the wrought-iron gates which lead to the new memorial cloister.

The restored building is divided into three main sections—the church, with its crypt; the guard house; and the war memorial cloister and the staircase hall. The guard house contains a robing-room and vestibule and makes a striking entrance to the cloister (Fig. 3). Here an ancient piece of stonework found on the site has been incorporated in the

tracery and provides the inspiration for the cloister's design. The crucifix can be seen from the street through the wrought-iron gates. The interior of the walls of the 60-ft.-square church have been whitened, showing the texture of the medieval aeval stones and the Tudor brickwork; the only colour is supplied by an occasional banner. This simplicity accentuates the beauty of the altar with its reredos incorporating 18th-century carving salvaged after the bombing and the two wings of the Weston triptych. The latter was given to the church by Grand Prior John Weston about 1480 to commemorate the Order's victory at the siege of Rhodes; unfortunately the centrepiece of this exceptionally fine example of 15th-century Flemish art is missing. Curtains can be pulled across in front of the altar to screen it during an investiture or conference. The lion-head handles on the church doors which were found in the ruins of the Muristan, site of the Order's original hospice in Jerusalem, were presented by Sir Harry Luke. The architects responsible for the restoration were Messrs. Seely and Paget.

The priory in Clerkenwell was never a hospital treating the sick, like St. Bartholomew's and St. Thomas's. It was

the administrative headquarters of the Order of St. John in England, responsible for its estates here from which revenue was sent to Jerusalem and Rhodes for the Order's activities, both military and charitable. The Clerkenwell priory also recruited young noblemen to fight in the wars against Islam. After the reformation the buildings disappeared bit by bit, except part of the church, which remained as a chapel and was restored by Simon Mitchell, from whom it was purchased in 1723 by the Commissioners of Queen Anne's Bounty and made into a parish church. It ceased to be this in 1931 when it became again the church of the

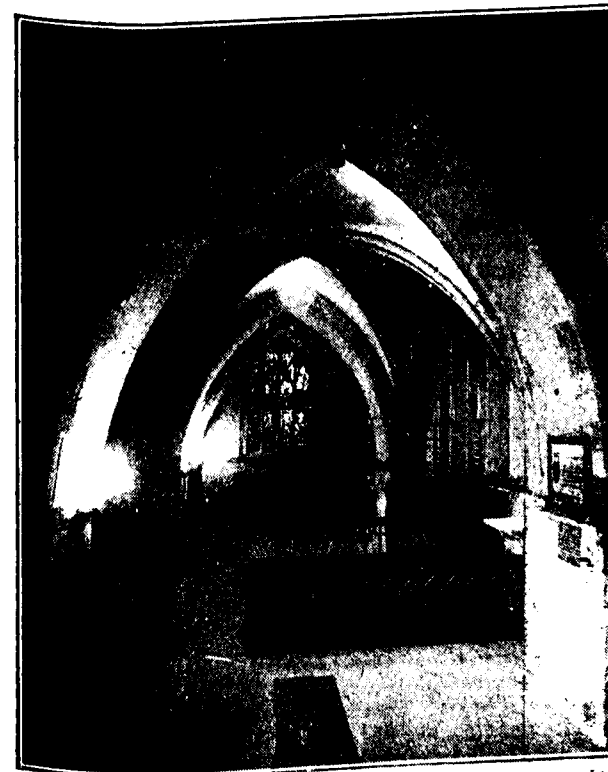
Order of St. John. Members of the St. John Ambulance Brigade throughout the Commonwealth have subscribed just over £4,500 for the furnishing of the restored church. Of the structural cost of the restoration, £20,000 has still to be found.

The restored church of St. John is not open to the public but may be viewed by appointment with the Curator of the Order, Miss Daphne Edmonds (Clerkenwell 6644), who will also show those interested the Order's museum at St. John's Gate, a part of the priory buildings erected in 1504.



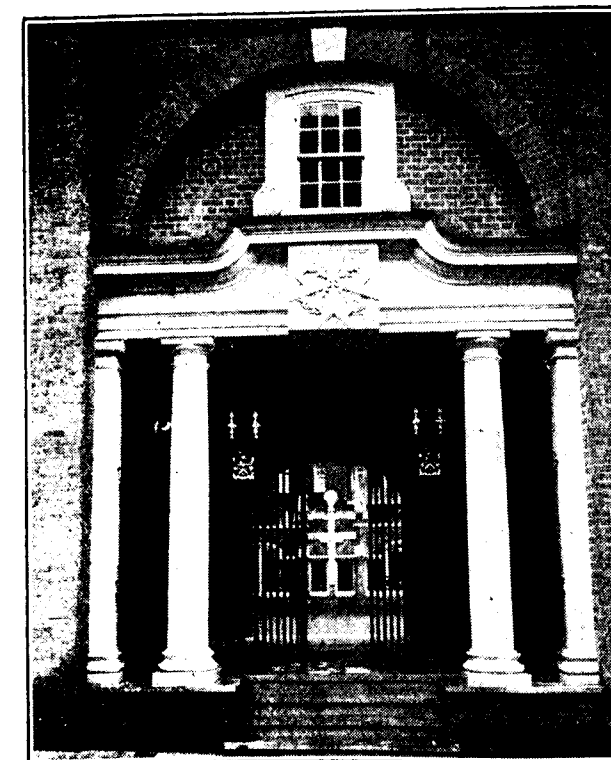
[Sport and General Press Agency, Ltd.]

FIG. 1.—Interior of the restored church, showing the reredos and altar. Behind the altar are mounted the surviving two panels of the Weston triptych.



[Sport and General Press Agency, Ltd.]

FIG. 2.—Part of the crypt.



[Planet News, Ltd.]

FIG. 3.—Guard house and Docwra gates, showing the crucifix and part of the memorial cloister beyond.

WHY SUFFER FROM RHEUMATISM ?

A REVIEW OF 157 "CURES" SUBMITTED TO
THE RESEARCH SUBCOMMITTEE OF THE
EMPIRE RHEUMATISM COUNCIL*

Since ancient times man has been searching not only for the elixir of youth and the prevention of old age, but also for cures for the various aches and pains which harass the bones, muscles, and joints of mankind. These aches and pains derive from a very large number of mental and physical disorders, but all are loosely labelled "rheumatism" or "fibrositis" by the lay public, and even to-day there is in this country relatively little use of the terms "rheumatoid arthritis" or "osteoarthritis" by them. Accurate diagnoses aided by the use of new diagnostic methods are only now taking their proper place among members of our profession; it is by no means remarkable, therefore, that the layman lags behind. Unless an accurate diagnosis is made the effect of various therapeutic remedies cannot mean anything, for what benefits one patient's "rheumatism" will probably have no effect on another whose "rheumatism" is due to an entirely different pathological process. Indeed, it is estimated that there are over 70 different conditions which may give rise to so-called rheumatic pain. This simple fact is responsible for many of the false claims in the past: Mrs. A, who suffers from a traumatic disk protrusion, will begin to benefit (as her condition naturally subsides) whilst being treated with substance X, while Mrs. B, on the same substance but suffering from a progressive type of rheumatoid arthritis, worsens. Seldom do people outside the medical profession distinguish between the various arthropathies—rheumatism is rheumatism, fibrositis is fibrositis, and that is the end of it. Nature cures and family remedies may indeed have benefited some sufferers at some stage of their illness, but what that illness was in the majority of cases is never exactly known. *Post hoc, ergo propter hoc* is as common an argument to-day as it was under the Caesars, and just as difficult to resist.

It is with an open but not over-optimistic mind, therefore, that we have reviewed 157 remedies sent to us at the Empire Rheumatism Council in the last five years from all over the world. We are extremely grateful for these contributions, for from such as these may spring the next great therapeutic advance. Many contributors have been at great pains to give details and have gone to considerable trouble on behalf of the rheumatic sufferer. While most are submitted by people outside medicine, a minority come from members of our own profession. To all we would gratefully tender our thanks.

Analysis of "Cures" Submitted

The cures and remedies sent to us fall into three main groups. Group 1 states in effect that if you take X (or Y or Z) you will never have rheumatism; group 2, that if you take Y (or X or Z) you will get better from rheumatism; group 3, that if you never take Z (or X or Y) you will never get rheumatism.

The last (or never-never) group is the smallest. Five substances have been advanced as aetiological agents; if these are always avoided the patient will continue to remain free from symptoms. They have a homely ring: salt, tap-water, milk, tea, and marmalade. It may well be that sensitivity factors may play a part in causing pains due to allergic factors, but it is hard otherwise to make a case for these five agents of evil. Perhaps Western civilization suffers from the rheumatic disorders because of the breakfasts it eats, the United States being only partly saved by preferring coffee to tea. Three other contributions emphasize that tea is to be avoided at all cost. In addition, freedom from rheumatism may be assured by avoiding gases and certain fumes, eye-strain, and certain postures and stances. Here again it can be seen how certain mild painful disorders could be

*Compiled by the Research Subcommittee of the Empire Rheumatism Council.

alleviated by attending to these factors, but not the more serious diseases such as rheumatoid arthritis.

Group 1, comprising the prophylactic agents, is also a small one compared with the therapeutic group 2. Iodine lockets, string shirts, underwear made of special material—for example, flannel, which is useless unless it is red—pendants, and bangles of various sorts are quoted. Many of these "cures" are almost as old as civilization; they are essentially lucky charms in many cases, protecting the wearer by their own particular magic. Some harness modern science to the ju-ju by incorporating iodine (or sodium carbonate) in a locket worn round the neck. A cord round the waist will apparently prevent disk herniation to-day just as effectively as yesterday it prevented lumbago and rheumatism in the back, and the day before that the evil eye, the ague, or the creeping palsy.

In the second therapeutic group the largest single subgroup is regrettably the "secret remedies," of which there are 14, details of which were to be revealed only at a price or on proper compensation. Nevertheless it is important and encouraging to note that all the remaining 143 writers offered and wished to give their remedy to mankind with no mention of any payment or reward, and this point must be strongly emphasized. Next most common were external applications (11), fluids and salts of different sorts taken by mouth (10), herbs (9), special diets (9), and special baths (7). After this came a large number of cures and remedies with relatively few supporters. It is of interest that in this scientific age there were only four remedies depending for their effect on radioactive substances, three on certain rays and emanations, and one on electromagnetic packs, whereas applications of mud had four supporters, "old-fashioned medicines" dispensed by senior chemists and practitioners two, and herbal remedies as noted above nine. Many, such as bee venom (3), gold salts (4), salicylates (3), to mention only three, have been, and are being, used in medicine to-day.

On the physical side, deportment (2), massage (1), various rays (3), a certain warm climate (1), and an unspecified mechanical device (1) were suggested; on the psychological or spiritual side a strong magnetic personality (1) and psychokinetic education (1).

Some of the Remedies

Water.—Water, externally or internally, has since the beginning of time been used in the treatment of the rheumatic disorders. In this series two cures depend essentially on the drinking of large amounts of plain water. In one, simple boiled rain-water is advanced as a cure; three-quarters to one pint, filtered through cotton-wool, must be taken early each morning to abolish rheumatism completely. A second cure is even simpler, depending essentially on drinking tap-water whenever the opportunity presents, all day and every day, and arranging one's life accordingly. A rival claim is that simple tap-water contains mineral salts and elements which initiate an allergic state which, by depositing salts in the joints, causes rheumatism; by avoiding these contaminants one can remain free from rheumatism. Ten cures depend essentially on consuming fluid in which certain curative salts are in solution in different combinations. These solutions may be naturally occurring ones from certain springs or may be made in the home—for example, Epsom, Glauber, and Rochelle salts and potassium "filtrate"—of this mixture one teaspoonful must be taken each morning.

Herbal Cures.—These are still much in evidence, and with special diets come fourth in popularity, nine of each type of remedy being submitted. Of these herbal cures one depends essentially on celery seeds, one on garlic, one on mistletoe, one on parsley, one on buttercup paste, one on yerba maté, one on mixed nettles, dandelion, and burdock leaves, and so on. They are essentially the old countryside prescriptions popular in the homes in the last century and obviously still widely used to-day. Only some depend on purgation for their effect, and, one, buttercup paste, on local inunction. To give an example in greater detail, one, yerba

maté, or Paraguay tea, is a beverage prepared from the leaves of the *Ilex paraguariensis*, a member of the holly family, Aquifoliaceae, which grows wild in parts of South America, and is also largely cultivated and has been used from time immemorial by the Indian natives. It contains up to 0.9% caffeine, and to this may perhaps be attributed much of its restorative and stimulatory properties. It contains no tannin and is preferred to either tea or coffee by many once the slightly bitter taste is acquired. It is, according to *Chambers's Encyclopaedia* (1950), the universal drink of 15 million South Americans, and is also popular in the United States. Our informant made the observation that when the quality of tea available during the war became very poor he changed to yerba maté. After the lapse of two to three years he noted that the fibrositis in his shoulders from which he had suffered for very many years disappeared; but his wife, unable to take the tea because of its effect on her digestion, remained unimproved. This last point is important; for herbal teas, although widely used for centuries, may on occasion in certain subjects be productive of most unpleasant symptoms.

Diet.—Nine different varieties of diet were submitted, most depending on calorie reduction and increased fruit-juice content. There is no doubt that even in severe rheumatoid arthritis one does occasionally see relief and remission occurring on such regimes; fasting is one of the oldest of remedies in this field of medicine. What is not usually recorded is how long such remissions last and how many failures are to be set against each success.

Discussion

The first point that emerges very forcibly from the vast majority of the statements about curative agents submitted is that the diagnosis of the disorder that has been cured is completely unknown. When efforts have been made, as was done for the Empire Rheumatism Council by Dr. E. T. D. Fletcher and his unit at the Royal Free Hospital, London, some six years ago, to clarify diagnosis in connexion with a lay study of the importance of climatic variations, the patients with "rheumatism" and "arthritis" were found on examination to have a wide variety of conditions ranging from rheumatoid arthritis to cases where no disease process whatsoever could be found. One does not know, therefore, what disorder has been "cured" except in very few instances. A second point is that with very few exceptions the numbers cured are not given, nor are the numbers not so cured on the same treatment—that is, the failures. Many cures are quoted on one case only, usually that of the writer of the letter, and these are in most cases the only ones where any detailed history is given. The third point is the complete absence of any comparable untreated control group with which the treated group may be compared; this is hardly surprising in view of the large number of papers written on similar lines still appearing in medical journals in some parts of the world.

Finally, the probability that a natural remission has produced the beneficial effect rather than the curative agent is high in many if not most instances. It is well known to the medical profession that complete or partial remission may occur in any of the rheumatic disorders; gout aborts in a few days, rheumatoid arthritis may subside rapidly for no apparent reason after months or years of continuous activity of the disease, and even degenerative joint disease may rapidly or gradually become less painful or even entirely pain-free. The fact that natural remission of disease occurs and that pain can disappear spontaneously does not seem to be properly appreciated by the layman. Effect, particularly if he is the patient, must be in his eyes preceded by a cause. Finally, faith in a therapeutic substance or method, even though misapplied, may often be followed by symptomatic relief, even if only temporarily.

Happily the sufferer with any form of rheumatic disease is usually an optimist, and he will try anything within (and sometimes without) reason which might conceivably help his

painful condition, however bizarre it may seem. This high optimism is of the utmost therapeutic and prognostic importance; without it the patient becomes a tired, exhausted cripple who has given up the fight. Almost anything which preserves his optimistic attitude and helps to keep the flame alight is worth while unless it is dangerous to health, crippling to joint, or exhaustive of pocket. Medical treatment may have to be extremely bad if it is to delay natural remission and recovery in some cases. It is a field of medicine, for this reason, that has attracted, perhaps in the past more than to-day, many odd forms of treatment and many unusual practitioners both within and without the medical profession.

Conclusion

The fact that so many communications have been received is extremely heartening. In the not very remote past the lay public was perhaps rather more concerned with the problems and prevalence of the rheumatic diseases than, regrettably, was the medical profession. The fact that large numbers of laymen attack the problem on their own and from their own particular points of view is not only encouraging but potentially of great importance, if only because some chance observation may well lead future research into fruitful new fields and herald some new major advance. We are extremely grateful, therefore, for the large number of communications received. All of them are recorded, and all are available should any research worker wish to consult them on any particular point. Where causes are unknown it is impossible to say that any factor, however seemingly improbable, may not later prove to be of the greatest importance.

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BRITISH INTERPLANETARY SOCIETY

SYMPOSIUM ON SPACE MEDICINE

[FROM A SPECIAL CORRESPONDENT]

On October 16 and 17 the British Interplanetary Society held a symposium on space medicine at B.M.A. House. If not the first international conference in the world to be devoted exclusively to the medical and biological aspects of space flight, it was certainly the first on this side of the Atlantic. Speakers came from the Netherlands, Sweden, and the United States, as well as from Britain. The chair at the four sessions was taken in turn by Dr. L. R. SHEPHERD, chairman of the British Interplanetary Society, Dr. J. B. PARRY, an Air Ministry scientific adviser, Dr. H. A. CLEGG, Editor of the *British Medical Journal*, and Professor E. P. SHARPEY-SCHAFER, professor of medicine at St. Thomas's Hospital.

Scope of Space Medicine

Hitherto the British Interplanetary Society has been mainly interested in the logistic and mechanical aspects of space travel. By comparison the human factors have been somewhat neglected, but upon these depend whether manned space flight is possible at all.

The likely physiological and psychological stresses of space flight are of two main sorts. First there is the question of survival for days or even months in a hermetically sealed, artificial microcosm. With increasing altitude there is a progressive loss of the protective and life-sustaining qualities of the atmosphere: physiologically speaking, space begins at sea-level. At only 40,000 ft. (12,000 m.), the ambient pressure falls too low for even a 100% oxygen atmosphere to fully oxygenate the blood, so that pressure-breathing or a pressure cabin becomes necessary. Above 52,000 ft. (15,850 m.), where the ambient pressure falls to

foot or hand control (see Diagram). When the latter is depressed the compressed gas passes to the ram, which applies a thrust to the piston of the syringe and empties it. The release of the foot or hand control immediately exhausts the gas in the ram to atmospheric pressure. In practice we have used only two gauge settings—one of 90–120 lb. per sq. in. (6.3–8.4 kg. per sq. cm.) for injection through a catheter, and the other of 25–35 lb. per sq. in. (1.8–2.5 kg. per sq. cm.) for intravenous injection. The actual pressure applied to the ram is seven times that indicated on the gauge.

When employing selective angiocardiology a cardiac catheter of the largest bore possible is passed under fluoroscopic control through a peripheral vein into the heart. The catheter tip is placed in the superior or inferior vena cava, right or left atrium, right ventricle, or pulmonary artery, the exact site depending on the type of case under investigation. For thoracic aortography the catheter is inserted into the radial artery immediately distal to its origin, and is advanced into the ascending aorta so that its tip lies 2 in. (5 cm.) distal to the aortic valves. Alternatively, a polythene tube may be inserted percutaneously into brachial, carotid, or femoral arteries, and its tip advanced to the same site. The patient is then moved into position on the film changer and the catheter connected to the syringe on the injector chassis. On depressing the hand control, rapid injection at a predetermined rate is achieved. In general, injection rates of 20–30 ml. per second are employed. The accompanying Table illustrates the various injection times which can be achieved by the use of this apparatus.

Quantity of Contrast Medium Injected	Size of Cardiac Catheter	Injection Time in Seconds
70 ml.	10	2
60 „	9	2½
50 „	10	2
40 „	9	2½
30 „	10	1½
25 „	9	2
20 „	8	2½
15 „	10, 9, and 8	1–1½
10 „	10, 9, and 8	1
5 „	7	2
3 „	9, 8, and 7	1–1½
1 „	9 and 8	½
	7	1

The above injection times are obtained with a gauge reading of 90–120 lb. per sq. in. (6.3–8.4 kg. per sq. cm.).

The use of the 50-ml. and 25-ml. syringes facilitates accurate measurement of the smaller doses of contrast medium required in children and infants. Furthermore, the lower bore/stroke ratio and reduced friction of the smaller syringes permit an adequate injection rate even through a No. 7 catheter, which may be the largest that can be employed in the very young patient.

The injector has been used over 350 times at the Middlesex Hospital and the London Chest Hospital for angiocardiology and thoracic aortography. The only untoward incident ascribable to the apparatus was the rupture of an arm vein on three occasions. These accidents were undoubtedly due to incorrect positioning of the metal cannula employed at the time. Such have not been experienced since the metal cannula was replaced by flexible tubing or cardiac catheter.

The advantages of the injector are the provision of rapid safe injection of contrast medium into the chambers of the heart or the great vessels, and simplicity in design and operation. It is cheap to buy and maintain, and has given satisfactory results over the past six years.

The apparatus is manufactured by the Talley Anaesthetic Equipment Ltd., 37a, New Cavendish Street, London, W.1. A succession of registrars and assistants have used the injector, and at their suggestion several modifications have been incorporated in the design.

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Tenormal (Imperial Chemical Industries Ltd.).

Perolysen (May and Baker Ltd.).

These are preparations of pempidine tartrate (1:2:2:6:6-pentamethylpiperidine hydrogen tartrate) in tablets of 5 and 10 mg. Pempidine is a tertiary amine which lowers blood pressure by ganglion blockade. When given by mouth it is freely absorbed from the gut, and diffuses easily into tissues, readily crossing the blood-brain barrier. It thus closely resembles mecamylamine in its action, the most important difference being its quicker excretion. Thus, in contrast to mecamylamine, which is slowly excreted, acts for up to 12 hours, and is administered twice daily, pempidine acts for 6 hours and is usually given four times daily. The hypotensive action is usually observed within an hour.

Pempidine may prove to be an improvement on mecamylamine, for all the drug in the plasma is active, in contrast to mecamylamine, 25% of which is bound to plasma protein. Furthermore, the rapid excretion helps to prevent toxic accumulation of the drug. The excretion of both drugs is influenced by urinary pH, the clearance being increased in acid urine and decreased in alkaline urine. But variation in excretion is less with pempidine, and its hypotensive effect is therefore less likely to be influenced by changes in acid-base balance than that of mecamylamine.

Treatment may be started with 2.5 mg. orally four times daily, increasing each dose by 2.5 mg. daily until the desired control of blood pressure is achieved. A smooth hypotensive effect throughout the day may be expected. The indications for pempidine are those applicable to ganglion-blocking agents in general—severe, complicated, or malignant hypertension. The same side-effects, such as faintness, nausea, and constipation, must be watched for, though they may be less severe.

N.H.S. basic price: Tenormal and perolysen, 50 5-mg. tabs., 7s. 6d.; 50 10-mg. tabs., 13s. 4d.

Compicillin-V Filmtabs (Abbott Laboratories Ltd.).

These are tablets of the hydrabamine salt of phenoxymethylpenicillin (penicillin V). They are available as 125-mg. tablets (200,000 units) or 250-mg. tablets (400,000 units). The advantage of penicillin V is that it resists destruction by the hydrochloric acid in the stomach, and adequate blood levels can therefore be obtained when it is given by mouth. Further information about penicillin V was given in this column on August 16 (p. 445). It is a convenient means of administering penicillin in cases of infection by organisms sensitive to it.

Peganone (Abbott Laboratories Ltd.).—This is ethotoin (3-ethyl-5-phenylhydantoin) made up in tablets of 500 mg. It is of the same family of chemicals as phenytoin sodium, and is also closely related in its chemical formula to methoin (5-ethyl-3-methyl-5-phenylhydantoin). The hydantoins as a class are fairly well tolerated by mouth, and they have a specific anticonvulsant effect, the nature of which is unknown. Each chemical in this family has different toxic effects, though, apart from rare blood dyscrasias, they have not been severe. The present member of this family has been subjected to an extensive clinical trial; no severe toxic reactions have so far been reported, and it does not appear to have any toxic effects not already encountered in its widely used predecessors. It is likely to be of use for major epilepsy, and for focal attacks, but not for the petit mal of childhood.

N.H.S. basic price: 100 tabs., 26s. 8d.

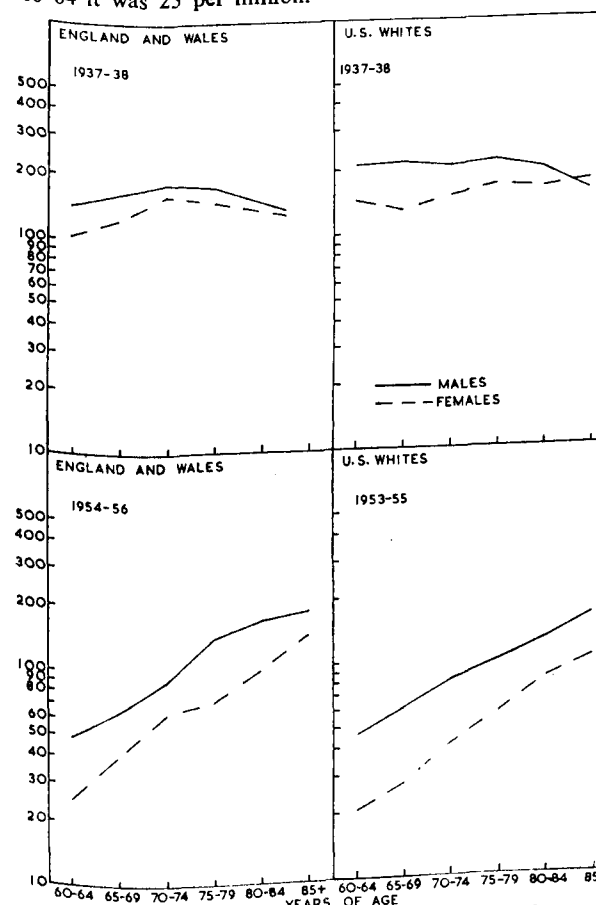
Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Appendicitis in the Aged

SIR,—Dr. Erik Christensen's paper on "Appendicitis in the Aged" (*Journal*, October 4, p. 832) draws attention to this problem. The following observations on its statistical aspects, made as part of a larger study undertaken in this unit, may also be of interest.

Before the 1939–45 war, in both England and Wales and the United States, the reported death rate from appendicitis was no higher in the very old than in late middle-age. To-day in these countries the position is quite different (see Fig.), as the death rate reported for those aged more than 80 is over twice that of those aged 60–64. For example, mortality in women aged 80–84 in England and Wales during 1954–6 was 97 per million; for women aged 60–64 it was 25 per million.



Appendicitis death rates per million. Sources: Volumes of Registrar-General's Statistical Review of England and Wales and Vital Statistics of the United States

Three possible mechanisms that could have produced this change seem worth consideration. Firstly, there might have been a real change in the disease—either that it now attacks middle-aged people less, or that those currently middle aged have by reason of some feature of their previous experiences a lowered susceptibility to the disease. Secondly, for many diseases recent improvements in treatment have benefited younger rather than older people, and it is possible that the new pattern of the death rate has been produced by this change. Finally, an increased liability to die from appendicitis in old age, compared with middle age, may have existed for a long time; but only now is this being recognized clinically. It is well known that the diagnosis

of appendicitis is not always easy. Diagnosis of strangulated hernia in the old is probably less difficult, and it is interesting to find that the death rate from this condition increases sharply with age to-day, and, in contrast with appendicitis, did so before the war.—I am, etc.,

J. A. H. LEE.

M.R.C. Social Medicine Research Unit,
London, E.1.

Dosage of Pancreatin

SIR,—It has come to our notice that general practitioners and others treating children who suffer from cystic fibrosis of the pancreas are finding some difficulty in regard to the dosage of pancreatin. Until recently there were on the market two strengths of pancreatin, standard B.P. and triple strength. The dose required of triple-strength pancreatin was as much as 10 g. per meal.

The 1958 edition of the *British Pharmacopoeia* gives a new standard strength which is approximately the equivalent of the triple-strength pancreatin. A new concentrated pancreatin is also available, the equivalent of 15 times the old B.P. strength and 5 times the 1958 standard. This concentrated pancreatin is now being widely used. The dose should be about one-third of the dose of the triple-strength pancreatin. Experience shows 0.25 g. with each feed to be sufficient for small babies and up to 2 g. for older children. The cost of the five times concentrated pancreatin is about half the cost of an equivalent dose of the standard strength. In all cases the dose given is determined by the effect on digestion and on the stools. In the case of babies some irritation of the skin of the lips, chin, and buttocks may occur if an excessive dose is given. The taste of the five times strength is much stronger than that of the standard, and for this reason some children are unable to tolerate it. In practice almost all of them become used to it and even develop a liking for it.—We are, etc.,

A. D. M. JACKSON.

A. P. NORMAN.

W. F. YOUNG.

London, W.1.

After Dinner

SIR,—The heart of every reader of your annotation "After Dinner" (*Journal*, October 11, p. 904) must be moved to pity for the habitual guest at annual medical school dinners: most of all, perhaps, for the editors of our medical journals, who have to attend so many but never speak at them. Does this silence express an agreed self-denying ordinance amongst editors, or indicate that their hosts do not realize that men who have an assured command of the written word are, at worse, not less likely to make a good show with the spoken word than some senior whose fame rests upon other things than eloquence or a nice wit?

The apparent poverty of good after-dinner speakers amongst us probably arises from our methods of choice. I do not doubt that there are men and women who can speak the Queen's English with elegance and point, but whom we are never allowed to hear in public. If one may generalize from experience, it seems that the surgeon who has no ideas of his own falls back upon anecdote when called upon to speak, while the physician, in like plight, takes refuge in compliments and platitudes, thus preserving his cherished respectability, but not redeeming himself from the charge of essential dullness. Of course he gets fewer laughs than the surgeon so easily commands for his idiom. However, few would seriously dispute that the anecdotal sequence as the basis of an after-dinner speech is the last hope of the culturally destitute. A good speech is a work of dramatic art, carefully prepared, and appropriate in form and substance to its end. The speech that wasn't worth preparing can scarcely be worth listening to. Nevertheless, those who attend these dinners to listen or to speak cannot find the situation as intolerable as you suppose. Were it so, old students would not return to them year after year as they do, and men with nothing particular to say and no gift for saying it would not be found to be so universally delighted as they are to be invited to speak. Don't let us waste our

pity. Our audiences don't expect much, and our speakers have a mysterious confidence in their ability to be coherent and amusing without topic or preparation. As you say, Sir, the toast of the guests is always the nadir of after-dinner oratory. It would be a healthy custom if every proposer of this toast who started on the *Who's Who* tack were swiftly and silently removed from the room. Nothing less will save us from these unimaginative bores. Not all spell-binding speakers are cultured, as the politicians have taught us. Yet eloquence is a part of culture. Out of a simple desire to be constructive I suggest that the Royal Colleges might add to their many and varied diplomas a conjoint diploma for eloquence and pith in spoken and written speech. All future officers of these Corporations would of course hold it as a preliminary to becoming eligible for office. Clinical professors and teachers of medicine and surgery would be expected to sit for it as often as might be necessary to gain it, while its possession, though no secret, might be a condition of the grant of a merit award. Such a plan would in a single generation not only resolve the particular situation you so rightly deplore, Sir, but it would transform the medical scene. It would render unnecessary all the dreary debates about medical education by providing a *corps d'élite* of men and women securely possessed of perhaps the most essential weapon in their role as educators: the power to move the hearts and the minds of their students.—I am, etc.,

London, W.1.

FRANCIS WALSH.

Anthrax from Bone Meal

SIR,—I was most interested in your recent annotation on the subject of anthrax from bone meal (*Journal*, October 4, p. 844). You say that human disease is not often traceable to this material. While this may be true for bone meal *per se*, it is less accurate so far as other bone products are concerned. I feel that this statement requires some qualification, because in some parts of this country the association between bone products and human anthrax is well known, and has been so since 1947. Human cases of anthrax due to bone material have received mention in the reports of the Ministry of Health^{1,2} and the reports of the Chief Inspector of Factories.³⁻⁶ In 1953 a paper was published by Dr. D. G. Davies and myself on dried bones as a source of anthrax,⁷ which reviewed some of the literature on the association of bone products and anthrax in man and animals. We also recorded the occurrence of 14 cases of human anthrax in connexion with a chemical factory using crushed bones as raw material. The crushed bones were imported from the Middle East and from Pakistan. A second paper was published in 1955 on the isolation of *Bacillus anthracis* from imported bones,⁸ in which we recorded the isolation of the organism from 5 out of 41 cargoes of imported crushed bone (12.2%). We made the point that this was probably a considerable underestimate of the true figure and gave reasons for this statement. Apart from the isolation of *Bacillus anthracis* from the crushed bones, it has also been isolated from sacks which had previously contained bones. Such sacks have been occasionally incriminated in the spread of anthrax.⁹

The second point I should like to make is your reference to the obligatory disinfection of bone. This is not merely a question of economic feasibility. Heat treatment of crushed bones is incompatible with their use as the raw material for gelatin manufacture. Gelatin is a most important export of this country and involves considerable trade with the North American continent. Heat treatment of bone meal does not always result in the destruction even of organisms of the salmonella group, which do not form spores. A treatment sufficient to destroy anthrax may well be very difficult to apply. The difficulties of the task of sterilization of bone products should, of course, not be used to prevent the study of the problem. This is particularly so in view of the fact that this material is also a potential source of salmonella infection. Of 49 samples of crushed bones examined, all have without exception showed the pre-

sence of salmonellae. Each specimen contained anything from two to ten serotypes.

Finally, the absence of an efficient sterilization process does not mean that we have no means at our disposal for minimizing anthrax infection due to bones. The number of cases seen has declined since the introduction of more efficient mechanical handling of the raw material in the factory concerned.^{3,4} It is only fair to say that the management of the factory have been extremely co-operative in introducing improvements suggested by the authorities. It is perhaps in this approach to the problem that the short-term answer may lie.—I am, etc.,

Cardiff.

R. W. S. HARVEY.

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- 2 Ibid., for Year 1952, 1953, Part II, p. 67.
- 3 Annual Report of Chief Inspector of Factories for Year 1950, 1952, p. 140.
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- 5 Ibid., for Year 1952, 1954, p. 163.
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- 7 Davies, D. G., and Harvey, R. W. S., *Lancet*, 1953, 2, 880.
- 8 ——— Ibid., 1955, 2, 86.

Reactions after Polio Vaccine

SIR,—I was interested to read the report by Dr. A. Fowden (*Journal*, October 4, p. 835) on a probable reaction to penicillin in poliomyelitis vaccine, and your annotation (p. 843). With increasing use of the vaccine, problems of this sort may be frequently encountered; and several difficulties arise in their assessment. Reactions may occur not only to penicillin or streptomycin but to other substances in the material—for example, the other antibiotics occasionally present, various proteins and formaldehyde, etc. When reactions are seen in patients who have no history of having had penicillin, or of being sensitive to it, are these to be regarded as irrelevant, or as reactions to the other substances? When they occur after the first injection the second is often withheld and, ironically, uncertainty is perpetuated. This point is shown in many of the American papers on the subject, few clearly showing the responsibility of penicillin as does that of Zimmerman.¹

We saw recently a child who developed an unusual rash a few days after the first injection. There was no history of sensitivity to penicillin. Intradermal tests to the British and to the Salk vaccine and to penicillin and streptomycin were negative, and the second injection was given after the situation had been explained to her mother; there were no ill effects.

There is at present no simple answer to the problem. Some writers have advocated desensitization if sensitivity is suspected or shown; many would doubt the virtue of this, when the chances of producing lupus erythematosus and related disorders in this way have been stressed. Intradermal tests are unreliable. The relative risks must be balanced in deciding whether or not to give a second injection. In considering the matter in a patient known to react to penicillin, it may be noted that Stroud *et al.*² say that most of these people have been safely vaccinated. It would probably help if a careful descriptive record were to be kept of all reactions; a general picture might emerge and, at least where the skin alone is involved, the irrelevant coincidental rashes of impetigo, scabies, and the like excluded.—I am, etc.,

London, E.1.

C. M. RIDLEY.

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- 2 Stroud, G. M., Brodell, H. L., Lascheid, W. P., Potus, L. W., *Ibid.*, 1958, 166, 251.

SIR,—During the past few weeks I have seen three cases of sulpha-drug reaction; one of these occurring in an adult and two in children. All had previously been treated with the drug and had suffered no ill effects. On investigation a coincidental factor was shown to be a recent poliomyelitis vaccination, the children having had Salk and the adult the British vaccine.

Case 1.—A girl of 6 was seen at the evening surgery with a recurrence of her frequent sore throats. She was given her

usual treatment of sulphadimidine. Half an hour after the initial dose she developed a bronchial spasm, angioneurotic oedema of the face, and an urticarial rash on the body. Intramuscular antihistamine was given, and the following morning she showed a marked improvement. The child had received her second Salk vaccination ten days before.

Case 2.—A lady aged 38 had two injections of the British vaccine a month previous to taking "dosulfon" for an inflamed throat. A few hours later she developed a generalized pruritus and maculo-papular rash. There was some difficulty in swallowing, due to oedema of the soft tissues of the throat, and some puffiness of the face was evident. Antihistamines were given, but it was a full week before the swelling of the face subsided.

Case 3.—A male child aged 3 had been vaccinated against poliomyelitis in February, 1958, with Salk vaccine. Two months later he was given sulphadimidine for an upper respiratory tract infection. In the evening he developed an urticaria and bronchial spasm. An antihistamine cleared the rash within 24 hours.

It would be interesting to discover whether other practitioners have had a similar experience and whether there is reason to suspect cross-sensitization.—I am, etc.,

Bradford, 7.

J. SAMUEL.

Immunization Card

SIR,—With the increase in the number of diseases for which immunization is available it has become almost impossible for the average man or woman to remember or perhaps even to understand what they or their children have been protected against. The situation would not be so serious if the family doctor had a complete record, but unfortunately this is impossible as so many protective inoculations and vaccinations have been carried out in the public health clinics, H.M. Forces, etc., and these records are not easily available. Further, the general practitioner has no suitable place on the N.H.S. medical record card to register the immunizations in tabular form.

For some years now in this partnership we have stamped the table illustrated below on the back of forms E.C.5 and the table illustrated below on the back of forms E.C.5 and have recorded on it all

Sensitivities					
BLOOD GROUP		Rh.			
		Diphtheria	Pertussis	Tetanus	T.A.B.
1st					
2nd					
3rd					
Boost					
Boost					
Mantoux		B.C.G.		Other Inocs.	
M.M.R.					

our own findings and immunizations and those that have been notified to us; as a result of recent developments a column for poliomyelitis is now required on the stamp. But this does not help us as much as we had hoped, as only a few immunizations are notified to us by the public health authorities and none by H.M. Forces.

It seems to us that family doctors should be made aware of all immunizations carried out on their patients, and that the patient's medical card should be provided with some such table as is used in this practice. Public health authorities should be required periodically to notify general practitioners of protective inoculations carried out under public health auspices. On discharge from H.M. Forces notification could perhaps be done by amending form E.C.13 so that the clerk could copy the inoculation record from the man's paybook on to a portion of the form which the general practitioner could detach and retain. We feel that it is important to start some such arrangements soon, before routine immunization procedures multiply further. Vac-

cinia and B.C.G. scars can be confused, and, as many people react severely to A.T.S., it can be most important to know urgently the patient's state of immunization to tetanus, and helpful to know about diphtheria, whooping-cough, poliomyelitis, and enteric fevers also.

We have submitted these suggestions to our local medical committee and our medical officer of health. We would be interested to hear if any such scheme exists in another area.—We are, etc.,

P. J. K. FERGUSON.

I. R. W. ALEXANDER.

M. PATERSON.

Edinburgh, 7.

Premonition of Death

SIR,—I should like to add a further case of premonition of death to those already given (*Journal*, October 11, p. 914). This took place in a ward of tuberculous patients, all of them from a particular area of Glasgow. During their enforced association within the confines of the ward, these patients, already bound by strong subcultural ties, naturally developed particularly intense relationships with each other. The patient concerned had, however, been partially separated from his fellows for many weeks by screens, since he was clearly dying and subject to rather frequent and distressing haemoptyses. Day and night about, each change of duty among the nursing staff carried with it the expectation of this man's death before the resumption of duty, and each return to duty brought renewed surprise at his continuing existence. His bed, I remember, lay in a corner at the end of the ward farthest from the door, and on the night of his death, and on that night only, this man called from behind his screen, in turn, correctly, bed by bed around the ward, the name of each of his fellows, most of whom he had not seen for months. To each he wished good night, and one who was already asleep drew the comment, "Aye, Lachlan, ye old bugger, ye're aye sleepin'." If this farewell was coincidental, it was certainly striking.

Many of the men of this ward came to a premature and lingering end, and a large proportion of them had full insight extending over long periods of time. Close association with such a community is not lightly forgotten. Beigler¹ has reviewed various ways in which organic disease can be detected from psychiatric and psychoanalytic evidence, and presents case histories in which this knowledge has been applied to diagnosis of impending death not indicated on ordinary clinical grounds. Sandford² has also contributed relevant notes on a dying patient.—I am, etc.,

Broxburn, West Lothian.

J. B. COLLINSON.

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SIR.—A mother came to me worried about her daughter, aged 4 years. Her daughter told her that she was going to leave her, but she was not to worry because she was going to a very beautiful place. Her mother greatly scolded her and said, "Darling, how unhappy I would be if you left me; how unhappy we would both be." To which the child replied, "I shall be able to see you, but you will not be able to see me."

This was repeated over a number of days. The child was healthy, full of buoyancy—both physically and mentally—normally alert and psychologically normal.

After a short period of days—I cannot remember exactly, perhaps a week to a fortnight—the child suddenly developed acute meningitis and died in a few days. This was before the advent of antibiotics.—I am, etc.,

Worthing, Sussex.

J. C. JONES.

SIR.—I well remember, when I was resident medical officer at the Royal Albert Dock Hospital, the uncanny experience of seeing some of the seriously ill Lascars stripping off their night attire and saying, "Me die, Sahib." Sure enough that night they died, in spite of all we tried to do to save the poor creatures.—I am, etc.,

Thornton Heath, Surrey.

DOUGLAS BENTON.

Medical Education

SIR,—Dr. Hugh Gainsborough's letter (*Journal*, September 27, p. 795) is of particular interest to medical social workers and will encourage them greatly, since his conception of medicine as "a study of all aspects of man as he lives in society" comes very close to the ideal which social workers set before themselves. How wonderful it would be if from the beginning of their clinical course medical students were expected to concern themselves with people, their home background, family worries, and anxieties about hospital treatment.

I wonder, however, if Dr. Gainsborough is not expecting too much of human nature in suggesting that the specialists concerned are necessarily the people best qualified to teach what the attitudes aroused by particular forms of treatment are likely to be. Some very great physicians can do this; but perhaps most of us, when we have to carry out painful or humiliating procedures on others, cannot afford to think too deeply how the patient feels about it. We have to concentrate our attention rather on the ultimate benefit to the patient and on developing the most efficient and swiftest method of achieving this end. Moreover, even if ward rounds were more generally organized in such a way as to give patients the opportunity of a quiet talk with their consultant, I am not sure how free they would feel to tell of their fears. They know usually that the surgeon is doing what he considers necessary for their health, and the stiff upper lip seems the most courteous and helpful attitude to take with him.

In whom, then, is the patient most likely to confide about the things that are troubling him? Certainly in the general practitioner if he is already a trusted friend, and sometimes in a sympathetic and not too busy member of the hospital team. But in hospital the person to whom some patients talk most easily is the almoner. It takes a special skill to encourage people to talk freely about intimate fears which they may expect others to think ridiculous; it takes enormous patience and understanding to discover what is the significance of a particular operation for a particular patient, and it requires a conviction that there is value for the patient in talking about these things rather than in fighting them by himself. Moreover, from the patient's point of view the almoner stands a little apart from the rest of the hospital team and has less power over him. It is often through their understanding and support that almoners make their main contribution to the patient's recovery. I wonder, too, if medical schools might not use them more often than they have done in the past as sensitive instruments able to register and demonstrate to students the responses of their patients to hospital experience.—I am, etc.,

London, N.W.3.

ISABEL BOAG,
Almoner.

SIR,—The articles written on general practice and medical education (*Journal*, September 6, p. 577) seem to reflect a disquiet on this subject which springs, I feel, from a general experience that the training which we acquire at medical school and hospital is designed to produce hospital specialists rather than general practitioners. In fact, the majority of medical students do eventually become general practitioners. The staff of a hospital is becoming increasingly a body of specialists rather than people who have a wide medical experience, and many deplore the passing of the general hospital consultant. Further, his place is surely now taken by the general practitioner, who is, in fact, treating many of the conditions that required hospitalization in the past. It is precisely this elevation of status of the general practitioner that seems to be missing from the proposals made in the articles on medical education.

I suggest that the general practitioner needs to be reintegrated not only with local but also with the teaching hospital staffs; that he has an important part to play in the training of students, and that, as a general practitioner, he should be a member of the hospital staffs, not doing sessions in hospital as a consultant but still working as a general practitioner. Because of the nature of

medical students and their concern to pass examinations, as a first step the general practitioner should, I believe, be an integral part of the final examinations board. He should be present all along the line, both at the setting of questions, their marking, and at the vivas. I feel that to suggest less than this will have little effect on the present situation.

Because of the present relationship between general practice and the hospital services, and, in particular, what Dr. M. Balint calls "the perpetuation of the teacher-pupil relationship," it would probably be better for the general practitioner if such posts were chosen from an agreed panel drawn up by some qualified body such as the College of General Practitioners. This would obviate, to some degree, the appointment of unsuitable people who sometimes tend to be overawed in the atmosphere of hospital medicine.

Clearly a fundamental change is necessary in medical education, but, in the present set-up, I believe this proposal would be a first step. Suggestions of students visiting general practice for a fortnight, while admirable in themselves, have in fact been attempted for some time with little response; and until, I feel, the examination question is faced, not by some question being asked which would seem appropriate to general practice, but by shift of emphasis on the sort of answers that are required, little satisfactory progress will be made.—I am, etc.,

Orpington, Kent.

P. A. L. CHAPPLE.

"Sytron"

SIR,—We have seen your note on "sytron" (*Journal*, August 30, p. 562) and also Mr. C. Beaven's letter (*Journal*, September 27, p. 801) regarding this preparation of sodium ironedetate. In the last two or three years we have been trying out iron chelate substances in the treatment of iron-deficiency anaemia. Among those we have used is sodium ironedetate in two preparations—(a) a solution of the chelate suitably flavoured, and (b) capsules containing the chelate as a powder. In each case the dosage employed was 70 mg. of elemental iron three times a day. The liquid was given to 55 patients and the capsules to 26 patients, making a total of 81 cases. Diarrhoea occurred in 23 cases and was moderate or severe in 20 cases. Though it sometimes settled gradually, this was not always the case and it was indeed a major disadvantage. There was a minority of patients in whom severe constipation was improved. Nocturnal cramps in the legs also occurred in 16 cases but did not usually commence until nearly four weeks after the start of treatment.

Before a new preparation of iron is introduced there should be no doubt that it either has less tendency to produce unpleasant side-effects or is a better haematinic in view of the many satisfactory preparations available. This preparation was unsatisfactory in the former respect and had no special value from the latter point of view. As it was colourless and almost tasteless it was felt that it might have a limited place as a liquid preparation, but was certainly not suitable for large-scale therapy. We are reporting this work in detail at a later date.—We are, etc.,

Manchester, 13.

JOHN F. WILKINSON,
J. T. LEEMING.

"Nilergerx"

SIR,—In their recent letters Dr. A. Fry (*Journal*, September 6, p. 636) and Dr. R. P. Warin (*Journal*, October 4, p. 859) are critical of the claim that "nilergerx" has a very low incidence of side-effects. The former bases his criticism on one case, but Dr. Warin reports 6 cases of drowsiness out of 13 patients given the drug. Their figures compare very unfavourably with those reported from America (5 out of 602 patients). I have used nilergerx for the past eight months and have been impressed by the relative absence of side-effects. I have made careful inquiry about these from every patient because of the American claim.

In a preliminary survey of a series of cases intended for later publication, 67 cases have data available with regard to side-effects. A considerable further number are not included because

of as yet insufficient information. The accompanying Table shows the frequency of these effects in relation to the dosage given.

Doses as high as 72 mg. daily have been given, which are considerably higher than recommended by the manufacturers. In no cases were the side-effects severe. The figures shown for side-effects give an exaggerated impression of toxicity. Examination of the eight cases exhibiting drowsiness revealed that the case on 72 mg. daily had no drowsiness on 48 mg. daily. The same 72 mg. daily was only drowsy for a few days, she was equally drowsy the following week on dummy tablets, and when nilergerx was restarted at the same dose level there was no drowsiness. One case on 36 mg. daily had only very slight sleepiness.

Dosage mg.	No. of Cases	Drowsiness	Other Side-effects	No Side-effects
72	5	1	2	3
60	2	2	0	0
48	30	1	2	27
36	6	2	0	4
24	9	0	0	9
16	3	2	0	1
12 or less	12	0	1	11
Total	67	8	4	55

This leaves 4 cases out of 67 (6%) with definite drowsiness. I have the clinical impression that this was not as marked as with certain other antihistamines. Only two patients volunteered the information that the tablets made them feel sleepy. On the other hand one patient was emphatic that nilergerx gave her a feeling of greatly increased energy. Two patients had attacks of asthma whilst taking nilergerx, but these were probably not directly attributable to the drug, as they subsided without its withdrawal. One child was sick with the syrup. Another patient complained of a sensation of burning in the oral and nasal mucosa whilst taking nilergerx.

Without going into the merits of nilergerx as an antihistamine my series shows that it is a drug with noticeable freedom from side-effects—in particular, drowsiness. In this respect I find it as good as any other antihistamine and better than most. The absence of a sedative effect is not always essential in these drugs but of great value in those driving vehicles or working with machinery.—I am, etc.,

Glasgow

J. O'D. ALEXANDER.

Chemotherapy in Primary Pulmonary Tuberculosis

SIR,—I would like to thank Dr. J. K. Cameron, Professor I. D. Hay, and Mr. L. J. Temple (*Journal*, May 31, p. 1301) for replying to my letter (*Journal*, April 12, p. 887) and for clarifying their conclusions concerning the value of "antibiotics" in the treatment of primary pulmonary tuberculosis. Unfortunately it appears that the main point in my letter has escaped them. This was simply that in every case of active tuberculosis, child or adult, an effort should be made to rid them of their tubercle bacilli in order not only to prevent spread of disease and possible complications such as meningitis and bone and joint involvement, but also to minimize relapse at a later age.

Dr. Cameron, Professor Hay, and Mr. Temple raise several questions in their recent letter which I feel require answering: (1) The development of drug resistance: I cannot see the pertinence of this matter to a decision to give chemotherapy or not—but if chemotherapy is commenced, the chances of drug resistance developing are increased by giving ineffective doses. Therefore adequate treatment must be given. (2) The patient's own resistance in combating disease: I agree that this is a very significant factor in every case of tuberculosis. In a percentage of patients, however, this is not sufficient and complications and later relapse do occur—it is to prevent such occurrences, in every case if possible, that chemotherapy is recommended. (3) Is every child who converts a Mantoux test to be treated? If recent, I would again say yes, as a preventive measure. (4) Toxic side-effects of chemotherapy: There is no doubt that this danger exists and must be weighed against the possible good advantages of treatment. I feel that with careful management these can be kept to a minimum and that children should not be denied adequate treatment because of a possibility that they might appear.

One should remember that every child sterilized of tuberculosis germs, apart from being cured himself, may save many others from being subsequently infected with tuberculosis.—I am, etc.,

Adelaide,
S. Australia.

R. MUNRO FORD.

Thoracic Outlet Compression Syndrome

SIR,—In their paper in the *Journal* of September 20 (p. 709), Professor C. G. Rob and Mr. A. Standeven contend that the changes which they observed in the arms were due to local mural thrombosis of the subclavian artery followed by embolism or spreading thrombosis, and that this local thrombosis was due to extrinsic pressure in the region of the first rib. The evidence for the second of these propositions was the presence of a cervical or abnormal first rib, the presence of a systolic murmur in some of the cases, and the improvement which followed removal of the abnormal structure.

Some recent cases have made us doubtful whether this evidence is sufficient, at least in those over 40 years of age. As mentioned in the article, symptomless cervical ribs are common enough; systolic murmurs and thrills due to a stricture anywhere between the aortic valve and the supraclavicular fossa may best be detected at the latter site; and the improvement following surgery is unconvincing evidence of the cause, as sympathectomy was performed in each case and Case 4 was improved although the suspected rib was not removed and the artery damaged and repaired. The following cases have all been studied recently.

Case 1.—A sales manager aged 42 had experienced pain in the left arm for several weeks when he was aged 38 and again at 41. He had had coronary thrombosis at ages 37 and 41. He had impaired pulsation in the left subclavian and distal arteries with a coarse thrill and murmur in the left supraclavicular fossa. The blood pressure was 170/70 and 90/70 in the right and left arms respectively. Carotid pulsations were equal. Arteriography (see Figure) demonstrated narrowing of the subclavian artery between the origin of the vertebral artery and the thyroid axis.

Case 2.—A clerk of 58 was aware of a hissing noise coincident with the pulse. He had both effort angina and intermittent claudication. The physical signs were similar to those of Case 1, the blood pressure was 165/85 and 140/110 in right and left arms. Aortography revealed constriction of the left subclavian just above the origin of the vertebral artery.

Case 3.—A butcher aged 64 became dizzy on bending his head forwards and developed intermittent claudication in the right arm when splitting carcasses. He had gross impairment of pulsation in the right carotid artery with diminished pulsation in the right subclavian artery and a marked systolic thrill and murmur in the right supraclavicular fossa. Blood pressure was 105/90 and 165/85 in the right and left arms. At aortography the innominate artery was shown to be markedly narrowed 2 cm. from its origin.



Case 4.—A farm labourer aged 64 developed occipital headache whenever he slept on his left side, rapidly relieved by standing. The physical signs were similar to Case 3. The blood pressure was 135/105 and 210/105 in the right and left arms. This lesion is evidently in the innominate artery, but arteriography has not yet been performed.

This group all had evidence of arterial narrowing anatomically unrelated to the first rib and had no structural abnormality in the neck, but in each the thrill and murmur were best appreciated in the supraclavicular fossa. Had a cervical rib been found it would have provided a ready explanation for partial occlusion of the subclavian artery. Aortography and subclavian arteriography were performed by retrograde passage of a catheter following percutaneous puncture of a femoral artery, an investigation which we have found safe and of great value in establishing an exact diagnosis. We suggest that it would be wise to exclude other lesions of the subclavian artery before accepting pressure by a cervical or abnormal first rib as the cause of a patient's symptoms.—We are, etc.,

J. R. H. TOWERS. C. P. NEWCOMBE.
Leeds. P. G. KEATES. M. D. SUMERLING.

Pathogenesis of Fever

SIR,—Your review of the pathogenesis of fever in rabbits (*Journal*, October 4, p. 839) is timely in view of the important discoveries now being made in this field, but there is a regrettable omission of any reference to the British publications which are the only studies of man. It has been shown that the latent period in the action of bacterial pyrogen is greatly reduced if it is incubated *in vitro* in fresh human blood before injection.¹ The presence of a minimal number of leukocytes, probably polymorphs, in the blood is necessary for this property to be achieved.² Incubation of bacterial pyrogen in cell-free plasma or serum conversely inhibits the febrile response,³ and in this important respect man differs from the rabbit, in whom a similar preparation produces an accelerated and augmented fever.

We postulated that human endogenous pyrogen is produced by the *in vitro* incubation of leukocytes with bacterial pyrogen, and the properties of this substance were examined.⁴ Human endogenous pyrogen fails to pass an ultra-filter or a dialysing membrane, and unlike bacterial pyrogen is destroyed by heating to 70° C. for thirty minutes. In addition to the difference in latent periods, bacterial pyrogen fails to produce fever when injected intramuscularly, whereas endogenous pyrogen does so, and the repeated injection of endogenous pyrogen does not lead to tolerance. Endogenous pyrogen was present in the blood of a patient who had been previously injected with bacterial pyrogen.

So far we have failed to produce human endogenous pyrogen from human leukocytes alone, and it remains to be determined if this substance is released from white cells or whether the properties attributed to it are due to an alteration of chemical structure of bacterial pyrogen (lipopolysaccharide) by some action of leukocytes. In view of the different properties of human and rabbit serum, the results of animal experiments must for the present be carefully distinguished from the evidence derived from man. For this reason alone it is unfortunate that your annotator omitted to mention the human work.—I am, etc.,

London, W.2.

E. S. SNELL.

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Ergometrine with Hyaluronidase

SIR,—I was most interested to read the paper by Drs. M. P. Embrey and W. J. Garrett (*Journal*, July 19, p. 138) and the letter by Dr. A. H. Labrum (*Journal*, October 4, p. 857) on the speed of action of ergometrine in conjunc-

tion with hyaluronidase. As a woman can lose a serious amount of blood even in the 4–6 minutes before the onset of the action of ergometrine accelerated by hyaluronidase, would it not be safer—and cheaper—to employ routine intravenous ergometrine at the end of the third stage? I would suggest that the injection—of 0.25 mg. intravenously and 0.25 mg. intramuscularly—be given after the delivery of the placenta to avoid its retention.—I am, etc.,

Drayton, Norfolk.

J. N. GALE.

The Peacehaven Syndrome

SIR,—I see every year a condition which I call the Peacehaven syndrome. The patient, let us call him Joe Murgatroyd, is from up North and is around the retiring age. He has been rather short of breath over the past few years and decides to buy a bungalow and retire to the South Coast to help his bronchitis.

When the move comes, his wife goes on ahead by train to get some food in, while Joe goes with the van to see that the furniture does not go astray. Joe usually gives the van-driver a beer on the road and has one or two himself. That night he is taken ill and is sent into hospital with what is called acute bronchitis. When he comes in, his bladder is up to the umbilicus, his blood pressure is sky high, and he is waterlogged. His prostate is enlarged. He is never the same man again, and his disconsolate widow may find herself, a year later, selling the house at a loss and returning to the North where her friends are. The only people who are happy are the house agent and the undertaker.

The moral, of course, is to make sure that you are fit enough before you make a serious change in your way of life.—I am, etc.,

Hove.

FORDE CAYLEY.

The Pharmaceutical Industry

SIR,—Among the criticisms of the pharmaceutical industry Dr. R. S. Inch (*Journal*, October 4, p. 846) makes no mention of the confusion, annoyance, and waste of time caused by the existence of several names for the same drug. In recent years new drugs with proprietary names such as "dindevan," "achromycin," "inversine," or "equanil" have been announced with a barrage of propaganda from the manufacturers. Later we have read articles in medical journals about phenindione, tetracycline, mecamlamine, or meprobamate, and have been subjected to more propaganda from other firms about the same drugs under other proprietary names, such as "tetracyl" or "miltown." According to the *British National Formulary* prednisolone has the following proprietary names: "codelcortone," "delta cortef," "delta cortril," "delta-stab," "di-adreson-F," "hydrodeltalone," and "precortisyl." Sulphanilamide was said to have over 40 proprietary names.

Unlike many of the other problems mentioned by Dr. Inch this one is capable of solution. If the pharmaceutical industry, in association with the General Medical Council, cannot solve it, I would favour legislation to ensure that one drug has one name.—I am, etc.,

Farnham, Surrey.

J. W. TODD.

Homosexuality

SIR,—Dr. Desmond Curran's review of four books on this subject (*Journal*, October 4, p. 837) is one of the ablest and most helpful I have read—on any topic. Far from being "ill-chosen asides," as implied by Dr. W. A. O'Connor (*Journal*, October 18, p. 979), Dr. Curran's criticisms are precisely the sort of comment that is really useful to a potential book-buyer; and his concluding suggestion of a truly informative book is exactly what the reader needs.—I am, etc.,

Manchester.

RAYMOND WHITEHEAD.

* * This correspondence is now closed.—ED., B.M.J.

Obituary

HENRY WALLACE-JONES, M.Sc., M.D.
F.R.C.P.

Dr. Henry Wallace-Jones, formerly senior honorary physician and physician in charge of the department of cardiology at Liverpool Royal Infirmary, died suddenly at Johannesburg, South Africa, on October 8. He was 70 years of age.

Henry Wallace-Jones was born in Liverpool on August 1, 1888, the son of Dr. Henry Jones, and was educated at University College, Liverpool, and at Liverpool University, where he graduated first in science. Obtaining the B.Sc., with first-class honours, in 1910, he proceeded to the M.Sc. in the following year. Then, having decided to complete the course in medicine, he went on to take the degrees of M.B., Ch.B. in 1913, again with first-class honours. In 1914 he proceeded to the M.D., and also obtained the now obsolete diploma in ophthalmic surgery (D.Ch.O.). Elected a Member of the Royal College of Physicians of London in 1921—he had taken the London Conjoint diploma in 1912—he became a Fellow of the College in 1930. After taking his medical degrees he held the appointments of house-physician, house-surgeon, and house-surgeon to special departments at Liverpool Royal Infirmary. During the first world war he served as a captain in the R.A.M.C. and was pathologist to the Liverpool Merchants' Hospital in France. After the war he returned to Liverpool to practise as a consulting physician. He became honorary assistant physician at Liverpool Royal Infirmary in 1919, progressing to senior assistant physician, full physician, and ultimately senior physician. From the middle twenties until he retired soon after the end of the second world war he was medical officer in charge of the cardiology department at the Royal Liverpool Children's Hospital, and over much of the same period was head of a similar department at Liverpool Royal Infirmary. He was also consulting cardiologist to Waterloo Hospital and honorary consulting physician to Liverpool Maternity Hospital. He assisted Professor Ernest Glynn in the preparation of the report of the Medical Research Council (Special Report Series No. 79, 1923) on bacteriological and clinical observations on pneumonia and empyemata. In 1924 he contributed a paper to these columns on types of dextrocardia; in 1926 on congenital absence of the pectoral muscles; in 1927 (with Dr. Robert Coope) on the urea concentration test in nephritis and its prognostic value, and (with Professor John Hay) on trauma as a cause of auricular fibrillation, its medico-legal significance; and in 1928 on vital capacity in heart disease. He was the author, jointly with Dr. E. Noble Chamberlain, of *Electrocardiograms: An Elementary Atlas for Students and Practitioners*, a small manual published in 1939. A member of the British Medical Association for forty years, he was honorary secretary of the Liverpool Division from 1928 to 1930. In 1926 the Association awarded him a research grant. He leaves a widow.

G. S. SEED, F.R.C.S., D.L.O.

Mr. G. S. Seed, senior aural surgeon to the General Infirmary at Leeds and to St. James's Hospital, Leeds, died in London on October 13 at the age of 53.

George Sutcliffe Seed was born on April 27, 1905, and was educated at Heath Grammar School, Halifax, and at Leeds University, where he graduated M.B., Ch.B. in 1927. Three years later he obtained the D.L.O. of the English Royal Colleges, and in 1936 was admitted F.R.C.S. After graduation he held the appointments of house-surgeon and house-physician at the West Bromwich and District General Hospital, and senior house-surgeon at the Birmingham and

Midland Ear and Throat Hospital. He then returned to Leeds as resident aural officer at the General Infirmary, subsequently becoming aural surgeon to the infirmary and to St. James's Hospital. When the British Medical Association held its Annual Meeting at Harrogate in 1949 he served as a vice-president of the Section of Oto-rhino-laryngology. He leaves a widow and three daughters.

T. McM. B. writes: The privilege of working alongside a man of George Seed's integrity and selflessness is not given to everyone. He was brought up in Halifax, the only child of parents who themselves must have been admirable, for George of all people showed none of those weaknesses which sometimes betray an only child. He was educated at Heath Grammar School, Halifax, and there must have been laid down the foundations of the character which endeared itself to so many. The results of this early education in George's case were a fine example of all that is good in the British educational system. After graduation and the usual hospital appointments he returned to the General Infirmary at Leeds as resident aural officer, a post he held without blemish for seven years, probably a record term of office for any resident appointment in this hospital. It was typical of his assiduity of purpose that, after taking his F.R.C.S., he immediately decided to broaden his experience and knowledge by a prolonged tour of clinics in Zurich, Vienna, Berlin, and Scandinavia. On his return, and when the late E. W. Bain retired, George was the obvious successor, and he was appointed consultant not only to the infirmary but to St. James's Hospital and Dewsbury General Hospital. It was at this time that he first saw an auburn-haired almoner, and I well remember the shyness with which he contrived an introduction to the girl whom he married in 1939. A year or so before this he had joined the Territorial Army and was embodied in September, 1939. He saw service with the British Expeditionary Force in France, before Dunkirk, and later on had over three years in India, where for a period he served as a brigadier in his specialty.

On his return home George was always determined not to work in clinical isolation, and it was his vigour and his inspiration which resulted in the foundation of the North of England Otolaryngological Society. He became its president, and the youthful zest of its activities is a fitting tribute to his memory. He spent and enjoyed a lot of his spare time in clinical discussions, and a measure of the esteem in which his colleagues in many places held him is that he was a member by invitation of the Visiting Association of Ear, Nose, and Throat Surgeons of Great Britain, as well as of the Midland Otolaryngological Club. He had recently been elected a vice-president of the section of otology of the Royal Society of Medicine. It was always a joy to observe the delight with which his colleagues greeted him at the meetings of these societies. He visited clinics in America and, despite a prolonged and serious illness five years ago, continued these activities, and it was during one of these journeys that his life ended. His particular clinical interest was probably in malignant disease. He had written on this and other subjects, but his clinical abilities lay mainly in his thoughtful judgment of what was best for the patient rather than indulgence in exciting, probably short-lived, new theories. He was, however, ready to familiarize himself with new techniques, but in our weekly combined clinics a flitting frown of dismay would indicate a firm stand against unorthodox suggestions. Patience was one of his virtues, and despite his heavy commitments he was always an inspiration to the rest of us. His painstaking and unhurried methods in the diagnosis and care of his patients were a fine example to his juniors and students. After his long period of residence and prolonged absence abroad he had revelled in the joys of family life, and it is with gratitude that we know this was a happy one. He had enjoyed fishing in recent years, and very recently had returned from one such holiday in Scotland. His impish sense of fun made him a delightful companion, and his gentle nature a man who was liked by everybody who knew

him, and loved by many. The sympathy of his many friends will be extended to his widow and three daughters in the loss of one who was professionally so mature and yet who still retained his youthful enthusiasm. Perhaps his life can best be summed up by quoting from a letter I received from a mutual friend. He says: "George did as much and more for the infirmity by being selfless, generous, and unassertive as many have done with more aggression; his influence was entirely beneficent."

JANE H. TURNBULL, C.B.E., M.D.

Dr. Jane Turnbull, who died at Canterbury on October 15 at the age of 87, was formerly in charge of the Maternity and Child Welfare Division of the Ministry of Health.

Jane Holland Turnbull was born in 1871, the daughter of Lieutenant-Colonel Archibald Turnbull, of the Indian Army Veterinary Service. Both her parents died in India when she was still a young child. Some of her early education was in Edinburgh, but later she went to live in Reading with a friend of the family who kept a school there and for whom Dr. Turnbull had a great affection. After studying medicine at the London School of Medicine for Women she graduated M.B., B.S. in 1899, with first-class honours in surgery. Five years later she proceeded M.D. After graduation she became a demonstrator of anatomy at the London School of Medicine for Women and then obstetric assistant at the Royal Free Hospital. After a period of work at the East Anglian Sanatorium at Colchester she returned to London as R.M.O. and tutor in obstetrics at the Royal Free, where she did useful work in organizing the district midwifery service. She also began a long association with the Elizabeth Garrett Anderson Hospital (known then as the New Hospital for Women), where, after being house-surgeon and house-physician, she became assistant obstetrician. Another appointment she held was that of assistant surgeon to the Canning Town Medical Mission Hospital. After settling in private practice in 1905, Dr. Turnbull continued to serve the Royal Free Hospital as anaesthetist and lecturer in anaesthetics. An examiner to the Central Midwives Board, in 1913 she was appointed a member of the committee which established the South London Hospital for Women, and later she joined the staff of that hospital as assistant surgeon.

During the first world war Dr. Turnbull became Controller of Medical Services, Queen Mary's Army Auxiliary Corps, and she was appointed C.B.E. for her services in 1918. The Ministry of Health was set up in the following year and she joined its staff as a medical officer. She was chiefly concerned with the maternity and child welfare services and for three years worked as director of the Maternity and Child Welfare Division at the Ministry before her retirement in 1936. Thereafter she continued to make a useful contribution to the development of the work in which she was interested by serving as chairman of the National Association for Maternity and Child Welfare from 1939 to 1948, and for the next three years as vice-president of that association.

We are indebted to Sir ARTHUR MACNALLY for the following appreciation: Dr. Jane Turnbull's death at an advanced age brings to mind many memories. After service at the Royal Free Hospital, on the honorary medical staff of the Elizabeth Garrett Anderson Hospital and the South London Hospital for Women, and as Controller of Medical Services, Queen Mary's Auxiliary Corps, she was appointed a medical officer of the newly established Ministry of Health in 1919. I did not see a great deal of her in her first years at the Ministry, for she was chiefly occupied in the inspection of maternity and child welfare schemes and out of the office, but whenever I conferred with her on official subjects I found her a most helpful and understanding colleague. Her good work was especially valued by her immediate chief, Dame Janet Campbell, to whom she became Deputy Senior Medical Officer in 1929. On Dame Janet's retirement in

1933 Dr. Turnbull was put in charge of the Maternity and Child Welfare Division. She retired in 1936 after three years of excellent and strenuous work as acting S.M.O.

Dr. Turnbull participated in the comprehensive special investigation into maternal mortality in England, the report on which was published as a White Paper in April, 1937. One of the first results of this investigation was an improvement in the standard of midwifery practice, both domiciliary and institutional, through the Midwives Act of 1936. This provided a salaried domiciliary service of trained midwives throughout the country. In the establishing of this service by local authorities Dr. Turnbull's advice and experience were of value both to the Ministry and to medical officers of health. Much of Dr. Turnbull's work was unobtrusive. She succeeded in her aims to improve the well-being of mothers and children by wise administration, because her arguments were logical, tactfully expressed, and in matters of controversy given with appreciation of the other person's point of view.

Dr. Turnbull was of medium height, white-haired, and erect. She was alert and brisk, but reserved in disposition, and a lover of books and of flowers, which she cultivated in her garden at Princes Risborough. She had a dry sense of humour which occasionally revealed itself in the course of conversation. With a strong sense of vocation, she helped to make the world better than she found it, and for this she would wish to be remembered.

E. B. writes: Dr. Jane Turnbull was a Scot by birth, an Anglican by training, and a very gentle, courteous lady. All through her life she always believed the best once she had learned to like and respect anyone. She never made up her mind quickly on important issues, and always sought the help of those whom she knew were trustworthy. She had had her Edinburgh roots severed at too young an age and was never able to forget how gracious the old pre-war type of life had been, and she found it very hard to let people, even in times of emergency, relax the courtesies of life. In her later years she lived with a god-daughter, who helped her through her time in Canterbury Hospital after a fall last summer and a weary time with a fractured hip. But she made a good recovery and was able to be home for some time and enjoy the garden, and it is now from that quiet home that has come the news of her passing. Her gentle courtesy and beauty of early life will be long remembered by all to whom she endeared herself through a long and useful life.

J. K. J. HAWORTH, M.D., M.S.

Mr. J. K. J. Haworth, honorary surgeon to Sutton Hospital, Surrey, and surgeon to the Carshalton and District Hospital, died suddenly at Mullion, Cornwall, on October 4. He was 69 years of age.

James Kenworthy Johnston Haworth was born at Durham on December 9, 1888, the son of Canon Haworth, formerly principal of St. Hild's College, Durham. From Durham School he entered Durham University College of Medicine, going on to the Royal Victoria Infirmary, Newcastle upon Tyne, three years later. He graduated M.B., B.S. from Durham University in 1912 and proceeded to the M.D. in 1914 and the M.S. in 1920. After graduation he held a number of appointments at the Royal Victoria Infirmary, Newcastle upon Tyne, ultimately becoming resident medical officer. In August, 1914, he joined the R.A.M.C., and in October went to Lucknow with the 4th Battalion, Royal West Surrey Regiment. He also served in Egypt, Rangoon, and Mesopotamia, from where he was invalided back to Lucknow in 1916, and was not demobilized until September, 1919. While in India he lectured in anatomy and examined in surgery for Allahabad University. After the war he returned to his Newcastle appointment, but left there to go to Durban, South Africa, but came back to Britain in 1922 to become medical superintendent of St. Mary's Hospital, London. In the following year he was appointed senior assistant medical officer under the old Metropolitan

Asylums Board at Queen Mary's Hospital for Children, Carshalton, Surrey. Soon afterwards he decided to set up in practice in near-by Sutton, and became honorary medical officer to the Carshalton War Memorial Hospital and honorary surgeon to Sutton and Cheam Hospital. During the second world war he was a surgeon in the Emergency Medical Service. For some years he was an examiner in surgery for the General Nursing Council of England and Wales.

J. M. T. and T. H. W. write: Pat Haworth, as he was affectionately known locally, was interested in people, and felt that general practice was the most satisfying medical work. He began practice in Sutton in 1927, and after such a varied and distinguished professional experience both in this country and abroad the impact of his personality was soon felt. Within a short time he was appointed to the surgical staff of Sutton and Cheam Hospital and to the Carshalton War Memorial Hospital, where he practised surgery with skill not bettered in higher circles. In his work, care and thought for the individual were his chief concerns. There can be few general-practitioner and surgical colleagues in the district of his time who did not benefit from his wise advice and sage counsel. In private practice patients were assured not only of first-class individual attention but also of a degree of human kindness and interest in their ordinary affairs. Haworth was remarkable because he was both the best type of family doctor and a skilful surgeon. Outside medical practice Pat Haworth had many interests. He was a good listener and yet could talk wisely on most subjects. A keen observer of life in general from nature to politics, he brought a boyish enthusiasm to each new interest and to all that he did. Conversation with him could never be dull or uninteresting; he enjoyed an argument, and one usually left him having learned something. He was outspoken, vigorously supported what he considered ethically correct, and never took a pessimistic view of anything.

A serious illness in 1950 made him retire from active medical practice, and curtailed his physical activities, but his agile mind could not be curbed and he decided to read law. With zest and enthusiasm he became a student member of Gray's Inn. Intensely interested in this new sphere, he completed the whole of part I, and was hoping to take part II of the Bar examination, when he passed away. Considerable time in late years was devoted to hospital committee work, where his valued services were in much demand, and he had recently joined the management committee of Long Grove Hospital. Haworth was concerned for the welfare of the nurses at his hospitals and was interested in their training, and had been for many years up to his death an examiner in surgery for the General Nursing Council. He was a past president of the local medical society. Sutton and district is much poorer as the result of his passing, but his memory will live long with us, and in particular with those many patients who have such good cause to remember his kindness and skill.

D. R. CURNOCK, M.R.C.S., L.R.C.P., L.D.S.

Dr. D. R. Curnock, who was in dental practice with his brother, Mr. G. L. Curnock, in London for many years, died at his new home at Dorking, Surrey, on August 23. He was 65 years of age.

A. E. S. writes: Reginald Curnock died at Dorking in August a few hours after moving there with his wife from Wanstead, where they had lived for many years. He had been ill intermittently for some years and had to retire early this year. He and his brother carried on their father's dental practice in the City. When they were bombed out of Christopher Street they moved to Wimpole Street. Reginald had a large and devoted following. His great interests outside his work were Methodism and archaeology. His grandfather led the singing in the Methodist Conference. His father's cousin, the Rev. Nehemiah Curnock, discovered

the key to the cipher of John Wesley's *Journal*. Hymn tunes and Wesley's hymns were an endless delight to Reginald. In illness he always came up smiling and optimistic. His conversational powers never waned. One of his sons (Henry) is a doctor.

J. W. MURDOCH, M.B., Ch.B.

Dr. J. W. Murdoch, general superintendent of the mental hospitals in the State of North Carolina, U.S.A., died on September 16 at the Memorial Hospital, Chapel Hill, North Carolina. He was 58 years of age.

James Wilson Murdoch was born at Stonehaven, Kincardineshire, in 1900, and was educated at Aberdeen University, where he graduated M.B., Ch.B. in 1924. After graduation he held appointments at Inverness District Asylum and the Devon Mental Hospital, Exminster, before entering the Colonial Medical Service in 1928. Posted to Malaya, he was appointed second assistant medical superintendent of the Central Mental Hospital at Tanjong Rambutan, in Perak, later becoming medical superintendent. He left the Colonial Medical Service in 1941, and took up an appointment at the Hospital for the Insane, Claremont, Western Australia, returning to Britain at the end of the second world war. In 1947 he became superintendent of the newly opened Butner State Hospital in North Carolina, and three years ago was appointed head of all the mental institutions in the state. While at the Butner State Hospital he worked hard for reforms in the treatment of mental patients, and introduced a method of voluntary admission. He insisted that all patients, including those who were receiving custodial care, should have medical treatment. After he became general superintendent of the mental hospitals in North Carolina he extended the system to include all mental institutions. His profound sympathy for and understanding of the needs of the mentally ill were such that before very long he was able to introduce more humane methods of treatment. He lived to enjoy a good measure of support for his ideas from his colleagues and others interested in the problem. Soft of speech, he had a very likable manner which endeared him to all. By his death the State of North Carolina has lost a valuable member of the community and his patients a steadfast friend. He leaves a widow and one daughter.

A. McWATT GREEN, M.B., Ch.B.

Dr. A. McWatt Green, who was in general practice at Bo'ness, West Lothian, died suddenly on September 21. He was 43 years of age.

Alexander McWatt Green was born on May 28, 1915, in Bo'ness, though his early years were spent in India. After the family had returned to this country, he was educated first at Glasgow High School and thence at Glasgow University, where he graduated M.B., Ch.B. in 1939. In that year he joined the Royal Navy, and saw action in many parts of the world. He was a lieutenant-commander, R.N.V.R., at the end of the war, when he left the Service to enter practice with the late Dr. W. A. Shafto.

C. D. L. writes: Dr. A. McWatt Green packed much into his short life. He was a true general practitioner, with an inexhaustible liking for people and an extraordinary memory. He was an active member of the Edinburgh Obstetrical and Medico-Chirurgical societies. His well-informed clinical acumen was always thoroughly seasoned with kindly common sense. Each patient became a personal friend, and, although as a consequence Dr. McWatt Green's time was so little his own, he was incapable of saying an unkind word to anyone. His interests were many. For years he played Rugby football with distinction. He was a keen sailor and was vice-commander of the Upper Forth sailing club. He somehow found time for a little fishing, golfing, swimming,

Counsel then said that his third head of supplementary benefit was that a skilled pharmacist provided a better service of storage of medicines than an ordinary trader. As against these benefits, what was there in the debit scale?—the trifling inconvenience of not obtaining C.F. goods at grocers or self-service stores. If this constituted a substantial grievance, members of the public would have sprung forward to give evidence.

Interpretation of the Act

Mr. CYRIL HARVEY, Q.C., beginning his submissions for the Registrar, said that the Federation's case was based on a fundamental mistake. Mr. Roche had treated section 21 (1) (b) as merely a looking-glass reflection of section 21 (1) (a). But section 21 (1) (a) provided for the justification of a restriction if it were reasonably necessary to protect the public against injury, while section 21 (1) (b) provided for its justification if its removal would deny the public other substantial benefits. Mr. Roche had submitted that the restriction was necessary because it tended to make people buy chemical goods only at places where they could obtain good advice, and that because of that factor it came within section 21 (1) (a); but that, if the Court did not think chemists' advice was reasonably necessary to protect the public against injury, it could be regarded as a substantial benefit to the public and therefore justified within section 21 (1) (b). That submission was fallacious. All that the Registrar had to contend with was the argument that the skilled advice of chemists gave the public protection against injury.

Mr. JUSTICE DEVLIN.—If it be shown that chemists' advice is not reasonably necessary to protect the public against injury, could not the denial of chemists' advice be a disadvantage to the public?

Counsel said that the section was not dealing with disadvantages but with benefits.

Mr. JUSTICE DEVLIN.—We do not think that Mr. Roche has made out a *prima facie* case on fact in relation to his point about advice under either (a) or (b). We would like to hear you on the benefit said to be conferred by the standards committee; we do not want to hear you on the benefit by the preservation of the small chemist or the benefit in storage. We would also like to hear your argument on the construction of the Act.

Counsel said that the restriction left uncovered a substantial part of the consumer purchases of the relevant products and it was necessary to bear that in mind in asking what "reasonably necessary" in paragraph (a) meant. He would submit, on the test proposed by Mr. Justice Boddey in *Stanford v. Roberts*, that it meant the restriction that a reasonable man might consider necessary and that it meant more than "desirable" or "required." That was the relevance of the fact that the restriction here did not work, for a reasonable man would not say that such a restriction was necessary for the protection of the public. As to paragraph (b) he (counsel) would draw attention to the words "specific and substantial benefits." A classic example of what was not specific was the point made for the Federation, the tendency of an undefined number of persons to resort to chemists' shops, where, if served by the pharmacist himself, they might, or might not, get advice. Even if that was a substantial benefit, it was not specific.

"On the Whole a Good Thing"

Conceding that the C.F. List was on the whole a good thing as regards the standard of products on it—and he was conscious of the justice of the criticism that only two or three items on the List had been attacked as being of dubious quality—there was no evidence to show that abolition of the List would lead to the break-up of the Federation or even that the removal of the main restriction would lead to the cesser of the List. Once the restriction was removed, there could be concentration on one limb of policy—that was the drawing up of one List comprising all products, whether of C.F. manufacturers or not, which were of good quality. But in any event the C.F. List tagged behind the point made about chemists' advice. It depended for its efficacy upon a series of mights—that the customer might be served by a pharmacist and not by an unqualified assistant, that the customer might seek his advice, and that the pharmacist, when his advice was sought, might refer to the C.F. List. Such cases must be very minute indeed.

On October 13, the sixth day of the hearing, Mr. ROCHE, making his final submissions for the Federation, said that

there were two possible constructions of the word "other" in paragraph (b) of section 21 (1). Mr. Harvey's construction was that it referred back to and covered benefits which were not within paragraph (a) of the subsection. The other construction, which he (counsel) submitted was the right one, was that, as registrable restrictions were deemed to be contrary to the public interest unless the Court was satisfied of certain circumstances, the word "other" was used to distinguish the noxious restrictions and those which were harmless. But, even if the Registrar's construction of the section were right, it did not make any practical difference because his (counsel's) case was a true "and/or." The difference of the C.F. scheme from that of any other body was that it not only exercised the negative control of preventing unworthy advertising but also had the positive advantage of promoting the sale of quality products.

The Court then conferred.

Decision of the Court

Mr. JUSTICE DEVLIN, giving the decision of the Court, said that the case involved a number of restrictions upon which they would have to pronounce in due course, but underlying them was one fundamental restriction described in the introduction to the *Handbook of the Chemists' Federation* as the principle in which chemists believe "that the correct channel for distribution of medicinal preparations is through premises registered under Section 12 of the Pharmacy and Poisons Act, 1933"—that was, premises under the personal control of a registered pharmacist. The Court, therefore, thought it would be helpful and desirable that they should consider that fundamental restriction first, before they dealt with the terms of the agreements, and they had so considered it. It was sought to justify it on the ground that it was reasonably necessary to protect the public from injury and alternatively that its removal would deny to the public benefits which were specific and substantial.

The Court was not satisfied that it came under either of those grounds, and it followed that they would have to declare it void. As this was the first case and some interesting questions of general importance had been raised they thought it desirable that they should put their reasons into writing. His LORDSHIP then invited counsel to consider the effect of the Court's finding upon the restrictions.

Mr. ROCHE, dealing with restrictions alleged by the Registrar, but not admitted by the Federation, stemming, *inter alia*, from the Federation's guidance to retailer members that personal recommendation should be given to C.F. products, asked the Court not to deal with these restrictions until after the Federation had had an opportunity of considering whether it desired to go on. As to the agreed restrictions, counsel said that No. 11, not to sell any C.F. product otherwise, in effect, than in the container in which it had been packed by the proprietor, was clearly severable, and so, possibly, was No. 5, that manufacturers should not supply any products eligible for inclusion in the C.F. List without first offering them for inclusion in the List.

Question of an Injunction

After an adjournment to allow counsel to take instructions, Mr. HARVEY said the Court could either go on and examine the evidence with regard to discrimination or—and as counsel on both sides would prefer—the matter could wait until after the Court had given their reasons for their decision. In the meantime the Registrar would be able to negotiate with the Federation to see whether or not they would be able and willing to give an undertaking which would have the effect of putting an end to the discrimination to which the Registrar objected. His (counsel's) submissions on restrictions 5 and 11 were that they were merely ancillary to the main restriction and must fall with it. The Registrar also felt that there should not merely be a declaration that the restrictions were void but that there should also be an injunction. As a general principle an injunction ought normally to follow such a declaration.

Mr. ROCHE agreed that it would be difficult to make further progress until the Federation had had an opportunity of considering the Court's judgment. As to the application for an injunction, his submission was that the Court, as a superior Court of Record, ought not to follow any principles other than those followed by any other Court of Record. There was no evidence that the Federation had the slightest intention to do anything that was illegal, and if it continued to exist there would be no objection to informing the Registrar as to its activities from time to time.

Conclusion

Mr. JUSTICE DEVLIN said that the order as to the alleged restrictions would be that the issue in relation to them should be stood over with liberty to either party to apply. The Court would hear argument as to restrictions No. 5 and No. 11 in the morning, and also any argument that either side wished to relate upon the proper judgment in relation to any of the agreed restrictions. The Court would deal with the application for an injunction when they gave their reasons for their decision.

The hearing was accordingly adjourned, and the next day (October 14) the Court heard counsels' arguments on restrictions Nos. 5 and 11. After thanking counsel for their assistance, Mr. JUSTICE DEVLIN said the reasoned judgment of the Court would be given at a later date.

DIMINISHED RESPONSIBILITY REJECTED

[FROM OUR LEGAL CORRESPONDENT]

On September 25 the jury at the trial of Donald Ferguson Forbes in Edinburgh on a charge of capital murder rejected his defence of diminished responsibility (*Scotsman*, September 26). Forbes was charged with assaulting Allan Fisher, a night watchman, by beating him with an iron bolt, with robbing him of a cigarette case, a lighter, and £11 10s., and with his murder.

Psychiatric Evidence

Sir David Henderson, formerly professor of psychiatry at Edinburgh University, who had examined Forbes as to his mental condition in Saughton Prison on September 17, gave evidence for the defence. He said that Forbes was in one of those difficult conditions when one almost hesitates to differentiate between what one calls sanity and what one calls a certain state of mental instability which from time to time can be exaggerated by the circumstances in which the person is placed. His was the nearest approach to what is called a "psychopathic constitution," where reason and intelligence are unimpaired but where a person for the time being is dominated by an episodic burst of conduct apt to come about in strained circumstances. He was not suffering from any form of mental unsoundness which would justify certification and admission to a mental hospital, but showed an amount of emotional instability which brought him within the category of diminished responsibility. He corresponded to the psychopathic type of person who is essentially a law unto himself, and that, in the witness's view, was a sign that he suffered from some form of mental disease, so that he came within the definition of diminished responsibility.

For the prosecution Dr. William Boyd, who had first examined Forbes in prison on June 10, said that in his opinion Forbes did not border on or approach to insanity, nor suffer from any form of mental disease or great aberration or peculiarity of mind. Although he had had three years' psychiatric treatment and supervision he was not suffering from substantial impairment of responsibility. Dr. Macrae, who examined Forbes on June 11, said that he found no evidence of diminished responsibility, mental disease, partial insanity, or peculiarity of mind.

Lord Wheatley in summing up told the jury that on the diminished responsibility the onus of proof was on the defence to prove their case on the balance of probabilities. Forbes had had unfortunate experiences as a child, and whether the maladjustment from which he suffered as a

child had subsided or proceeded into his present state and whether that condition, alone or in combination with other factors, had produced a defect of mind sufficient to justify invocation of the doctrine of diminished responsibility, had to be resolved by the jury. They were not entitled to hold diminished responsibility proved because they thought there were mitigating circumstances in Forbes's life, unless these circumstances constituted a condition of mind which in itself would justify the invocation of the doctrine.

The jury returned a majority verdict after an absence of an hour and a half, and sentence of death was passed. It was subsequently commuted to life imprisonment by the Secretary of State for Scotland.

Vital Statistics

Diphtheria

The 25 cases of diphtheria notified in England and Wales in the week ending October 11 were the largest total for nearly three years. Seven of them were in Essex, Barking M.B. (where one child has died), and 15 in London—Finsbury 10, Holborn 4, and Islington 1.

The outbreak at Barking is caused by the *gravis* strain. Two further cases were notified in the week ending October 18, and numbers of notifications exclude 14 carriers found by swabbing. The outbreak began in a single class of about 35 children in an infants' school. It has not so far spread beyond the children of that class and their home contacts. The child first to be detected with the disease has died, and two others have carditis. The other cases are mild.

The outbreak in London is caused by a virulent *mitis* strain. The cases are mild, and the majority of those notified were carriers detected by swabbing. The two initial cases were not clear-cut, and several cases are apparently primarily of tonsillitis but also carry the diphtheria organism.

Week Ending October 11

The largest rises in the number of notifications of infectious diseases in England and Wales during the week ending October 11 were 790 for measles, from 1,988 to 2,778, 70 for dysentery, from 442 to 512, 44 for acute poliomyelitis, from 69 to 113, and 20 for diphtheria, from 5 to 25; the largest falls were 87 for food-poisoning, from 316 to 229, and 51 for whooping-cough, from 551 to 500.

The number of notifications of acute poliomyelitis, 113, was the largest reported this year and is an exceptionally late peak incidence. These cases were 30 more for paralytic and 14 more for non-paralytic cases than in the preceding week. The largest returns were Lancashire 27 (Manchester C.B. 12, Blackpool C.B. 3, Padiham U.D. 3, Burnley C.B. 2); Yorkshire West Riding 16 (Leeds C.B. 5); Bedfordshire 8 (Bedford M.B. 8); Cheshire 8 (Stockport C.B. 2, Bebington M.B. 2); Durham 7 (Brandon and Byshottles U.D. 3); Middlesex 6 (Heston and Isleworth M.B. 3).

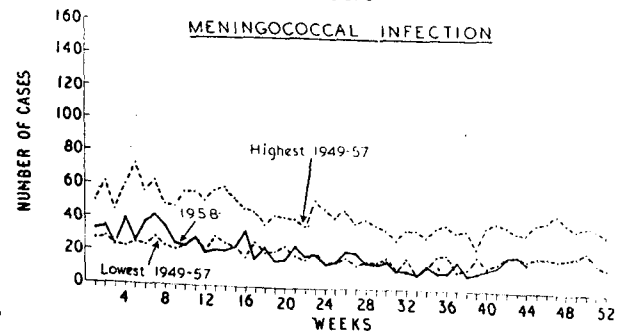
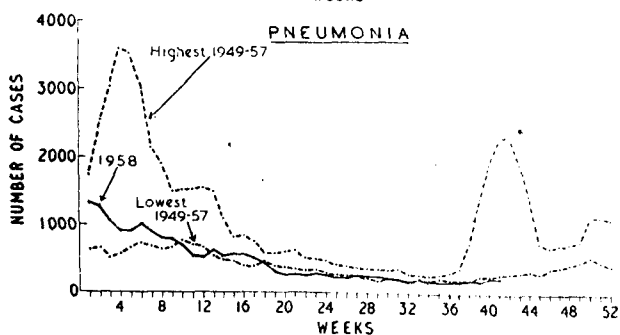
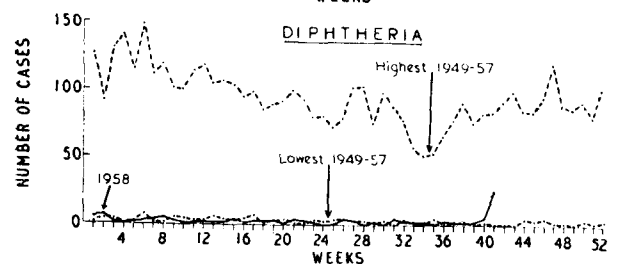
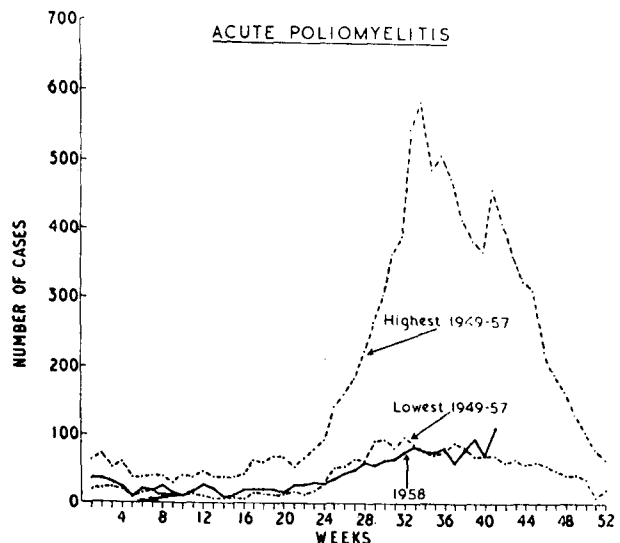
The number of notifications of diphtheria were the largest for almost three years, and are the subject of a separate report. The largest increases in the incidence of measles were 106 in Yorkshire West Riding, from 200 to 306 (Keighley M.B. 59, Royston U.D. 45); 94 in Cheshire, from 82 to 176 (Congleton M.B. 53); 87 in Devonshire, from 53 to 140 (Axminster R.D. 49); 58 in Lincolnshire, from 47 to 105. The largest fluctuations in the trends of scarlet fever were a rise of 22 in Lancashire, from 83 to 105, and a fall of 22 in Staffordshire, from 56 to 34. The total notifications of scarlet fever, 648, were 9 fewer than in the preceding week. No large variations in trend were reported in the local returns of whooping-cough.

For the fifth consecutive week the number of notifications of dysentery have increased. The chief centres of infection during the week were Yorkshire West Riding 98 (Leeds C.B. 22, Dearne U.D. 22, Ripon and Patley Bridge R.D. 14), London 69 (Islington 13, Hammersmith 11), Lancashire 44

(Liverpool C.B. 15), Warwickshire 41 (Coventry C.B. 24, Birmingham C.B. 10), Hampshire 31 (Southampton C.B. 25), Glamorganshire 29 (Cardiff C.B. 9, Penarth U.D. 9), and Essex 28 (West Ham C.B. 17).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus - - - - -, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending October 4 (No. 40) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	5	4	0	0	2	3	0	7	1	4
Dysentery	442	51	222	17	1	262	22	93	4	
Encephalitis, acute	3	1		0		3	0		0	
Enteric fever:										
Typhoid	1	0	0	6		6	0	0	0	
Paratyphoid	5	0	11(B)	0	6(B)	4	0	0	0	
Food-poisoning	316	42	19	1		115	16	2	1	
Infective enteritis or diarrhoea under 2 years										
Measles*	1,988	122	19	17	115	1,328	23	26	20	25
Meningococcal infection	12	0	9	0		14	3	10	0	
Ophthalmia neonatorum	25	3	5	0		34	5	8	0	
Pneumonia†	211	19	121	9		1,880	85	872	17	2
Poliomyelitis, acute:										
Paralytic	53	2	21	3	7	87	5	2	12	2
Non-paralytic	16	2				29	2			
Puerperal fever‡	207	19	12	0		271	35	4	3	
Scarlet fever	657	49	74	13	30	305	28	54	17	20
Tuberculosis:										
Respiratory	494	45	91	17		439	51	122	14	3
Non-respiratory	74	6	15	2		57	4	11		
Whooping-cough	551	20	63	46	26	383	29	31	2	19

DEATHS	1958					1957				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	0	0	0	0		0	0	0		
Encephalitis, acute		0		0		0			0	
Enteric fever	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years	3	0	0	1	0	6	0	1	1	
Influenza	9	0	0	0	0	24	75	5	1	
Measles		0	0	0	0	0	0	0	1	
Meningococcal infection		0	0			1	0	0		
Pneumonia	322	26	21	9	3	39	71	16	8	
Poliomyelitis, acute	5	0	0	0	0	1		0	0	
Scarlet fever		0	0	0	0	0	0	0	0	
Tuberculosis:										
Respiratory	86	5	8	1	4	0	9	3	3	
Non-respiratory		1	1	0	1	1	1	0	0	
Whooping-cough	1	0	0	0	0	0	0	0	0	
Deaths 0-1 year	302	30	34	4	10	31	24	8	20	
Deaths (excluding stillbirths)	8,506	678	554	110	134	785	812	119	145	
LIVE BIRTHS	14,239	1161	1041	226	319	1181	1038	249	404	
STILLBIRTHS	341	25	29			22	9			

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

Medical News

On Call to a Nation.—The B.B.C. marked the tenth anniversary year of the National Health Service with a documentary film of it at work. Shown at a peak viewing hour on the evening of October 22, the film, "On Call to a Nation," lasted 75 minutes and was the longest documentary programme the B.B.C. television service had done. There were no professional actors: the audience saw genuine doctors, dentists, and other medical workers, together with patients, in the natural setting of their relationship. The programme, however, was not intended as a study of the Health Service itself. It mainly pictured the daily life of doctors and how the Health Service affected them. Twenty-five of the 57 doctors appearing had something to say about it. Rural G.P.s, urban G.P.s, big-list men, and small-list men, and men in organized group practices, gave their views, such as time would allow, on general practice. At one extreme was a big-list town G.P. who entirely approved of the Service, and at the other was a semi-rural practitioner who entirely disapproved. In between were seven others who had reservations of varying degree and kind. Some of the criticisms were of other branches of the Service, and the criticisms were not confined to G.P.s. The audience saw a consultant dictating letters at the end of an out-patient session, and heard his comments on cases and on doctors' letters. The cost of the Service and the public's responsibility for financing it was plainly put by another consultant. The cost of drugs was emphasized in scenes in which a pricing bureau was shown dealing with millions of prescription forms, and the need for capital expenditure on hospitals was highlighted by several shots of antiquated buildings and makeshift premises whose span of service had long exceeded the few years originally intended for them. The programme's anchor was a family doctor's waiting-room. One at a time the doctor dealt with eight patients, and their cases served to move the programme from one aspect of the Health Service to another. Mr. Richard Cawston wrote and produced the film and Colin Wills spoke the commentary. Professional bodies were consulted in the first place, it was stated, but they had no part in planning the actual programme. The speakers' opinions, too, were their own and not those of any organization.

Wellcome Research Grants.—The Wellcome Trustees announce that among the grants sanctioned by them during the half-year ended August 31 were the following: (1) *Post-graduate Medical School of London.*—Up to £60,000 for the cost of including a Wellcome research library in the proposed new buildings. (2) *Institute of Psychiatry, Maudsley Hospital.*—Up to £37,000 to provide laboratories in which integrated research by the departments of neuro-endocrinology and neuropathology may be carried out. (3) *Department of Anatomy, Birmingham University.*—Up to £36,500 to extend the research laboratories and animal accommodation. (4) *Department of Zoology, Edinburgh University.*—Up to £25,000 to provide additional research accommodation. (5) *University of Western Australia.*—£50,000 to endow a Wellcome research department of pharmacology. (6) *Institute of Medical Research, North Shore Hospital of Sydney.*—Up to £17,000 to build and equip laboratories for experimental medicine and surgery. In addition, three electron microscopes are being purchased at a cost of approximately £34,000, for indefinite loan to the M.R.C. Biophysics Research Unit at King's College, London, the Sir William Dunn School of Pathology, Oxford, and the London School of Hygiene and Tropical Medicine.

Anglo-French Exchange Bursaries.—Applications are now invited for the bursaries which will be awarded in 1959 to young British doctors under the exchange scheme arranged by the French Embassy in London between the Institut National d'Hygiène in Paris and the Ciba Foundation in London. The value of the French grants is 60,000 francs

a month, tax free. Bursaries will be awarded for periods of two to four months to medical men who wish to obtain clinical experience or carry out research in France. Application forms and further details may be obtained from Dr. G. E. W. WOLSTENHOLME, Ciba Foundation, 41, Portland Place, London, W.1. The closing date is January 31.

P.R.C.P.I.—Dr. P. T. J. O'FARRELL, a past-president of the British Medical Association, has been elected President of the Royal College of Physicians of Ireland.

First Manson Oration.—On October 16 Sir PHILIP MANSON-BAHR delivered the first Manson Oration before the Royal Society of Tropical Medicine and Hygiene. He gave an autobiographical review entitled "The March of Medicine During the Last Fifty Years." The oration was at the Society's house in London.

"Clinical Science."—Professor G. M. BULL is to succeed Professor W. MELVILLE ARNOTT as editor of *Clinical Science* on January 1. Professor Bull is professor of medicine at Queen's University, Belfast.

"Nursing Times."—The layout of the *Nursing Times*, the journal of the Royal College of Nursing, has been attractively restyled as a result of a questionnaire to its readers. "Many of you besought us to look lighter and more readable," states the journal. Certainly the October 10 issue, the first to appear in the new uniform, looks thoroughly attractive.

W.H.O.—Dr. W. A. TIMMERMAN, assistant director-general of W.H.O. in charge of Central Technical Services, is retiring under the age limit. His successor has not yet been appointed. Dr. Timmerman, who joined W.H.O. in 1950, was previously director of the National Institute for Public Health in the Netherlands.

Chair of Paediatrics, Makerere College.—Dr. D. B. JELLIFFE, visiting professor of tropical medicine at Tulane University, New Orleans, has been appointed to the Unicef chair of paediatrics at Makerere College, University College of East Africa. Dr. Jelliffe graduated in medicine from the Middlesex Hospital in 1943.

General Board of Control.—The Secretary of State for Scotland has appointed Dr. ANNE N. M. BRITAIN a deputy medical commissioner of the General Board of Control for Scotland.

COMING EVENTS

Association of Industrial Medical Officers.—Meeting in London, October 30 (jointly with the Empire Rheumatism Council) and November 1. Details from the hon. secretary, 47, Lincoln's Inn Fields, London, W.C.2.

Mitchell Banks Memorial Lecture.—Sir GORDON GORDON-TAYLOR will lecture on "The Incomputable Factor in Cancer Prognosis" at 4.45 p.m. on October 29 at the New Medical School, Liverpool University.

Uses of Plastics in Medicine.—Six lectures on Wednesdays, 6.30-8.30 p.m., starting on October 29, at the National College of Rubber Technology, Holloway Road, London, N.7. Details from the head of the College.

Heath Clark Lectures.—Dr. KARL EVANG, of Norway, will give five lectures on "Health Service, Society, and Medicine" at 5.30 p.m. daily, from November 3 to 7, at the London School of Hygiene and Tropical Medicine.

Bradshaw Lecture.—Professor K. W. DONALD, D.S.C., will lecture on "Heart Disease and Exercise" at 5 p.m. on November 6 at the Royal College of Physicians, Pall Mall East.

McMurray Lecture in Orthopaedic Surgery.—Professor W. P. BLOUNT, of Marquette University, Wisconsin, will lecture on "Fractures in Children" at 5.15 p.m. on November 7 at the New Medical School, Liverpool University.

Stephen Paget Memorial Lecture.—Mr. RICHARD FORT, M.P., will lecture at 5.30 p.m. on November 18 in the lecture theatre, Zoological Society of London, Regent's Park, on "The Irrational in Public Life." The annual meeting of the Research Defence Society will follow the lecture.

Faculty of Radiologists.—Postgraduate course in radiology, November 22 and 23 at the Royal College of Surgeons. Further details from the Faculty, 47, Lincoln's Inn Fields, London, W.C.2.

Bethlem Royal and Maudsley Hospitals.—Medical staff ball, November 28, at the Kensington Palace Hotel. Tickets from Dr. BRIAN ACKNER at the Maudsley Hospital, Denmark Hill, London, S.E.5.

London School of Hygiene and Tropical Medicine Association.—Annual dinner at the Waldorf Hotel, Aldwych, London, W.C.2, on Thursday, November 27, at 7 for 7.30 p.m. (dinner jackets). Tickets, 30s. each (exclusive of drinks but including light refreshments at 10.30 p.m. and dancing until midnight), from Miss K. M. SHAW at the School. Guests may be invited.

Sixth International Conference in Planned Parenthood.—New Delhi, February 14 to 21, 1959. Further details from the conference secretary, 1, Metropolitan House, Dadabhai Naoroji Road, Bombay, 1.

NEW ISSUES

SPECIALIST JOURNALS AND ABSTRACTS

The journals listed below are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Ophthalmology.—Issued monthly (£6 annually). The new issue, Vol. 42, No. 10, includes:

SPECIFICITY AND COMPARATIVE ACTIVITY OF THE CARBONIC ANHYDRASE INHIBITORS NEPTAZANE AND DIAMOX ON ANIMAL AND HUMAN EYES. M. E. Langham.
BENZOCAINES URETHANE SOLUTION IN OPHTHALMOLOGY. P. A. Graham.
CYBERNETICS OF OCULAR MOVEMENT. D. Stanley-Jones.
HISTOLOGICAL SIGNIFICANCE OF HEMISPHERICAL BODIES IN THE EYE. N. Ashton and A. F. M. Mohamed.
INTRA-OCULAR FOREIGN BODY. W. J. Levy.
FAMILIAL MACULAR DEFECTS. I. D. R. Gierory.
PENETRATION OF SODIUM AND THIOCYANATE INTO THE POSTERIOR AND ANTERIOR CHAMBERS. V. E. Kinsey and E. Palm.
ALTERNATIVE TO THE 3-SNP OPERATION FOR LACRIMAL DRAINAGE INSUFFICIENCY. C. Montague Ruben.
AMBLYOPIA DUE TO ETHYL ALCOHOL. M. Quatermass.
COMPLETE OPHTHALMOPLÉGIA IN A CASE OF ACUTE TOXIC POLYNEURITIS. F. R. Neubert.
UNUSUAL TRAUMATIC DEFORMITY OF THE LENS. P. Sivasubramaniam.
GLAUCOMA FOLLOWING RADIOTHERAPY. R. F. Jones.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, October 27

GUY'S HOSPITAL.—At Anatomy Lecture Theatre, 5.15 p.m., lecture-demonstration in endocrinology by Dr. P. M. F. Bishop: Exophthalmos.
INSTITUTE OF CHILD HEALTH.—5 p.m., Guest lecture by Professor I. Dogramaci (Turkey): Malnutrition in Infancy and its Management.
MANCHESTER MEDICAL SOCIETY.—(1) SECTION OF ODONTOLOGY.—At Lecture Room, Dental Hospital, 4.30 for 5 p.m., Presidential Address by Mr. D. H. Cartledge: Our Dental Heritage. (2) SECTION OF GENERAL PRACTICE.—At Large Anatomy Theatre, Medical School, Manchester University, 8.30 for 9 p.m., Professor S. Alstead: Medical Truants.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Guest lecture by Dr. B. Ackner: Psychiatric Aspects of Termination of Pregnancy.

Tuesday, October 28

BRISTOL UNIVERSITY.—At Large Lecture Theatre, H. H. Wills Physics Laboratory (Royal Ford), 8.15 p.m., 47th Long Fox Memorial Lecture by Professor A. I. Darling: Decay of the Teeth (Dental Caries).
BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. G. S. Wilson: Infectious Enteritis.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. G. C. Wells: Dermal Connective Tissue.
ROYAL STATISTICAL SOCIETY.—At New Small Lecture Theatre, London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. O. M. Lidwell and Dr. R. E. O. Williams: Effect of Various Factors on the Incidence of the Common Cold.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. David Currie: Miracle of Childbirth.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. G. Parsons-Smith: neurological demonstration.

Wednesday, October 29

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Ringworm Infections.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. F. H. Scadding: Open lecture on the mode of presentation of carcinoma of the bronchus.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. D. M. Wallace: Vesical Neoplasms.
LIVERPOOL UNIVERSITY: FACULTY OF MEDICINE.—At Large Lecture Theatre, New Medical School, Ashton Street, 4.45 p.m., William Mitchell Banks Memorial Lecture by Sir Gordon Gordon-Taylor, K.B.E.: Incomputable Factor in Cancer Prognosis.
● NATIONAL COLLEGE OF RUBBER TECHNOLOGY, Northern Polytechnic, Holloway Road, London, N.—6.30 p.m., Dr. S. A. Leader: Application of Plastics to Medicine and Surgery. (The first in a course of six lectures.)
OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Dr. W. G. Spector: The Role of Endogenous Mechanisms in Acute Inflammation.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Guest lecture by Dr. P. Fourman: Magnesium Metabolism.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. Annie Sydenham: Maternity and Child Welfare Work in a Hong Kong Mission Hospital (illustrated).

Thursday, October 30

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. R. E. O. Williams: Epidemic Staphylococcal Infection in Hospitals.
HONYMAN GILLESPIE LECTURES.—At Anatomy Theatre, University New Buildings, Teviot Place, Edinburgh, 5 p.m., Professor A. G. R. Lowden: Emergency Re-operations in Abdominal Surgery.
INSTITUTE OF DERMATOLOGY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. R. E. O. Williams: Epidemic Staphylococcal Infections in Hospitals.
INSTITUTE OF PSYCHIATRY.—At Maudsley Hospital, 5 p.m., Inaugural Lecture by Professor P. M. Daniel: Some Experimental Approaches to Neuro-pathology.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Thomas Vicary Lecture by Sir John McNee: Barber-Surgeons in Great Britain and Ireland.
ROYAL NORTHERN HOSPITAL.—2.45 p.m., Mr. R. J. McNeill Love: Abdominal Pain (cases and discussion).
ST. ANDREWS UNIVERSITY.—At Physiology Department Lecture Theatre, 5 p.m., Mr. Hedley Atkins: Three Pillars of Clinical Research.

Friday, October 31

COLLEGE OF GENERAL PRACTITIONERS: SOUTH LONDON FACULTY.—At King's College Hospital Medical School, 8.45 p.m., Professor J. S. Mitchell: Nuclear Fission in Relation to Medicine.
● INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. I. Muende: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. K. F. W. Hinson: clinical demonstration.
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—(1) 3.30 p.m., clinical discussion for general practitioners by Miss Edith Whetnall: Advances in the Use of Hearing-aids. (2) 5.30 p.m., clinical lecture by Dr. T. V. L. Crichtlow: Some Oesophageal Problems.
KEIGHLEY AND DISTRICT MEDICAL SOCIETY.—At Victoria Hospital, Keighley, 8.30 p.m., Mr. A. B. Pain: Pain in the Arm.
MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—At 11, Chandos Street, W., (1) 7 p.m., 37th annual general meeting; (2) 8.15 p.m., Dr. B. F. Reeves: Variations in the Leucocyte Content of the Cervical Secretions; Dr. J. H. Eckersley and Dr. J. Barrow: Locan Pessaries in the Treatment of Trichomonas Vaginitis.
PLYMOUTH MEDICAL SOCIETY.—At Freedom Fields, 8.30 p.m., Dr. A. E. Clark-Kennedy: The Right to Die.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 10 a.m., Guest lecture by Professor P. A. Fitzserald: Adrenal Surgery. (2) 4 p.m., Guest lecture by Dr. E. N. Chamberlain: Rheumatic Carditis.
● ST. MARY'S HOSPITALS, MANCHESTER.—At Large Lecture Theatre, Clinical Sciences Building, York Place, Manchester, 4.30 p.m., Lloyd Roberts Lecture by Professor A. M. Clave: Teaching of Obstetrics—New Edition.

Sunday, November 2

COLLEGE OF GENERAL PRACTITIONERS: WELSH FACULTY.—At Maternity Hospital, Cardiff Royal Infirmary, 10.45 a.m., The Pathology Department and the General Practitioner. Speakers: Professor J. Gough, Dr. J. L. Withey, and Dr. R. A. Holman.
MANCHESTER UNIVERSITY: FACULTY OF MEDICINE AND NORTH-WEST ENGLAND FACULTY: COLLEGE OF GENERAL PRACTITIONERS.—At Theatre 1, Clinical Sciences Building, York Place, 11 a.m., Dr. F. R. Ferguson: Headache.
UNIVERSITY COLLEGE HOSPITAL.—10.15 a.m., meet in Front Hall of main hospital. Lecture-demonstration for general practitioners. Clinical demonstration by Dr. K. E. Harris: Cardiac Irregularities, Their Significance and Treatment.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Edwards.—On October 11, 1958, at Liverpool Maternity Hospital, to Phyllis (formerly Pinchin), wife of Dr. David G. Edwards, of 12, Childwall Park Avenue, Liverpool, a brother for Jacqueline—Robert David.
Oakenfull.—On October 7, 1958, at the Maternity Home, Scunthorpe, Lincs, to Isabel (formerly Heath), M.B., Ch.B., wife of Basil G. P. Oakenfull, F.F.A.R.C.S., a son (Andrew)—a brother for Michael.
Smith.—On October 9, 1958, to Loretta, wife of Colin McPherson Smith, M.B., F.R.C.P.(C), D.P.M., a brother for Joy and Colin—John Graham.

DEATHS

Barker.—On September 29, 1958, Robert Sidney Barker, M.B., B.S., of 13, Byway Road, Leicester, aged 75.
Beddows.—On October 3, 1958, at Ingleton, Gullane, East Lothian, Edward Charles Beddows, O.B.E., M.C., M.R.C.S., L.R.C.P., Brigadier, late R.A.M.C., retired, aged 72.
Cohen.—On September 30, 1958, at Park Hospital, Davyhulme, Manchester, Percy Cohen, M.R.C.S., L.R.C.P., of Manchester Road, Bolton, Lancs, aged 44.
Collard.—On October 5, 1958, Bevil Molesworth Collard, M.R.C.S., L.R.C.P., of 37, Elms Road, Leicester.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Anaesthesia for Forceps Delivery

Q.—What is your opinion of an anaesthetic for domiciliary forceps delivery consisting of 0.5 g. thiopentone sodium, continuing with N₂O and air (midwife's apparatus), and 50 mg. intravenous pethidine later if necessary?

A.—The suitability of a particular anaesthetic technique for domiciliary obstetric surgery must be judged against a background of many factors, not the least of which is the skill and experience of the administrator. The safe use of a combination of drugs such as this obviously requires familiarity with their clinical effects. In addition it requires a good knowledge of the hazards of general and intravenous anaesthesia in obstetrics, and of the special risks of this combination of drugs, such as extravenous and intra-arterial injection and respiratory depression of mother and child. Certainly the administrator should possess the skill and equipment for maintaining oxygenation during any period of respiratory insufficiency. Whether all these desirable conditions are likely to be found in the circumstances of domiciliary obstetrics is another matter.

Penicillin Sensitivity

Q.—Can penicillin lozenges (1,000 units) cause penicillin sensitivity when taken for a few days only?

A.—It is well known that penicillin is a potent sensitizing agent, particularly for the epidermis, and that the indiscriminate use of penicillin on the skin or by ingestion is discouraged. Allergic reactions have occurred after the oral use of penicillin, and, although it is unlikely, there is no reason to believe that oral penicillin could not cause sensitivity.

Dietary Treatment for Pseudo-hypertrophic Muscular Dystrophy

Q.—What is the rationale of a dietary treatment for pseudo-hypertrophic muscular dystrophy, and have any controlled studies shown its value in this disease?

A.—Evers' has advocated a dietary treatment of "progressive muscular dystrophy (Erb)." He quotes two patients of whom he believes to have benefited from this form of therapy. A note at the end of the paper indicates that the diagnosis in one case may have been polyneuritis. Details of the diet are not given but may be obtained from Dr. Evers; the rationale of the treatment is not discussed. There is no evidence that dietary treatment is of value in muscular dystrophy. Assessment of the efficacy of treatment in these patients may be difficult, as long periods of arrest are a characteristic feature of some forms of the disease.

REFERENCE

1 Evers, J., *Münch. med. Wschr.*, 1954, 2, 41.

Hiatus Hernia

Q.—What are the indications and contraindications for operation for hiatus hernia?

A.—About 85% of patients with hiatus hernia can be controlled moderately well on a medical regime with emphasis on weight reduction, sleeping with the shoulders raised above the level of the abdomen, avoiding stooping and bending, and the use of antacids. However, there is a small proportion for whom life remains a misery, and these are the patients to select for surgery. Some will have severe symptoms from peptic oesophagitis with much heartburn, and sometimes dysphagia from stricture forma-

tion. Others may have acute discomfort with a feeling of a heavy lump after eating. The presence of an associated gastric or duodenal ulcer accentuates the indication for operation. A gastric ulcer at the level of constriction at the diaphragm is a common site. Recurrent haematemesis and recurrent aspiration pneumonia are further indications. The operation is well tolerated and patients convalesce quickly. The contraindications are those for any abdominal operation: obesity particularly should deter a surgical programme. On no account should a patient without relevant symptoms ever be considered for surgery just because the diagnosis has been made radiologically.

Speaker's Fright

Q.—What advice and treatment would you suggest for those who are afflicted with nervousness and excessive salivation when faced with having to give a talk or make an after-dinner speech?

A.—The symptoms described are those of a mild anxiety-tension state which is quite normal and usual in the circumstances. The tendency to salivation is unusual, drying of the mouth being more common, and if there is enough of it to be an embarrassment it might perhaps be countered by a small dose of atropine. The anxiety and nervousness could also be relieved to some degree by a tranquillizer such as meprobamate, or if necessary by a small dose of a quickly acting barbiturate. Caution should be exercised in the latter event if alcohol is taken too.

The best long-term treatment for this syndrome is the gaining of greater experience. With a little practice, short speeches on social occasions soon become no trouble, even to those liable to anxiety. Having something one actually wants to say is a great help; if there is sincerity in what is said audiences are very tolerant indeed of anxiety or faults in presentation. The tyro after-dinner speaker is strongly recommended to put his speech entirely out of his mind during the dinner, and to concentrate on the conversation of his neighbours and the other pleasures of the occasion. If he has a few notes in his pocket, he can safely rely on them when the moment comes.

Keeping Toddlers in Cots

Q.—What is the best way to prevent toddlers falling out of standard hospital cots?

A.—Any form of restraint is certainly psychologically objectionable for toddlers, but unfortunately some form of restraint is necessary in hospital, and often at home, if the child is left alone in its cot to any extent. The string net covering the top of the cot and tying at the sides allows the most freedom and is probably the pleasantest. It allows a child to crawl about inside the cot, although the bigger toddler cannot stand upright. There is the risk that a child of 18 months and upwards will learn to untie the net and even to get its head between the net and the side of the cot, but for all that it is probably the best form of restraint for the small child. The alternative is the restrainer shaped like a waistcoat and tying at the back with straps sewn on at the sides just above the hips and tied to the horizontal sides of the cot. These are perfectly safe and do not involve risk of strangulation, but do not allow movement on the part of the child.

Fat at 15

Q.—An otherwise healthy girl of 15 has become rather rapidly overweight. The diet is already reduced to a minimum. Can any drug or hormone therapy be advised?

A.—Even though a "fat spurt" takes place at puberty, there can be little doubt that, whatever the ultimate cause may be, the mediating factor in this developing obesity is excessive calorie intake. If weight gain is continuing then the diet, far from having been reduced to a minimum, is still in excess of the actual physiological requirements; to bring about weight loss the diet must obviously be less than the physiological requirements, so far as total energy

content is concerned. The only drug therapy likely to be of value is some form of amphetamine such as dextro-amphetamine sulphate or methylamphetamine hydrochloride, which helps to control excessive appetite. No hormone therapy can possibly be of value, and in particular it may be mentioned that thyroid therapy is quite useless. Only by producing a state of thyrotoxicosis can it lead to weight loss, and if given in doses too small to do this it either has no effect or increases the appetite.

Treating Tapeworms at Home

Q.—Is there any treatment, short of hospitalization, for tapeworm infestation in a child of 3 to 5 years who has already been antagonized to any medicine by treatment with *Filix mas*?

A.—Domiciliary treatment for tapeworms is not advisable, for toxic effects not easily managed at home—for example, collapse—may occasionally occur. Moreover, the relapse rate at home is high because it is difficult to ensure complete starvation and proper administration of drugs. In the case in question treatment with dichlorophen could be tried, but experience shows that the relapse rate following such treatment is high. The usual treatment with dichlorophen consists of a single dose of 0.5 g. per 16 lb. (7.2 kg.) of the patient's body weight.

NOTES AND COMMENTS

Treatment of Schistosomiasis.—Dr. H. A. K. ROWLAND (Ibadan, Nigeria) writes: In "Any Questions?" (August 2, p. 339) the relative advantages and disadvantages of the available drugs for the treatment of schistosomiasis were briefly discussed. It was stated that sodium antimony gluconate gave rise to few side-effects but that after treatment twice as many patients continued to have symptoms as after sodium antimony tartrate. During 1954-5, a clinical trial of sodium antimony gluconate was carried out,¹ 148 patients suffering from urinary schistosomiasis being treated with total dosages of (1) 18-31.3 mg./kg. administered over periods ranging from 24 to 120 hours, and (2) 12.5-17.1 mg./kg. in 8 hours. The test of cure consisted of urine examinations by microscopy and hatching tests on the centrifuged deposit at monthly intervals for six months, the last examination being on three consecutive daily specimens. In addition a rectal biopsy was carried out at six months.² The criteria of cure were fulfilled in 67 of the 80 patients in group 1 and in 9 of 18 in group 2—cure rates of 83% and 50% respectively. Over one-half of these patients were followed to eight months and almost a third to 10 months. Side-effects were common, the incidence increasing as the duration of the course was shortened, but they were not severe, and only in one of the 148 patients treated had the course to be abandoned, and he was receiving the most intensive. It is difficult to compare the effectiveness of different drugs, as the criteria of cure and period of surveillance are frequently not the same. Results up to 100% have been claimed for intensive sodium antimony tartrate and short courses of "miracil D" (lucanthone). It is generally agreed that the standard course of tartar emetic—30 gr. in 30 days—can be expected to give cures in 75-80% of patients. It is doubtful whether more than a 60% cure-rate can be hoped for using stibophen, although 70% has been obtained using intensive courses, and the most optimistic figure for anthiomaline is 50%, even when given intravenously. Side-effects have been greatly reduced by giving sodium antimony tartrate well diluted and slowly, but on occasions have been so severe following lucanthone that courses have been abandoned; this has especially been noticeable in reports from Egypt. It would therefore appear that sodium antimony gluconate can give a high rate of cure with mild side-effects and with the added advantages of a short course and an ambulant patient. The preparation has, however, to be given intravenously; oral administration has been tried unsuccessfully.

OUR EXPERT replies: I agree with almost everything in Dr. Rowland's letter. His experience corroborates the statements given with answers to the original question. Even according to the figures he gives it may be deduced that persistence of symptoms following treatment with sodium antimony gluconate is commoner than after treatment with sodium antimony tartrate, for in his two series treated with the former there were cure rates of 83% and 50%, and, as he states, many workers have claimed a cure rate of 100% following treatment with sodium antimony tartrate. It should be pointed out, moreover, that

few have found treatment with sodium antimony gluconate to bring about a cure in up to 83% of cases. Using a very similar dosage regime and method of assessing cure as that which Dr. Rowland found to bring about cures in 83% of cases, Messent,³ working in Accra, obtained cures in only 55% of cases.

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Extra Skin Crease.—Mr. DENIS BROWNE (London, W.1) writes: The value your expert ("Any Questions?" June 14, p. 1432, and "Notes and Comments," September 20, p. 753) puts upon asymmetrical skin folds as indicating possible congenital dislocation of the hip leads to the conclusion that the 40% of babies having them should be x-rayed at birth; but, as the sign is obviously useless in regard to double dislocations, all the rest should be x-rayed as well. Perhaps it would be both cheaper and better to study the mechanics of this mechanical accident, with due regard to family history, and investigate accordingly. If this is done, it will be found that the "Ortolani click" on abduction, though a true sign of dislocation, is a rare one, just as is "telescoping." According to my ideas suspicion should always be aroused by a valgus moulding of the foot; the earliest diagnosis I have made (at 16 hours of age) was because of this.

Medical Blood Donors.—Dr. J. W. TODD (Farnham, Surrey) writes: In reply to the question whether or not doctors and nurses should enrol as blood donors, your expert states ("Any Questions?" August 30, p. 574): "It may be argued that some doctors and nurses lead a particularly strenuous life, and that they should be spared any additional physical burden. Probably they should be discouraged from acting as blood donors, although they should surely be allowed to give blood occasionally (perhaps once a year) if they express a strong wish to do so." He thus implies, first, that the lives of doctors and nurses are peculiarly strenuous, and, secondly, that giving blood is a physical burden. I suggest that both these propositions are untrue, and that doctors and nurses should be encouraged to act as blood donors to the same extent as are other people.

OUR EXPERT replies: The phrase "it may be argued . . ." was meant to imply that the view stated was a not unreasonable opinion held by some people. I purposely included the word "some" before "doctors and nurses," wishing to emphasize that I did not consider that all of them led a particularly strenuous life, and I thought I had clearly implied that only those who were leading an unusually strenuous life should be discouraged from acting as regular blood donors. In the first paragraph of my reply (not quoted here) I pointed out that the chronic effects of blood donation are due mainly to iron depletion, although they can be adequately counteracted by taking iron. There is no doubt that, unless extra iron is taken, regular blood donation does produce iron depletion.¹⁻³ Thus blood donation is at least potentially a physical burden, although it is one which healthy people can most justifiably be asked to bear.

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THE PHYSIOLOGICAL ACTIVITY OF D-THYROXINE

BY

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The human thyroid gland produces only the laevorotatory isomer of thyroxine (Harington and Salter, 1930); D-thyroxine has, however, been produced synthetically and its properties appraised by many workers, using many different methods. All are agreed that its potency is considerably less than that of L-thyroxine, estimates of relative strength varying between 1:2 and 1:∞.

Estimates of their relative activity in human beings have been few, and much of the earlier work was vitiated by the fact that both preparations were partly racemized. Using purer isomers, Pitt-Rivers and Lerman (1948) found, on the criteria of clinical response and B.M.R., that D-thyroxine had only one-eighth to one-tenth of the potency of L-thyroxine. Starr and Liebhold-Schueck (1953) compared the effects of L-thyroxine, D-thyroxine, triiodothyronine, potassium iodide, and a placebo on the level of protein-bound iodine (P.B.I.) and on the uptake of radio-iodine. Their results were expanded by Starr (1958), and from these two papers some important conclusions may be drawn: (1) that D-thyroxine in a dose five times as great as that of L-thyroxine had an equal effect on the P.B.I.; (2) that by means of a sufficiently large dose of D-thyroxine it was possible to raise the P.B.I. to "thyrotoxic" levels without raising the B.M.R.; (3) that D-thyroxine had very little effect on the level of serum cholesterol; (4) that in hypothyroid patients even a fivefold dosage of D-thyroxine was unable to maintain a B.M.R. stabilized by L-thyroxine; (5) that, whereas the E.C.G. of myxoedematous patients was affected by as little as 0.1 mg. of L-thyroxine, as much as 10 mg. a day of D-thyroxine given for 18 consecutive days was ineffective; (6) that when almost complete suppression of the uptake of radio-iodine was achieved with a given dose of L-thyroxine the same dose of D-thyroxine caused a suppression to only about 40% of the initial uptake; (7) that these results were not vitiated by the iodine content of the thyroxines.

To summarize previous work, it would appear that the effect of D-thyroxine on the metabolic processes considered is extremely slight in comparison with that of L-thyroxine. On the basis of the E.C.G. it may be as little as 1/100 of that of L-thyroxine, and on the basis of the B.M.R. not more than 1/5 and perhaps 1/10. Yet its effect on the uptake of radio-iodine suggests that its depressant effect on the production of thyrotrophic hormone (T.S.H.) is about half that of L-thyroxine.

This observation, if confirmed, suggests several interesting corollaries. For instance, (1) If some forms of hyperthyroidism arise in the pituitary the suppression of the output of T.S.H. (without significant rise in metabolism) by means of D-thyroxine should control the hyperthyroidism. D-thyroxine might prove to be the tool by means of which the primarily thyroid case of thyrotoxicosis could be distinguished from the primarily pituitary case, if indeed two such types exist. (2) If exophthalmos, as is still believed by some despite evidence to the contrary (Greene, 1955; Gilliland and Strudwick, 1956), is due to an excessive production of T.S.H., it should be possible to reduce it by means of D-thyroxine without detriment to the patient.

Experiment I: Clinical Effects of D-thyroxine in Hypothyroidism

In the earlier cases, treatment was begun cautiously with a dosage of 0.25 mg. daily, gradually increased at fortnightly intervals to allow observations to be made at each dosage level. As experience has accumulated the initial dose has been raised.

Eight patients, diagnosed clinically and by laboratory tests as suffering from hypothyroidism, have been treated with D-thyroxine. The results were as follows.

Case 1.—Fibrosis of the thyroid and severe myxoedema. The patient became euthyroid when treated with D-thyroxine in a dosage of 8 mg. daily for a fortnight, and has since remained well on 0.4 mg. daily of L-thyroxine. The ratio of potency of L-thyroxine to D-thyroxine (L:D) is in this case 20:1.

Case 2.—Mild hypothyroidism with impalpable thyroid. She became euthyroid after 4 mg. daily of D-thyroxine had been administered for a fortnight, and has since been maintained in good health with 0.4 mg. of L-thyroxine. L:D=10:1.

Case 3.—Hashimoto's disease and extreme myxoedema. Improvement did not begin until D-thyroxine, 20 mg. daily, had been given for a fortnight. L-thyroxine has now been prescribed in a dosage of 0.5 mg. L:D=40:1.

Case 4.—Moderate myxoedema with impalpable thyroid. Ten mg. of D-thyroxine administered for a fortnight had no effect. She has since been maintained in good health with 0.5 mg. daily of L-thyroxine. L:D=>20:1.

Case 5.—Large diffuse goitre with mild clinical hypothyroidism. She responded in a fortnight to 10 mg. daily of D-thyroxine and has since been kept well with L-thyroxine 0.2 mg. daily. L:D=50:1.

Case 6.—Nodular goitre with mild hypothyroidism. She was relieved by 10 mg. daily for a fortnight, and has since remained well with L-thyroxine 0.4 mg. daily. L:D=25:1.

Case 7.—Moderate post-operative hypothyroidism. D-thyroxine 15 mg. daily for a fortnight had no effect. L-thyroxine was effective in a dosage of 0.5 mg. daily. L:D=>30:1.

Case 8.—Severe post-operative hypothyroidism. 15 mg. daily of D-thyroxine for a fortnight relieved her and she has remained well with 0.3 mg. daily of L-thyroxine. L:D=50:1.

Results of Experiment I

These figures are admittedly meagre, but they support the contention of previous authors that the metabolic effects of D-thyroxine, judged by clinical means, are very slight, the most responsive patient having an "L:D ratio" of 10:1. In the majority of patients it appears that the ratio is far higher, and may be as high as 50:1 or more. Neither the B.M.R. nor the serum cholesterol was measured consistently in a sufficient number of patients for firm conclusions to be drawn, but in no patient was a rise in the former or a fall in the latter observed with a daily dose of less than 4 mg. In 6 of the 8 cases, 10 mg. or more was needed. The serum cholesterol (*pace* Starr, 1958) appeared to fall when the clinical condition was corrected.

Experiment II: Effect of D-thyroxine on the Immediate Thyroidal Uptake of Radio-iodine

In the earlier cases, numbering 10, the slope "S" of the immediate uptake of ^{127}I (Farran, 1958) was measured before the administration of D-thyroxine and afterwards at fortnightly intervals during its administration in various doses.

(a) Four of the patients were originally euthyroid by all criteria. A suppression of iodine uptake occurred with a dose of 1 mg. daily of D-thyroxine in three cases (two with single "hot" nodules, and one with slight diffuse thyroid enlargement). In one patient with a multinodular goitre no suppression occurred with either D-thyroxine (1 mg.) or L-thyroxine (0.3 mg.). One of the patients with a single "hot" nodule showed suppression of iodine uptake with a dose of 1 mg. of D-thyroxine but no suppression with 0.2 mg. of L-thyroxine.

(b) Six of the patients were thyrotoxic and deserve more detailed consideration.

Case 9.—Severely toxic diffuse goitre with severe exophthalmic ophthalmoplegia. The uptake expressed as "S" on 0.25 mg. daily of D-thyroxine was temporarily suppressed from 3.4 to 0.85; 1 mg. daily of D-thyroxine was needed to maintain it at this level. In 10 months no change in the eyes or in the degree of thyro-

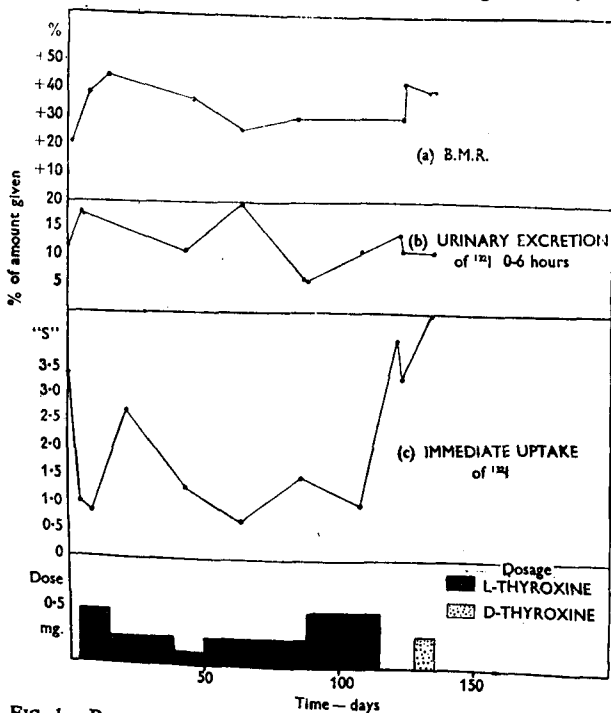


FIG. 1.—Response of Case 9 to varying dosage levels of D-thyroxine. (a) B.M.R. (b) Urinary excretion of ^{127}I during 0-6 hours.

toxicosis occurred, and it was necessary to treat the exophthalmos with x-rays to the orbits and the thyrotoxicosis with carbimazole. L-thyroxine 0.3 mg. daily failed to suppress the uptake (see Fig. 1).

Case 10.—Severely toxic diffuse goitre, with severe exophthalmic ophthalmoplegia, acropachy, and pretibial myxoedema. D-thyroxine 0.5 mg. suppressed S from 2.8 to 1.1, but only temporarily; 1 mg. failed to produce any further depression, and it was necessary to terminate the experiment and give x-rays to the orbits and carbimazole.

Case 11.—Slight thyrotoxicosis with impalpable thyroid and exophthalmos. D-thyroxine 0.5 mg. daily produced suppression of S from 2.8 to 1.1; but an increase in dosage to 1 mg. produced no further depression or clinical change, and the experiment was discontinued after three months.

Case 12.—Slight thyrotoxicosis with slightly enlarged thyroid and exophthalmos and a thyroid index ("T") of 24. D-thyroxine in a dosage of 0.5 mg. daily suppressed S to 0 in four weeks; 1 mg. was required to maintain depression, but on stopping treatment S rose to 1.2. No clinical changes occurred.

Case 13.—This and the next case are worthy of special consideration. Case 13 was a male suffering from severe thyrotoxicosis judged by clinical standards. He had a slightly enlarged diffuse goitre, a severe but stationary degree of exophthalmos, a B.M.R. of +24%, a characteristic E.C.G., and pretibial myxoedema. T was 29. D-thyroxine in a dose of 0.25 mg. daily raised gradually to 1 mg. had no effect, but after a fortnight on 1 mg. a slight suppression of uptake occurred, and after 14 weeks the value of S sank gradually from 1.8 to 0. During this time his clinical condition steadily improved and at the end he was clinically euthyroid. His weight had increased by 12 lb. (5.44 kg.) and his B.M.R. had dropped to +11%. Treatment was stopped without, during nine months of clinical observation, any detriment to his clinical condition. Throughout there was no significant change in his exophthalmos, but his pretibial myxoedema disappeared (Fig. 2).

Case 14.—This case also deserves special consideration. It was that of a young woman with severe recurrent thyrotoxicosis four

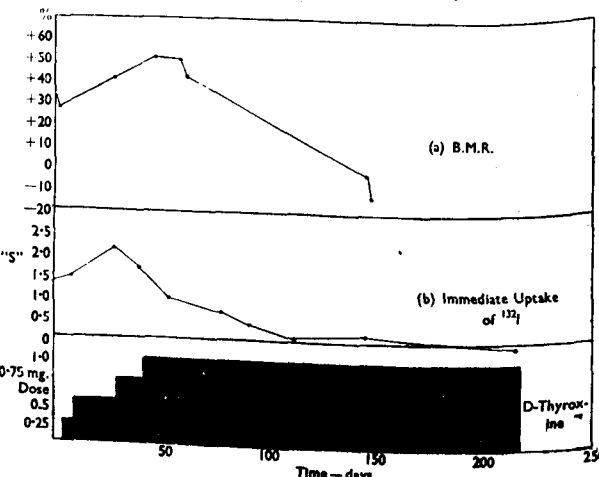


FIG. 2.—Response of Case 13 to treatment with D-thyroxine. (a) The effect on the B.M.R. (b) "S."

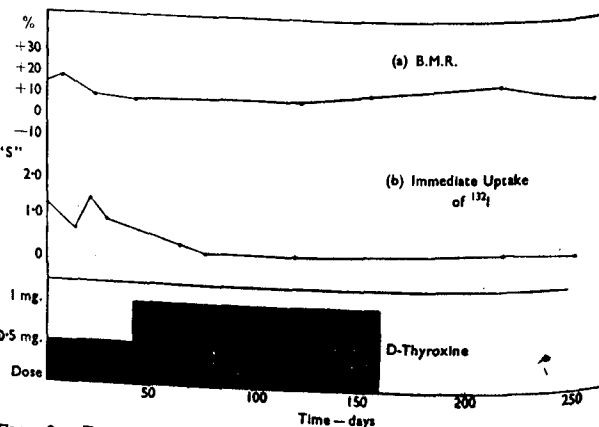


FIG. 3.—Response of Case 14 to treatment with D-thyroxine. (a) The effect on the B.M.R. (b) "S."

years after thyroidectomy, with severe and recently progressive exophthalmos. The B.M.R. was +21%. D-thyroxine in a daily dosage of 0.5 mg. reduced the value of S from 1.6 to 0.75. The dose was gradually raised to 1 mg. daily and the value of S dropped to 0.2. During five months she steadily improved and became clinically euthyroid, with a B.M.R. of +9%. There was no change in the degree of exophthalmos. When seen six months later she remained well (Fig. 3). It would appear, therefore, that 1 mg. daily of D-thyroxine suppressed the uptake of radio-iodine in all these six thyrotoxic patients, albeit temporarily in two. In two, a complete remission of thyrotoxicosis occurred during treatment with D-thyroxine, but in neither was any improvement in exophthalmos observed.

Summary of Results of Experiment II

Of 10 patients—6 thyrotoxic, 4 euthyroid—9 showed a depression of uptake of radio-iodine, most with doses as low as 0.25 mg. daily of D-thyroxine. However, in the majority a daily dosage of 1 mg. was necessary for suppression to be maintained. The only patient in whom suppression did not occur had a multinodular goitre without evidence of either hyperthyroidism or hypothyroidism. A daily dose of 0.3 mg. of L-thyroxine likewise failed to suppress uptake, though, unlike D-thyroxine, it rendered the patient thyrotoxic.

Two patients are worthy of particular stress. Both were suffering from thyrotoxicosis with exophthalmos. A daily dose of 1 mg. of D-thyroxine apparently rendered them euthyroid but failed to improve their exophthalmos. Though the operation of chance cannot be excluded, it is difficult to escape the conclusion that in these two patients the thyrotoxicosis was due to an excessive production of T.S.H. and that the exophthalmos was not, in the period of observation, relieved by its reduction.

Experiment III: Effect of D-thyroxine on the Discharge of Radio-iodine from the Thyroid

The first experiment having shown that 1 mg. of D-thyroxine was sufficient to produce an effect on the uptake, it was decided that the discharge of radio-iodine from the thyroid would perhaps be a more reliable index of the suppression of T.S.H. production. In 12 cases ^{131}I was given orally, 50 μc to patients under 45 and 200 μc to older patients about to undergo treatment with radioactive iodine. After 48 hours, treatment was begun with carbimazole in a dosage of 20 mg. eight-hourly, given in order to prevent re-use of circulating iodide by the thyroid. This drug was chosen instead of potassium perchlorate, which might from some points of view be considered preferable, because in our clinic it is normally used for the preparation of thyrotoxic patients for thyroidectomy and often for therapy with radioactive iodine. Thenceforward counts over neck and thigh were made twice daily, using a partially collimated, wide-angle scintillation counter with an efficiency of about 10 counts per second per μc in the neck. The counting rate over the thigh, minus that over the neck, was plotted against the time in hours, using over the thigh, was plotted against the time in hours, using the semilogarithmic paper, so that the biological half-life of the radioactive iodine in the thyroid could be plotted as a straight line. The slope of this line could usually be determined after three or four days, though in one or two cases six or seven days were necessary. When the initial slope had been determined, 1 mg. of D-thyroxine was given daily for 5-10 days, counts twice daily continuing.

Results of Experiment III

An immediate effect of D-thyroxine was observed in 5 of the 12 cases. In 5 cases no discernible change in the slope occurred during the succeeding 7 to 14 days (Figs. 4 and 5). In two cases the initial biological half-life was so long that the results could not be assessed.

An analysis of the characteristics of the five "successful" cases gives no indication of any which clearly differentiates them from the "unsuccessful" cases. All patients in both groups were thyrotoxic, most of them severely. Both groups contained examples of diffusely enlarged and nodular goitres with various degrees of enlargement, and

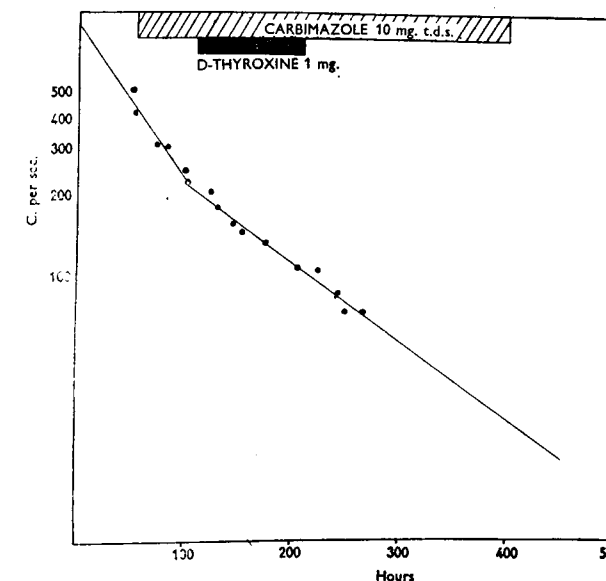


FIG. 4.—Effect of 1 mg. of D-thyroxine daily on the rate of discharge of ^{131}I from the thyroid. Showing suppression of T.S.H.

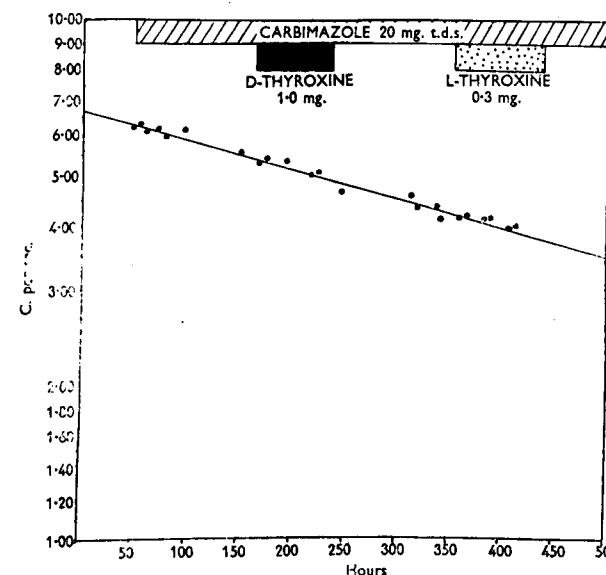


FIG. 5.—Effect of 1 mg. of D-thyroxine daily on the rate of discharge of ^{131}I from the thyroid. Showing no apparent effect on T.S.H. production.

of exophthalmos. It is clear that if any clinical difference exists between the two groups a larger series must be examined before it becomes manifest.

Discussion

The results of these experiments give support to previous work and strongly suggest that D-thyroxine has a very weak effect upon tissue metabolism. A numerical estimate of the relative potency of D-thyroxine and L-thyroxine cannot be made at present, but it appears that L-thyroxine is at least 10 times as effective as D-thyroxine by any criterion, and the figure may well be higher. On the other hand, small doses of D-thyroxine have, even in thyrotoxicosis, a suppressive effect on the thyroidal uptake and discharge of radio-iodine and, it may be inferred, upon the production of T.S.H. by the anterior pituitary. This finding is surprising. Werner *et al.* (1952) failed to suppress by means of desiccated thyroid the radio-iodine uptake of thyrotoxic patients. Morgans *et al.* (1952) reported a like failure using L-thyroxine, and Werner and Hamilton (1953) using triiodo-L-thyronine. The fact that in two of our patients suppression

was produced by D-thyroxine but not by L-thyroxine might suggest that D-thyroxine has a qualitatively different effect from that of L-thyroxine on the anterior pituitary. This seems highly improbable, and further work with both isomers is necessary to resolve the dilemma.

The expectation that cases of thyrotoxicosis might be found in which it would be possible to reduce the metabolism to normal by means of D-thyroxine has apparently been fulfilled in two of six patients treated for three months. This is not so surprising, for Means (1948) has reported a clinical improvement in cases of Graves's disease treated with desiccated thyroid, and Werner *et al.* (1952) quote a single case personally communicated to them by Greer. Moreover, these authors noted that in several of their patients treatment with thyroid was accompanied by a fall in the level of P.B.I. They advanced three possible causes for this finding—the effects of non-hormonal iodine in the desiccated thyroid, of repeated doses of ^{131}I , or of rest in bed. None of these explanations is applicable in our patients. Moreover, the danger to the patient of using thyroid or L-thyroxine is absent when the relatively non-calorigenic D-thyroxine is used.

Although the output of T.S.H. was inhibited, at least temporarily, in almost every case in our series, in no instance was any change seen in the degree of exophthalmos. This observation cannot be explained by the hypothesis that exophthalmos, originally produced by an excess of T.S.H., has become irreversible, for it is a common observation that exophthalmos may decrease or even disappear spontaneously. The doses of D-thyroxine used, smaller than in the hypothyroid patients, were large enough to depress the uptake of radio-iodine for periods up to 10 months, but not large enough to increase metabolism. Our results give support to those who have long doubted the classical hypothesis that exophthalmos is due to an excessive production of T.S.H. by the pituitary.

Summary

The metabolic effects of D-thyroxine are very slight when compared with those of L-thyroxine, the latter being at least ten times as potent. On the other hand, doses of D-thyroxine too small to effect metabolism directly are capable in most cases, even of thyrotoxicosis, of suppressing the uptake of radio-iodine and, by inference, the production of T.S.H. Suppression of the production of T.S.H. appeared to induce a remission of Graves's disease in two of six patients, but the exophthalmos was not improved.

We are grateful to other members of the staff of the department of endocrinology of New End Hospital for allowing access to their patients, and to Dr. A. W. G. Goolden for much helpful advice. Glaxo Laboratories Ltd. have most generously supplied all the D-thyroxine used.

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The fourth annual "Aircen" medical conference, dealing with aviation medicine and the medical aspects of nuclear warfare against air bases, was held at Headquarters, Allied Air Forces Central Europe, Fontainebleau, from October 8 to 10. Group Captain E. S. Sidey, Medical Branch of the R.A.F., presided. Over 50 delegates attended, including senior officers from the Medical Services of the armed Forces of the United Kingdom, the United States, Canada, France, Belgium, the Netherlands, West Germany, and Italy.

THE IMMEDIATE UPTAKE OF RADIOACTIVE IODINE AS A TEST OF THYROID FUNCTION

BY

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The rate of uptake of radioactive iodine by the thyroid has been used as the basis of a number of tests of thyroid function (Myant, Pochin, and Goldie, 1949; Astwood and Stanley, 1947; Goolden, 1958). It is commonly agreed that in about 90% of the cases tested a good separation can be achieved between thyrotoxic and euthyroid patients with an overlap of 5 to 10% whichever method is adopted. The technique reported here has been found of value when an answer is needed immediately or when serial investigations are required on the same person. The radiation dose is extremely small, particularly when ^{132}I is used.

Material and Method

Four scintillation counters with sodium iodide crystals, $1\frac{1}{2}$ in. (3.8 cm.) diameter and 1 in. (2.5 cm.) long, are used. Each crystal is backed by a perspex light guide, $1\frac{1}{2}$ in. (3.8 cm.) in diameter and $\frac{1}{2}$ in. (1.9 cm.) long, which forms the optical connexion to a photomultiplier. The pulses from the four counters are fed into a mixer unit and from there, through an amplifier, to a ratemeter which is connected to a pen recorder (Fig. 1). The counters are mounted in cylindrical lead shields 2 in. (5 cm.) thick, which are positioned so as to form a ring 20 cm. in diameter. The patient is seated in a dental chair, which can be adjusted

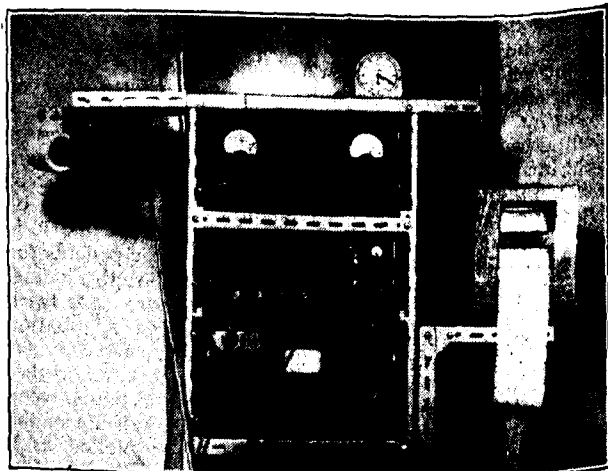


FIG. 1.—General view of the equipment.



FIG. 2.—The counters in position round the patient's neck.

so that the counters are at the level of the thyroid (Fig. 2). The pen recorder is started as soon as the patient is comfortably settled and measures the background radiation under the conditions of the test. When serial tests are made this recording can be used to correct for any residual activity in the neck due to previous investigations. Normal saline containing 3–5 μC of either ^{131}I or ^{132}I is injected intravenously, and the uptake of the radioactive iodine is continuously recorded for 30 minutes after the injection is given. The recording is continuous, but, if necessary, intermittent readings made on the recording, which continues to run until the test is finished.

Calculation of Results

The uptake of iodine by the thyroid is dependent partly on renal clearance and partly on the rate of diffusion into the extracellular tissues. Various mathematical expressions have been suggested to fit these conditions (Oddie, 1949; Berson *et al.*, 1954, 1955; Larsson, 1955). Astwood and Stanley (1947) found empirically that the activity in the thyroid plotted against the square root of time resulted in a straight line, and this convention has been adopted here. The counting rate is taken from the recording and re-plotted against the square root of the time in minutes. The resultant straight line is extrapolated back to the time of the injection to find the counting rate at zero time (C_0). The result of the test is then expressed as an arbitrary quantity "S," which is calculated from the formula: $S = \frac{C_{25} - C_0}{C_0}$, where C_{25} is the counting rate 25 minutes after the injection. S is thus independent of the amount of activity given.

C_0 varies slightly with the size and shape of the person being investigated, since it is a measure of the proportion of the activity which is seen by the counters, and is of the order of 80–100 counts per second per μC of ^{131}I injected; 1 μC of ^{132}I gives twice this counting rate. The background counting rate before any activity is given is usually 120–150 counts per second, and the efficiency of the counters is such that 1 μC of ^{131}I gives 800 counts per second and 1 μC of ^{132}I nearly 2,000 counts per second. Small variations in the position of the source make very little difference to the counting rate.

In patients suffering from severe thyrotoxicosis this graph of the uptake does not remain a straight line even for the first 25 minutes, and in these cases C_0 is calculated from the first straight portion of the curve; but the actual value of initial straight portion of the curve; but the actual value of C_{25} is used, so that the value for S is less than would be expected from the initial rate of uptake. C_0 is proportional to the extrathyroidal activity, which decreases during the test owing to clearance of the radioactive iodine by the thyroid and kidneys. In patients whose thyroids concentrate little or no iodine, either because they are hypothyroid or because of the administration of antithyroid drugs, S has a negative value.

Results

Tests of thyroid function have been made on 357 subjects in whom the clinical diagnosis is reasonably certain. The criterion for selection has been the expressed opinion of two independent clinicians, or, when this has not been available, the opinion of one clinician when that opinion has been subsequently confirmed by laboratory tests or by a therapeutic trial of antithyroid drugs, usually carbimazole. In 50 of the patients 10 μC , or more, of ^{131}I has been given and measurements made of the radioactivity in the urine. In Fig. 3 the value for S has been plotted against T (Fraser *et al.*, 1953). It can be seen that, while there is reasonably good correlation for the non-toxic patients, there is a wide scatter in the toxic ranges, although the overall assessment of thyroid state is in good agreement. Of the 357 patients, 100 were thyrotoxic, 136 had non-toxic goitres, and 105 had no thyroid disorder, while 16 patients were clinically hypothyroid. The results in the first three classes are shown in Fig. 4.

This test has proved most useful in investigating the effects of drugs on thyroid function where several tests are often required on the one person (Greene and Farran, 1958; Greene *et al.*, 1958). In these circumstances ^{132}I is preferable to ^{131}I , because of its shorter half-life. Any residual activity due to ^{131}I contamination of the ^{132}I can be corrected for by subtracting the background counting rate before subsequent injections are given.

It is not possible to say whether or not S is of value in the diagnosis of hypothyroidism until more cases of proved hypothyroidism have been tested. Negative values of S probably indicate a hypothyroid state, but many more patients will have to be investigated before a firm conclusion can be reached regarding its suitability or otherwise for this purpose. A limited number of patients have been tested three months after having had treatment with radioactive iodine, but here again the results are inconclusive. It seems, however, that residual thyrotoxicosis can be excluded if S falls within the euthyroid range (0–0.8).

This test has now been in routine use at New End Hospital for over 18 months, and it is felt that its simplicity

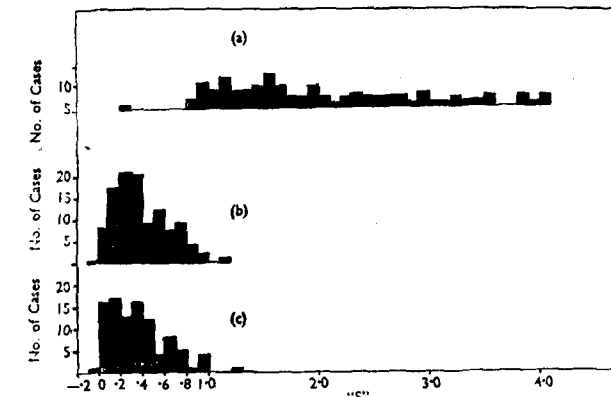


FIG. 4.—Histograms of the value of S obtained in (a) thyrotoxic patients, (b) patients having non-toxic goitres, and (c) patients without any apparent thyroid disorder.

and the fact that an answer can be obtained less than an hour after requesting the test make it of considerable value in a busy department. It is merely a simplified version of other tests based on clearance rates, but, particularly if ^{132}I is used, it has the advantage that the radiation received from each test is practically negligible, which enables serial tests to be made safely on the same person over a long period.

Summary

A simple test for thyroid function which consists in measuring the rate of uptake of radioiodine by the thyroid during the first 30 minutes after the intravenous injection of 3–5 μC of radioactive iodine is reported. A good separation between thyrotoxic and euthyroid subjects is obtained in about 90% of the cases tested.

Its main use is in serial measurements to test the response to drugs and other antithyroid substances. Other possible uses are discussed.

I wish to thank my clinical colleagues at New End Hospital for permission to use their material and also Miss E. V. Webb for her technical assistance.

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OCCULT BLOOD IN FAECES AFTER ADMINISTRATION OF ASPIRIN

BY

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It is known that aspirin (acetylsalicylic acid) may occasionally cause a gastric haemorrhage due to gastritis or a peptic ulcer (Douthwaite and Lintott, 1938; Hurst and Lintott, 1939; Hurst, 1943; Douthwaite, 1954; Muir and Cossar, 1955; Kelly, 1956; Lange, 1957). Despite the frequent use of this drug such complications have been rare. Moreover, it is difficult if not impossible—certainly in individual cases—to establish a direct proof of an immediate causal connexion. This may be a reason why insufficient thought has been given to this possibility.

In some of our patients, who had been treated with aspirin for rheumatoid arthritis, unexplained occult blood in the stools occurred. This article describes an attempt to determine the possible role of aspirin as a cause of this blood loss. The only paper on this subject was published by Lange in November, 1957, concomitantly with my thesis which recorded the results of our own investigation. Lange came to the conclusion that, even when the most readily soluble salicylic acid preparations were used, irritation to the gastric mucosa, accompanied by an occult loss of blood, could not be avoided. He was of the opinion that this irritation was of a general nature and was not confined to ultrasensitive persons. According to him the frequency of the occult loss of blood could be reduced if the patient took the medicine after meals. He furthermore suggested that the frequency of this blood loss might also be reduced if the tablets were given a good coating.

As Lange himself points out, his tests are open to criticism. He did not ascertain in all his test cases whether the occult loss of blood could not be due to some other cause than the taking of aspirin preparations. Furthermore, he did not prescribe a meat-free diet for his patients, and consequently there was always a possibility of the benzidine reaction in the faeces being influenced by the quantity of meat consumed by the patients prior to the tests. Lange accordingly found a relatively large number of instances in which there were positive benzidine reactions in the cases of patients who had not been treated with aspirin, whereas they should have been negative, provided that there was nothing else to

cause bleeding. Moreover, he does not state the number of patients who had a positive benzidine reaction in the faeces, but only how many positive and negative specimens of faeces had been obtained from a group of patients during a certain period of time. It would have been more valuable if from each of the patients the same number of samples of faeces had been collected. During our tests we eliminated the above-mentioned drawbacks.

Method of Investigation

Since the results of tests for occult blood in the faeces are far from reliable in out-patients, the investigation was carried out only on patients who were hospitalized because of some rheumatic complaint. Those whose histories recorded stomach trouble were excluded from treatment with aspirin. Otherwise no selection was made.

The aspirin was administered in the form of tablets taken with milk or water shortly after a meal. As, according to the literature, a distribution of fine particles is less harmful than concentrated bulk, the patients included in this study were emphatically told not to swallow the tablets whole, but to permit them to disintegrate in the mouth or to chew them. It might have been better to administer the substance in the form of powder; but we gave up this idea, as patients generally object to taking it in this form and would seldom do so at home; it seemed to us that it would be better to carry out our experiments under conditions that were as near as possible to those generally prevailing in actual practice. We did, however, administer the drug in powder form to a small group of persons to determine whether results might be different.

The quantity of aspirin given as a medicine was not changed. In the main the quantity was 750 to 3,000 mg. a day, a few larger amounts being given as an exception. This moderate dosage may be taken as a criterion for the quantities generally administered in practice.

A meat-free diet was prescribed and the patient was not allowed to brush his teeth. In order to obviate possible disturbing factors, green vegetables and preparations containing iron were also forbidden; and, to preclude the possible influence of food consumed previously, no use was made of the first three lots of faeces produced after the diet had begun.

The benzidine reaction test was carried out as follows: Approximately 150 mg. of benzidine was dissolved in 7 ml. of ethyl alcohol 96%; to this was added 7 ml. of glacial acetic acid and 7 ml. of hydrogen peroxide. The strength of the resultant benzidine solution was therefore approximately 0.75%.

Gregersen (1919) showed that the benzidine reaction becomes more rapid in proportion to the concentration of the benzidine solution. He therefore recommended a solution with a strength of 0.5%, while Hulst (1933) obtained good results with a solution of 1%. We therefore certainly did not use too high a concentration of the solution in our experiment. This is proved by the fact that the reaction was always negative in the periods when no aspirin was taken. After the benzidine solution had been prepared we waited a while to make sure that it did not become coloured through the presence of impurities before the faeces were added. Then, using a glass rod, we took a small quantity of faeces from the centre of the mass and mixed it well with the benzidine solution. The following criteria were established:

Strongly positive ..	Deep blue colouring within 20 seconds
Positive ..	Deep blue colouring within 60 seconds
Slightly positive ..	Greenish blue colouring within 60 seconds
A trace positive ..	Green colouring within 60 seconds
Negative ..	No colouring within 60 seconds

In order to ensure the greatest possible uniformity in these observations all benzidine tests were carried out by the same technician.

Only after a positive or a negative reaction had been found in three successive specimens of faeces was the result

recorded as such. A benzidine reaction which showed only a trace (green colouring within 60 seconds) after aspirin had been taken was regarded as negative. As a rule the benzidine diet was prescribed after the patient had been taking aspirin for 14 days. In some cases, however, the diet was prescribed after the patients had been taking the medicine for a much longer period. A patient was said to react to aspirin *negatively* when the benzidine reaction was still not positive after aspirin had been taken for 20 days or longer (the last six days of the period with a diet).

A patient was said to react to aspirin *positively* when the benzidine reaction was positive during the taking of aspirin and became negative when he stopped taking it. The following scheme illustrates this classification.

Aspirin given	{ Benzidine - Benzidine - Benzidine - }	Patient reacting negatively to aspirin.
Aspirin given	{ Benzidine + Benzidine + Benzidine + }	Aspirin stopped
	{ Benzidine - Benzidine - Benzidine - }	Patient reacting positively to aspirin.

As it was found that "entrosalyl" (coated sodium salicylate) never caused a positive benzidine reaction, those patients for whom salicyl therapy was desirable were given this medicine after they had stopped taking aspirin.

The results obtained when aspirin was taken were checked in two ways: (1) By determining the possibility of reproducing the phenomenon during alternating periods with and without administration of aspirin. Here the patient himself serves as a control. (2) By bringing groups of healthy volunteers into the scheme. With these control groups of healthy men and women we followed the same method of testing.

Results

Altogether 144 patients were examined. In four cases an alternating positive and negative benzidine reaction was observed after the patients had taken aspirin, and they could therefore not be designated as reacting positively or negatively. These four cases are left out of further consideration. Of the remaining 140, 95 showed a positive reaction to aspirin. These 140 patients comprised 38 males and 102 females; 23 and 72 respectively showed a positive reaction to aspirin (Table I).

TABLE I

	No.	Positively Reacting
Males ..	38	23 (60.5%)
Females ..	102	72 (70.6%)
Total ..	140	95 (67.9%)

Out of the 95 patients who had reacted positively, 79 who needed further treatment with salicyl were given sodium salicylate instead of aspirin (10 patients were given ordinary tablets and 69 coated tablets). In all these cases the benzidine reaction became negative.

Reproduction of the Phenomenon.—In 27 of the 28 cases in which the possibility of reproducing the phenomenon was examined, we were able to cause a repetition of the positive or negative benzidine reactions by administering or not administering aspirin. Examples are given in the Graph in which it is shown how the benzidine reaction repeatedly became positive after the administration of aspirin and became negative when the drug was discontinued. In one case it was not possible to reproduce this condition. After this patient had taken aspirin for 18 months the benzidine reaction was strongly positive. When entrosalyl was substituted the reaction became negative. When aspirin was administered again the benzidine reaction was still negative after 45 days. It was not possible to ascertain the reaction of this patient again at a later date.

Controls with Groups of Healthy Volunteers

The possibility that rheumatic patients would react to aspirin differently from healthy persons should be con-

sidered. For this reason the same method of testing was applied to a number of men and women who could be assumed to be healthy. If a person was found to have any sort of gastric complaint he was excluded from the experiment.

It was found impossible to take an absolutely random sample from the general population. We had to confine ourselves to persons who took their meals in groups. This made it easier to check whether the diet prescribed was being strictly observed and also whether the tablets were taken as directed.

The control groups consisted of 20 women and 20 men (Table II). The doses prescribed for the 20 women were: 8 women to take 3 g. a day (3×2 tablets); 12 women to take 1.5 g. a day (3×1 tablet). It was our intention to

TABLE II

Quantity of Aspirin (mg. day)	Negatively Reacting	Positively Reacting			
		Total	Slightly Positive	Positive	Strongly Positive
Females					
1,500	3	9	—	3	6
3,000	2	6	1	1	4
Total	5	15	1	4	10
Males					
1,500	4	16	1	7	8

split the group of men in the same way, but when a gastric ulcer was found in one of the women in the 3 g./day group it was decided for safety's sake not to give the dose again, although this isolated case may have been merely coincidental. Consequently each of the 20 men was given 1.5 g. a day.

Table III shows a comparison between the results obtained with the control group and those obtained with the patients.

TABLE III

	No.		Positively Reacting	
	Females	Males	Females	Males
Control group ..	20	20	15 (75%)	16 (80%)
Patients ..	102	38	72 (70.6%)	23 (60.5%)
Total ..	122	58	87 (71.3%)	39 (67.2%)

If we now summarize the results of this experiment we find that after taking aspirin a large proportion of the persons examined (70%) had a positive benzidine reaction in the faeces (Table IV).

TABLE IV

	No.	Positively Reacting
Males ..	58	39 (67.2%)
Females ..	122	87 (71.3%)
Total ..	180	126 (70%)

Influence of Dosage

The quantity of aspirin given to the patients as a part of the medical treatment varied from 750 to 6,000 mg. a day. The customary doses were 1,500 and 3,000 mg. a day to 68 and 30 patients respectively. We did not find that a positive benzidine reaction occurred more often in those larger doses.

When the positive reactions were divided into slightly positive, positive, and strongly positive, we likewise found no distinctive difference between the results from larger or smaller doses.

No association was found between the ages of patients and their reaction to aspirin. The age of the patients was mostly between 40 and 60 years; there were a few younger and older patients—some of 11 and some of 72 years. On the whole, younger adults were taken for the control group.

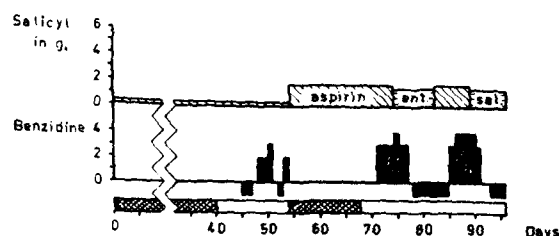
As stated in the description of the method applied, the benzidine diet was as a rule prescribed after the patient had been taking aspirin for 14 days, and the first three lots of faeces were not examined.

In order to determine how rapidly the benzidine reaction can become positive we examined the stools of four patients from the very first day on which aspirin was taken. In these four cases the change from negative to positive occurred after three, six, four, and three days respectively (see Cases 1 and 2 in Graph).

Nevertheless the change need not always occur in such a short time. For instance, when we tried to reproduce the condition in a female patient who had originally reacted positively we found no clearly positive reaction even after three weeks of aspirin treatment. When the benzidine reaction was checked again after a space of 60 days it was found to be definitely positive (see Case 4 in Graph).

From the examples given it will be seen that among those persons who were recorded as having reacted negatively during our experiments there may have been some who would have shown a positive reaction during a longer period of observation.

In 70 cases we were able to determine in how many days the benzidine reaction became negative after the administration of aspirin was discontinued. The average period was found to be four to five days, but here again there were some exceptions. In three patients the benzidine reaction was still positive after 20, 23, and 31 days respectively. When the examination was repeated after 56, 43, and 53 days respectively the reaction had become negative.



63 yrs. C.vdK.-H.

R.A. S.M. 102/56

R.A. = Rheumatoid Arthritis

2g. Aspirin

2g. Enterosalicyl

BENZIDINE

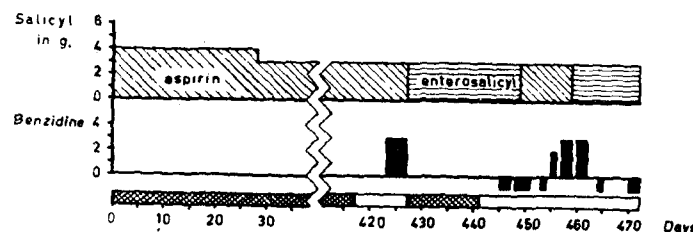
Strongly pos. 4

Slightly pos. 2

Negative 0

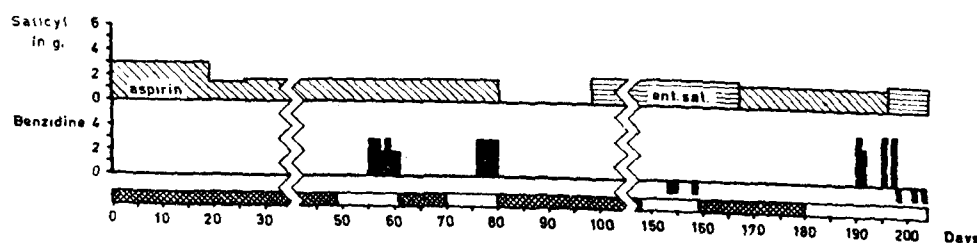
Ordinary diet

Benzidine diet



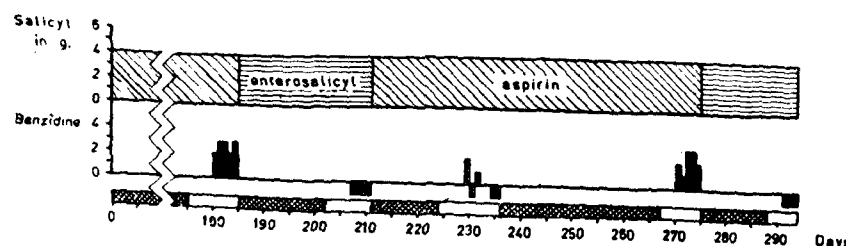
55 yrs. C. B.-K.

R.A. S.M. 99/55



53 yrs. A.v.A.

R.A. S.M. 31/56



34 yrs. C.S.-M.

R.A. S.M. 41/56

It appears from our experiments that taking aspirin, even in moderate doses, causes a positive benzidine reaction in the faeces in a high percentage of cases.

It was not possible to find any association between the occurrence of this deviation and the occurrence of subjective complaints. Complaints of a slight feeling of fullness and "burn" in the region of the stomach were made by only a few of our patients. Such complaints were, however, made not only by patients who had reacted positively to aspirin but also by those who had shown a negative reaction. In the case of only one patient, to whom a dose of 3 g. of aspirin a day had been administered, the complaints were of such a nature that treatment had to be stopped. In the female control group, for whom 3 g. a day had been prescribed, complaints of stomach trouble were far more frequent than in the patients who had been given the same doses. Five of the 10 women undergoing the experiment complained of nausea and pains in the stomach. In two cases the pains were so violent that the women were unable to continue with the experiment. It is possible that the frequent occurrence of stomach trouble in this control group was due to a considerable extent to psychological factors. The persons concerned knew that they were undergoing a test, and they may have been expecting gastric troubles. On the other hand, the patients were given aspirin as a medicine, and it is therefore likely that although some of them were troubled they did not complain.

Some research workers have attributed stomach troubles when aspirin was administered to an increase in the value of the gastric acids. We did not carry out any systematic

experiments to determine the gastric acidity when aspirin was taken. As, however, we found five positive reacting patients with an achylia that was refractory to histamine, in addition to a few patients with an increase in gastric acid values after taking aspirin, it may be said that the increase in gastric acid values is possibly not the only factor when stomach troubles occur after the taking of the drug. It has been suggested in the literature that no stomach disorders occur when aspirin is administered as a powder. We have already said why we did not regularly give it in this form. We did, however, give a small control group of four patients and six healthy volunteers 500 mg. of aspirin powder suspended in water three times daily after meals. All these persons had previously shown a positive benzidine reaction after one tablet of 500 mg. had been taken three times a day. In all 10 cases there was once again a loss of blood found in the faeces. There was no clear difference in the strength of the reactions compared with those which occurred when tablets had been taken.

It would appear that the ideal substitute for the ordinary tablets would be coated tablets of aspirin, which would not disintegrate until they reached the small intestine. Talkov *et al.* (1950) do mention the disappearance of subjective disorders after patients had taken such tablets, but this does not imply that there was no occult loss of blood. We carried out a tentative experiment with coated tablets, which we gave to 20 patients who were showing a positive benzidine reaction caused by taking ordinary tablets. In 5 of these 20 cases the benzidine reaction became negative within the four to seven days after taking the coated tablets. The reaction of two others became clearly less strongly positive, and in the 13 remaining cases the reaction after an average of 13 days was still unchanged in intensity.

From the data given in the literature it may be concluded that when aspirin is taken in moderation it is highly improbable that hypoprothrombinaemia is the cause of the gastric haemorrhage. Nevertheless, to ascertain whether this was the case four patients with strongly positive benzidine reactions during the administration of aspirin were analysed with regard to their coagulation mechanism. No disorder was found, and notably there was no hypoprothrombinaemia. Time and again normal values for the bleeding-time were found. Therefore in our opinion we need not take into account the possibility of a disorder in the coagulation mechanism of the blood being the cause of the positive benzidine reaction which we had found.

For various reasons we did not carry out a systematic x-ray examination whether or not there was an ulcer in these cases, especially as there were no complaints. The stomach and intestines were radiographed in only four cases in which the patients showed a positive reaction. There was no sign of disorder in any of these x-ray films that would account for the positive benzidine reaction. We did, however, prove by means of x-ray films the presence of a gastric ulcer in a woman in the control group who had been taking 3 g. of aspirin a day for a period of three weeks. This woman had never previously complained of stomach trouble. As she had violent pains coupled with a strongly positive benzidine reaction after taking aspirin we made an x-ray examination of the stomach. Unfortunately we did not have an x-ray film of her stomach taken before she had the aspirin. There is accordingly no proof that the gastric ulcer was brought about by the aspirin. It can be said with greater certainty that the aspirin was the cause of the stomach troubles and of the strongly positive benzidine reaction. For, after the medicine had not been taken for four days the stomach troubles ceased and the benzidine reaction became negative.

We considered the possibility of the positive benzidine reaction, after taking aspirin, being due to a substance other than blood. In order to preclude this possibility the stools of six patients were examined spectroscopically and spectrophotometrically. In cases with a positive benzidine reaction we found a typical blood-absorption curve. The experiment is explained at greater length elsewhere (Stubbs, 1957). Kelly (1956) has stated that the loss of

blood as a consequence of the taking of aspirin may lead to serious anaemia. We on our part found a woman of 23 suffering from extreme anaemia (Hb content 30%), which had been brought about by taking not more than two tablets of 500 mg. of aspirin a day. In the hospital we found the benzidine reaction negative, as no more aspirin was administered after the patient was admitted. When we administered a tablet of 500 mg. of aspirin three times a day during two periods, after we had taken all kinds of precautionary measures, we found signs of melaena after four days and again after seven days, without any complaint on the part of the patient. No disorder could be found when the patient was suffering from melaena, either by x-ray examination or by coagulation tests; the bleeding-time was also normal. After iron had been administered orally it was found that the Hb content had risen to 90% within two months of taking aspirin. These extreme cases are, however, exceptions and are fortunately seldom met with. The occult loss of blood, on the other hand, is a complication very often encountered in aspirin therapy, as we have already said.

To obtain an idea of the amount of blood lost in such cases a few patients were given a small quantity of their own blood to drink 10 times a day. In this way we were able to ascertain with what loss of blood the criteria employed for determining the strength of the benzidine reaction approximately corresponds.* It was found that when 4 ml. of blood was administered there was a strongly positive benzidine reaction.

Although this experiment was carried out with only a few patients one might conclude from the results that a patient with a strongly positive reaction loses about 30 times 4 ml. = 120 ml. of blood a month. Those patients who show a strongly positive reaction within the space of a few seconds will probably lose even more blood.

By way of comparison we might take the average quantity of blood a woman loses a month during the menses. According to Wright (1952) the loss amounts to 40 ml. (varying from 10 to 210 ml.).

Discussion

It is known that bleeding may occur in the stomach after a person has taken aspirin. But, considering the enormous quantities of this drug which are consumed and the frequency with which it is taken, such an occurrence may be regarded as an exception.

Subjective complaints of the stomach are not of rare occurrence, but, so far as we know, no one has ever systematically tried to ascertain whether these coincide with organic disturbances. When there are no subjective complaints at all it is generally supposed that objective disorders are out of the question. From our experiments, however, it appeared that about 70% of the persons who took this medicine, and who mostly had no complaints, lost blood with the faeces. It goes without saying that the observance of a positive benzidine reaction is also dependent on the sensitivity of the reaction. The existence of a physiological blood content of the faeces was established in experiments by Hulst (1933) and others.

From this it would appear desirable not to raise the sensitivity of the reaction too high by making the concentration of the benzidine solution too strong. On the other hand, it is of interest clinically to be able to demonstrate the pathological loss of even small quantities of blood. As already stated, we used a benzidine solution of about 0.75% for our experiment, on the basis of data given in the literature. And it appears, from the fact that the reaction was invariably negative during the control periods without the administration of aspirin, that the reaction in the course of the experiment was not too sensitive.

The observations made by Douthwaite (1938, 1954) and other research workers, who with the aid of the gastro-scope saw rapid changes occur in the mucous membranes only around the particles of aspirin and not at other places

*A detailed description of the method applied was given in our thesis (Stubbs, 1957).

situation on the basis of the number of anginal attacks and the effort required to produce them. It should always be stopped before the patient returns to work.

Because of the danger of masking myocardial ischaemia, the numerous side-effects, and the risk of serious liver damage, iproniazid is not indicated for the patient with mild angina.

Although the drug could theoretically give rise to "silent infarction," this did not happen in any of our patients. Two of them had infarcts while receiving iproniazid. Both were at rest at the time and had typical pain.

The side-effects of iproniazid are described by Robitzek and Selikoff (1952) as, firstly, those referable to autonomic stimulation, including dryness of the mouth, constipation, delayed micturition, and difficulties in visual accommodation; secondly, those referable to central nervous system stimulation, including vertigo, muscle-twitching, hyper-reflexia, excitement, euphoria, somnolence; and, thirdly, those referable to antagonism to vitamin B, including peripheral neuropathy. Unfortunately these and other side-effects limit the usefulness of the drug.

Summary

Iproniazid has been given to 40 patients with severe angina pectoris from occlusive coronary atherosclerosis, and was highly effective in reducing the frequency and severity of anginal attacks. It appears to act by blocking pain and not by improving the coronary circulation. Side-effects are common; many of our patients complained of giddiness and two developed pulmonary oedema, presumably from fluid retention. The blocking of angina may encourage the patient to be more active and may precipitate infarction. Because of this and the side-effects, the drug is not indicated for patients with mild angina pectoris. In the patient with severe and intractable angina it is of great value, especially if anti-coagulant therapy can be given in addition. The patient can often be helped over a prolonged ischaemic episode, the drug being withdrawn when the condition improves.

We are grateful to Dr. Margaret Briggs, of Roche Products Limited, for her help and for supplies of marsilid.

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"We have learnt a great deal during the last three years from three reactor accidents which have led to partial melt-out of the reactor fuel elements. Although two of the reactors were put out of commission for a year and one was written off, no one was hurt by these accidents or received an overdose of radiation. The results of the accidents agree in a remarkable way with laboratory experimental work in showing that only a very small fraction of some of the bone-seeking isotopes escaped from the melted fuel. The disturbances due to these accidents were accordingly less than envisaged previously. Later generations of reactors than these early models are much better protected by containment and instrumentation, and some papers have shown considerable progress in advanced designs of containment which are thought to be proof against the maximum credible accident. This gives us considerable confidence in safe operations in the future, and we may, in due course, expect the location of plants in more populated areas. There has also been a growth of national reactor safety and inspection organizations, analogous to those in being for the aircraft industry. They inspect designs and prescribe codes of operation to help to maintain safety."—From a lecture by Sir JOHN COCKCROFT, F.R.S., to the Danish Society of Civil Engineers on October 6.

JAUNDICE ASSOCIATED WITH ADMINISTRATION OF IPRONIAZID

REPORT OF TWO CASES

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Iproniazid ("marsilid"; or 1-isonicotinyl-2-isopropylhydrazine phosphate) is a variant of isoniazid, which was first used for its antituberculous properties in 1952. Then described as a drug which made patients "dance and sing in the ward" and as a "fountain of energy," it was discarded by chest physicians as too apt to produce side-effects, including psychotic episodes; it has since been hailed by psychiatrists as a powerful "energizer," and been found useful in the treatment not only of depressive states but also in angina pectoris and collagen diseases, gastro-intestinal conditions, etc. Zeller *et al.* (1952) found that iproniazid was a powerful inhibitor of amine oxidase. Udenfriend *et al.* (1957) were able to demonstrate a rapid and large rise in brain serotonin in animals given the drug. The effect of the drug on mood in humans has been attributed to this increase in serotonin.

In a symposium (1958) in New York in 1957 many preliminary studies were presented, but concluding speakers stressed the need for carefully controlled trials before definite claims for the value of the drug in psychiatric and other conditions could be made. During the course of such a trial in this hospital, two cases of jaundice have occurred. The possibility of this drug being hepatotoxic has recently been raised. In view of the increasing use of iproniazid in psychiatric practice, these cases seem worthy of immediate report.

Case 1

The patient, a 53-year-old working-class widow, had been subject to spells of agitation and depression, with increasing suspiciousness and misinterpretation for three years. She was previously hardworking and loyal, and had struggled to bring up five children, one of whom was diabetic from infancy. She had had no serious illness previously, and had never been jaundiced. She had not received injections and there was no contact with cases of infective hepatitis.

She was admitted to hospital on October 11, 1957, and made a good initial response to hospitalization. Iproniazid was first given at 150 mg. daily on January 11, 1958, and reduced to 100 mg. daily on February 11. During the first week of March she began to feel vaguely unwell, suffered from giddiness and palpitations, and later complained of superficial pains in the limbs and shivering attacks. All but the latter symptoms have been described as side-effects and are often encountered in iproniazid therapy. Our patient minimized these for fear that she might be taken off the drug, which was helping her considerably. On March 24, however, she developed mild anorexia with constipation and took to her bed. Iproniazid was discontinued. Two days later, though subjectively much improved, she was jaundiced and had a pale stool and biluria.

On examination the liver edge, slightly tender, could be palpated two fingerbreadths below the costal margin, but liver dullness was not greatly increased. She was, and remained, apyrexial. (For details of investigations, see Table.) With a low-fat diet, rest, and vitamins her strength and

appetite improved further, though jaundice deepened. On April 6, however, there was a return of anorexia and nausea was persistent. Her clinical condition deteriorated, some petechiae appeared, hepatomegaly was no longer demonstrable, but the spleen was found to be enlarged and easily palpable. Rubefacience, circumoral pallor, with "cherry-red" lips and red palms, were observed. There was no tremor or other signs of encephalopathy. Subacute hepatic necrosis was diagnosed, and our findings were confirmed by Dr. Philip Harvey, who kindly saw the patient and on April 9 arranged her transfer to St. Stephen's Hospital for further investigation and treatment.

Intravenous corticotrophin in dextrose was immediately given, the patient receiving a total of 600 units over a period of three days. Diet was restricted to 1,500 calories (with 35 g. of protein). Neomycin and tetracycline were given orally, together with soluble insulin (5 units before meals) and propyltestosterone, these measures aiming at diminishing protein katabolism. Vitamin K, folic acid, and vitamin B₁₂ completed the regime. Twelve hours after initiation of this therapy icterus had greatly diminished. The serum bilirubin level had fallen from 16.6 to 6.4 mg. at the end of corticotrophin administration; by April 25 this level had fallen to 2.8 mg., and her recovery has since been uninterrupted.

A liver biopsy, performed by Dr. Gordon Signy on April 14 (after completion of the corticotrophin treatment), was reported as follows: "There are widespread fatty changes. There are focal areas of swollen hepatic cells and some bile thrombi, focal areas of infiltration, with small cells, including lymphocytes, polymorphs, and eosinophils, mostly occurring round the central vein. There is some increase of collagen fibres around the central vein and the portal spaces. The picture is one of focal necrosis." An electrocardiogram showed sinus bradycardia only. The white blood count remained within normal limits, and the sedimentation rate was not raised.

Case 2

A 31-year-old single woman, secretary to a business executive, had been admitted for the third time to Bethlem Royal Hospital in September, 1957, on account of severe and disabling neurotic symptoms accompanied by depressive features. After discharge from hospital in January, 1958, she remained apathetic, mildly depressed, and unable to work.

Iproniazid was given on January 31 in doses of 150 mg. daily and continued until April 12. Soon after initiation of this therapy she was able to resume work, and remained so well that she failed to keep her out-patient appointments. At the beginning of May she began to feel ill, nauseated, tense, and depressed, but attributed such symptoms to her anxiety relating to a difficult emotional situation. Nausea had been a frequent feature of her various neurotic illnesses.

When seen in the out-patient department on May 9 she appeared agitated and depressed. Iproniazid was again prescribed in doses of 75 mg. daily, combined with chlorpromazine, 150 mg. daily. Later that day she noticed that her

urine was dark and her stools were pale. On the following day jaundice appeared. Iproniazid and chlorpromazine were discontinued after only a few doses. When she reported sick to her firm's medical officer she was found to be pyrexial, and on examination the liver was palpable and tender. "Toxic jaundice" was diagnosed, and she was sent home to bed and treated with a fat-free diet. She had not received injections and there was no contact with other cases of jaundice. Unfortunately, we were not informed of these events until May 30, by which time the jaundice was resolving. She was visited at her home on June 1. On examination she was still slightly jaundiced, the liver edge was palpable but not tender, there was no splenomegaly, and haemorrhage and other skin manifestations were absent. After this visit she was admitted to St. Stephen's Hospital, and a liver biopsy was carried out by Dr. Gordon Signy on June 6. The tissue obtained proved to be part of a haemangioma, and no information could be obtained from the few liver cells present in the sections. The patient suffered no after-effects and was discharged home.

Laboratory Investigations on June 1.—Serum bilirubin: direct, positive; indirect, 2.3 mg.; thymol turbidity, 3 units; zinc flocculation, 9 units; colloidal gold, 0; alkaline phosphatases, 9.6 units; serum transaminase, 47 units; Total protein, 6.5 g. (albumin 4.2 g., globulin 2.3 g.). Electrophoresis showed that the α_2 pattern was less prominent than usual. Abnormality of gamma-globulin was not found.

Discussion

Jaundice was reported during iproniazid administration in tuberculous patients (Bosworth *et al.*, 1955; Ogilvie, 1955). Although only one more case has been published since then (deVerteuil and Lehmann, 1958), jaundice was referred to by Kline (1958) as the most serious complication of iproniazid treatment. The incidence of this jaundice is estimated to be under 0.05% and to approximate that of infective hepatitis (Marks, personal communication). The mortality rate, however, is higher than that reported in infective hepatitis.

The five cases reported during treatment of tuberculosis recovered, but the case reported by deVerteuil and Lehmann, occurring during a trial of iproniazid on 31 depressed and apathetic patients, was fatal. Necropsy in this case showed a "hepatic necrosis of the type sometimes seen in response to toxic agents."

Scherbel (1957a) has described four cases of jaundice in a trial of isoniazid and iproniazid in rheumatic arthritis. In two of his patients there was evidence of previous liver damage: one patient was alcoholic and had a portal cirrhosis and the other, previously subjected to cholecystectomy, had a biliary cirrhosis. The liver biopsies presented a picture typical of "viral hepatitis." The serum bilirubin was 7.2 mg. in the most severe of his cases. Unfortunately, it is not clear from his report whether the patients were receiving isoniazid or iproniazid when jaundice occurred.

During the course of the above clinical trial Scherbel (1957b) described a state of behavioural hyperactivity in some of his patients who were receiving iproniazid. Labora-

Table of Laboratory Investigations

	March 26	April 2	April 11	April 14	April 25	May 6	May 24
Bilirubin	4.2 mg.	19.4 mg.	16.6 mg.	6.4 mg.	2.8 mg.	1.4 mg.	0.6 mg.
Alkaline phosphatases	18.8 u.	19 u.	26.7 u.	—	—	7 u.	—
Thymol turbidity	6 u.	3.	2 u.	—	—	3.	—
Thymol flocculation	Neg.	Neg.	Neg.	—	—	Neg.	—
Zinc turbidity	6 u.	6 u.	6 u.	—	—	3 u.	—
Colloidal gold	7 u.	—	—	Neg.	—	—	—
Total protein	6.1 g.	7.1 g.	—	—	—	7.4 g.	8.6 g.
Albumin	3.8	3.6	—	—	—	3.9	5.9
Globulin	2.3	3.5	—	—	—	3.5	2.7
Serum transaminase	—	—	160 u./ml.	19 sec.	—	—	—
Prothrombin time	—	—	—	(14 sec. control)	—	—	—
Blood urea	—	—	—	29 mg.	—	—	—
Haemoglobin	10.9 g.	—	—	12.7 g.	—	12.7 g.	—
Urine	Urobilin + Urobilinogen— not detected	—	Bile—trace Urobilin—excess Urobilinogen—excess	—	Urobilin—trace Urobilinogen— not detected	—	—

tory investigations showed an increase in gamma-globulin, a decreased pseudo-cholinesterase, and increased bromsulphthalein retention in the absence of a rise in serum bilirubin. These findings were suggestive of hepatic dysfunction.

Pare (personal communication) has studied the effect of iproniazid on the serum transaminase level and found this to be increased in some patients, although other liver-function tests remained normal. This again might suggest some liver dysfunction.

Further evidence of liver involvement is supplied by Fouts and Brodie (1956). These authors discovered that iproniazid inhibited the enzymes in the liver, whose function is to detoxify such drugs as barbiturates, amphetamine, aminopyrine, and acetanilid. Toxic cerebral reactions following injections of pethidine have been reported by Mitchell (1955) and by Papp and Benaim (1958), and can be similarly explained on the basis of potentiation of the drug by iproniazid.

Randall (1958) reports slight parenchymatous degeneration in the liver and kidney, engorgement of the spleen, and bone-marrow hyperplasia in animals receiving large doses of iproniazid. Such changes were dependent on the dosage administered, and all were reversible.

Our two cases of jaundice occurred during a clinical trial of iproniazid on 60 depressed patients. Case 1 had received the drug for 72 days to a total of 8.6 g. when jaundice developed. The course of the disease was unlike that of infective hepatitis. Prodromal symptoms were minimal, asthenia and anorexia becoming marked only when clinical signs of necrosis supervened. Liver enlargement and tenderness were slight. There was no fever, and the E.S.R. remained normal throughout her illness. The initial liver-function tests were in favour of intrahepatic cholestasis. In common with other investigators, we found disturbance of protein metabolism with an increase in globulin. Unfortunately, electrophoretic studies were not carried out. The marked change in condition on the twelfth day of jaundice, with the development of clinical signs of liver failure, pointed to the onset of necrosis. This diagnosis was supported by a high serum transaminase level and by the biopsy findings, which showed evidence of focal necrosis in spite of the administration of corticotrophin for three days beforehand. Moreover, the presence of eosinophilia in the sections is strong evidence of drug-induced jaundice (Hollister, 1957).

Case 2 had received iproniazid for 75 days to a total of 11.25 g. It is unfortunate that the case was not seen until 22 days after the onset of jaundice, by which time she was recovering. No definite conclusions can be reached on the information available.

The hypothesis was originally put forward that jaundice occurring in iproniazid therapy was due to a coincidental occurrence of viral hepatitis and an inhibition of the amine oxidase system by the drug, causing failure of the detoxicating mechanisms of the liver. From the evidence available, however, it is difficult to escape the conclusion that iproniazid may have a direct toxic effect on the liver. The fact that jaundice has occurred in patients receiving as little as 25 mg. daily and that it appears unrelated to the duration of administration (Marks, personal communication) suggests that an element of idiosyncrasy may be present.

While it is difficult to decide at this stage whether iproniazid jaundice is of obstructive or hepatocellular type, the severity of some of the cases reported, including our first case, supports the latter possibility. Moreover, our liver biopsy provided definite evidence of hepatocellular damage. The picture was very different from that encountered in chlorpromazine jaundice, obstructive in type and benign in course, in which one invariably finds bile plugs in biliary canaliculi and minimal inflammatory changes (Movitt *et al.*, 1955).

It is clear that further research is needed to establish beyond doubt the mechanisms whereby iproniazid produces liver damage and jaundice. It is hoped that such risks can

be eliminated and that this very helpful drug can continue to be used by psychiatrists and physicians with a greater degree of safety.

Summary

Two cases of jaundice occurring during a clinical trial of iproniazid in 60 depressed patients are reported. Both patients recovered.

Details of biochemical investigations and of a liver biopsy are given. These, together with the course of the disease, suggest that iproniazid is a hepatotoxic drug. Possible mechanisms of action are discussed and the need for further research is emphasized.

We thank Dr. R. F. Hobson and Dr. J. G. Hamilton, under whose care the patients were admitted, for permission to publish this report, and Dr. Linford Rees for his advice and encouragement. To Dr. Philip Harvey we are indebted for seeing and treating our patients; and to Dr. Gordon Signy for performing the liver biopsies. Dr. J. Marks, of Roche Products Ltd., supplied the marsilid for our clinical investigation and provided us with much unpublished information.

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TOXIC EFFECTS OF IPRONIAZID IN A PATIENT WITH ANGINA

BY

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Iproniazid ("marsilid"), closely resembling isoniazid in its chemical structure, was originally planned as an anti-tuberculosis drug. Its use in tuberculosis had to be abandoned because of its unpredictable side-effects on mood, ranging from mental excitement to frank psychoses, when given in doses of 4 mg. per kg. of body weight (200–300 mg. a day) as at first advised (O'Connor, Howlett, and Wagner, 1953). This euphoric effect was recently exploited in psychiatry for the treatment of mental depression, where, with smaller doses (100–150 mg. a day), promising results were obtained (Kline, 1958; Dally, 1958). The use of iproniazid in angina pectoris is based on a chance observation in a patient with mental depression who recovered from incapacitating angina while on the drug. Encouraged by this result, Cesarman (1958) tried iproniazid in 41 patients with moderate to severe angina. He reports "total remission" of anginal pain in all of his patients, with electrocardiographic improvement in some. Cossio (1958) out

of 36 patients found almost complete relief of angina in 15, improvement in 11, and no benefit in 10. The daily dose varied from 100 to 150 mg. (two to three tablets). Side-effects have been minor, such as euphoria, constipation, difficulty of micturition, giddiness caused by orthostatic hypotension, and impotence. Dally in his recent large series of 131 psychiatric patients mentions only two in whom treatment had to be stopped on account of fainting caused by postural hypotension.

We were less fortunate in one patient, out of the few, in whom the drug was given for incapacitating decubital angina by one of us (C. P.). This patient developed a transitory toxic cerebral state while taking iproniazid.

Case Report

A married woman underwent bilateral lumbo-dorsal sympathectomy for severe hereditary hypertension in 1948, when aged 40. There was at the time slight renal involvement and grade II–III retinopathy; but the main indication for operation was disabling angina with attacks refractory to nitrites, lasting for hours, cut short only by injections of morphine. She did not sustain cardiac infarction then or morphine. At any time later, and the electrocardiogram showed extreme left ventricular strain with ischaemic changes only. Surgery proved a great success; she was able to resume an active life, lost the angina, and the electrocardiogram reverted to normal. Now, ten years after the operation, the blood pressure in erect posture is still normal, while in recumbency it varies between 160/100 and 180/120.

During the past four years the cardiac symptoms recurred in the form of increasingly severe decubital angina. It was thought that the raised blood pressure in the lying position was causing the attacks, during which the electrocardiogram showed acute ischaemic changes. Prolonged bed rest with showed acute ischaemic changes. Prolonged bed rest with ganglion-blocking agents and rauwolfia, which effectively lowered the recumbent blood pressure, did not prevent the attacks. Heavy sedation, long-acting nitrites, and various coronary vasodilators were all tried without success. Parenteral pethidine, 100 mg. at first, later 200 mg., suppressed attacks of moderate severity; occasionally she needed morphine in addition. Pethidine never caused any side-effects, and the morning after the injections she was as usual active in her home. In March, 1958, when she had almost daily attacks, left stellate ganglionectomy was performed. After a fortnight the attacks reappeared and within days they became as severe as they were before the operation.

Iproniazid was started on April 26. For the first fortnight she was given 50 mg. twice a day, then three times a day. After a fortnight the attacks became less frequent—about twice weekly, and milder. Trinitrine was effective for the lighter attacks, though for the severe ones she still required pethidine injections. At this stage the only adverse effect was pronounced postural hypotension. On May 27 she complained of difficulty of micturition. At 10 p.m. on May 30, after not having had angina for four days, she had a severe attack. Pethidine, 100 mg. by injection, did not relieve her, and the same dose was repeated half an hour later. Within minutes she became extremely restless and confused, and passed into a state of uncontrollable hyperactivity. She was tossing and turning, flopping her arms aimlessly, and it was difficult to keep her in bed. There was general clonus, tremor, excitation, grinding of teeth, and continuous picking of bedclothes. She was semiconscious, had an anxious expression, and became completely unmanageable.

Paraldehyde, 5 ml., phenobarbitone sodium, 3 gr. (0.2 g.), and promethazine hydrochloride, 50 mg. by injection, and pentobarbitone sodium and quinalbarbitone sodium, 3 gr. (0.2 g.) of each orally, were given with no effect. Finally the chlorpromazine, 50 mg. by injection, two hours after the attack began, quieted her, and she fell asleep within half an hour. Iproniazid was now stopped, she having had a

total of 4,400 mg. in 35 days. Next day she was calm and in a normal mental state; she had impaired memory of the events of the previous night. The next evening (June 1) she had a further bout of angina, suppressed with 200 mg. of pethidine by injection. Again a similar state of agitated hyperactivity developed, which was easily controlled with an injection of 50 mg. of chlorpromazine. Thereafter oral chlorpromazine was given, 50 mg. three times a day. A further attack of angina on June 3, for which 200 mg. of pethidine had to be injected, was not followed by restlessness. One week after iproniazid had been stopped postural hypotension and difficulty of micturition still persisted.

Liver-function Tests.—Serum bilirubin: direct, negative; indirect, 1 mg. per 100 ml.; thymol turbidity, 3 units; zinc flocculation, 9 units; colloidal gold, 0; alkaline phosphatase, 3.9 units; serum transaminase, 30 units per ml. Serum proteins: total, 5.8 g. per 100 ml. (albumin 4 g., globulin 1.8 g.). Electrophoresis of proteins showed no rise of γ -globulin. Urine analysis showed no abnormalities.

Discussion

In a recent symposium on the biochemical and clinical aspects of iproniazid Kline (1958) reported that jaundice was the most serious side-effect of the drug. One of us (S. B.) has studied two cases of iproniazid jaundice; his findings are reported at p. 1068. Hepatic dysfunction in the absence of jaundice has been reported by Scherbel (1958) in the treatment with this drug of patients suffering from rheumatoid arthritis. Four of his cases suddenly developed restlessness and hyperactivity. Laboratory investigations showed an increase in bromsulphthalein retention, a diminution of pseudo-cholinesterase, and a disturbance of proteins with an increase of γ -globulin.

Fouts and Brodie (1956) found that iproniazid inhibits the enzyme system in the liver responsible for detoxication of various drugs—for example, barbiturates, amphetamine, aminopyrine, and acetanilid. This study, together with that of Randall (1958), explains the potentiation of these drugs by iproniazid. He also suggests that the toxicity of iproniazid may result from this enzyme inhibition.

Pethidine is de-esterified and demethylated in the liver (Goodman and Gilman, 1955), and it is now recommended that this drug should not be used in patients suffering from severe liver disease, as exaggerated responses, especially cerebral excitation and confusion, may occur (Dundee and Tinckler, 1952).

There was a clear temporal relationship in our patient between the administration of pethidine and each attack of cerebral excitement. Since pethidine was given in therapeutic doses, such exaggerated response could be interpreted as evidence of interference by iproniazid with the detoxicating mechanism of the liver. Such liver-function tests as were carried out were normal. It is unfortunate, however, that no test of bromsulphthalein retention was performed in our patient, since this is one of the most sensitive tests available (Neeffe *et al.*, 1955).

Randall has shown that iproniazid has a cumulative effect, and this may explain why our patient, who was receiving pethidine frequently, developed signs of central nervous system intoxication only during the fifth week of iproniazid treatment. The slow excretion of iproniazid accounts for the persistence of the ganglion-blocking effect as well as the exaggerated response to pethidine after its withdrawal.

Among the many reports dealing with the toxic effects of iproniazid upon the central nervous system, we found only one other instance where the first signs of toxicity appeared after pethidine (Mitchell, 1955). A patient with tuberculosis who had been taking 250 mg. of iproniazid a day for one month developed nausea and muscle-twitchings 20 minutes after 100 mg. of pethidine, which he used to take without side-effects. He became cyanosed, was sweating, and had a rapid pulse, exaggerated tendon reflexes, ankle clonus, and a bilateral plantar extensor reflex. This condition subsided

within 36 hours. He continued on the same dose of iproniazid for a further five months, during which time he showed signs of increasing restlessness, euphoria, insomnia, and other mild toxic effects. He died in coma after an acute illness characterized by fever, coarse tremor, hallucinations, and "auditory delusions." At necropsy the brain showed that death was due to haemorrhagic encephalitis; since no other cause was apparent this was believed to be due to the toxic effect of iproniazid.

The toxic manifestations of the central nervous system caused by pethidine and iproniazid are similar: cerebral excitation, confusion, restlessness, and muscle twitchings are common to both. It is difficult to decide whether in our own and Mitchell's case cerebral symptoms were caused by the simple additive effect of the two drugs or by a more complex inhibition of the enzyme-detoxifying system in the liver. The problem, however, is of theoretical interest. It is of practical importance that the two drugs become incompatible once a certain level of iproniazid is reached in the tissues. This may take up to four weeks.

The response to chlorpromazine was remarkable and perhaps a life-saving measure in our patient. Barbiturates commonly invoked in the treatment of cerebral excitation did not help, and in larger doses could have done actual harm if, as we have suggested, the liver detoxifying system was affected by iproniazid.

Although the pharmacological action on the heart is not yet clearly established, the improvement in this case and in others still under observation suggests that iproniazid is a promising drug in the treatment of angina. Patients with decubital angina, however, need heavy sedation with morphine analogues and barbiturates; potentiation with iproniazid may give rise to toxic cerebral reactions as in our patient. It is because of such therapeutic implications that this case is reported.

Summary

A case of decubital angina treated with iproniazid is reported. Although the frequency of the attacks diminished, occasional pethidine injections were still needed for the relief of pain. During the fifth week of iproniazid treatment these injections were followed by signs of severe cerebral irritation and excitement which responded dramatically to chlorpromazine. Either the simple additive effect of the two drugs or more complex interference with the normal detoxification of pethidine in the liver by iproniazid is believed to have caused toxic cerebral damage. It is suggested that pethidine should be used with caution in patients on iproniazid treatment.

ADDENDUM.—Since this paper was submitted a different complication of iproniazid treatment has been encountered in a 63-year-old man suffering from incapacitating angina of effort. On a dose of 50 mg. twice daily, much improvement resulted. One month later, while still on the same dose, he complained of difficulty of micturition and giddiness, and his blood pressure had fallen from 140/80 to 110/75. Iproniazid was discontinued, and then resumed after one week. A fortnight later he developed a small cerebral thrombosis, from which he fortunately recovered. Hypotension caused by iproniazid may have precipitated this complication.

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TREATMENT OF ULCERATIVE COLITIS WITH LOCAL HYDROCORTISONE HEMISUCCINATE SODIUM

A REPORT ON A CONTROLLED THERAPEUTIC TRIAL

BY

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With an Appendix by M. H. HAMBLING, M.B., B.S.

Two previous studies have dealt with the use of hydrocortisone applied topically to the colon in ulcerative colitis by means of a nightly rectal drip (Truelove, 1956, 1957). In the first study, 21 mild or moderate attacks of the disease were treated with hydrocortisone in the form of the free alcohol, and there were 14 rapid remissions, these remissions usually occurring in the first few days of treatment. However, although the sigmoidoscopic findings showed improvement in parallel with the clinical response, the histological picture as judged by biopsy specimens was little altered. As hydrocortisone itself is poorly soluble in water, the actual solution used for the rectal drip was prepared by diluting hydrocortisone dissolved in 50% ethyl alcohol with 10 times its volume of saline. There was the possibility that the weak alcoholic solution used as the vehicle for the hydrocortisone prevented the mucosa from healing.

In the second study, a compound freely soluble in water, hydrocortisone hemisuccinate sodium, was used. The clinical response was similar to that obtained with hydrocortisone itself in that there were 11 rapid remissions out of 18 courses of treatment. However, the histological picture of the colonic mucosa showed a favourable response in those subjects enjoying clinical remission, and it was therefore decided that the hemisuccinate (or some other water-soluble compound) was the corticoid of choice for this form of treatment.

The view that hydrocortisone applied topically is a useful form of treatment in this disease could be only presumptive on the results so far mentioned. In other words, this view rested solely on a personal clinical judgment that no considerable proportion of patients with an attack of ulcerative colitis would go swiftly into remission unless the treatment was having some strongly positive effect. Any student of ulcerative colitis must view with scepticism the use of a treatment based upon personal impressions, for the history of the disease includes a large variety of treatments which in their turn were introduced with enthusiasm on the strength of a few favourable responses and then slowly abandoned when they were found to be ineffective. The disease is one which manifests itself by exacerbations and remissions which are often unpredictable. Furthermore, a large body of opinion regards it as a psychosomatic disorder, so that a new form of treatment might possibly be beneficial for reasons unconnected with the pharmacological actions of the therapeutic agent. It is therefore essential that new forms of treatment should be put to formal tests so that patients are not exposed unnecessarily to useless methods of treatment.

Objects of the Present Study.—The main object of the present study was to compare the effect of hydro-

cortisone hemisuccinate sodium used topically with an inert preparation which resembled it superficially. The second object was to form an impression whether the combined use of hydrocortisone and antibiotics was better than hydrocortisone used alone. The third object was to determine whether patients who went into remission with local treatment would remain relatively free from relapse if they received maintenance treatment on two nights a week.

Method

The study comprised three parts, corresponding to the three objects of the trial.

Part I. Blind Controlled Trial of Local Treatment Lasting One Week

Patients with active symptoms of ulcerative colitis were allotted in a random order to treatment with either preparation A or preparation B, one of which was actual hydrocortisone hemisuccinate sodium while the other was an inert replica. These preparations were made and labelled by Glaxo Laboratories, and their identity was unknown to all the other persons concerned in the trial until after its conclusion. Treatment was prescribed in the following form:

A. J. Smith
U. C. No. 23

R Special rectal drip nightly for seven nights.

Patients were numbered consecutively as they entered the trial, and the hospital pharmacist entered their names on a prepared list that showed which preparation a patient with any particular serial number was to have. Treatment consisted in dissolving the contents of one ampoule of A or B in 120 ml. of normal saline and dripping the solution into the rectum at night. No other treatment was used.

The inert preparation was made by the manufacturers by freeze-drying concentrated dextran solution put up for intravenous use. The resulting powder closely resembled the preparation of hydrocortisone hemisuccinate sodium used in the trial. Each ampoule of inert preparation consisted of 20–30 mg. of freeze-dried dextran, which corresponded in volume to 100 mg. of hydrocortisone in the form of the hemisuccinate sodium ester. On general principles we should expect this small amount of intravenous dextran in 120 ml. of saline to be harmless to the colonic mucosa, and practical tests on patients with ulcerative colitis immediately after going into remission support this view.

Part II. Open Use of Hydrocortisone and Antibiotics for Two Weeks

At the end of the first week all patients were given nightly rectal drips of known hydrocortisone and antibiotics. Penicillin, 1 mega unit, and streptomycin, 1 g., were added to the hydrocortisone solution, which contained the hemisuccinate in an amount equivalent to 100 mg. of hydrocortisone itself. In 10 instances neomycin in a dose of 250 mg. was used in place of penicillin and streptomycin.

Part III. Blind Controlled Trial of Maintenance Treatment Employing Rectal Drips Twice a Week Over the Course of Six Months

Patients who were in clinical remission at the end of Part II were admitted to the maintenance part of the trial. The practical arrangements were analogous to those used in Part I in that Glaxo Laboratories supplied preparations labelled X and Y, one of which was actual hydrocortisone and the other was inert. In the earlier stages of this part of the trial neomycin or an inert replica, labelled as antibiotic X or antibiotic Y, was used in combination with hydrocortisone or its "dummy," but this was later given up for reasons set out below.

Selection and Assessment of Cases

Only patients with active symptoms from ulcerative colitis were admitted to the trial. As in the previous studies, severe cases with much constitutional disturbance were excluded.

Many of the patients were ambulant and were treated as out-patients, although some were in hospital.

Some patients who went into remission but who relapsed during or after maintenance therapy were readmitted to the trial, once again being allotted to treatment A or B at random.

The clinical condition immediately before treatment was recorded. All patients were examined by sigmoidoscopy on the day when treatment began, and the findings were recorded. During this examination a mucosal biopsy was performed by means of an improved version of an instrument devised for serial biopsy (Truelove *et al.*, 1955) and a swab was taken from the lower colonic mucosa for bacteriological study.

At the end of Part I and of Part II of the trial, exactly similar observations were made. They were also made during Part III (trial of maintenance therapy), although they might be limited to the final attendance six months after the conclusion of Part II.

Barium-enema studies were not made as a routine. In every patient at least one barium-enema examination had previously shown evidence of ulcerative colitis. This examination not infrequently causes an exacerbation of symptoms. The patients are usually young and suffer from a disease from which they are likely to have future attacks in the course of which further x-ray studies may be essential. Many of them are women in the reproductive years of life, and unnecessary gonadal exposure to x-radiation is to be avoided. For all these reasons, the barium enema should be used sparingly in ulcerative colitis.

Forty courses of treatment were given, it being arranged beforehand that 20 would be with preparation A and 20 with preparation B during Part I of the trial. In the interests of brevity, individual case histories are not recorded.

Part I. Controlled Trial of Local Hydrocortisone Treatment

Clinical Response.—The clinical response to the two preparations is given in Table I. It can be seen that there is a striking difference between the clinical response shown with inert treatment and that with actual hydrocortisone, only 1 in 20 treatments with a "dummy" resulting in clinical remission, compared with just over one-half with hydrocortisone. In statistical terms, the difference is highly significant, as it would occur by chance less than 1 in 100 times.

TABLE I.—Clinical Results of One Week's Treatment With Hydrocortisone or an Inert Preparation

Treatment Group	No. of Patients	No. Symptom-free	Test of Significance
A (Inert therapy)	20	1	$\chi^2_c = 9.6$ $n = 1$ $P = 0.01$
B (Hydrocortisone hemisuccinate)	20	11	

* calculated with Yates's correction for continuity in view of the small numbers involved.

Sigmoidoscopic Responses.—The sigmoidoscopic findings resembled the clinical responses in showing a marked preponderance of favourable changes among the group receiving actual hydrocortisone. Once again the results are statistically highly significant (Table II). It is worth mentioning that there was almost perfect agreement between a good clinical response and a clear-cut sigmoidoscopic improvement. All the patients going into clinical remission showed improved sigmoidoscopic appearances. The only discrepancy was that one patient in each treatment group

TABLE II.—Sigmoidoscopic Response to One Week's Treatment With Hydrocortisone or an Inert Preparation

Treatment Group	No. of Patients	No. Showing Definite Improvement	Test of Significance
A (Inert)	20	2	$\chi^2_c = 8.9$ $n = 1$ $P < 0.01$
B (Hydrocortisone)	20	12	

showed improved sigmoidoscopic appearances even though they were not in clinical remission. Both later became symptom-free.

Histological Response.—Before treatment all the biopsy specimens taken at 15–20 cm. from the anal margin showed inflammatory changes of the type associated with ulcerative colitis. They have been classified as showing severe, moderate, or mild inflammation, according to the criteria employed by a pathologist colleague in a previous study (Truelove and Richards, 1956). Table III shows the histo-

TABLE III.—Histological Responses to One Week's Treatment With Hydrocortisone or Inert Preparation

Treatment Group	Degree of Inflammation	Before Treatment	After Treatment	Significance of Differences Before and After Treatment
A (Inert therapy)	Severe	8	7	No significant difference
	Moderate	10	11	
	Mild	2	2	
B (Hydrocortisone hemisuccinate)	Severe	8	4	$\chi^2=8.6$ $n=2$ $P<0.02$
	Moderate	11	7	
	Mild	1	9	
Significance of differences between A and B		No significant difference	$\chi^2=6.2$ $n=2$ $P<0.05$	

logical picture as judged from biopsy specimens in each treatment group before and after the one week's controlled trial. Before treatment the two groups of patients were closely similar in respect of the histological changes. After treatment the histological picture in group A (inert therapy) was for all practical purposes identical with that before treatment. In group B (real therapy) there was a definite swing towards histological mildness. In statistical terms this group was significantly better histologically after treatment than it was before ($P<0.02$) and was also significantly better than group A after treatment ($P<0.05$). We may therefore justifiably conclude that topical hydrocortisone hemisuccinate exerts a favourable influence on the actual pathological picture of the colonic mucosa in ulcerative colitis (Fig. 1).

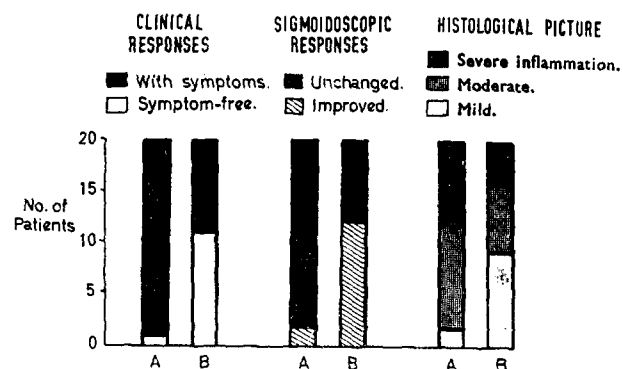


FIG. 1.—Position at end of Part I of trial, showing the differences in the clinical, sigmoidoscopic, and histological pictures after one week of treatment with either an inert preparation or real therapy. (A=Inert preparation. B=Hydrocortisone hemisuccinate sodium.)

Part II. Two Weeks' Treatment with Known Hydrocortisone and Antibiotics

Clinical Response.—At the end of another two weeks, when all patients had been treated with known hydrocortisone hemisuccinate and antibiotics used locally, the two treatment groups were closely similar in respect of their clinical state. In treatment group A, which began with only one patient in clinical remission, 12 patients went into remission during this period, making a total of 13 for the group. In treatment group B, which began this part of the trial with 11 patients in remission, another 5 became symptom-free, making a total of 16. The final difference between the two treatment groups is small, and would be expected to occur frequently by chance alone (Table IV).

TABLE IV.—Clinical State at End of Part II of Trial, When All Patients Had Completed Two Weeks' Treatment With Known Hydrocortisone and Antibiotics

Treatment Group	No. of Patients	No. Symptom-free	Test of Significance
A	20	13	$\chi^2=1.1$ $n=1$ $P>0.05$
B	20	16	

Sigmoidoscopic Response.—Once again the sigmoidoscopic appearances moved in parallel with the clinical response. All of the 29 patients who were free of symptoms at the end of the third week showed sigmoidoscopic appearances which were decisively better than when they began treatment. Some residual inflammation (as judged by gross appearances) was present in a number of these 29 patients, but in 18 the appearances were judged to be "normal" or "near-normal," the latter term implying that the only abnormality was a fine pin-point granularity not accompanied by hyperaemia or by increased mucosal fragility. Three of the 11 patients still having bowel symptoms at the end of three weeks' treatment showed sigmoidoscopic improvement, and in all three there had been lessening of the bowel symptoms, although they were not yet symptom-free. Table V shows that the two treatment groups A and B were closely similar at the end of the second part of the trial.

TABLE V.—Sigmoidoscopic Appearances at End of Three Weeks' Treatment, the Last Two Weeks Having Been With Known Hydrocortisone and Antibiotics

Treatment Group	No. of Patients	No. with Normal or Improved Sigmoidoscopic Appearances	Test of Significance
A	20	15	$\chi^2=0.5$ $n=1$ $P>0.05$
B	20	17	

Histological Response.—The histological responses likewise showed improvement in both treatment groups after known therapy, and there was little difference between them at the end of this part of the trial. The small advantage maintained by group B is not statistically significant (Table VI, Fig. 2).

TABLE VI.—Histological Picture at End of Part II of the Trial

Treatment Group	Degree of Inflammation	No. of Patients	Test of Significance
A	Severe	3	$\chi^2=1.2$ $n=2$ $P>0.05$
	Moderate	6	
	Mild	11	
B	Severe	1	
	Moderate	6	
	Mild	13	

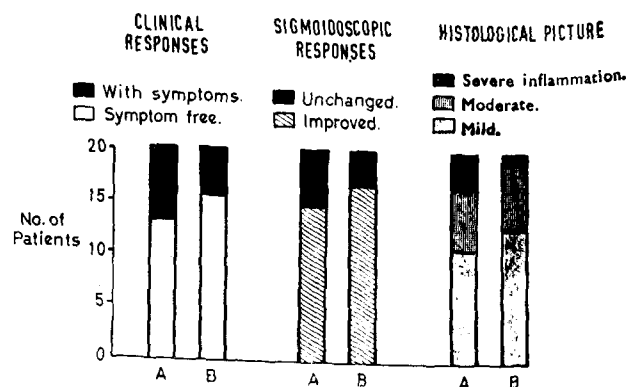


FIG. 2.—Position at end of Part II of trial, showing the similar clinical, sigmoidoscopic, and histological pictures after both treatment groups had received topical treatment with known hydrocortisone hemisuccinate sodium.

Action of Antibiotics Added to the Rectal Drip

The effect of antibiotics is not straightforward. The first thing to note is that in a few patients their use was attended by a sharp exacerbation of symptoms. In two of these cases it was known that the patients had previously had sensitivity reactions to penicillin given by injection, so that no great surprise was aroused when immediate symptomatic deterioration occurred. Both these patients had colonic biopsy specimens taken in the phase of flare-up, but the specimens showed only those changes which we associate with active ulcerative colitis; in other words, there was no specific recognizable change to be attributed to the penicillin. The antibiotics were stopped in these two patients, and they continued on the second part of the trial with hydrocortisone hemisuccinate alone; both went into clinical remission in this period. There were three other patients without known sensitivity reactions to any antibiotic who behaved in a similar manner. Two of these were among the 10 patients who were treated with neomycin in the drip instead of penicillin and streptomycin. One of them was already in remission when going into this second part of the trial, but she promptly relapsed on going on to known hydrocortisone and neomycin. On stopping the neomycin she rapidly became symptom-free, and remained so for some months. For this reason neomycin was discontinued for the remainder of the study.

On the other hand, there were some patients in whom it has been found that hydrocortisone alone did not have any appreciable effect during the first week of therapy but who improved rapidly when antibiotics were added to their treatment. (That such patients were on actual hydrocortisone during the first week has, of course, been known only since the study ended.) In parenthesis, it may also be added that the study ended.) In parenthesis, it may also be added that the study ended.) In parenthesis, it may also be added that the study ended.) In parenthesis, it may also be added that the study ended.)

Consequently, there appear to be two conflicting factors at work. On the one hand, the inflamed colonic mucosa may sometimes react badly to the topical application of antibiotics in high concentration. On the other hand, some patients who are not responding to local hydrocortisone alone appear to do so promptly when antibiotics are added to the rectal drip. The net effect of these two opposing influences seems to be a small gain in the number of remissions achieved, if one can go on a comparison of the results obtained in the present study with those of the two previous studies of local hydrocortisone in ulcerative colitis (Table VII). The differences are not statistically significant, and

TABLE VII.—Comparison of Results Obtained When Antibiotics are Added to the Rectal Drip of Hydrocortisone with Those Obtained with Hydrocortisone Alone

	No. of Patients	Remissions		Test of Significance
		No.	%	
(I) Hydrocortisone (free alcohol) for 2–3 weeks (Truelove, 1956)	12	14	66.6	$\chi^2=0.8$ $n=2$ $P>0.05$
(II) Hydrocortisone hemisuccinate sodium for 2 weeks (Truelove, 1957)	18	11	61.1	
(III) Hydrocortisone hemisuccinate sodium plus antibiotics (present study)	40	29	72.5	

inspection of the figures is sufficient to discount any idea that the addition of antibiotics makes any major difference to the success of this form of treatment. Nevertheless, one can tentatively suggest the following working rules: (1) Antibiotics should not be used as a routine addition to a rectal drip of hydrocortisone hemisuccinate. (2) If no response is obtained with hydrocortisone alone in one week, it is worth trying the effect of adding antibiotics, and a mixture of penicillin and streptomycin seems preferable to neomycin. If the addition of antibiotics causes symptomatic exacerbation they should be stopped immediately. If the response is good, antibiotics can be continued for a week or 10 days, being then discontinued even if treatment with local hydrocortisone is to be maintained.

Of course, this opinion refers only to the use of high concentrations of antibiotics. It is possible that the use of lower concentrations might not cause exacerbations, but further work will be necessary to decide this.

Bacteriological Findings

Colonic swabs taken serially from the patients were examined bacteriologically by Dr. M. H. Hambling, who has summarized his findings in an Appendix to this article. The main object of this part of the study was to see whether the use of antibiotics frequently gave rise to colonic organisms insensitive to the antibiotics used, and, if so, whether this circumstance influenced the response to treatment. In brief, it can be said that resistant organisms sometimes appeared in the bowel, but their presence seemed to have no influence on the clinical response to local hydrocortisone.

Part III. Controlled Trial of Week-end Maintenance Therapy with Local Hydrocortisone for a Period of Six Months

Twenty-six of the patients who were symptom-free at the end of Part II of the trial were put on to maintenance treatment consisting of a rectal drip on two consecutive nights each week (week-end maintenance therapy). Of these, 13 received treatment with hydrocortisone hemisuccinate sodium (preparation Y) and 13 with the inert preparation (preparation X).

These two treatment groups did not differ in their liability to clinical relapse during the six months covered by this part of the trial. In each group of 13 patients there were five who suffered from clinical relapse accompanied by sigmoidoscopic and histological deterioration (Fig. 3). It has therefore been shown that week-end maintenance therapy with local hydrocortisone does not protect against relapse occurring.

However, it must be mentioned that among the 10 patients who relapsed during the maintenance part of the trial 9 rapidly became symptom-free with nightly rectal drips of hydrocortisone; the tenth did not respond to topical hydrocortisone alone, but did so promptly when oral prednisolone, 5 mg. four times a day, was given in addition.

Discussion

The present study has shown beyond all reasonable doubt that hydrocortisone hemisuccinate sodium administered in a rectal drip produces rapid clinical remissions in a considerable proportion of patients with mild to moderate attacks of ulcerative colitis. These clinical remissions are accompanied by improvement in the sigmoidoscopic appearances and by lessening of the inflammatory changes seen in colonic biopsy specimens. The experimental design of the trial permits the conclusion that the beneficial effect is a pharmacological one, because a control group receiving a placebo given under identical conditions showed a negligible number of favourable responses.

It is probable that the hydrocortisone hemisuccinate sodium acts chiefly by some direct effect upon the actual mucosa of the colon. In the first place, the beneficial effect commonly appears to be much more rapid than that observed with cortisone and its analogues used systemically. Secondly, some patients outside the present study have been maintained on nightly rectal drips of hydrocortisone hemisuccinate sodium for periods of several months without any clinical evidence of cortisonism. Thirdly, the preliminary

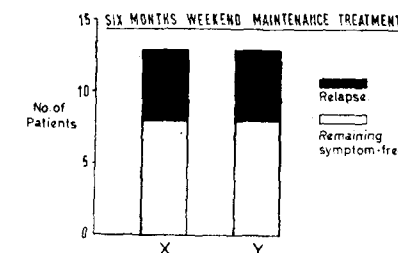


FIG. 3.—Position at end of Part III of trial, showing the similar state of patients given week-end maintenance therapy with either an inert preparation or real therapy. (X=Inert preparation. Y=Hydrocortisone hemisuccinate sodium.)

results of my colleague Dr. I. E. Bush suggest that only a comparatively small fraction of the hydrocortisone hemisuccinate sodium reaches the systemic circulation. Finally, and perhaps most convincingly, favourable clinical, sigmoidoscopic, and histological responses have been observed in patients with ulcerative colitis limited to the rectum and recto-sigmoid region by the use, once or twice a day, of suppositories containing only 10 mg. of hydrocortisone as the hemisuccinate. As some of these patients had previously suffered from attacks of classical ulcerative colitis involving a substantial part or the whole of the colon, there is no need to consider the possibility that they were not true examples of ulcerative colitis.

The therapeutic action would appear to resemble what happens in those skin diseases, such as atopic dermatitis, which respond favourably to topical application of hydrocortisone in a lotion or ointment. Absorption through the skin is very small, being of the order of 2%, so that the systemic effect is negligible, but the favourable results can be impressive, and have been shown by properly controlled studies (Sulzberger and Witten, 1954) to be directly due to the hydrocortisone. An analogous improvement of the buccal mucosa has been observed in patients with severe recurrent aphthous stomatitis who were receiving amounts of hydrocortisone hemisuccinate sodium too small to have any appreciable systemic effects (Truelove and Morris-Owen, 1958).

The addition of antibiotics to the rectal drip has turned out on balance to be beneficial in only a small proportion of patients. Although the weight of evidence is heavily against ulcerative colitis being a bacterial disease, there is little doubt that secondary bacterial infection is responsible for many of its most unpleasant complications. It seemed possible that the presence of bacterial infection might be the reason for some patients failing to respond to local hydrocortisone treatment. As it has been shown by elegant experiments that an infected atopic dermatitis may respond neither to local hydrocortisone alone nor to local antibiotics alone but will respond when the two are used together (Robinson *et al.*, 1956), it was hoped that an analogous response might be obtained in ulcerative colitis. In the event, the gain from adding antibiotics to the rectal drip of hydrocortisone has appeared to be small, and sharp exacerbations have occurred in a few patients from the direct application of antibiotics to the inflamed colon.

Although some patients enjoy a prolonged remission after a short course of local hydrocortisone, about two-fifths of the patients have a recurrence of symptoms in the course of the next six months and require further treatment. This fact illustrates the major problem in the management of ulcerative colitis to-day. By one method or another most attacks of ulcerative colitis can be brought under control by medical methods and the patient rendered symptom-free. However, once a patient has suffered from an attack of ulcerative colitis he is extremely liable to have subsequent attacks, and we know of no method to prevent them. The part of the present study which concerned maintenance therapy was designed to see whether, once a patient had been brought into clinical remission with local hydrocortisone, he could be held in remission by means of local treatment given on two consecutive nights a week only (week-end maintenance treatment). The answer is a decisive "No." A more fruitful approach to the problem may be to give a much more prolonged initial course of local treatment in those patients who respond well to it, in the hope that the colon will become more permanently improved by this means.

Outside the present study, a number of patients have been on prolonged treatment with nightly rectal drips of hydrocortisone, and the results so far appear to be very favourable, not only as regards the immediate benefits but also with respect to the production of a long-lasting remission. However, more patients need to be treated and to be observed for longer periods before this important question can be answered with any degree of assurance. Alternatively, the liability to recurrent attacks can be accepted and each one

can be treated as it arises. When a patient has once responded well to local hydrocortisone it is likely that he will do so in subsequent attacks, and a number of patients have now been kept free of any major disability by intermittent courses of treatment given whenever clinical relapse occurred.

Although the present study has shown topical hydrocortisone hemisuccinate sodium to have a genuinely favourable effect in ulcerative colitis, it remains to be seen whether this form of treatment is superior to others which have been shown to be of value in cutting short attacks of the disease, such as corticoids used systemically. My impression is that local hydrocortisone hemisuccinate sodium scores over corticoids used systemically by the rapidity with which favourable responses are obtained and by the absence of any evidence of systemic side-effects of therapy. At present, my experience of this form of treatment extends to its use in about 100 patients, a number of whom have had more than one course of treatment, while some others have been on treatment for periods of several months consecutively. There have been no side-effects discernible clinically and no complications. In my own experience, therefore, the method has proved entirely safe.

Although this and the two previously published studies have been concerned with the less severe attacks of ulcerative colitis, it should not be thought that local hydrocortisone hemisuccinate sodium is valueless in the severe attacks. A number have been treated, and the results have been most encouraging. However, the local treatment of severe attacks raises certain problems, one of which concerns methods of ensuring that the therapeutic agent is retained in the colon. Propantheline bromide, given intravenously, is one agent which has been used to assist in retention. Heavy sedation of the patient and elevation of the foot of the bed also help. But these are issues which lie outside the province of the present study, which is concerned mainly with a formal demonstration that topical hydrocortisone hemisuccinate sodium is an effective form of treatment for a large proportion of patients with mild or moderate attacks of ulcerative colitis.

Summary

A formal therapeutic trial has been conducted to show whether topical hydrocortisone hemisuccinate sodium has a genuinely beneficial action in ulcerative colitis.

In the first part of the trial a controlled comparison was made of hydrocortisone and an inert preparation which resembled it in appearance. At the end of one week of treatment the patients receiving hydrocortisone therapy showed a striking advantage over those on the inert preparation, not only in respect of the clinical state but also as regards the sigmoidoscopic appearances and the histological appearances of colonic biopsy specimens.

All patients were then given open therapy with topical hydrocortisone and antibiotics used in conjunction for two weeks. About three-quarters of the patients were in clinical remission at the end of this period. By comparison with other studies in which antibiotics were not used, the addition of antibiotics seems to confer a small gain in the number of successes with topical hydrocortisone therapy, although at the price of a few patients developing exacerbation of symptoms.

Twenty-six of the patients who were in clinical remission after open therapy were entered for a trial week-end maintenance therapy lasting six months. Thirteen of the patients received hydrocortisone and the other 13 an inert preparation. The clinical course of the two groups was identical, each having five patients who relapsed during the six-months period. Week-end main-

tenance therapy with local hydrocortisone is therefore ineffective in reducing the chance of relapse.

The implications of these various findings are briefly discussed.

I am indebted to Glaxo Laboratories, who not only made a gift of the hydrocortisone hemisuccinate sodium and the inert preparation, but also packed and labelled them ready for use in this trial. I am also indebted to the Medical Research Council for a grant for technical assistance. I wish to thank the following colleagues: Dr. M. H. Hambling for conducting the bacteriological studies; Dr. R. L. Vollum and Dr. W. H. H. Jebb for advice on antibiotics and bacteriology; Miss H. Enser, who assisted me in the sigmoidoscopic examinations and prepared the histological specimens; Miss M. G. Craig and Miss S. V. James, who issued the various therapeutic agents according to the prepared plan; and Miss M. C. McLarty, who made the Charts.

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APPENDIX: BACTERIOLOGY OF THE COLONIC SWABS

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Methods

At each examination the pelvic colon was swabbed through the sigmoidoscope. Bacteriological examination of the swab was made: (1) to exclude intestinal pathogens of the Salmonella and Shigella groups; and (2) to determine the antibiotic sensitivities of the predominant organisms in order to detect any marked increase of resistant strains following rectal antibiotic therapy.

Each swab was shaken with 5 ml. of digest heart broth, and a loopful of the broth was inoculated to each of the following media:—*Solid media*: Two blood-agar plates (one for anaerobic incubation), a deoxycholate citrate agar plate and a MacConkey agar plate. *Fluid media*: A Robertson's cooked-meat medium, and a Robertson's cooked-meat medium to which 10% NaCl had been added.

Finally 5 ml. of selenite F (Leifson, 1936) was added to the remainder of the broth and all cultures were incubated at 37° C. overnight.

The following day the plates were examined. The Robertson's cooked-meat medium was plated to two blood-agar plates (one for anaerobic incubation), one deoxycholate citrate agar plate, and one MacConkey agar plate; the Robertson's cooked-meat medium containing salt was subcultured to a plate of nutrient agar containing 7% salt and cultured to a blood-agar plate (for aerobic incubation). The selenite F broth was plated to a deoxycholate citrate agar plate. All the plates were then incubated overnight at 37° C.

No special media were used in an attempt to isolate yeasts, lactobacilli, or anaerobic Gram-negative rods.

The organisms most frequently isolated were lactose-fermenting Gram-negative rods (L.F.s), *Streptococcus faecalis*, *Clostridium welchii*, *Staphylococcus aureus*, micrococci, Proteus, and paracolon organisms; and of these, L.F.s and *str. faecalis* were the most common.

The Gram-negative rods were examined for sensitivity to streptomycin and neomycin, while the Gram-positive organisms were tested against penicillin and neomycin.

Findings

1. No member of the Salmonella or Shigella groups was isolated from any of the 137 specimens examined.
2. Lactose-fermenting Gram-negative rods isolated from the 30 patients treated with rectal penicillin and streptomycin tended to show an increased resistance to streptomycin.

Before treatment, 34 strains of L.F.s were isolated of which 4 were sensitive to 25 units of streptomycin per ml., and 30 sensitive to 12 or less units of streptomycin per ml.; whereas after treatment 24 strains were isolated, of which 7 were resistant to 100 units of streptomycin per ml., 1 was sensitive to 50 units of streptomycin per ml., 3 were sensitive to 25 units of streptomycin per ml., and the remaining 13 strains were sensitive to 12 or less units of streptomycin per ml. Strains of *Str. faecalis* isolated before and after treatment showed no increased resistance to penicillin.

3. Strains of *Staph. aureus* were isolated from eight patients, but in no case was a penicillin-sensitive strain replaced by a penicillin-resistant strain, and in only one patient (an in-patient) was *Staph. aureus* isolated from every specimen.

Colonic swabs from the smaller series of patients who were given neomycin rectally were subjected to the same culture routine as above, but in no case were neomycin-resistant organisms isolated.

Summary

Bacteriological examination of 137 colonic swabs failed to isolate any member of the salmonella or shigella groups.

Following rectal administration of streptomycin, penicillin, and neomycin it appeared that a few strains of lactose-fermenting Gram-negative rods showed increased resistance to streptomycin, but no Gram-positive organisms showed increased resistance to penicillin or neomycin.

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TREATMENT OF ULCERATIVE COLITIS WITH TOPICAL HYDROCORTISONE HEMISUCCINATE SODIUM

A CONTROLLED TRIAL EMPLOYING RESTRICTED SEQUENTIAL ANALYSIS

BY

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The many reports indicating that systemic corticoid therapy was of value in the treatment of ulcerative colitis, and the fact that topical hydrocortisone had been used successfully in various eye, joint, and skin diseases, made it possible that mild cases of colitis would respond to this method of treatment.

Favourable reports of the use of topical hydrocortisone in colitis have already appeared (Truelove, 1956, 1957). These results were considered by him to be encouraging enough to merit a controlled trial of this form of treatment of colitis.

A controlled trial has therefore been undertaken where the relative merits of solutions of hydrocortisone hemisuccinate sodium and an inert preparation administered rectally to patients with haemorrhagic proctocolitis and ulcerative colitis have been assessed in a blind controlled trial. In order to obtain a significant answer as rapidly as possible a method of restricted sequential analysis devised by Dr. Peter Armitage has been used in the planning and control of the trial. A significant advantage in favour of the potent hydrocortisone has been demonstrated by 19 treatments in 16 patients with colitis where symptomatic remissions and sigmoidoscopic improvement occurred significantly more commonly in those receiving potent therapy. The

responses of patients receiving potent and dummy treatments are first contrasted and later the method of sequential analysis of the results obtained is detailed.

Method of Administration

Glaxo Laboratories were kind enough to provide potent and inert agents for the trial, labelled Y and X respectively. Treatment was administered to patients as follows: 100 mg. of hydrocortisone hemisuccinate sodium or the dummy preparation was dissolved in 100 ml. of normal saline. It is important that the solution be freshly prepared before use, as slow hydrolysis occurs and causes some of the hydrocortisone to precipitate out of the solution on standing. The patient lies on his left side, and the solution is then administered through an intravenous drip set attached to a rectal catheter at a fairly rapid drip rate of one to two drops per second over a period of 15 to 30 minutes. The rectal infusion is retained overnight and is repeated on 15 successive evenings. Usually the technique was rapidly mastered by the patients receiving it, and after two to three nights of

treatment in hospital they returned home and continued nightly infusions there.

In more severely affected patients in whom nocturnal diarrhoea might prevent the retention of the infusion an intravenous injection of propantheline, 15–30 mg. half an hour before the infusion, was given to aid retention overnight.

Patients Treated

Sixteen patients with haemorrhagic proctocolitis or colitis were treated on 10 occasions with potent therapy and on nine with an inert preparation, three patients being treated twice. Treatments were allocated in random fashion to both groups, as is described later. All patients gave typical histories of recurrent diarrhoea and blood-stained stools, and showed mucosal changes on sigmoidoscopy which were consistent with the diagnosis. Barium-enema examinations were undertaken in each patient to assess the extent of colonic involvement. Precise clinical information on the age and sex, duration of history, and extent and severity of the disease is given in Tables I and II, and is summarized

TABLE I.—Patients Receiving Hydrocortisone

Treatment No.	Sex and Age	Duration of History	Extent of Disease*	Pre- and Post-treatment Assessments					Comment	Progress
				Hb	E.S.R.	Stools Daily	Blood	Mucus		
1	M 28	2 years	R.S.	—	—	6	++	++	3	Remission
2	M 59	2 "	R.S.D.	69	30	7	+++	+	4 (u)	Remission in severe acute colitis with associated ankylosing spondylitis. Mucosa restored to normal
4	M 37	6 "	R.S.	90	—	6	++	+	2	Symptomatic remission without sigmoidoscopic improvement
6	F 28	4 "	R.S.	90	12	3	+	+	3	Symptomatic remission. Mucosal improvement
9	F 48	1 year	R.S.D.	79	15	8	+++	+	3	Failure—slight improvement
11	F 49	1 "	R.S.D.	85	6	2	+++	+	3	Clinical remission. Mucosal improvement. Associated duodenal ulcer
13	F 20	3 years	R.	93	15	5	++	+	3	Clinical remission. Mucosal improvement
15	F 53	25 "	R.S.	73	15	6	++	++	3	" " "
16	M 74	½ year	R.	74	—	5	+++	+	4 (u)	Clinical remission. Considerable mucosal improvement
18	F 44	7 years	R.S.	69	18	5	+	++	3	Clinical remission. Restoration of mucosal normality

* Extent of Radiological Changes: R = Rectum only; no x-ray changes. R.S. = Rectum and sigmoid colon. R.S.D. = Rectum, sigmoid, and descending colon. † Sigmoidoscopic findings: 1 = Normal mucosa. 2 = Mild granularity with minimal contact bleeding. 3 = Marked granularity and contact bleeding. 4 = Spontaneous rectal haemorrhage, ulceration (u).

TABLE II.—Control Cases

Treatment No.	Sex and Age	Duration of History	Extent of Disease*	Pre- and Post-treatment Assessments					Comment	Progress
				Hb	B.S.R.	Stools Daily	Blood	Mucus		
3	M 65	20 years	R.S.D.	80	10	3	++	+	3	Slight improvement
5	F 25	1 year	R.S.	65	15	10	++	++	3	Improved. Received second course dummy preparation
7	M 34	2 years	R.S.	88	12	3	++	+	3	Worse after treatment
8	F 48	25 "	R.	90	5	2	++	+	3	Slight improvement
10	F 25	1 year	R.S.	75	11	6	++	++	3	Failure
12	F 35	1 "	R.S.D.	82	25	6	++	+	4 (u)	"
14	F 53	25 years	R.S.	85	—	6	+++	+	3	"
17	F 66	6 mths	R.S.	89	20	7	++	+	3	Clinical remission. Mucosa unchanged
19	F 48	1 year	R.S.D.	75	35	10	++	+	3	Failure

* † See footnotes to Table I.

in Table III, where those receiving potent and inert therapy are contrasted. It will be seen that the two groups of

TABLE III.—Comparison of Effects of Topical Hydrocortisone with Dummy Preparation in Haemorrhagic Proctocolitis and in Ulcerative Colitis. Potent and Dummy Treatments Allocated in Random Manner to 16 Patients

	Potent Therapy	Control Cases
No. of treatments	10 (4 males, 6 females) 20–74 years	9 (2 males, 7 females) 25–66 years
Extent of disease	Rectum 2 Rectum and sigmoid colon 5 Rectum, sigmoid, and descending colon 3	1 5 3
Duration of history	< 1 year 1 1–2 years 4 3–4 " 2 5 years + 3	1 5 0 3
Ulcerative lesions	2	1

patients treated are surprisingly similar in age, sex distribution, extent of disease, and duration of history. Two patients with more severe ulcerative lesions were treated with potent therapy and one with inert drug.

Method of Investigation

In all cases a clinical assessment of the patient's condition was made personally by an inquiry into the severity of diarrhoea and the blood content of the stools, the observer being unaware of the treatment given. A haemoglobin and an erythrocyte sedimentation rate were determined before and after treatment. Sigmoidoscopic examinations were performed before treatment and within two or three weeks of completion of the course of infusions. These examinations were made by an independent observer (Professor J. C. Goligher), who was also unaware whether potent or dummy treatment was being given. As will be seen, the clinical response of the patients receiving hydrocortisone (Table I) was strikingly better than those receiving inert therapy (Table II). In most patients receiving hydrocortisone the stools rapidly became normal; usually within two to three days of starting treatment blood disappeared from the stools and an improvement in the patient's general condition was shown by increased well-being and a rise in haemoglobin level and reduction in the erythrocyte sedimentation rates. The sigmoidoscopic appearances often returned to normal, but were improved in most of the cases going into clinical remission. Table II shows that inert therapy was strikingly ineffective: diarrhoea, if anything, was worse after treatment; haemoglobin and E.S.R. levels were unchanged or rather worse; and sigmoidoscopic appearances showed no change or a deterioration.

The overall results obtained in 19 treatment periods are summarized in Table IV. Of 10 patients receiving potent therapy all but one went into clinical remission as compared with only one out of nine patients receiving inert treatment. Two, however, showed slight improvement after inert

TABLE IV.—Topical Hydrocortisone in Ulcerative Colitis. Results of Treatment

	Potent	Control
Clinical	9	1
Mucosal appearances	3	3
Remission maintained	3	2
Relapses	3	7

therapy. Mucosal appearances became normal in 3 and improved in 6 of the 10 patients receiving the potent agent, and contrasted markedly with those receiving the dummy treatment, where only three showed slight improvement. It

has not been definitely established how long remission will be maintained after an initial course of treatment, but 4 of the 10 patients treated with hydrocortisone have remained in clinical remission for six to nine months. Three relapses have already occurred but have responded to further courses of treatment. The one patient showing remission on dummy therapy relapsed within a month of stopping treatment.

The response of three patients who were treated in the trial by both agents is of interest.

Case A: Courses 5 and 10.—A woman aged 25 gave a history of rectal bleeding, diarrhoea, and mucus discharge for one year, and sigmoidoscopy confirmed the presence of a haemorrhagic proctosigmoiditis. An initial course of dummy treatment effected a slight improvement with a reduction of the frequency of diarrhoea from ten to five stools daily and a lessening of rectal bleeding. Relapse occurred within one month and the patient re-entered the trial. She was unfortunate enough to be allocated a further course of dummy treatment, which had no effect upon her diarrhoea. She continued to pass six loose stools daily which contained more blood than before treatment was given. Mucosal appearances also worsened. Potent therapy was given outside the trial and induced a rapid clinical remission, with a reduction of stool frequency from six to two daily, a disappearance of blood from the stools, and an improvement in the mucosal appearance. A mild relapse has occurred in this patient after two months.

Case B: Courses 14 and 15.—A woman aged 53 gave a history of recurrent rectal bleeding, mucus discharge, and diarrhoea for 25 years. Sigmoidoscopy again confirmed the presence of a haemorrhagic proctosigmoiditis. An initial course of dummy treatment effected a slight improvement in the character of the stools and mucosal appearance, but relapse occurred within two months. A course of potent drug caused a striking clinical remission with a reduction of stool frequency from six to one daily and a disappearance of rectal bleeding. Mucosal appearances were improved.

Case C: Courses 9 and 19.—A woman aged 48 gave a history of ulcerative colitis for one year and severe mucosal inflammation, and ulceration was confirmed sigmoidoscopically. Treatment with the potent drug initially induced a slight improvement, with a reduction of bowel action from eight to five stools daily and a lessening of rectal bleeding. Mucosal inflammation was less marked after treatment. A severe relapse, however, occurred after one month, and treatment on a second occasion by dummy therapy considerably worsened the patient's diarrhoea and the appearances sigmoidoscopically. This patient showed some improvement with systemic corticotrophin, but required surgery to control her symptoms.

It will be seen that two of these patients serving as their own controls showed appreciable advantages in favour of potent therapy. The third patient did not seem particularly responsive to any form of corticoid treatment, but certainly fared better with potent than with dummy treatment. The successful outcome of potent therapy in the majority of patients treated is therefore clearly apparent. A method of sequential analysis used to demonstrate significant differences between the forms of treatment is now detailed.

Sequential Analysis

The statistical technique of restricted sequential analysis has been developed in particular relation to therapeutic trials by Dr. Peter Armitage, and formerly has been used to establish the relative merits of analgesics and cough-suppressive agents (Armitage, 1954, 1957; Newton and Tanner, 1956; Snell and Armitage, 1957). Treatments are allocated to pairs of patients in a random order, and the course of the trial is followed by accumulating the qualitative comparisons between treatments which are provided by each pair of patients. Results are recorded on a chart while the trial is in progress, the boundaries of which determine the minimum number of observations necessary to establish a significant advantage in favour of one treatment. Alternatively, other specified limits indicate that if no significant difference emerges when a certain number of pairs of patients have been treated the trial should be abandoned.

Sequential analysis is therefore the method most economical of patients and of time in the comparison of two treatments, and seemed admirably suited to compare the relative merits of hydrocortisone and a dummy prepara-

tion in the treatment of colitis. By this method the significant advantage of potent treatment has been established in the strikingly small number of 19 treatment periods. Dr. Peter Armitage was kind enough to devise a chart suitable for the trial and to suggest the method of random allocation of the treatments given. Without his generous help the trial could not have been undertaken in this particular form.

Method of Random Allocation

A master sheet was prepared and held by the pharmacist dispensing the two forms of treatment. Pairs of patients, one receiving potent and one receiving dummy preparations, were first paired by the system of random numbers shown below, which is seen to be different for each group of 10 patients studied. The order of treatments given to each pair was determined by the spin of a coin, the next patient entering the trial receiving the alternative treatment and completing each pair. In this way a doubly randomized method of selection was ensured. Pairs of randomized treatments were as follows:

Patient's No.:	1	2	3	4	5	6	7	8	9	10
P	P	D	P	D	P	D	D	P	D	
11	12	13	14	15	16	17	18	19	20	
P	D	P	D	P	P	D	P	D	D	

P=Potent. D=Dummy treatments.

Both patient and physician were unaware of the nature of the treatments given until the course had been completed. Patients told that the relative merits of two unproved therapeutic agents in colitis were being compared, and that they stood even chances of receiving either, agreed willingly to participate in the trial.

Method of Sequential Analysis

The outcome of treatment in the pairs of patients studied is one of the four types indicated in Table V. Potent or inert therapy might be equally successful or ineffective; these are termed "tied" pairs and show no particular advantage for one agent and are not recorded on the chart. Pairs of subjects, where potent or inert therapy is effective in one instance and fails in the other, are termed "untied" pairs, and are recorded on the control chart as a point in favour of one form of treatment. The comparative frequencies of symptomatic remission and mucosal improvement assessed sigmoidoscopically are summarized in Table V, and provided information for separate control charts.

TABLE V

	"Tied" Pairs		"Untied" Pairs	
	+	-	+	-
Potent ..	..	..	..	..
Dummy ..	..	..	..	..
Symptomatic remission ..	2	1	6	—
Sigmoidoscopic improvement	—	2	7	—
Method of recording on chart	Not used in investigation	Plot as point in favour of potent drug	Plot as point in favour of dummy preparation	

Similar success or failure occurred in five pairs of patients which were not used in the investigation. The number of "tied" pairs is the only factor which cannot be predicted in advance in this type of trial. The frequency of "tied" pairs in this trial is remarkably small, as it might have been expected that similar numbers of pairs of patients might be "tied" or "untied." In six pairs of patients symptomatic remissions were induced by hydrocortisone, while in seven pairs mucosal appearances improved with the

potent drug. Inert therapy in each pair of patients was uniformly unsuccessful. The number of untied pairs in favour of hydrocortisone was sufficient to establish a significant advantage when recorded on the control charts.

The outcome of treatment in each untied pair was completed on the chart shown in Fig. 1. Information is entered

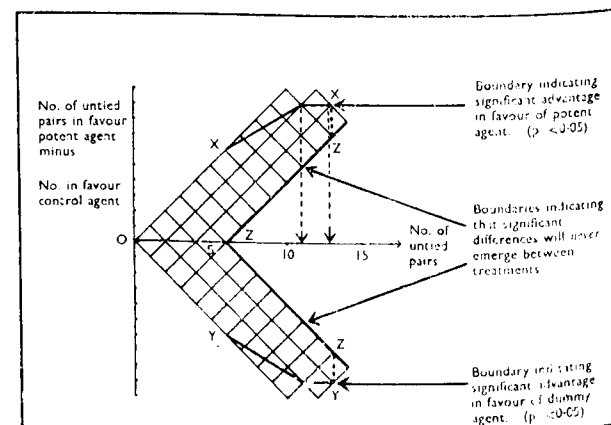


FIG. 1.—Sequential analysis chart comparing treatment of granular proctitis with dummy and that with hydrocortisone. Outcome of treatments in untied pairs, starting at point O. For each untied pair favouring hydrocortisone a point is drawn diagonally upwards towards the upper limit of the chart, XX, and for each untied pair favouring inert therapy diagonally downwards towards the lower limit, YY. As soon as one of these limits is intersected the significant advantage of one form of therapy is established. This will occur if 6 of 6, 10 of 11, or 11 of 13 untied pairs favoured one agent. If no significant differences are demonstrated between treatments the control line will oscillate up and down and eventually intersect the inner limits of the chart, ZZ, which might occur after as few as 6 or as many as 13 pairs of dissimilar responses had been entered on the chart. Intersection of these inner limits, ZZ, would indicate that the trial should be abandoned, as no significant advantage for a particular treatment would emerge.

on the chart starting at point O. For each untied pair showing an advantage in favour of hydrocortisone a line is drawn one point diagonally upwards towards the upper limit of the chart XX and for each untied pair in favour of the dummy therapy one point diagonally downwards towards the lower limit YY. If the differences between treatment are great, successive points in favour of the potent remedy rapidly approach the upper limit XX, and once this margin is intersected a significant advantage for potent therapy to the 5% level has been demonstrated.

As will be seen from Fig. 1, this might be possible if six out of six untied pairs favour hydrocortisone when significant differences could be shown after 12 patients had been treated. If one untied pair of patients favoured inert therapy in the course of the investigation the outcome of the trial would be delayed until 10 or 11 untied pairs had favoured hydrocortisone and the upper margin of the chart had been intersected. Finally, if two pairs of patients favoured dummy preparation the outcome of the trial would be delayed until at least 13 untied pairs of patients had been obtained. A similar outcome would occur if dummy treatment was better than potent, when the progression of the line would be downwards to intersect the lower limit YY on the chart. If no significant difference existed between treatments the line would oscillate backwards and forwards and eventually intersect the inner limits of the chart labelled ZZ, which would indicate that even if the maximum number of 13 untied pairs were obtained no significant difference would emerge, indicating the limit to which the trial should be pursued.

The disadvantages of this type of analysis are that the number of tied pairs cannot be predicted precisely and that unless the difference between the agents compared is a great one a significant result will not emerge.

Special charts were used to record the frequency of symptomatic remission and sigmoidoscopic improvement.

The chart illustrating the occurrence of symptomatic remission in the pairs of patients treated is shown in Fig. 2, where it will be seen that remissions were induced in six of six untied pairs treated with hydrocortisone and that the control line favouring this agent rapidly approached the upper limit of the chart, demonstrating a significant advantage in favour of this agent.

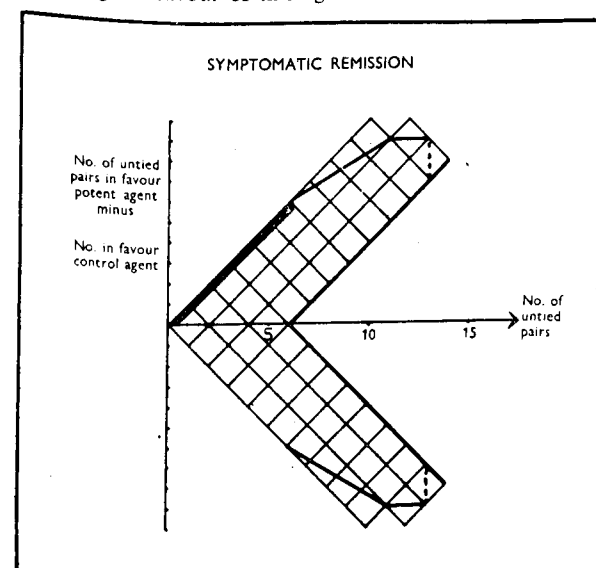


FIG. 2.—Sequential analysis chart illustrating the frequency of symptomatic remission in pairs of patients treated is here shown. As remissions were induced in six or six untied pairs treated with hydrocortisone the control line passed rapidly upwards and intersected the upper limit of the chart, demonstrating a significant advantage for hydrocortisone.

An almost exactly similar chart is shown in Fig. 3, where improvement in mucosal appearance assessed sigmoidoscopically has been recorded. Here again seven of seven untied pairs favoured hydrocortisone, and the control line uninterruptedly approached and intersected the upper limit of the chart, demonstrating again a significant advantage for the potent drug.

Hydrocortisone hemisuccinate sodium therefore was shown to be more effective than a dummy preparation after the

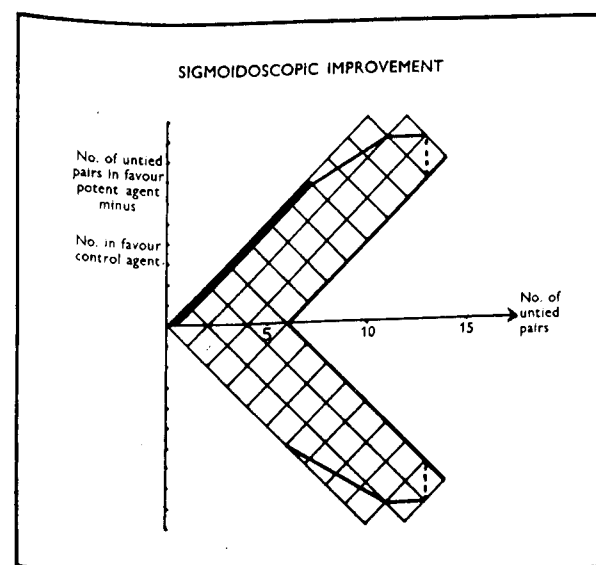


FIG. 3.—The frequency with which mucosal appearances improved sigmoidoscopically is entered on this chart, where again the significant advantage of potent therapy is demonstrated by an uninterrupted progression of the control line upwards to intersect the upper limit of the chart after seven pairs of patients had been treated.

small number of 19 treatments had been given and seems a valuable form of therapy for ulcerative colitis, particularly in mild cases where the inflammatory process is confined to the rectum and sigmoid colon. Its use in more severe cases of colitis is being further investigated. In these patients the intravenous administration of 15–30 mg. of propantheline half an hour before the rectal infusion reduces colonic motility overnight and enables the patients with nocturnal diarrhoea to retain the agent overnight. It might also be possible to incorporate the hydrocortisone hemisuccinate sodium in a suppository for use in patients with proctitis. This, too, is being investigated, as this method would prove far more convenient to patients with this disease.

Discussion

The favourable results reported by Truelove in 1956 and 1957 on the treatment of mild cases of colitis by the topical administration of hydrocortisone seemed to merit further inquiry, and for this reason the controlled trial into the value of this mode of treatment was undertaken and has been detailed above.

Truelove in 1956 treated a group of 17 patients with ulcerative colitis on 21 occasions by rectal infusions of a solution of hydrocortisone-free alcohol administered by slow rectal drip, and induced rapid clinical remissions in 14, accompanied in most instances by an improvement in the sigmoidoscopic appearances. A year later he reported a second series of 15 patients with colitis treated on 18 occasions by rectal injection of a solution of the more soluble derivative, hydrocortisone hemisuccinate sodium. Rapid clinical remissions were induced in 11 patients; sigmoidoscopic improvement was observed in every case in remission, accompanied in this instance by reductions in the severity of the inflammatory process judged histologically by serial colonic biopsies and by an improvement in cell morphology as judged by exfoliative studies.

The advantage of potent over dummy therapy has been demonstrated in three ways. Firstly, in the contrasting responses of patients treated in the two ways, where the majority of patients receiving hydrocortisone improved and those receiving dummy treatment worsened. Secondly, in the responses of two patients, serving as their own controls, who received both forms of treatment and who in both cases failed to respond to inert treatment and to undergo remission when potent therapy was given. Finally, by the use of sequential analysis, by which potent therapy was shown to induce symptomatic remission and sigmoidoscopic improvement significantly more commonly than the other form of treatment, the value of the rectal instillation of hydrocortisone hemisuccinate sodium was definitely established.

The new method of restricted sequential analysis designed by Armitage in 1957, modified from the method described by Bross in 1952, proved an extremely satisfactory method of demonstrating the differences, and a significant answer was obtained after 19 treatments had been administered.

Summary

An assessment of the value of rectal instillations of topical hydrocortisone hemisuccinate sodium in patients with ulcerative colitis has been undertaken.

The frequency with which symptomatic remission and sigmoidoscopic improvement were induced has been compared in pairs of patients receiving potent or dummy treatments.

The responses of the groups of patients receiving potent and inert therapy are contrasted. The majority of patients receiving potent hydrocortisone improved and those receiving inert therapy worsened.

In two patients serving as their own controls, dummy treatment failed to induce improvement while hydrocortisone caused a remission to occur.

Finally, comparison by sequential analysis showed that symptomatic remission and improvement in mucosal appearances were significantly more often induced by potent than by inert treatment.

My thanks are due to Glaxo Laboratories, who provided supplies of both potent and inert hydrocortisone for the trial; to Dr. P. Armitage, who designed the sequential analysis chart; and to Professor J. C. Goligher, who performed sigmoidoscopic examinations. I am grateful also to Professor J. C. Goligher, Mr. A. V. Pollock, Mr. G. Smiddy, Mr. E. T. McCartney, Dr. W. S. Suffern, Dr. M. Atkinson, and Mr. D. B. Feather, who referred patients for treatment.

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ANKYLOSING SPONDYLITIS

BY

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In the spring of 1958 a questionnaire was sent to 343 patients with ankylosing spondylitis who had been seen, and the majority treated, at Westminster Hospital since the war. Answers were received from 209; most of the rest were returned by the Post Office, the present address of those patients being unknown. Many of the patients had been seen and treated while in the armed Forces, and the difficulty in tracing many lay in this fact. In the vast majority of cases, however, where the questionnaire was sent to the correct address an answer was received within three weeks, demonstrating once again the high degree of co-operation found in our previous study with this group of patients (Hart, Robinson, Allchin, and MacLagan, 1949). Questions were related particularly to the effects of treatment as assessed by the patient himself and the ability to do his work and earn his own living.

Duration of Disease.—Of the 209 who returned their questionnaires, 23 had suffered from ankylosing spondylitis since before the onset of the second world war, in 58 the onset lay during 1940–4, in 75 during 1945–9, in 44 during 1950–4; in only 9 had it developed since that date.

Results

Work Capacity.—200 question sheets were returned fully completed. Of these, 21 were from women, 179 from men. This 8.5:1 ratio is an artificial one owing to the high number of Service men seen; it therefore does not reflect the true sex ratio in this disease. Of this number, 160 were working full time, and, if housewives, were doing their full duties in the home. Many stated that in addition to their ordinary duties they worked voluntarily in the evenings, and others did gardening and played games. 40 stated that they were incapable of full duties, but only 9 were incapable of any duties whatsoever. 19 were capable of modified duties and 12 of light or occasional duties. In addition the questionnaire had been returned by relatives of four patients, all male, who had died: one of amyloidosis, one of coronary thrombosis, one of carcinoma of the pancreas, and one of a neoplasm of uncertain nature. These figures—160 at full work, 19 at modified work, and only 21 capable of little or no duties—are typical of the group as a whole, and similar figures have been reported by Blumberg and Ragan (1956). Although working full time, many commented that the duties

in their particular post were not physically hard and some that the post had been selected because of their disability. In four instances a regular paid post had been given up for full-time independent work where self-imposed duties could be varied to avoid the stiffness and discomfort attendant on too little mobility at work. Once again the well-known fact became evident that a stiff spine alone does not cripple, though stiff hips and peripheral joint involvement may.

General Health.—Of 191 patients who answered questions relating to their general health, 36 stated it was excellent, 74 good, 71 "fairly good," and 10 poor. Asked specifically about indigestion, 11 complained of severe recurrent or chronic dyspepsia, 38 of more moderate but annoying symptoms. Radiological investigation in 37 cases had revealed peptic ulcers in 10. Of these 191 cases, therefore, 49, or roughly 25%, have dyspepsia to the point of being a definite and occasionally a major complaint. Although some symptoms were obviously related to or aggravated by therapy, this was clearly not so in all cases. This group of spondylitic dyspeptic patients remains a major therapeutic hazard, for almost all current forms of therapy may aggravate gastro-duodenal symptoms or cause complications. Of other disabilities, the next most common was iritis. Although no specific question was asked and although the eye was not mentioned on the questionnaire, 36 patients mentioned iridocyclitis when asked for general comments about their health. One was registered as a blind person from this disability. Three patients were under treatment for pulmonary tuberculosis; one had had a thoracoplasty. Vertigo was mentioned by 7, headaches by 4, anaemia by 4, and recurrent bronchitis by only 4, although 8 made major complaints regarding stiffness of the chest wall and inability to breathe deeply.

Analgesics.—To the question, "What medicines have you found to be most helpful for your spondylitis?" 43 answered none, 49 aspirin in some form, 54 compound codeine tablets, 56 phenylbutazone, and 9 steroid therapy. This last is a small group, as only a small minority had been offered steroid therapy. No other drug was mentioned more than once.

Radiotherapy

One of the main reasons for the follow-up was to learn what the patients thought of the long-term results of deep x-ray therapy and to find out what blood disorders had occurred, if any. The large majority of these patients were treated at Westminster Hospital by Dr. F. M. Allchin, Mr. Tom Prosser, and Dr. Kenneth Newton in the conservative dosage reported by us previously (Hart *et al.*, 1949); only a few treated elsewhere received a total dosage above 1,500 r to any part of the spine, and the majority received under 1,200 r. Of 143 patients who had received therapy to the spine, 114 (80%) stated they had received some benefit, 29 (20%) that they had not. Of those who stated that they had received benefit, 41 (28.7% of all patients treated with deep x rays) stated that some benefit still persisted, after follow-up periods varying from 2 months to 17 years since therapy was given; 27 of these 41 patients had received therapy more than four years previously. 30 patients had had symptomatic relief for six months or less, 18 for seven months to five years, 3 for periods over five years, the effect then completely wearing off. In 22 cases details of duration of relief were not adequately given.

While some of this improvement may be psychogenic and reflect the high optimism of the patients as a group, the stories given fall into fairly regular patterns, and suggest more than "therapeutic persuasion." In some cases the question of introduction of a natural remission has to be considered where for many years after therapy the condition appears to have remained largely or completely quiescent. On these figures it seems that 20% of irradiated spondylitics will derive no benefit whatsoever, 20% a temporary symptomatic improvement for a period of up to six months, the remaining 60% some degree of relief for periods varying from seven months to many years.

Discussion

With so many missing returns no conclusions could be drawn as regards mortality and morbidity, though the main reason for failure to return the questionnaire was the migratory nature of these patients and frequent change of addresses. Nevertheless, of the returns received 80% of the patients were at full work and only 5% capable of no work whatsoever of any sort, the remaining 15% being capable of modified, light, or occasional duties. These figures are the most encouraging we have in the rheumatism unit—far better than those for rheumatoid arthritis. 110 of 191 patients considered their general health good or excellent and only 10 poor.

As regards the most popular of the drugs used it is of interest that aspirin in some form, compound codeine tablets, and phenylbutazone were quoted in almost identical numbers, the last-named coming top in this poll by the narrow margin of two votes. It has been our impression in the unit for some time that, if tolerated, this drug is the single most useful one for spondylitics at all stages of their painful disease, and Bauer and Ropes (1956) found it more useful in this disease than in rheumatoid arthritis.

The effect of any drug, however, depends on its regular daily administration; its beneficial effects rapidly disappear on stopping it. In contrast, deep x rays appear, on this survey, to give some degree of lasting relief in many cases, for 32 of 114 patients (28%) obtained some amelioration of symptoms for over four years. Caution is necessary, however, in interpreting these figures, for a course of deep x-ray therapy, like a surgical operation, sticks in the memory as a landmark in the disease course, and subsequent improvement may falsely be attributed to it when, in fact, natural remission has occurred. Improvement, also, is as compared by the patient with pre-treatment symptoms which were severe enough to bring the patient to hospital. One may therefore be comparing symptoms of exacerbation with symptoms of remission, and the therapy given between the two may have been unrelated. A second point to emphasize is that it is impossible on the returns to tell whether symptomatic improvement was great or small; all that can be said is that some measure of symptomatic improvement occurred after therapy.

Wilkinson and Bywaters (1958) found that 43% of 200 irradiated patients required no regular analgesics within a year of completion of therapy, this figure dropping to 22% after a ten-year follow-up. These figures, obtained by clinicians from assessment of analgesic consumption, do not differ very greatly from those obtained by us from an assessment of our patients' own statements.

While I have hitherto been doubtful about the induction of natural remission in this disorder by this form of therapy, there is some indication on these figures that it may occur. The hazards of irradiation are well known, and have latterly received much attention; it is as well to record the reverse side of the coin.

Summary and Conclusions

Question sheets were sent to 343 patients with ankylosing spondylitis, and 209 answers were received. Of these returns, four were from relatives of deceased patients, and five were incomplete. Of the 200 fully completed returns, 179 were from men, 21 from women.

160 (80%) stated that they were working full time; 19 were capable of modified duties, 12 of light or occasional duties; and only 9 were permanently incapable of any work whatsoever.

Of 191 patients who answered questions relating to their general health, 36 stated that it was excellent, 74 good, 71 fairly good, and 10 poor. 11 complained of severe, 38 of moderate but annoying dyspepsia. X-ray examination in 37 cases revealed peptic ulcers in 10.

Of 143 patients given deep x-ray therapy to the spine, 114 (80%) derived some benefit; 41 (28.7%) claimed some measure of lasting relief, which still continues 2 months to 17 years after treatment. Of these 41 patients 27 were irradiated over four years previously. 30 claimed transient improvement lasting six months or less, 18 improvement for periods of seven months to five years, 3 for more than five years. 32 of 114 (28%) of these patients derived some measure of symptomatic relief for periods exceeding four years.

These results once again emphasize the relatively good prognosis as regards work capabilities in this group of patients and a reasonably satisfactory response to existing forms of therapy.

My thanks are due to Professor J. H. Kellgren and Dr. J. Sharp, of the Rheumatism Research Centre, Manchester University, for their helpful and constructive comments.

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VALUE OF AZACYCLONOL ON
CHRONIC SCHIZOPHRENIC PATIENTS

PRELIMINARY OBSERVATIONS

BY

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Azacyclonol hydrochloride ("frenquel") is the gamma isomer of pipradrol hydrochloride ("meratran"), the latter drug being used in this country as an antidepressant agent. Chemically, azacyclonol is α -(4-piperidyl) benzhydrol hydrochloride. Despite its structural resemblance to pipradrol, azacyclonol has been reported to possess different clinical properties inasmuch as it exerts a tranquillizing effect.

Both mescaline and L.S.D.25 have been reported to produce states resembling schizophrenia. Fabing (1955a, 1955b, 1955c), working in the United States, has reported a series of controlled experiments on "normal" volunteers who were each given L.S.D.25. This dose produced a characteristic psychosis with symptoms resembling schizophrenia. The experiment was then repeated, but some of the volunteers were given a course of azacyclonol prior to the administration of the L.S.D.25 and the other volunteers were given control tablets. It was observed that, although the effects of L.S.D.25 began as usual, the more acute symptoms were inhibited in the patients who had been pretreated with azacyclonol. The vivid hallucinatory experiences were absent and some of the group even succeeded in carrying out their normal duties. It would appear from this work that azacyclonol has some blocking effect in experimental psychosis or clinical conditions of disorientation.

The nature of this neurochemical effect is not yet fully understood.

Fabing and Hawkins (1955) have reported on clinical trials with azacyclonol in a series of acute and chronic schizophrenic patients. It appears that azacyclonol affords schizophrenic patients some amelioration of

their symptoms and that it might be a useful addition to the ataractic group of drugs. It was therefore decided to attempt a controlled study of the value of azacyclonol in a group of chronic schizophrenic patients.

Method

Twelve female patients were selected. Their ages varied from 19 to 54 years, with an average of 36.9. The 12 patients were then divided equally into groups known as A and B. The total period of the trial was to be 12 weeks. For the first six weeks the six patients in group A received azacyclonol and the remainder (group B) received identical placebo tablets. The converse of this arrangement was used for the second six weeks.

The experiment was conducted by the usual "double blind" technique. The issue of the tablets was controlled by a member of the male nursing administrative staff who did not know the patients concerned in the trial, and selected the patients for the two groups in a random manner. Until the period of the trial was complete no one else knew which patients were receiving active and which inert material, and all observations were made before the key was broken. During this time none of the patients selected received any other forms of medication, with the exception of one patient, a chronic asthmatic, whose ephedrine, ½ gr. (32 mg.) daily, was continued.

All patients were interviewed prior to the beginning of the trial and their type of schizophrenia was classified as follows: simple, 1; katatonic, 2; hebephrenic, 3; paranoid, 6 (see Table).

The following adjustments were made in ward routine to facilitate observation of the patients. Nurses were instructed to make notes on their patients' behaviour in a special book, with emphasis on the following points: (1) hallucinations, commenting whether patients behaved as if hallucinated or admitted to hallucinatory experiences; (2) degrees of accessibility of patients to friendly approaches by staff or whether hostile, aggressive, or asocial; (3) helpfulness in ward; willingness to partake in household duties and to show initiative with regard to these; (4) response to efforts of staff to keep them tidy in dress and clean in habit; and (5) whether interested in hair styles and responsive to normal use of cosmetics.

Handicraft classes took place in the ward and not in the occupational therapy centre, to maintain continuity in the observation of the patients. The nursing staff assisted at the occupational therapy and accompanied the patients when they were engaged in activities outside the ward—for example, dancing classes, P.T. classes, and walks.

Results

Patient	Classification of Illness	Therapy During Phase 1	Observation During Phase 1	Observation During Phase 2
J. P.	Simple Hebephrenic	Azacyclonol	Improved	Deteriorated
M. N.	"	"	"	"
O. S.	Paranoid	"	No change	No change
T. S.	"	"	"	"
J. T.	"	"	Improved	Maintained improvement
K. B.	"	"	"	"
M. P.	Katatonic	Placebo	Much improved	Deteriorated
O. R.	Hebephrenic	"	No change	No change
	"	"	Slight improvement	Improvement maintained
K. G.	Paranoid	"	No change	No change
M. B.	"	"	Deteriorated	Much improved
M. Bu.	Katatonic	"	Improved	Improvement maintained
J. K.	Paranoid	"	Deteriorated	Much improved

Results

Three patients were much improved when receiving azacyclonol. These three patients had several features in common. They were all paranoid schizophrenics, hallucinated, and hostile. They were also asocial, with a tendency

to be aggressive if disturbed. Here are summaries of their case histories.

J. K., aged 29. She was suspicious and at times violent, responding to auditory hallucinations and delusions of persecution. On placebo (phase 1) she deteriorated. On azacyclonol she improved and became more accessible. She did not appear so distressed by hallucinations and co-operated in various occupational activities. Her condition deteriorated again after cessation of the trial.

K. B., aged 49. She was sullen, asocial, and suspicious, with no insight. She experienced auditory hallucinations, during which she heard voices of men planning sexual assaults. She had occasional outbursts of physical violence. Her behaviour improved with azacyclonol. She became friendly, co-operative, and helpful with regard to domestic duties. She did not appear to be hallucinated, and denied hallucinatory experiences. Previously she had freely admitted these. Her behaviour deteriorated steadily throughout the placebo phase and the subsequent period after the trial.

M. B., aged 54. At the time chosen for this trial this patient was almost constantly hallucinated. All day long she carried on noisy and interminable conversations with hallucinatory voices. These outbursts often continued far into the night. It was with considerable fortitude that the nursing staff bore with her behaviour and adhered to the rule that nothing other than azacyclonol or placebo should be used during the trial. On azacyclonol her behaviour improved and she became much quieter. She took part in occupational therapy and her hallucinations appeared to diminish in force and intensity.

It will be observed also that two other paranoid schizophrenics displayed no appreciable change throughout the course of the trial. Both of these patients (K. G. and T. S.) had histories of being hallucinated, but did not appear to be so at the time of the trial. Both had well-preserved personalities despite the chronicity of their illnesses, and both had delusions of the paranoid type. It will be appreciated that it is more difficult to observe changes in this type of patient than in the more grossly disintegrated personalities of K. B., M. B., and J. K.

Five further patients showed some improvement in the azacyclonol phase. One of these maintained her improvement later on placebo, but two deteriorated in the placebo phase.

O. R. showed some improvement on placebo in phase 2 but deteriorated after cessation of all tablets.

Discussion

The number of patients selected for this trial was small because it was felt that it would be difficult to assess accurately a larger number of patients. It must be remembered that the nursing staff conducting this trial also had the responsibilities of their routine ward duties.

Conflicting reports have been published referring to the use of azacyclonol. It has been suggested that its major use is for hallucinated patients where the hallucinations are of either schizophrenic or toxic origin (Fabing and Hawkins, 1955).

Later publications, such as reports by Ferguson (1956) and Cohen and Parlour (1956), have shown that higher doses than those used in the trial may be more effective. Recent work with azacyclonol in this hospital has confirmed these observations. It is possible that the principal use of this drug lies as an adjunct to other forms of therapy, when quite noticeable improvement may sometimes be obtained. Fortunately, even in combination, high doses of azacyclonol can be given, as it appears to be completely free from all forms of toxicity and side-effects.

During the early part of the trial detailed blood tests were carried out on all patients, but as no change could be detected this procedure was considered unnecessary and deleted from the programme.

Summary

A study of the effect of azacyclonol on 12 schizophrenic female patients is reported.

The double blind technique was used throughout with the dose standardized at two tablets three times a day (120 mg. daily). In every case all other psychiatric treatment was withdrawn for the duration of the trial.

Substantial improvement was noticed in three patients and some improvement in a further five.

No side-effects were noted.

It would appear that further trials with this drug in disturbed hallucinated patients would be justified and possibly very helpful.

I should like to thank Dr. D. F. Macgregor, medical superintendent of Carlton Hayes Hospital, for his co-operation and assistance with the trial. Also Mr. Mills, senior technician, Mr. Cannings, and other members of the nursing staff. My thanks are also due to Mr. B. A. Weightman, of Riker Laboratories Ltd., who kindly supplied the azacyclonol used in the trial.

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AN AFRICAN'S MENTAL OUTLOOK IN BRITAIN

BY

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"Were all the circumstances, internal and external, scanned closely and weighed accurately it would be seen that there is no accident in madness" (Maudsley, 1879).

To-day, considerable effort is being expended on establishing "scientifically attested knowledge" about how to keep normal persons mentally healthy (Bartlett, 1949). How to maintain the mental health of university students is a serious problem (Parnell, 1951; Gibson, 1953). Indeed, tuberculosis and mental diseases are "the two major medical problems among undergraduates" (Practitioner, 1957).

Immigrants suffer mental ill-health more commonly than do the indigenes (Hill, 1943; Crew, 1955). It stands to reason that the mental health of foreign students must be an even graver problem than that of the British-born.

Otis (1955), of Illinois University, has discussed the mental-health problems of foreign students in America. He recommended that "in order to better prepare future students" there was need to analyse problems "met by one's countrymen who have been students abroad." I wish, therefore, to report my own experiences while studying in Britain. It is hoped that this may be of some help to those who are in a position to counsel foreign students.

Writing on colour prejudice in Britain, Richmond (1954) stated that "examples can be cited of psychotic individuals whose behaviour is clearly conditioned by the conflicts that they have experienced through racial prejudice in this country." Sclaire (1953) also drew attention to the effect that racial discrimination has on the neurotic pattern seen among American negroes.

If colour prejudice can thus undermine mental health, in what way may the negro student be safeguarded? In presenting my own solution I have in mind what Max-

well (1871) told a meeting of the British Association for the Advancement of Science in 1870: "It was a great step in science when men became convinced that, in order to understand the nature of things, they must begin by asking, not whether a thing is good or bad, noxious or beneficial, but of what kind is it? and how much is there of it?"

Present Investigation

Human beings are "notoriously elusive subjects for objective study and quantitative measurement" (McCalman, 1953). An objective assessment of discriminatory trends in a British city has been made, using a simple, measurable, behavioural quantity—namely, the presence or absence of courtesy in a public utility.

Between November 22, 1954, and November 8, 1955, whenever I paid my fare in any Glasgow Corporation transport I took careful note of whether my fare was accepted with thanks or not with thanks. As a control, I observed whether a European passenger, whose fare was taken just before, or, failing that, just after mine, was thanked or not.

In all, 500 journeys were made. Three types of data were obtained and entered in my diary, each record being made soon after the journey.

Type I—408 cases in which a European fellow passenger and I were both courteously thanked; type II—73 cases in which neither of us was thanked; type III—19 cases in which a European was thanked but I was not. In no case was I thanked but not a near-by Caucasian.

Discussion

It was Lord Lytton (1956) who said that "courtesy is a duty public servants owe to the humblest member of the public." Indeed, the General Manager of Glasgow Corporation Transport Department (1955) reported that his "greatest difficulty is to inculcate amongst the staff a spirit of courtesy and pride of service." Since courtesy is valued so highly in Britain, this social grace is a dependable criterion for a scientific analysis of discriminatory behaviour in this country.

From the above analysis we see that in only 19 cases out of 500 was there acceptable evidence of discrimination. This finding is not statistically significant ($\chi^2=0.72$, $P<0.05$).

The 73 type II cases are noteworthy. Each is potentially fraught with the danger that the negro might think that there was discrimination. If he is not to think so, then comparable discourtesy to Europeans travelling with him has first to be observed. How often, we may well wonder, would such a controlled observation be made in everyday life? Kenneth Little (1947) has said that the negro in Britain may often suspect discrimination and aloofness "where they were never intended." I think that this is true.

What clinical clue, if any, does this conclusion contribute? Weinberg (1955) found that "too frequent and embarrassing uncertainties may lead to inner insecurity, or cause a latent insecurity to become overt." Or, as Hume (1947) put it, sociological factors may undermine mental health by "multiplying precipitating situations." Consequently, the negro student who overestimates prejudice multiplies psycho-social trauma and runs a graver risk of mental breakdown. It is in his own interest that he does not make this mistake.

Admittedly, other investigations may yield a different result; for example, if a criterion other than courtesy is employed. Nevertheless, we may conclude that if there is insight into the difference between real and imagined prejudice the probability is that the threshold of what is unbearable will not be approached. Mental hygiene requires that "environmental difficulties should not be excessive" (Stevenson, 1945). As Bartlett (1949) also said, "there are limits of toleration, both environmental and internal, the persistent passing of which leads to mental trouble."

In education for mental health, correct perception of reality is important (Florence Clothier, 1951). If other

essentials such as financial backing and academic background are satisfactory, a correctly oriented negro student will, like Richmond's (1954) ideal, "not be unaware of the frustrations and tensions which negroes experience, but he will be able to face up to such conflicts, precisely because he has succeeded in achieving, for himself, a measure of status and security. He is less bound by the personal anxiety and inner conflicts which besiege so many of his fellows."

Conclusion and Summary

In Britain to-day the mental health of undergraduates is receiving considerable attention. Since immigrants and those open to racial discrimination are prone to suffer mental ill-health, the mental health of the negro student must be an even graver problem than that of the British-born.

Courtesy shown to me and to European fellow passengers by Glasgow Corporation transport workers has been scientifically analysed. The survey suggests that the negro student may easily overestimate the incidence of racial prejudice.

Now, unfavourable sociological attitudes such as prejudice tend to precipitate mental breakdowns, particularly when they are recurrent. Consequently, adequate insight into the racial environment in Britain will, by ruling out instances of imagined rather than real discrimination, help the African student or a student of other lands to maintain a healthy mental outlook while in this country.

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Medical Memorandum

Congenital Reduplication of Ileo-caecal Valve Presenting as an Acute Intussusception

The presence of two separate openings in an intussusception protruding from the anus is unusual enough to be worthy of record. Kolb *et al.* (1956) reported a case of intussusception presenting at the anus with duplication of the caecum, but not of the ileo-caecal valve.

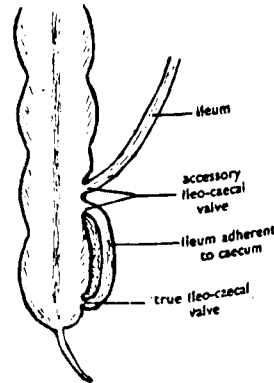
CASE REPORT

A male child aged 19 months was admitted to hospital on July 1, 1955, with a diagnosis of intussusception. He was a firstborn, and was quite well until a week before admission, when he developed abdominal pain and looked ill. Forty-eight hours before admission this pain seemed to become worse, and on the next day he vomited four times and passed loose stools. No blood was seen. On the day of admission he vomited three times, and the mother noticed "that something was protruding from the back passage."

On examination he was a well-nourished but very ill boy, being pale and listless, with a temperature of 99.4° F. (37.4° C.) and a pulse rate of 130. A sausage-shaped tumour was felt in the left iliac fossa and a portion of bowel 5 cm. long was protruding at the anus. On closer examination this was found to have two separate openings, one at the tip and one on the left side. A catheter could be passed into each opening separately for a distance of 15 cm. without difficulty.

At operation the prolapsed bowel was reduced inside the rectum. Laparotomy through a left lower paramedian incision showed a little blood-stained fluid in the peritoneal cavity. The intussusception was felt at the level of the pelvic floor and reduced without difficulty. The appendix and caecum were congested but viable. The terminal ileum was adherent to the ascending colon for 5 cm. above the ileo-caecal valve. As the child was very ill the abdomen was closed rapidly, but, despite emergency measures, he died a few minutes later.

Necropsy (Dr. J. B. Enticknap).—The terminal ileum and lower right colon were congested. The last 4 cm. of the former was firmly attached to the caecum and opened into it at both ends of this length (see Diagram). The lower opening was a normal valve in position and form. At the upper one the ileum entered the caecal lumen and almost immediately left it again. Histological section at this point showed the muscular walls of caecum and ileum to be continuous and regular, about 6 mm. of the ileum in the fixed and paraffin-embedded specimen forming part of the caecal wall. There was moderately advanced bronchopneumonia of the right upper lobe and an acute tracheobronchitis causing partial collapse of the periphery of both lungs.



COMMENT

The necropsy findings suggest that the two openings in the bowel prolapsing at the anus were separate ileo-caecal valves, and the regularity of the continuous smooth-muscle layer surrounding them makes it probable that this was a congenital reduplication and not an acquired internal fistula. Gross (1953) reported that 3 out of 702 intussusceptions were due to duplication of the terminal ileum, but neither in his report nor elsewhere have any instances of two valves on a single terminal ileal tube been found.

I thank Mr. R. Parkinson for his help and permission to publish this case.

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The Government is prepared to consider proposals for individual colours to be added to or removed from the permitted list now embodied in the *Colouring Matter in Food Regulations, 1957* (S.I. No. 1066), and the *Colouring Matter in Food (Scotland) Regulations, 1957* (S.I. No. 1123). The list as a whole is likely to be reviewed in less than five years, but interim modifications to the list are envisaged should new developments in colour manufacture or food processing, or fresh evidence relating to the safety or otherwise of colours, make this desirable. All such proposals should be addressed in the first instance to the assistant secretary, Food Standards, Hygiene, and Slaughterhouse Policy Division, Ministry of Agriculture, Fisheries, and Food, London, S.W.1.

Reviews

INTERNATIONAL OPHTHALMOLOGY

A Century of International Ophthalmology (1857-1957): Written at the request of the International Council of Ophthalmology. By Sir Stewart Duke-Elder. (Pp. 91; illustrated. 12s. 6d.) London: Henry Kimpton. 1958.

It is indeed appropriate that the task of writing this interesting historical record should have been undertaken by Sir Stewart Duke-Elder, president of the International Council of Ophthalmology, for no one has done more to further the international life of ophthalmology than he. The oldest international medical congress that survives to-day is the International Congress of Ophthalmology, the first meeting of which took place in 1857 in Brussels, the eighteenth meeting being due to take place in the same city in September of this year. If, however, the projected sequence of four-yearly meetings had not been disturbed by wars this year's meeting should have been the twenty-sixth.

This little book of praiseworthy brevity is fascinating to read. The list of chief topics for discussion at each congress shows the trend of ophthalmic thought over the years. The photographs of each successive president add to the attraction. Not the least interesting part of this book is concerned with the reflections of Sir Stewart on international congresses in general. He rightly emphasizes their value, but expresses some dismay at the increasing size of the congresses, which tends to replace the informal give-and-take argument, so valuable from the scientific point of view, by a purely formal discussion or even no discussion at all. He also deplores the increasing cost of the congress, which raises the subscriptions and thus tends to exclude the young ophthalmologist—indeed, the very man who will probably profit most from such meetings.

In Part II of the book Sir Stewart describes the activities of the International Council of Ophthalmology (formed in 1927) and its relation to other sponsored international ophthalmological bodies, and refers briefly to some of its future problems.

This book (as its author suggests) should inspire future generations to maintain the unity and brotherhood of ophthalmologists throughout the world.

T. KEITH LYLE.

INTRODUCTION TO PSYCHOLOGY

Introduction to Psychology. By Ernest R. Hilgard. Under the general editorship of Claude E. Buxton. Second edition. (Pp. 653+xv; illustrated. 55s.) New York: Harcourt, Brace and Co. London: Methuen and Co., Ltd. 1958.

This is the second edition of a very well known and widely used introduction to psychology. There can be no doubt about its excellence, and, though one may upon occasion disagree on points of detail, Hilgard has certainly succeeded in the main in his endeavour to present a fair and widely acceptable review of modern psychology. The new edition has been completely rewritten, and is an improvement on the first in that it sheds to a large extent the slight traces of dogmatism which were so characteristic of the earlier work.

The book is well produced and extremely well illustrated by photographs and diagrams. Indeed, if one were to make a criticism one might say that it is too well produced. The constant changes in size of type, cross-headings, etc., while obviously meant to help the reader, may be found rather distracting. Furthermore, many of the pictures seem quite unnecessary; the fact that Mozart revealed his talent for music at the age of 3 can surely be put over without including a badly reproduced picture of the infant prodigy. This American habit of making learning painless by "visual aids" assumes a level of willingness to learn rather lower than is likely to be found in Great Britain. If half the pictures had been omitted the volume could have been produced much more cheaply; it would also have gained in

dignity. However, these criticisms do not alter the fact that this is among the three best introductions to psychology available at the present moment. It will undoubtedly have a wide sale in Britain also.

H. J. EYSENCK.

MEDICAL ANNUAL

The Medical Annual, 1958. A Year Book of Treatment and Practitioners' Index. Edited by Sir Henry Tidy, K.B.E., M.A., M.D.(Oxon.), F.R.C.P., and R. Milnes Walker, M.S.(Lond.), F.R.C.S. (Pp. 580+x1; illustrated. 42s.) Bristol: John Wright and Sons Ltd. Toronto: The Macmillan Company of Canada Ltd. 1958.

Slight changes have been made in this 76th issue of the *Medical Annual*. Hitherto the articles have been arranged in alphabetical order. Now the year's work is reviewed in subsections complete in themselves, which run from Alimentary Diseases to Vital Statistics. This method encourages browsing, which is the attraction of a work of this kind, and there is an excellent index which makes it easy to look up a particular topic. The special articles at the beginning of the review deal with intersexuality, wound infection in operating theatres, dangers arising from the medical use of x rays, and the changing emphasis in paediatrics. There are the usual indexes of pharmaceutical and dietetic preparations, surgical appliances, and books of the year. The contributors all seem to be reporting from the active front of medical progress, and the reader of this volume will have a sound idea of recent advances in medicine. The *Medical Annual* is designed to appeal to medical practitioners throughout the Commonwealth, and it seems likely to continue to do so. It is not afraid of describing not merely the useful, as in the reagent strips for urine testing, but the dramatic, as in the extracorporeal circulation whereby the heart can be arrested and laid open for cardiac surgery, and also the bizarre, as in the series of lesions of the male urinary tract. It is something to have learnt that the erythroplasia of Queyrat is not a blood disorder but a lesion of the penis.

L. J. WITTS.

CORONARY HEART DISEASE

Coronary Heart Disease: Angina Pectoris; Myocardial Infarction. By Milton Plotz, M.D., F.A.C.P. Foreword by William Dock, M.D. (Pp. 353+x; illustrated. 90s.) London, Toronto, Melbourne, Sydney, and Wellington: Cassell and Co., Ltd. 1957.

Coronary heart disease, in spite of the intensity of clinical and metabolic and other investigations into its aetiology and natural history, remains one of the obdurate challenges in clinical medicine to-day. As the last important study of these diseases was published eight years ago, the appearance of *Coronary Heart Disease* by Dr. Milton Plotz is of particular interest. He approaches this problem with the concept that this disease is not an inevitable part of senescence, but a malady in which pathogenesis and treatment and prevention have to be studied. The author's interest is so great and his scope so wide that it is hard to find any aspect of coronary heart disease not touched upon and illuminated. The aim of presenting conflicting views in a fair and impartial way has been achieved, but Dr. Plotz has rightly stated his own opinions and practices, which are obviously founded upon a very great experience. To indicate the diversity of themes dealt with in these pages the following among the chapter headings are quoted: geographic and ethnic factors, lipid metabolism, tobacco, ballistocardiography, differential diagnosis, anticoagulant therapy, and surgical and preventive and medico-legal aspects, though this last relates to American law, which differs in material respects from the English.

Any physician who wishes to know the current outlook on any problem relating to coronary disease would be well advised to look herein and, if need be, amplify by study of the bibliography, which is well chosen but derived very largely from North American and British sources.

K. SHIRLEY SMITH.

SYSTEMIC PATHOLOGY

A Text on Systemic Pathology. Volume I. Edited by Otto Saphir, M.D. (Pp. 865+xv; illustrated, \$32.00.) New York and London: Grune and Stratton. 1958.

This volume, the first of two, departs from the conventional textbook in its restriction to systemic pathology. Its aim is to provide a work of reference for students and hospital pathologists. Though eleven contributors are listed, Dr. Saphir is personally responsible for most of the book, which includes the cardiovascular, respiratory, urino-genital, and haemopoietic systems. The treatment of these is in general comprehensive and up-to-date, and the text is generously illustrated in black-and-white. Bibliographies are provided at the end of each section.

The success of so ambitious a venture must rest largely upon comprehensiveness and ease of reference, and in these respects it is not above some criticism. For example (p. 460), "Hydronephrosis, Pyelitis and Destructive Pyelonephritis" heads a section in which these conditions are inextricably mixed. It includes, moreover, an illustration of necrotizing papillitis, but the description of the latter appears elsewhere (p. 398) under the main heading of "Nephrosis," without cross-reference to the illustration. If this arrangement is odd, it is even odder to find (p. 169) a note of the endocardial changes found in malignant argentaffinomas in the chapter on congenital heart disease. It seems disproportionate to allocate 28 pages to the subject of hermaphroditism and pseudo-hermaphroditism, interestingly though this is presented, while only 37 pages go to the diseases of arteries, 15 to the testis, and 12 to the spleen. The account given of the last of these omits mention of the storage of cystine in the splenic pulp and other parts of the reticulo-endothelial system in cystinosis. It is also surprising that no distinction is drawn between normocholesterolaemia and hypercholesterolaemia in describing the related storage phenomena in the section on lipidoses. The thymus is ignored both in the chapter on mediastinal pathology and in the treatment of the reticulo-endothelial system. This organ is doubtless relegated to the second volume, but it would seem to deserve some attention in the places indicated.

Despite these criticisms this is a book which can be fruitfully explored upon a wide range of topics, and it can only be regretted that the high and rising prices of this type of work inhibit a wide circulation on our side of the Atlantic.

DOROTHY S. RUSSELL.

CHOOSING DRUGS

Drugs of Choice, 1958-1959. Edited by Walter Modell, M.D. (Pp. 931. 95s.) London: Henry Kimpton. 1958.

There are numerous American textbooks of therapeutics, nearly all written by a team of authorities. Most of them are excellent, their only drawback being their size and price, since it may be doubted whether it is justifiable to purchase such sumptuous volumes on a subject undergoing such continuous and rapid metamorphosis. There are also several American textbooks of applied pharmacology, including Goodman and Gillman, which must be regarded as one of the medical classics of the century. The collaborative work under review is not strictly a textbook of therapeutics nor one of applied pharmacology, but something between the two. It seeks to supply the physician with information about the drug of choice for each therapeutic problem with which he may be confronted. The 35 chapters are concerned with the choice of a diuretic, the choice of an anti-infective agent, the choice of drugs for gastrointestinal disturbances, and so forth. Each section contains a short discussion of the clinical condition for which the drugs under consideration are used, an account of the several agents commonly employed in its treatment, and the nature of the available data which make one or another the more desirable. At the end of each chapter there is an extensive, but not necessarily complete, alphabetically

arranged drug index of the agents commonly used for the disorders under consideration, their dosage, and their proprietary names.

There is a great deal of valuable and wise information in this volume, but it is probable that more conventional textbooks on therapeutics are preferable. There are so many conditions in the treatment of which drugs play little or no part—hyperparathyroidism, for example—which cannot be dealt with satisfactorily by the method adopted, and the treatment of diabetes takes only one and a half of the 931 pages of the book; indeed, the choice of the insulins and hypoglycaemic agents is very inadequately discussed. It is always difficult to obtain a uniform method of presentation in 35 chapters written by 37 contributors, and it must be confessed that the editor of this work has not been entirely successful in this respect.

D. M. DUNLOP.

MODERN DEVELOPMENT OF SURGERY

The Surgeon's Tale. A Story of Modern Surgery. By Robert G. Richardson. (Pp. 256. 25s.) London: George Allen and Unwin Ltd. 1958.

In a modest preface the author of this book tells us that it was written "primarily for the reader with no medical background." He has actually done better than this. He has produced a readable, up-to-date account of the development of surgery during the past hundred years which can be read with advantage by readers who do possess such a background.

Recent books on the subject written for laymen have lacked balance and have over-dramatized certain parts of the subject. Here the writing is conscientious, factual, moderate in tone, and more detailed. Though the headings of the chapters may seem popular—"Bugs and Carbolec," "Mainly a Matter of Guts," "Into the Unknown"—the writing is serious and sensible. Yet even with the aid of a glossary (which is provided) it would be difficult for the uninitiated to understand the many operations for hernia or for hydrocephalus which are here described. If, then, we are not certain whether it will appeal to laymen, we have no doubt that medical students and practitioners will alike benefit by reading it, and every surgeon under the age of 50 (and many over that age) will find in it many facts which are new to him. There are some minor errors, but as a whole the book is reliable and accurate and is to be recommended.

ZACHARY COPE.

Volume XXII of the *Cold Spring Harbor Symposia on Quantitative Biology* is devoted to "Population Studies: Animal Ecology and Demography." Subjects discussed include the history of human populations, demographic theory, experimental and theoretical studies of animal populations, the growth of human populations, the ecology of natural populations, the structure of communities, and the population as a unit of evolution. The volume is available from the Biological Laboratory, Cold Spring Harbor, L.I., New York, price \$8.

The third edition of *Recent Advances in Oto-laryngology* (438 pp.; J. and A. Churchill, Ltd., 60s.) is the work of F. Boyes Korkis. Previous editions were by R. Scott Stevenson, who contributes a foreword to the present edition. The book has been entirely recast, rewritten, and enlarged. With the exception of some important historical references, the author has confined himself to an evaluation of work published mostly during the last five years. Many useful illustrations are included.

In the second edition of Dr. Sheila Sherlock's *Diseases of the Liver and Biliary System* (pp. 719+xvi; Blackwell Scientific Publications, 57s. 6d.) some careful pruning has made it possible to include new material without adding to the bulk of the book. A chapter has been devoted to jaundice, and the section on jaundice in infancy has been expanded into a more general account of hepatic disease in infancy and childhood. A new classification of hepatic cirrhosis has been included; a number of other additions reflect the advances made in the knowledge of the subject since the first edition appeared in 1955.

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ALLERGIC ENCEPHALOMYELITIS

Myelinated brain tissue contains some so far unidentified chemical substance which, by subcutaneous injection, can cause severe lesions in the central nervous system. Another component of the nervous tissue can produce polyneuritis and polyradiculitis in experimental animals.¹ The first indication of this phenomenon, and of its relevance to human pathology, was provided by the neuroparalytic accidents of anti-rabic treatment. The use of Freund's adjuvants (paraffin, lanolin, and heat-killed *Mycobacteria*)—which enhance antibody production in known immunological systems—along with the sterile brain tissue, regularly resulted in acute disseminated encephalomyelitis in a wide variety of species. The process is organ-specific but not species-specific. Moreover, since intramuscular injection of the animal's own sterile brain tissue, removed by lobotomy,² also caused the disease, experimental support was provided for the postulate of a morbid autoimmunity mechanism.

Perivenous inflammatory infiltrates with a variable degree of perivenous parenchymatous necrosis or demyelination are seen, and histologically the appearances are like those of the human post-exanthematous and post-infectious "myelinoclasts." Because of the curious uniformity in the character, and in the time of onset, of human post-infectious encephalomyelitis, independent of the nature of the primary infection, it had earlier been postulated that post-infectious "myelinoclasts" might be a specific disease process,³ possibly involving sensitization of the nervous tissue.⁴ The discovery of experimental allergic encephalomyelitis has therefore suggested

strongly that this may be the counterpart of this group of human encephalomyelitides. However, a connexion between exanthematous infections and encephalomyelitis has not yet been successfully shown experimentally.⁵ Furthermore, since some workers on human demyelinating disease see no hard-and-fast distinction between acute disseminated encephalomyelitis and multiple sclerosis, it has seriously been postulated that the latter disease also may belong to a group of immunopathological diseases of the nervous system. This thesis was warmly received by many neurologists at the International Congress of Neurological Sciences in Brussels in 1957 in view of the demonstration there, by Y. Uchimura and H. Shiraki,⁶ of the striking similarity of human post-rabic vaccinal encephalomyelitis to multiple sclerosis in Japan, where the latter disease is considered to be rare.

The fact that this experimental disease is a non-infective process has been established beyond doubt. For histopathologists it is an education to reflect that this "allergic" encephalomyelitis often far exceeds the most severe of known infective processes in the extent of the visible structural changes which it causes. And in this respect it can be said that the detection of this purely immunopathological process, along with its close counterpart, iso- and auto-allergic thyroiditis, opens up an entirely new field of structural pathology.

Whereas allergic encephalitis was primarily an empirical discovery in experimental pathology and its immunological background remains to be elucidated, experimental allergic thyroiditis is a discovery directly derived from systematic studies in the immunology of tissue substances. E. Witebsky and N. R. Rose⁷ found that antisera both to purified thyroglobulin and to unfractionated extracts of thyroid gland contained antibodies which were thyroid-specific and not species-specific. Quantitative studies indicated that the thyroid specific antigens, though closely related, were not identical in all species. When, following partial thyroidectomy, an animal was injected with extracts of its own thyroid tissue along with adjuvants, similar antibodies could be shown to appear in its serum. Witebsky and Rose⁸ have shown that these are true antibodies to thyroid protein. Thus, a specific antibody-globulin was produced autogenously in response to an identifiable protein identical with, or very closely related to, the animal's own thyroglobulin. As there was the possibility that denaturation in extraction had rendered thyroglobulin antigenic, the next step was to determine if the circulating antibody had affected the natural substance in the animal's own gland. This led to the discovery of

- ¹ Waksman, B. H., and Adams, R. D., *J. exp. Med.*, 1955, **102**, 213.
- ² Kabat, E. A., Wolf, A., and Bezer, A. E., *ibid.*, 1949, **89**, 395.
- ³ Greenfield, J. G., in *Medical Research Council, A System of Bacteriology in Relation to Medicine*, 1930, **7**, 133, London.
- ⁴ Glanzmann, E. L., *Schweiz. med. Wschr.*, 1927, **57**, 145.
- ⁵ Lumsden, C. E., and Prier, J. O., *Proc. roy. Soc. Med.*, 1958. In press.
- ⁶ Uchimura, Y., and Shiraki, H., *III^e Congrès International de Neuropathologie, Rapports et Discussions*, 1957, page 90, Brussels, *Acta Medica Belgica*.
- ⁷ Witebsky, E., and Rose, N. R., *J. Immunol.*, 1956, **76**, 408 and 417.
- ⁸ *Symposium on Immunopathology*, 1958, Seelischberg. In press.
- ⁹ *Science*, 1958, **127**, 1122.
- ¹⁰ Witebsky, E., and Steinfield, J. Z., *Immun.-Forsch.*, 1928, **58**, 271.
- ¹¹ Lumsden, C. E., Kabat, E. A., Wolf, A., and Bezer, A. E., *J. exp. Med.*, 1950, **92**, 253.
- ¹² Thomas, L., Paterson, P. Y., and Smithwick, B., *ibid.*, 1950, **92**, 133.
- ¹³ Kabat, E. A., *VII^e Congrès International de Neurologie, Rapports et Discussions*, 1957, page 31, Brussels, *Acta Medica Belgica*.
- ¹⁴ Waksman, B. H., *ibid.*, page 48.
- ¹⁵ Lumsden, C. E., *Proc. roy. Soc. Med.*, 1956, **49**, 148.
- ¹⁶ *III^e Congrès International de Neuropathologie, Rapports et Discussions*, 1957, page 34, Brussels, *Acta Medica Belgica*.

gross histological changes accompanying the rise of anti-thyroglobulin titre in the circulating blood. The circle of evidence establishing the authenticity of auto-antibodies and of auto-antibody disease would seem to have been successfully closed, and the thyroiditis system must serve as a model for studies of diseases where auto-immunization is postulated.

The present state of the immunology of experimental allergic encephalitis, reviewed recently,⁹ is by comparison still unsatisfactory, and there are important differences in detail from thyroiditis. Immunologically, Witebsky's species-nonspecific neural antigen,¹⁰ a lipopolysaccharide, is not itself the encephalitogenic factor. The brain disease occurs much more quickly than the thyroid disease. The antigen seems to be related to the myelin, and each of three types of chemical substance—certain proteolipids, certain proteins, and a phospholipid (? impure)—has encephalitogenic properties, though together they do not account for the total activity of crude brain tissue. Pending identification and purification of an encephalitogenic antigen, studies of the antibodies produced by the injections have been limited to complement-fixing antibodies (tested with crude extracts), and these have shown no clear relation to the disease in the brain^{11 12}; nor has either humoral or cellular passive transfer of disease been proved possible.¹³ Delayed skin reactions are the only immunological reaction yet found¹⁴ which show any correlation with the development of the disease, and this evidence is so far probably the best favouring the hypothesis of a delayed sensitivity of the tuberculin type as the probable immunological mechanism whereby the brain lesions are produced. The proliferation of the reticular cells in the brain and their maturation to plasma cells strongly support the idea that there is local formation of antibody in the brain itself—though for the same reason it seems this must also occur in the thyroiditis system. Lumsden^{15 16} has drawn attention to the localization of the reactive process to the venules in the brain, and has suggested this is due to a combination of a reticular sheath round post-capillary vessels, high permeability of the walls of these vessels, and relative stasis at this level of the brain circulation. The possibility of local liberation of pharmacologically active substances as a secondary phenomenon responsible for the demyelination has been suggested^{15 16} as consistent with what is known of other aspects of the pharmacology of the inflammatory response. Further work is therefore needed not only on the immunology but also on the pharmacology and cytology of experimental allergic encephalomyelitis.

UNMARRIED PARENTHOOD

The problems associated with unmarried parenthood have for long vexed administrators and perplexed ecologists. The prevalence of illegitimacy has for many years been greater in Scotland than in England, though the proportion of illegitimate births has fallen in both countries; in 1866, 10.27% of all the children born alive in Scotland were registered as illegitimate, the highest figure ever recorded since the inception of national statistics. The Scottish Registrar-General, in his early reports, was at pains to point out that the causes of illegitimacy in Scotland were essentially different from those prevailing in other European countries and had their origin in different social relationships. He returned to the subject in 1874, finding no correlation between the weight of illegitimacy and the extent of "ignorance or want of instruction" among the people.¹ There were wide variations in incidence from one part of the country to another, and the Registrar thought that the explanation for these must be sought in the habits of the people, their greater or less addiction to "night courtships," the want of moral training, "and to the incontinence of youth, which in some countries, particularly those in which the demand for labourers and workers is great, finds its legitimate channel in marriage, though it may be improvident marriage; while in others prudential check operates so strongly that it leads to that form of non-resident concubinage which results in illegitimate births." G. Seton,² writing some ten years later, reiterated that every statistician was "aware that the unrestrained passions which in rural districts result in illegitimate births are in large towns diverted into the channel of barren prostitution." It is certain that illegitimacy was, in general, more prevalent in the rural parts of the Scottish mainland than in other districts; the blackest areas of all were the counties of Banff and Wigtown. In the ten years following 1866 fully 25% of the 1,080 births registered in one Banffshire parish were illegitimate: 59 mothers gave birth to 153 illegitimate children in the course of these ten years, accounting for more than half of the total illegitimacy—2 produced 5 children each; 6, 4 children each; 11, 3 children

¹ Annual Report of the Registrar-General, Scotland, 1874.

² Seton, G., *Trans. roy. Soc., Edinb.*, 1883-4, 12, 117, 619.

³ Spence, J., Walton, W. S., Miller, F. J. W., and Court, S. D. M., *A Thousand Families in Newcastle upon Tyne*, 1954, London.

⁴ Nisbet, B., at Annual Conference of Scottish Council for the Unmarried Mother and Her Child, 1954.

⁵ Greenland, C., *Med. Offr.*, 1958, 92, 265, 281.

⁶ Registrar-General's Decennial Supplement, England and Wales, 1951, *Occupational Mortality*, Part II, 1958, Vol. 1, 159, H.M.S.O., London.

⁷ League of Nations, *Study on the Legal Position of the Illegitimate Child*, 1939, Geneva.

⁸ *The Law in Relation to the Illegitimate Child*, 1958, British Medical Association, London.

each; and 40, 2 children each. A local clergyman who studied the subject about that time came to the conclusion that both religion and education had failed to tackle the problems of illegitimacy: among the causes, he listed drink, seduction under promise of marriage (rarely fulfilled), insufficient supervision of servants, inadequate house accommodation, concubinage, the tolerance of public opinion, and the protection of the "male offender," to some extent, by the existing law.

The matter has continued to command attention in more recent times. J. Spence and his co-workers³ found that less than half of the illegitimate children in their Newcastle series were first babies; many of the second and third infants were born to parents living in established, if unofficial, families. In Kilmarnock, B. Nisbet⁴ found that 30% of the mothers of illegitimate children were cohabiting. Many of these families are living under extremely bad environmental conditions, often in condemned property, with little prospect of getting a better house—cohabitators do not rank high in official housing lists. In recent studies of unmarried parenthood, based largely on the case records of the National Council for the Unmarried Mother and Her Child (rather biased and incomplete material, as he points out), C. Greenland⁵ concluded that a combination of factors, such as residence away from home, and certain types of employment, particularly domestic and clerical work and nursing, appear to be associated with an increased risk of conception in young unmarried women. In many cases the mother had applied to the Council for general information and advice; in 13% she wanted advice about an affiliation order; in 9% she was seeking employment and a home; while in 8% she was concerned primarily with ways and means of keeping the child. Greenland found that men under 20 years of age, married men, or members of armed Forces were often the fathers of illegitimate babies, but his findings did not lend support to "theories which regard putative fathers as a homogeneous group having certain psychological features in common."

The welfare of the illegitimate child has long given cause for anxiety. At one time the official attitude to illegitimacy was more concerned with possible repercussions on the poor rate than with the welfare of the child. From 1868 onwards the officers of the Board of Supervision urged parochial boards in Scotland to offer only indoor relief to the mothers of illegitimate children, hoping by this course of action to reduce the burden of pauper illegitimacy, though the refusal of outdoor relief in these cases often led to the death

of the children. It has been the general experience that the prospects of survival of the illegitimate child are much less favourable than those of the legitimate. Recently the Registrar-General⁶ has pointed out that the mortality rates of illegitimate infants are much less accurate than those of the legitimate infants, partly because a proportion of the infants who are registered at birth as illegitimate and subsequently die are not recorded as illegitimate at death registration: it is probable that this has the effect of under-estimating the infant mortality of illegitimate children by about 16%. In 1930-2 the calculated illegitimate infant mortality rate was 79% higher than the legitimate rate; by 1949-53 the excess had fallen to 36% and there had been as well a substantial decline over that period in the mortality of infants in each social class. But, apart from considerations of mortality, the illegitimate child usually starts life with serious handicaps, social, emotional, moral, and legal. The League of Nations study⁷ of the legal position of the illegitimate child and, more recently, the joint report of the British Medical Association and the Magistrates' Association⁸ were agreed that changes in the law were urgently necessary to protect the unmarried mother and her child, and the time seems to be ripe for further action.

BLOOD GROUPS OF MUMMIES

The considerable success achieved by blood-grouping methods in the classification of living human populations has led from time to time to attempts to determine the blood groups of human bones and other tissues obtained from archaeological excavations. Most of the experiments have been limited to the antigens of the ABO system, and it is still exceedingly doubtful whether it will ever be possible to detect the antigens of the other systems in post-mortem material which has not been specially preserved. It is of course impossible to obtain intact red cells from archaeological material, and tests must therefore depend on the inhibition of the grouping sera by samples of the tissues or by extracts or preparations from them. The earliest experiments were those of W. C. Boyd and L. G. Boyd,¹ who performed inhibition tests with muscle tissues from Egyptian and American Indian mummies. Since then methods have been somewhat refined, though no great advances have been made; P. B. Candela² appears to have been the first to carry out tests on ground samples of bone, a substance much more widely available than muscle tissue. The literature of archaeological blood grouping up to 1953 has been reviewed by A. E. Mourant.³

¹ Boyd, W. C., and Boyd, Lyle G., *Proc. Soc. exp. Biol. (N.Y.)*, 1934, 31, 671.

² Candela, P. B., *Amer. J. Phys. Anthropol.*, 1936, 21, 429.

³ Mourant, A. E., *The Distribution of the Human Blood Groups*, 1954, Oxford.

The results of tests on series of ancient remains have proved generally consistent with those on the corresponding living populations, but have often shown an excess frequency of group AB above that required for genetical equilibrium. It thus appears probable that while, taken on a population basis, the results do give some indication of genetical constitution, most if not all series include some false positives. This is not surprising, since all the specimens tested must contain bacteria. Bacterial contamination is already known to give rise for various reasons to errors in the testing even of red cells only a few days or weeks old. Some such results depend upon the Thomsen phenomenon, which is due to the development of an antigen not closely related to the blood groups. This causes "false" positive agglutination and hence would give rise to false results in the detection of blood-group antigens by inhibition methods. On the other hand some bacterial polysaccharides are closely related biochemically and even immunologically to the blood-group substances and so might be expected to cause inhibition simulating that due to the blood-group antigens.

If blood-group tests are to be used for archaeological purposes, and if the results are to command any confidence, it is clear that existing techniques need to be refined considerably, or new methods developed. In either case the methods, before being applied to ancient specimens, must be shown to give correct results with recent cadaver material of which the blood group is known. It may be that the blood-group antigens are too unstable on the one hand or too similar to bacterial polysaccharides on the other for a standard of accuracy ever to be reached comparable with that attained in the testing of living persons; but if reliable results could be obtained they would be of such great value to archaeologists that it is important that renewed efforts should be made to improve the methods of testing.

The news is therefore welcome that a blood-grouping laboratory for these purposes has been set up at the British Museum (Natural History). Work is being carried out by Mrs. Madeleine Smith in the Anthropology Section, of which Dr. K. P. Oakley has charge. The first object of the laboratory is the development and critical assessment of new and more accurate testing methods. It is proposed, however, to undertake almost immediately the testing both of a certain amount of "mummified" material (for example, from the dry soils of Peru) and of a selection of bones of ancient Etruscans, which have been preserved under damper and presumably less favourable conditions. In the long run there is little doubt that mummified material will yield valuable if not completely accurate results; such results would of themselves fully justify the establishment of the laboratory. If in addition reliable methods can be developed for the testing of bones preserved under moist conditions a most important addition will have been made to the scope of archaeology, and a great contribution to the possibility of correlating ancient populations with those of the present day.

GOITROUS HYPOTHYROIDISM

Recent advances in knowledge of thyroid function have emphasized the diagnostic significance of a palpable thyroid gland in a hypothyroid subject, whether baby, child, or adult. The gland itself may be soft or hard, smooth or nodular, small or large, but from its enlargement certain conclusions may be drawn: that the thyroid is subject to some difficulty in producing thyroxine and triiodothyronine, that this difficulty has been present for some time, and that the deficient output of thyroid hormones has resulted not only in the clinical state of hypothyroidism but also in an increased production of the thyrotrophic hormone T.S.H. in the endeavour to stimulate output of thyroxine. This attempt is unsuccessful, and the best that T.S.H. can achieve in this situation is an enlargement of the gland due to hyperplasia.

The thyroid gland is not as a rule well palpated by medical students or by young clinicians. The correct method of examination remains a matter of opinion, but the method usually taught of standing behind the sitting patient and blindly palpating with both hands has little but custom to commend it. Few right-handed clinicians have a left hand as sensitive as the right (the trouble, as Trotter used to explain, with some of us is that we have two left hands), and everyone uses either hand more expertly when aided by direct vision. The methods of standing alongside (to the right if right-handed) the sitting patient and palpating with one hand appears to achieve better results when used by those clinicians not yet wedded to the older method. In hypothyroid children in whom no gland can be palpated in the usual situation the possibility of dysgenesis¹ (imperfect descent) is worth remembering, and the examining fingers should explore the neck on both sides below the jaw.

Further conclusions can be drawn from the nature of the enlarged gland in hypothyroid subjects when the patient and his environment are considered. The discovery of a small, even tiny, gland in a baby with cretinism or in a child with hypothyroidism suggests an inborn defect of thyroxine synthesis; this is even more firmly indicated when the gland is large and nodular and the patient older. The enlarging gland in the thyrotoxic patient treated by antithyroid drugs shows that the patient is moving over to hypothyroidism. The hard and enlarged gland of autoimmunizing thyroiditis is often associated with myxoedema in women.

But in the present state of our knowledge we must not conclude that, because the thyroid gland is atrophic and impalpable in the presence of hypothyroidism, the gland has therefore not been the seat of similar inborn defects or of pathological processes. It is easy to conceive that

¹ McGirr, E. M., and Hutchison, J. H., *J. clin. Endocr.*, 1955, **15**, 668.

² Wyngaarden, J. B., Stanbury, J. B., and Rapp, B., *Endocrinology*, 1953, **62**, 568.

³ Astwood, E. B., *Ann. N.Y. Acad. Sci.*, 1949, **50**, 419.

⁴ Mosier, H. D., Blizard, R. M., and Wilkins, L., *Pediatrics*, 1958, **21**, 248.

⁵ Stanbury, J. B., and Hedge, A. N., *J. clin. Endocr.*, 1950, **10**, 1471.

⁶ Kassenaar, A. A. H., Meijer, J. W. A., and Terpstra, J., *ibid.*, 1955, **15**, 1216.

⁷ Stanbury, J. B., Ohela, K., and Pitt-Rivers, R., *ibid.*, 1955, **15**, 54.

a gland destroyed by chronic thyroiditis is incapable of response to T.S.H., and remains shrunken and atrophic; and there is now good evidence that myxoedema is often, if not always, the result of such a process. It is also possible that the foetal thyroid gland, as the result of some inborn enzymatic defect, may also fail to respond to T.S.H.

One group of antithyroid drugs such as potassium perchlorate and thiocyanate act by preventing the uptake of iodide by the gland,² and they are used also in the investigation of thyroid function to procure the discharge of iodine unbound to tyrosine from the gland. Another group, the thiocarbamides such as methyl thiouracil and carbimazole, prevent the iodination of tyrosine³ (the second step in the synthesis of thyroxine). Three types of congenital defect in the synthesis of thyroxine have now been identified.⁴ The first defect occurs at the stage of iodination of tyrosine⁵ (the stage at which the thiocarbamides have their action). The second defect is due to a failure of deiodination of the iodotyrosines, presumably associated with a failure of the enzyme dehalogenase.⁶ And the third is a partial inability to form thyroxine and triiodothyronine from the iodotyrosines.⁷ No drugs are known to interfere with the late stages of thyroxine synthesis at which the second and third of these congenital defects declare themselves. Hypothyroidism which is due to the use of antithyroid drugs requires the temporary cessation of therapy. Hypothyroidism which is due either to congenital defects in thyroxine synthesis or to chronic thyroiditis requires lifelong thyroid therapy—sufficient for the needs of the body, sufficient to suppress the formation of T.S.H., and sufficient to put the overactive or pathological gland at rest.

IMMUNIZATION AGAINST DIPHTHERIA

The proportion of children in different parts of the country immunized against diphtheria varies widely. Though precise figures are not readily available, it seems to range from under 30% to over 70% in England and Wales, and to average about 70% in Scotland. The present outbreaks in Essex and London,¹ though small by the standards of 20 years ago, are a reminder that a high state of immunization is the surest barrier to the epidemic spread of the disease. The number of children immunized in England and Wales against diphtheria in the three years 1955–7 was 525,125, 567,989, and 546,776, respectively. The percentage of children who may be regarded as remaining protected—that is, children who had a course of immunization, primary or booster, during the preceding five years—for the years 1953–7 was 48, 48, 49, 49, and 48. In Scotland it was about 70%. Though the percentage throughout the country varies from place to place, it varies only slightly from year to year in any area. In a speech he made last week Dr. J. A. Stirling, the new president of the Society of Medical Officers of Health, wisely urged his colleagues to keep parents well informed about the necessity of having their children immunized.

¹ *Brit. med. J.*, 1958, **2**, 1051.

In England and Wales in 1956 there were 11 cases of diphtheria among the immunized with 1 death, and 40 cases among the non-immunized with 2 deaths. In 1955 there were 34 cases among the immunized with no deaths, and 120 among the non-immunized with 13 deaths. In Scotland, during the nine years 1949–57 there were 151 confirmed cases of diphtheria among the immunized children, with no deaths; among the non-immunized children there were 665 confirmed cases, with 35 deaths.

The number of notifications of diphtheria fell rapidly after the widespread introduction of immunization, from an annual average of about 55,000 in 1933–42 to 40 in 1957, while the number of deaths fell from an annual average of 2,783 in 1933–42 to six in 1957. The distribution of cases was sporadic, and the largest annual number of cases in local authority areas in 1955 was 19 in Uttroter R.D., 17 in Kingston-upon-Hull C.B., and 14 in West Ham C.B. Kingston-upon-Hull had the largest annual total in 1956 and 1957, with 7 and 6 cases respectively. It is interesting to note that, though full swabbing of family, school, and other contacts was performed in most areas where cases occurred, in only a few instances were carriers revealed; the source of infection usually remained unknown. Past experience has shown that in school communities where immunization rates are low diphtheria has only to be introduced to spread rapidly. It is at school entry that an opportunity exists to raise the number of immunized children in the community.

B₁₂ ASSAYS IN MEGALOBlastic ANAEMIA

Uncomplicated vitamin-B₁₂ deficiency in man frequently gives rise to megaloblastic anaemia, which can be differentiated from that seen in folic-acid deficiency or in scurvy^{1,2} by the fact that it is cured by treatment with vitamin B₁₂. However, the lingual and neurological lesions caused by deficiency of vitamin B₁₂ are sometimes found in patients who are not anaemic,^{3,4,5} and deficiency of B₁₂ and folic acid may occur together in patients with intestinal malabsorption syndrome. In such patients it may be impossible to diagnose deficiency of vitamin B₁₂ by clinical and haematological methods alone.

However, deficiency of B₁₂ can be detected in these patients by assaying the amount of it in the serum by the use of micro-organisms, of which *Euglena gracilis*^{6,7}

¹ Jandl, J. H., and Gabuzda, G. J., *Proc. Soc. exp. Biol. (N.Y.)*, 1953, **84**, 452.

² Brown, A., *Brit. J. Haemat.*, 1955, **1**, 345.

³ Badenoch, J., *Proc. roy. Soc. Med.*, 1954, **47**, 426.

⁴ Arias, I. M., Apt, L., and Pollock, M., *New Engl. J. Med.*, 1955, **253**, 1005.

⁵ Adams, J. F., *Lancet*, 1957, **1**, 1120.

⁶ Ross, G. I. M., *J. clin. Path.*, 1952, **5**, 250.

⁷ Hutner, S. H., Bach, M. K., and Ross, G. I. M., *J. Protozool.*, 1956, **3**, 101.

⁸ Rosenthal, H. L., and Sarett, H. P., *J. biol. Chem.*, 1952, **199**, 433.

⁹ Spray, G. H., *Clin. Sci.*, 1955, **14**, 661.

¹⁰ Mollin, D. L., and Ross, G. I. M., *Proc. roy. Soc. Med.*, 1954, **47**, 428.

¹¹ ——— in *Vitamin B₁₂ and Intrinsic Factor*. 1. Europäisches Symposium, Hamburg, 1956, edited by H. C. Heinrich, p. 413. Ferdinand Enke Verlag, Stuttgart.

¹² Lear, A. A., Harris, J. W., Castle, W. B., and Fleming, E. M., *J. Lab. clin. Med.*, 1954, **44**, 715.

¹³ Girdwood, R. H., *Quart. J. Med.*, 1956, **25**, 87.

¹⁴ Meynell, M. J., Cooke, W. T., Cox, E. V., and Gaddie, R., *Lancet*, 1957, **1**, 901.

¹⁵ Spray, G. H., and Wits, L. J., *Brit. med. J.*, 1958, **1**, 295.

¹⁶ Gardner, F. H., *New Engl. J. Med.*, 1958, **258**, 791.

¹⁷ Tarker, P. W. G., Mollin, D. L., and Berriman, H., *Brit. J. Haemat.*, 1958, **4**, 167.

and *Lactobacillus leichmannii*⁹ are the best known. Measured in this way, the B₁₂ concentration in the serum of patients with Addisonian pernicious anaemia¹⁰⁻¹⁵ is always lower than in normal subjects. While the B₁₂ concentration in the serum of normal subjects ranges from 140 to 900 µg. per ml., most patients with Addisonian pernicious anaemia have levels of less than 80 µg. per ml. However, some control subjects may have levels as low as 100 µg. per ml. and a few non-anaemic patients with Addisonian pernicious anaemia have levels up to 110 µg. per ml. On the other hand, all patients with subacute combined degeneration of the cord, even when they have no anaemia, have little or no measurable B₁₂ in their serum with the Euglena assay.¹⁰⁻¹¹ The diagnostic value of such an estimation is clear. In addition, this observation suggests that subacute combined degeneration does not develop until the tissues are almost completely depleted of B₁₂, and furthermore that the megaloblastic anaemia in pernicious anaemia may not be due solely to deficiency of B₁₂.

The incidence of B₁₂ deficiency may also be accurately assessed in other megaloblastic anaemias by this method. For instance, in patients with megaloblastic anaemia associated with gastrectomy and with anatomical lesions of the small intestine the B₁₂ concentrations in the serum are almost always subnormal, the levels being similar to those seen in Addisonian pernicious anaemia. Deficiency of folic acid rarely occurs in these patients, for they usually respond completely to treatment with vitamin B₁₂. Subnormal levels of B₁₂ in the serum are also common in tropical sprue¹⁶ and in "tropical megaloblastic anaemia,"¹⁷ but in these conditions they are more frequently associated with deficiency of folic acid, for the haematological responses to treatment with B₁₂ are slower and less complete. Subnormal levels are also found in about 50% of the patients with idiopathic steatorrhoea,¹⁰⁻¹⁴ and in one-third of these patients the levels are as low as in pernicious anaemia, being less than 100 µg. per ml. However, in such patients the B₁₂ deficiency is invariably associated with folic-acid deficiency, for none of these patients appear to respond completely to treatment with B₁₂ alone. Subnormal levels of B₁₂ in the serum are less frequent in megaloblastic anaemia of pregnancy,¹¹⁻¹⁵ and in most patients the concentrations are normal.

While the evidence suggests that a B₁₂ concentration in the serum of less than 80 µg. per ml. indicates clinical B₁₂ deficiency, serum levels between 80 and 120 µg. per ml. have been found occasionally in patients whose tissue stores of B₁₂ were normal.¹¹ Though such findings are very rare, they suggest that borderline levels of serum B₁₂ should be interpreted with caution.

ADVERTISING DRUGS

"You can count the number of useful drugs on the fingers of your two hands" one well-known physician used to say to his students little more than thirty years ago. Since then there has been a revolution in the drug treatment of disease. The revolution is still on. The brilliance of the bacteriologist, chemist, and pharmaco-

logist, combined with the energy and resourcefulness of the pharmaceutical industry, has let loose a flood of new and powerful remedies to be used by doctors for the benefit of patients. Politicians and administrators moan about the cost of this to the National Health Service. At one time the size of the national drug bill was attributed to unrestricted and free access to the simple remedies and dressings in the chemist's shop. Then the blame fell on the pharmaceutical industry for high-pressure salesmanship of remedies, and combinations of remedies, the cost of which was regarded as excessive. No one has been entirely free from blame, least of all the politicians who encouraged the whole population of the United Kingdom in the belief they could take what they wanted out of the chemist's shop without having to pay for it. But without the pharmaceutical industry modern medicine would be powerless to do good with the drugs modern science provides for it, drugs discovered often enough in the laboratories of the industry itself. Information about these drugs reaches the practising doctor in a number of ways, and elsewhere in this issue Dr. Audrey Baker describes the results of her inquiry into the value set by doctors on the information given by pharmaceutical houses through the post, by medical representatives, and in the advertisement columns of medical journals. Some 90% read the advertisements for drugs in medical journals—64% often or always, and 26% seldom. That 80% preferred to get their information on drugs by discussion with firms' representatives suggests that the industry as a whole might look more critically at the type of copy their agents send to the medical press.

What is of special interest to us is Dr. Baker's conclusion that there is "a *British Medical Journal* readership of between 80% and 90%," throughout Great Britain, a record far outstripping that of all other medical periodicals. This is gratifying to us and, we may assume, to the growing number of firms aware of the value of advertising their wares to the *B.M.J.*'s readers.

NOBEL PRIZE FOR CAMBRIDGE BIOCHEMIST

The award of the Nobel Prize for Chemistry to Dr. F. Sanger, F.R.S., is in recognition of his outstanding work in analysing the structure of the insulin molecule. The work took about ten years to complete and was carried out with his colleagues in the Biochemistry Department at Cambridge University during 1945-55. Now aged 40, Dr. Sanger was elected a Fellow of the Royal Society four years ago. At the time this work was completed the insulin molecule was the largest protein molecule to have had its chemical structure elucidated. This great achievement was an essential preliminary to any chemical synthesis of insulin as well as of analogues which may be easier to administer in clinical practice.

We record with regret the death on October 24 of Sir John Megaw, formerly professor of tropical medicine at the Calcutta School of Tropical Medicine and Director-General of the Indian Medical Service from 1930-33.

Drug Treatment of Disease

SEDATIVES AND TRANQUILLIZERS: PART II*

BY

WILLIAM SARGANT, F.R.C.P.

Physician in Charge of the Department of Psychological Medicine, St. Thomas's Hospital

Tranquillizers

In recent years over twenty so-called tranquillizers have been marketed by drug manufacturers to replace or to reinforce the older types of sedatives already discussed. Unfortunately some of these drugs have been offered to general practitioners long before they have been properly tested in Great Britain, and false claims and even some disasters have occurred. We have seen, for instance, the spate of suicides by depressive patients following the unwise advocacy of reserpine as a tranquillizer for general use and in the treatment of hypertension before this fatal complication of treatment had been fully realized. Many cases of jaundice likewise followed the enthusiastic claims made for chlorpromazine long before most British psychiatrists had had any real opportunity to test it out and to find its potential advantages and dangers. Again, it is now known that chlorpromazine can greatly increase depression in an already depressed person (though perhaps not to the same extent as reserpine), with the consequent risk of suicide. It is thus inadvisable to try out new tranquillizers in general practice until they have been thoroughly tested in Great Britain, and tested in circumstances which will prevent the disasters that have happened in recent years.

The writer has, so far, been able to try out only some of these new tranquillizers in a way which justifies their detailed discussion in an article of this nature. Others may be useful, but some have proved of little use at all, and should never have been put on the market or advertised for general use.

Chlorpromazine

This drug unfortunately produces jaundice in some patients, but the benefit it gives often makes this a worthwhile risk if the patients are properly selected for it. It is of far greater value in the sedative treatment of the psychotic patient in hospital than the neurotic patient out-patient. But there is now some evidence that chlorpromazine, if given in sufficiently large doses (200-400 mg. a day), may abort the development of acute schizophrenic illnesses in some of those persons predisposed to them. General practitioners may find it advisable to give this drug immediately to patients in the very earliest phases of the illness and to patients while awaiting, for instance, the taking of further expert advice on future treatment. Since its introduction in psychiatry, this drug has also enabled many schizophrenic patients to be treated much more speedily than previously, and some can now stay on as out-patients instead of having to go into hospital for insulin-coma and other treatments. Even when other treatments, such as full or modified insulin, E.C.T., and leucotomy also have to be used, chlorpromazine seems to be a drug of considerable value as a maintenance treatment, tending to prevent relapses. However, quite large doses are generally necessary, doses which can, in fact, markedly aggravate other neurotic and psychotic conditions. Indeed, schizophrenics may need to be given initially up to 1,000 mg. a day, and maintenance doses of 150-400 mg. a day may also be necessary later on. At present we do not yet know

how long these large doses have to be kept up; but relapses often occur within a month of the patient being taken off the drug even after prolonged use.

There are also many elderly senile patients, suffering particularly from agitation, in whom ordinary sedatives produce confusion and increasing upset of memory. Such patients are often greatly helped by the use of chlorpromazine in lower doses—say, 100-200 mg. a day. By damping down their agitation it may enable them to be nursed at home rather than in hospital. In ordinary neuroses chlorpromazine should be given much more hesitantly. Doses in the region of 100 mg. a day can help some patients with anxiety and depression, but the administering of this drug alone in cases of depression can increase the symptoms, sometimes to the point of suicide, and general practitioners must always be on their guard against this. Anxiety states, anxiety hysteria, and obsessional states are really little helped by this drug, and the barbiturates will be found much cheaper and much more effective. Chlorpromazine, however, may be used to reinforce small doses of barbiturates, and to prevent larger doses producing undesirable states of barbiturate addiction.

Several substitutes and equivalents have been produced for chlorpromazine, some of them claiming that jaundice is avoided as a complication of their use. These may be tried where jaundice has occurred, but whether they are as effective as chlorpromazine is as yet far from certain.

Reserpine

This drug has also had a recent vogue in the sedative treatment of anxiety states and in schizophrenia. Some excellent results have been reported in schizophrenic illnesses when the dose is pushed to as high as 8-10 mg. a day, and a maintenance dose of around 3-6 mg. a day is used later. But there are many undesirable features attaching to the use of this drug. Suicidal depressions are very common, and it is doubtful whether much better results are obtained with reserpine than with the skilled use of chlorpromazine in a proper high dosage. Smaller doses of reserpine (1-2 mg. a day) can, however, be given to supplement larger doses of chlorpromazine.

Some tension states are also undoubtedly helped by much smaller doses of reserpine—about 0.25 mg. three times a day. But it is difficult to delimit these, and one should try to use every other drug first, because of the drug's liability to produce such severe depressive reactions. The physician should be especially careful in treating anyone who has a prior history of a neurotic or psychotic attack of depression.

Meprobamate

This expensive sedative has had a great vogue in the U.S.A. But testing in Great Britain indicates that it has only limited uses as compared to, say, the much cheaper barbiturates. It is helpful in treating withdrawal states in the alcoholic. It relaxes muscle tension, and some patients with reactive tension depressions do seem to be helped by it; these patients may put on weight while on this drug.

Another group of patients which meprobamate helps are those who show mixed hysterical and obsessive phobic symptoms. These patients, when taking short-acting barbiturates, become easily addicted to them; they may also become addicted to meprobamate, and withdrawal symptoms have been reported; but so far this has not yet proved too serious a complication. Meprobamate does not help patients

*Part I of this article was published last week at p. 1031.

with pure obsessional states or deep endogenous depressions. Only 1-2 400-mg. tablets three times a day, and not more, should be prescribed where indicated.

Conclusions

Clearly sedation should not be given to patients without attempts also being made to deal with environmental and other stresses that may be a cause of the anxiety and tension. But it is a commonplace in general practice that the giving of judicious rest to the nervous system by sedation can often make problems which had temporarily seemed insuperable to a patient become quite easy to handle again. It is worth bearing in mind that the normal brain generally

adjusts to its environment, and, as was very obvious during the last war, the normal brain can tolerate very bad environments indeed for very long periods of time. Likewise the last war also showed in a most convincing manner what is just as true in peacetime—namely, that once breakdown happens it is comparatively easy to abort acute neurotic reactions if only proper sedative treatment is given in time. But neurotic reactions are much less easy to treat when new abnormal patterns of behaviour and thought have been allowed to become thoroughly ingrained in brain function through the lack of adequate sedation early on in the illness. It may truly be said that a grain of sedative in time saves nine.

THE PHARMACEUTICAL HOUSE AND THE DOCTOR

BY

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Recent correspondence in this and other journals has included statements that doctors are inundated by literature from pharmaceutical houses and that visits from representatives of these firms are not only unnecessary and time-consuming but contribute to the cost of drugs and the expense of the National Health Service.

The Survey

It was decided to ascertain the opinion of doctors themselves on this matter, knowing that only the few who feel strongly on the subject tend to write to the press; it was realized, however, that it would be difficult to obtain a true picture. Surveys are notoriously liable to error, whether in design, method of procedure, or interpretation, but a survey seemed to be the only practicable means.

It was considered that the effectiveness of the survey would depend on two factors: (1) the form of the questions, and (2) the way in which they were presented to the doctor.

The Questions.—(1) These must take only a very short time to answer. (2) They must be such that the answer would be unequivocal.

The Presentation.—(1) The doctor must be assured of his anonymity. (2) He must be asked but not pressed to answer.

Bearing these points in mind, a punch-card was designed with all the questions on one side, so arranged that only a tick or cross was needed in the appropriate spaces.

Knowing the almost universal distaste for questionnaires arriving by post, we gave supplies of blank cards to our representatives and instructed them as follows: "Carry out an interview in the usual way, and, when you are about to leave, ask a doctor politely for his co-operation in filling in the answers to some questions which are of interest to us—pointing out that this will take only about a minute. If any doctor prefers not to do so, do not press him, but record the number of such refusals each day." The representatives were further instructed to complete the back of the card themselves but not to enter the doctor's name anywhere.

All doctors visited were to be presented with cards, and all completed cards were to be returned to us each day.

Classification of Responses.—Cards were appropriately punched on receipt and were filed until enough had been received. The number used in the survey represents 10% of the total number in the National Health Service.

Results

The results are shown in the Table, from which the following observations can be made:

1. Less than 3.5% of the doctors interviewed failed to reply. This figure may be misleading because it takes no count of doctors with whom the representative failed to obtain an interview; but of those who replied, more than 80% said that they almost always see medical representatives.

2. Percentage variations in the replies to certain questions were so slight even in widely separated areas that a strong presumption seems justified that the answers are a true representation of medical opinion and not due to the influence

Table Showing Area Distribution

	Scotland	N. Ireland	N. England	W. England	East and Home Counties	London	Total All Areas
No. interviewed	569	340	867	804	651	304	3,535
.. not replying	2	0	7	51	28	38	126
Replies for analysis	567	340	860	753	623	266	3,409
Question	%	%	%	%	%	%	%
1. Do you see medical representatives?							
Almost always	519	305	759	656	501	187	3,409
Often	44	35	88	84	113	71	2,927
Seldom	4	10	9	11	5	3	435
Hardly ever	4	1	4	4	4	1	34
2. How many times a year would you prefer them to call on you?							
Three times	284	201	160	176	148	76	3,405
Twice	243	131	550	436	367	133	1,045
Once	36	7	137	132	99	50	1,860
Never	4	1	10	5	6	2	461
3. Do you read advts. for pharmaceutical preparations?							
Almost always	96	98	186	136	102	72	3,394
Often	195	124	403	343	283	115	2,973
Seldom	210	92	192	187	158	57	1,463
Hardly ever	62	24	76	85	77	21	896
4. Which journal?							
B.M.J.	513	273	773	665	523	226	4,952
Lancet	57	28	115	81	126	82	2,973
Other*	323	146	360	311	251	99	1,490
5. Do you prefer information on preparations?							
As advts. in journals	122	51	300	175	164	111	4,155
Discussed with reps.	525	304	646	602	513	212	923
Sent in post	55	22	139	114	72	79	2,802
6. Would you be willing to co-operate in any future survey of this kind?							
Total replies							3,394
Yes							3,207
By interview							1,344
By post							260
No							187
Not stated							1,603

More than one reply was given on some cards to questions 4 and 5. Some cards omitted replies to questions 2, 3, and 6. It is a coincidence that the numbers of omitted replies to questions 3 and 6 were the same, for a check has shown that they were not necessarily omitted from the same cards.

* Many filled in *Practitioner*.

of the interviewer; for example, in areas as far removed as Scotland and the West of England the answers to question 1 show the following sequences respectively: 91%, 8%, 1% (Scotland); 87%, 11%, 1% (West of England). Similarly, answers to question 4 indicate a *British Medical Journal* readership of between 80 and 90% throughout all areas, and answers to question 5 show that nowhere do more than 16% of doctors prefer obtaining information through the post. Such widespread lack of variation points to a greater significance where variation does occur.

3. Examples of Area Differences in Pattern.—In both Northern Ireland and Scotland the preference is for visits from representatives three times a year. In all areas in England the preference is for twice a year. There is a higher readership of the *Lancet* in the London area and the area including the Home Counties than elsewhere.

4. Other Observations.—Except in the London area, over one-third of all the doctors interviewed seldom or hardly ever read advertisements in journals. Approximately 80% prefer information from discussion with medical representatives. Only about 12% prefer information sent in the post. Classification according to the type of professions practised does not bring to light new facts, but data reveal the known link between consultant physicians and residence in the London area. Further analysis into counties and some of the larger conurbations provides numbers too small for conclusions to be drawn from them. Over 90% of the doctors interviewed expressed willingness to co-operate in a future survey. Among these five times as many preferred an interview to a postal request. Four doctors asked for copies of the survey. Reprints of this paper will be sent to them when available.

I am grateful to the medical representatives who collected the cards and to my assistant, Mrs. I. Winckler, who assembled the data.

TOOLS OF BIOLOGICAL RESEARCH SYMPOSIUM AT GUY'S HOSPITAL

[FROM A SPECIAL CORRESPONDENT]

The Surgical Research Society held a very successful symposium on the "Tools of Biological Research" at Guy's Hospital on October 10 and 11. Mr. H. J. B. ATKINS was responsible for the arrangements. Although the different communications covered an almost bewildering range of subjects, unity was achieved because every speaker first described a technique, its physical principles and limitations, and then showed how it had contributed to knowledge. The detailed proceedings are to be published by Messrs. Blackwells Scientific Publications Ltd.

Strategy and Tactics

In an introductory address, Sir CYRIL HINSHELWOOD, President of the Royal Society, said that the most economical campaign in research usually employed the newest methods. But it was successful only if it had a well-conceived master-plan. Any individual worker might be a specialist in his technical methods, but he should not be so in his thinking and knowledge; the more he was called upon to supervise the work of others, the more he must know what techniques were available and so avoid the tendency common to most of us, to continue to fight the last war. To neglect modern techniques was to be amateurish. They were highly complex and often demanded team-work, but collective action to be its most beneficial must provide opportunities without imposing restrictions.

Dr. PETER ARMITAGE said the original expansion of statistical technique owed much to Carl Pearson, but it was after

Please indicate your choice in the appropriate square

1. Do you see medical representatives?	ALMOST ALWAYS ☐	OFTEN ☐	SELDOM ☐	HARDLY EVER ☐
2. How many times per annum would you prefer them to call on you?	THREE TIMES ☐	TWICE ☐	ONCE ☐	NEVER ☐
3. Do you read advertisements for pharmaceutical preparations?	ALMOST ALWAYS ☐	OFTEN ☐	SELDOM ☐	HARDLY EVER ☐
4. Which journal?	B.M.J. ☐	LANCET ☐	OTHER ☐	
5. Do you prefer information on preparations?	AS ADVTS. IN JOURNALS ☐	DISCUSSED WITH REPS. ☐	SENT IN THE POST ☐	
6. Would you be willing to co-operate in any future survey of this kind?	YES ☐	BY INTERVIEW ☐	BY POST ☐	NO ☐

Front of card.

This is an attempt to find out the views of doctors on methods used by pharmaceutical firms.

All replies are anonymous but an analysis of the results obtained will be sent on request.

For office use only	
General practice	
Consulting physician	
Consulting surgeon	
Hospital staff	
Area	

Back of card.

To-day's Drugs

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Predsol and Predsol-N (Glaxo Laboratories Ltd.).—Ointments and lotions containing 0.25 or 0.5% prednisolone disodium phosphate, with the addition in predsol-N of neomycin.

Deltacortril DA (Pfizer Ltd.).—Prednisolone diethylaminoacetate hydrochloride 0.25% in an ointment with a greasy base.

Precortisyl (Roussel Laboratories Ltd.).—Prednisolone in a 0.5% cream or 0.25% lotion.

The value of hydrocortisone and of combinations of hydrocortisone with neomycin in the treatment of various skin diseases has been well established by clinical use in the course of the last two years or so. It is natural that prednisolone should be put to the same purpose in preparations such as these. They seem to be of a suitable strength, and their clinical effectiveness is very difficult to distinguish from the corresponding hydrocortisone applications. There will be little to choose between these preparations and those containing hydrocortisone, but individual patients may do better with one or the other. As with hydrocortisone, systemic absorption is minimal, and even when large areas are being treated the mildest systemic effects are most unlikely.

N.H.S. basic price: predsol lotion 0.1%, 20 ml., 5s.; 0.25%, 20 ml., 9s.; predsol ointment 0.25%, 5 g., 3s.; 0.5%, 5 g., 5s. 6d.; predsol-N ointment 0.25%, 5 g., 3s. 9d.; 0.5%, 5 g., 5s. 7½d.; deltacortril DA ointment, 5 g., 4s. 6d.; precortisyl cream, 5 g., 5s.; precortisyl lotion, 20 ml., 9s.

Aturbane (Ciba Laboratories Ltd.).—This product has, under the title Ciba 10870, been tested as a palliative measure in cases of Parkinsonism, whether idiopathic or post-encephalitic. It comprises an α -phenyl- α -(diethylaminoethyl) glutarimide hydrochloride, and is parasympatholytic in action. Pharmacologically it is capable of relieving spasm induced by acetylcholine. Clinically it has been found helpful in relieving the excessive salivation and the muscular rigidity of Parkinsonism. Any effect upon tremor and upon oculogyric crises is not usually obvious. Side-effects that have been observed include mental confusion, euphoria, dryness of the mouth, nausea, and vomiting, but all apparently slight in degree with ordinary therapeutic dosages. Glaucoma contraindicates the use of this drug. The drug is a white crystalline powder, soluble in water, dispensed in 5-mg. tablets. The suggested dosage is 10 to 20 mg. daily, though in exceptional cases as much as 50 mg. a day may be given.

N.H.S. basic price: 100 tabs., 17s. 4d.

(Continued from previous page)

a single expiration provided a practicable routine means of measuring the balance between gas and blood distribution in the lungs, so vital to the understanding of the functional pathology of many forms of respiratory disease; while sampling from different lobes or segments of the bronchial tree during diagnostic bronchoscopy had opened an entirely new field. Animal experiments showed that specific changes in gas-concentration patterns were associated with reduction of the air-flow or blood-flow within a lobe. It now seemed likely that the ventilation, blood-flow, and some mechanical properties of diseased lobes or segments of the human lung could be measured before surgery. The technique had also enabled the patterns of gas-flow within the bronchial tree to be measured, and a number of future applications in medicine, surgery, and paediatrics were envisaged.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Addiction to Unrestricted Drugs

SIR,—I think Drs. C. P. Seager and A. R. Foster (*Journal*, October 18, p. 950) have not considered the problem of carbromal addiction adequately. According to them an addictive drug should show one or more of the following properties—viz., craving, tolerance, dependence. One other characteristic could be added—i.e., the recipient should either derive pleasure or prevent distress. The morphine (or heroin) addict takes the drugs either for euphoria or to prevent withdrawal symptoms. Whilst under the influence of the drug he is normal physically and mentally. The three cases of carbromal overdosage described by Dr. Seager resulted in most disagreeable symptoms. No addict would have put up with such discomfort for one moment, neither would a normal person. The authors admit that these cases were psychopathic. They certainly exhibited masochism to a marked degree. It is because the normal person is neither psychopathic nor masochistic that such cases, due to carbromal, are almost non-existent. I cannot, therefore, agree with the authors' conclusion that the open chain ureides should be restricted. The mild insomniac should be able to obtain his sedative without hindrance; the presence of a few psychopaths in the community is insufficient warrant for alteration of the schedules.—I am, etc.,

Melbourne.

F. H. SHAW.

SIR,—In their article on addiction to unrestricted drugs (*Journal*, October 18, p. 950) Drs. C. P. Seager and A. R. Foster draw attention to the risks of habituation and addiction attending the unrestricted sale of certain non-barbiturate drugs. All the drugs they mentioned have been noted in our experience, too, to give occasionally rise to habitual abuse in large, often increasing, doses by unstable people, chiefly alcoholics of a hysterical, immature, and inadequate, or psychopathic, personality-type, who in the past often had also taken to excess barbiturates and amphetamines. Most frequent was the misuse of "persomnia" (a finding confirmed by several doctors in this country with experience in the treatment of alcoholics), and there were occasional cases of habitual excess of carbromal itself and "relaxa-tabs" (another carbromal-bromvalerone preparation), chlorodyne, and the stimulant "preludin." One alcoholic took large, increasing doses of meprobamate. Two cases were seen of habituation to glutethimide, one to methypylone (two non-barbiturate hypnotics which otherwise were found to be safe and effective in several hundreds of patients). Sometimes these people drank to excess simultaneously with taking excessive doses of the drugs, but in general the picture was similar: confusion, incoordination, and slight slurring of speech. There seemed to be a great desire to take large doses of the drugs in increasing amounts, but there was no real evidence of "compulsive craving" or of physical dependency in the form of a withdrawal syndrome.

Warnings against the risk of habit formation arising out of the indiscriminate use of such drugs have of course also been raised in other countries. Thus an American study¹ reports 72 cases of habituation and one of addiction following the use of tranquillizing drugs among 8,200 patients suffering from an anxiety state. In the case of meprobamate several observers noted the occurrence of withdrawal symptoms when the drug was discontinued.^{2,3} The W.H.O. Expert Committee on Addiction-producing Drugs states that "cases of misuse (of tranquillizing drugs) are being reported with increasing frequency," and believes that tranquillizers "must be classed as potentially habit-forming." German authorities have reported cases of habituation and addiction to meprobamate,⁴ 1-ethinyl-cyclohexyl-carbamate (a non-barbiturate hypnotic),⁵ and preludin.^{6,7} Swiss doctors

describe the abuse and addiction to "so-called harmless" analgesics (sometimes containing phenacetin)—not affected by the "Betäubungsmittelgesetz"—leading on sudden withdrawal to severe abstinence symptoms, with epileptiform fits, deliria, and hallucinosis.^{8,9}

Apparently among certain unstable, predisposed personalities any drug producing a feeling of improved well-being—perhaps by helping them "to get rid of something" (such as tension and anxiety) or "to get hold of something" (euphoria)—can lead to abuse and, at least, habituation. It therefore seems regrettable that again and again new drugs (as, e.g., a recently introduced non-barbiturate hypnotic) are described and advertised as not giving rise to habituation or addiction.—I am, etc.,

M. M. GLATT.

Southall, Middlesex.

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Oesophageal Stricture

SIR,—The papers by Mr. J. A. W. Bingham (*Journal*, October 4, p. 817) and Mr. K. C. McKeown (*Journal*, October 4, p. 819) draw attention to oesophageal stricture as a complication to the surgical treatment of peptic ulceration of the stomach and duodenum, and the authors put forward a number of possible causes. A study of their case records shows that 5 of the 6 patients had hiatus hernia, with a short oesophagus to a marked degree, and that, although this condition certainly existed prior to operation, it was not recognized clinically or radiologically. The sixth patient (McKeown's Case 2) had the symptoms of a reflux oesophagitis, and the operative findings were suggestive of oesophagitis, and the lower oesophagus. The type of gastric mucosa lining the lower oesophagus, is one hernia found, with shortening of the oesophagus, and it thus very commonly associated with oesophagitis, and it thus appears that all these patients had oesophagitis prior to their operative treatment for peptic ulceration of the stomach or duodenum.

The moral is that the symptoms of hiatus hernia and oesophagitis are overshadowed by the more severe symptoms of gastric or duodenal ulceration, until these latter symptoms are relieved by gastrectomy, whereupon they become noticeable. In many cases the removal of acid or pepsin secretion may well lead to the oesophagitis subsiding and giving no further trouble, but in some cases the oesophagitis will have been of such severity that it will heal by fibrosis and stricture formation, leading to more severe symptoms such as those described by the authors in their papers.—I am, etc.,

K. S. MULLARD.

Harefield, Middlesex.

Hiatal Herniorrhaphy

SIR,—In your issue of September 20 (p. 728) Mr. J. Borrie describes the right-sided approach for hiatal herniorrhaphy. He says "to date no record has been encountered of a right-sided approach for repairing such hernias." I repaired a hiatus hernia in Lewisham Hospital with Mr. J. Jemson on April 11, 1951, using the right-sided thoracic approach. I did this under the mistaken impression that Russell Brock, who to me represents the law and the prophets in all things surgical, recommended it. I found it very difficult and very unsatisfactory, and I vowed never to try it again and never have.

I waited to comment till I had traced the patient. I find that, after being free from symptoms for eighteen months, he returned to Guy's with dysphagia, and x-ray showed that his hernia had recurred. Robert Brain did a re-repair through the left chest in September, 1953, and the patient has since remained well. This 100% recurrence in a solitary

venture compared with more than twenty repairs done through the left chest at the Royal Masonic Hospital, Guy's, and Machynlleth, none of which has as yet recurred, so far as I have been able to discover.—I am, etc.,

London, W.1.

HENEAGE OGILVIE.

Mass Casualties from Nuclear War

SIR,—The paper¹ criticized by Dr. M. C. Berenbaum (*Journal*, September 27, p. 800) is very far from preaching complacency in face of nuclear attack: it is equally far from proclaiming a policy of inactivity and despair. He has not made himself familiar with the premises of the argument he opposes. Briefly, they are that in a mass casualty situation there can never be enough doctors or nurses on site to attend to all the injured: that, in consequence, non-professional men and women must be trained to accept responsibilities that up to now have rested entirely on doctors and nurses. Also that, since casualty sorting is the key to effective management of large numbers of casualties, a filter organization must be created, to prevent the hospitals further back from being overwhelmed either by the lightly injured or by those the hospitals will be unable to help.

We set out to estimate the greatest number of casualties which a given group of medical personnel forming a filter unit could effectively sort and treat in 24 hours. It was thought that this number might be in the region of 6,000. Experiments and time-and-motion studies have been made, to estimate whether a filter unit of the size described could deal with this task. Obviously there is a theoretical element to such tests, but the conclusion reached by the great majority of those to whom the problem has been demonstrated is that suitably trained personnel should be able to do so.

The paper in question, with the hand-out which accompanied it, gives a staffing list of the various departments of a filter unit and also shows among other definitions that the urgent surgery envisaged is limited to simple procedures such as control of bleeding, dealing with rapidly correctable respiratory defects, completion of incomplete amputations, and splinting of compound fractures of major bones. Many such cases will not need a doctor's attention but can be dealt with by others. From these documents, which I now quote because they had a limited circulation, it can be seen that in fact each of 1,200 patients to pass through the immediate treatment (urgent surgery) department would indeed have 9.6 minutes under active team treatment, or a total of 28.2 minutes of nurses' or nursing auxiliaries' time plus 3.6 minutes "doctor's time." This would be achieved by a staff of three doctors and eight teams each consisting of three nurses or nursing orderlies.

Effective casualty sorting, the key function of a filter unit, is a problem that can be tackled, but not by one surgeon as Dr. Berenbaum assumes. To sort 3,600 cases in 24 hours would be the work of two surgeons plus at least two other doctors, working as a team with 12 nursing orderlies to help them. The plan would be for the two doctors to decide upon the disposal of the more obvious cases, and call in the surgeons only when in doubt. The surgeons and doctors have 1.6 minutes to examine the cases referred to them—and by this time the injured will have had clothing removed and their injuries exposed. Experienced surgeons who have witnessed trials have said that casualty sorting of the kind needed in a situation such as this can be performed within this time.

I sincerely trust that readers of this correspondence will feel able, conscientiously, to join in a plan which, in our opinion, can help the victims if we should ever be faced with this kind of disaster.—I am, etc.,

Farnborough, Hants.

T. M. R. AHERN.

REFERENCE

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SIR,—Many of us interested in the medical aspects of civil defence may possibly agree that Dr. G. D. Kersley's paper (*Journal*, August 9, p. 379) may not produce the effect he desires, but the effects will be much more useful than the suggestions of Dr. M. C. Berenbaum in his letter (*Journal*, September 27, p. 800). Some of the most severe critics of the present civil defence arrangements and of their presentation to the community are themselves in civil

defence. It is only by propaganda directed at the Home Office and by energetic local action that the present inadequacies can be met, but we must never allow the statesmen to have their heads as suggested in the last paragraph of Dr. Berenbaum's letter. Even if they take responsibility for it, the medical profession will still be left to clear up the mess the politicians have created. We must tell the public the truth now and induce the Home Office to do the same. After a fairly extensive association with all workers in civil defence, I am convinced that there is not one who has any illusions about the appalling effects of nuclear warfare.

Dr. Berenbaum maintains that the medical services will be disrupted if a scheme on the scale suggested by Colonel Ahern is put into action. If the country is to survive at all this scheme will be the minimum we require. Other medical services, except those of the most urgent and vital character, will have to cease even before the shooting starts. This disruption will be but one part of the total survival plan which will have to be put into operation. If we are to face annihilation and to save anything from it, every man, woman, and child and every possible activity in which they engage will have to be subordinated to this provision. Even though millions are killed and much of this country and Western Europe are destroyed, we, who believe in ourselves, must have faith that our essential values are worth saving and that this saving can be effected.

In the past the Home Office were not planning on a large enough scale. There are signs now that they are getting away from the last war mentality, and this new approach is the result of the work of knowledgeable and imaginative members of the armed Services and civil defence organizations. There are plenty of memorials in the Health Service already to the work of politicians. A vital matter like this must not be left to their unaided efforts. The medical profession has taken too little interest in civil defence, but we must now play our proper part, and make our voices heard. We cannot avoid taking responsibility for the medical services in the defence of the nation.

—I am, etc.,
Shrewsbury.

E. N. OWEN.

Treatment of Asthma

SIR,—The article on the drug treatment of asthma by Dr. R. S. Bruce Pearson (*Journal*, October 11, p. 905) was both welcome and timely. It deals comprehensively and lucidly with a clinical problem which is becoming increasingly difficult in general practice, owing to the many diverse preparations which are now available, each understandably but none the less confusingly extolled by its manufacturer. May I, however, be permitted to offer some comments which arise from experience in a fairly typical general practice? The treatment of acute cases is not easy outside hospital, and I am chary of employing relatively large doses of corticosteroids on patients whom I cannot keep under continuous surveillance; in the few cases where I have tried it, I have found that corticotrophin has secured better results than the corticosteroids. Indispensable as these drugs now are in status asthmaticus, prophylactic measures outside hospital cannot usually include them, and in my view intravenous aminophylline remains the general practitioner's best standby in acute adult cases.

In less serious cases, and especially in early cases, I would suggest that sedatives can play an even more important part than Dr. Bruce Pearson suggests. I submit that all asthmatics are suffering from anxiety, and that the anxiety may be a primary cause of the asthma. In any event, anxiety predisposes to attacks, and the attacks induce more anxiety; this vicious circle can sometimes be broken by the use of suitable sedatives alone, or preferably in conjunction with antispasmodics to reduce the frequency and severity of attacks. I thus entirely concur with Dr. Bruce Pearson that a combination of sympathomimetic and xanthine substances with a sedative is most suitable in these cases, but disagree with his advocacy of keratin coating to delay absorption for prevention of nocturnal attacks.

In my experience the resin-ephedrine complex which he dismisses earlier is the most effective method of securing both sustained action for prophylaxis of day or night attacks

and reduction of the side-effects of ephedrine. This preparation (I believe "asmapax" is the only one of this kind on the market) contains theophylline and sedatives as well as the resin-ephedrine complex, and thus answers both Dr. Bruce Pearson's prescription and his comment on the high price; it is difficult to compare the cost of a medicament used 12-hourly, and combining several drugs, with the several components used at shorter intervals. Upon investigation I find that asmapax treatment costs the N.H.S. an average of 2s. 4d. weekly, surely a modest sum when compared either with the cost of corticosteroids or with the saving in suffering, working hours, and night visits which I find can be effected with this preparation.—I am, etc.,

London, N.W.2.

H. MARGULIES.

SIR,—As a psychiatrist treating a small but steady flow of asthmatic children and adults I wish to thank Dr. R. S. Bruce Pearson for his admirable article on the drug treatment of asthma (*Journal*, October 11, p. 905). While undoubtedly a large number of these patients have to receive palliative treatment only, and the best one can hope for is to make their lives a little more tolerable to them than it was before, there is no doubt at all that it is possible to cure a few of those that have been resistant to the orthodox management or derived only partial benefit, by the simple means of hypnosis and, especially, autohypnosis.¹

This is not a panacea, but is, with the necessary persistence, learnable; it is not time-consuming, and has few if any absolute contraindications. Apart from the important fact that it seems to help when nothing else does in the case of some patients, many have undoubtedly the capacity for profiting to some extent; it has especially often been remarked to me that "hangover" from drugs and other side-effects are completely absent. This particular technique can be easily acquired and has been used widely in Germany. There are literally dozens if not hundreds of publications in the German language on the matter.—I am, etc.,

Derby.

D. J. SALFIELD.

REFERENCE

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Malaria and Anaemia in Infancy

SIR,—Drs. R. G. Hendrickse and M. A. R. King (*Journal*, September 13, p. 662) have made an important contribution to the practice of paediatrics in West Africa by showing the relationship between malaria and the anaemia that is so frequent in infants here. An early verbal report of their findings had led us in this hospital to use routine suppressives on all Welfare infants. There are about 900 Welfare attendances at the hospital each week, and anaemia amongst these infants was at one time quite common. Over the last year it has been our practice to give a monthly tablet of pyrimethamine. This costs the hospital only 1.1d. per tablet. Since introducing this measure severe anaemia has become unknown amongst these children, and palpable spleens are uncommon.

Drs. Hendrickse and King offer no explanation for the frequency of negative blood-films. I should like to suggest that this may be due to small doses of quinine. The local mothers in this area are familiar with patent medicines containing quinine, and it is my experience that they may visit a local medicine stall for a dose of this before bringing their child to hospital. This small dose may temporarily clear the blood of parasites.—I am, etc.,

Wesley Guild Hospital,
Ilesha, Nigeria.

D. C. MORLEY.

Congenital Deaf-mutism

SIR,—Dr. L. Fisch (*Journal*, September 13, p. 692) finds it difficult to accept the evidence set out in my article (*Journal*, July 26, p. 201) on congenital deaf-mutism and criticizes the results of audiometry. I realized only too well the pitfalls associated with this method of examination, but, so far, there is no objective vibration. Awkward and

frustrating though it be, we still depend entirely on what the patient tells us.

For record purposes the audiometer used is a Peters fitted with its standard oscillator and providing in the cases noted an interrupted signal. The children mentioned in the article had experienced the sensations of hearing by earphones and therefore had a basis from which to work. With the oscillator applied to the mastoid region by an assistant, the child was repeatedly asked to differentiate between hearing and feeling, and, at the frequencies and intensities indicated, the answers were definite. In every case the signals were gradually increased from the minimal intensity up to the point of hearing.

Concerning the identical appearances of the audiograms noted by Dr. Fisch, it should be pointed out that since the original tests in May, 1957, repeat examinations have shown distinct variations in the curves although there remains in each the general pattern of bone conduction readings at lower intensities than air conduction.

The fact that the inner ear of the congenital deaf-mute is defective on histological examination may suggest that the initial lesion was in the cochlea, but tacit acceptance of this ignores (a) the association of deaf-mutism with congenital defects of the first visceral arch, (b) the complete absence of any recorded instance of other labyrinthine disorders in the deaf-mute child, and (c) the normal radiological appearance of the bony cochlea in deaf-mutism.

Mr. Bauer, who also finds my arguments unconvincing (*Journal*, October 4, p. 588), quotes the condition of bilateral congenital atresia of the auditory meatus with malformation of the incus to show that excellent inner-ear function may exist with an abnormality of the middle ear, but this does not mean that all middle-ear anomalies will allow of excellent cochlear function. His suggestion that the surgeon should examine the middle ear in the congenital deaf-mute through the operating microscope is an excellent one, and, so far as I am aware, has not yet been done. Undoubtedly it is the most direct method of proving or disproving my theory of the cause of congenital deaf-mutism, and I look forward to learning the results of such an investigation.—I am, etc.,

Aberdeen.

JOHN MCKENZIE.

Imbecile Children

SIR,—Dr. C. Guy Millman (*Journal*, October 4, p. 859) suggests that mentally defective children may die just as readily at home as in an institution, and that the high death rate which we reported in the post-admission period may therefore not be significant. He adds that one would not expect skilled nursing and medical attention to hasten the death of the children.

We do know that children on our waiting-list sometimes die at home. We wished, however, to draw attention to the very high death rate in the post-admission period. The figures which we reported provide an internal control, since they show that the death rate is related to the admission of the patient to hospital. If the children die merely because they are delicate, then there is no special reason why the deaths should be concentrated in the post-admission period. There is no question of the children being acutely ill on admission to hospital. They have been on our waiting-list for up to three years, usually at least one year, and we do not admit acutely ill children—they are referred to a paediatric department.

The problem of post-admission deaths merits further study. It is well known that there is a certain risk in admitting young children to hospital. In this respect mentally defective children seem to react like much younger children. We think that the excess of deaths can be partially explained on the following grounds:

(1) *Infection*.—Very backward children have often been rather isolated prior to admission and have not mixed with other children very much. On entering a large overcrowded ward they are exposed to a very considerable battery of mixed infection, much of which is new to them.

(2) *Status*.—At home most of these children are picked up, nursed, and moved a good deal by their mothers and others.

With the very limited nursing staff available this is not possible in hospital. This is particularly important in cripples. Static pneumonia associated with inefficient cough reflex and repeated inhalation of small quantities of food is the common cause of death.

(3) *Change of routine and fretting*.—Despite their low intelligence, our children have become accustomed at home to a certain diet, method of feeding, maternal attention, and so forth. Hospital admission means a sudden disturbance of this routine, with much reduced attention. Part of the loss of weight and other changes which so often follow admission may be attributable to this. Many of the children are manifestly miserable after admission.

It is not the skilled attention which hastens their death, but rather the shortage of it.—We are etc.,

London, S.W.17.

EVELYN B. LIND.

BRIAN H. KIRMAN.

Vitamin-D-resistant Osteomalacia

SIR,—In our report on "Vitamin-D-resistant Osteomalacia" we remarked upon a too ready acceptance of the theory that the basic causation of this group of disorders was simply a renal tubular defect with excessive phosphate leak (the "phosphate diabetes" of Fanconi). We quoted a paper by Dr. Alan Rose² as an illustration. Dr. Rose has pointed out to us that he did not in his paper actually state that the sole or basic cause of the osteomalacia in his case was a primary phosphate leak, although he emphasized the occurrence of a high renal clearance of phosphate.

In fairness we must agree that we all find a high phosphate clearance in these cases, but whether this is a primary renal tubular defect or whether secondary to some other disturbance (e.g., hyperparathyroidism) is uncertain. The title of Dr. Rose's paper was "Renal Tubular Osteomalacia," which would appear to indicate a basic aetiology, although this is not specifically stated. Certainly we (Jackson and Linder) previously agreed³ that a primary renal tubular defect provided a good explanation of the syndromes of "vitamin-D-resistant rickets and osteomalacia," but we are now less convinced, for reasons discussed in our recent paper.—I am, etc.,

W. P. U. JACKSON.

Capetown, S. Africa.

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- 1 Jackson, W. P. U., Dowdle, E., and Linder, G. C., *Brit. med. J.*, 1958, 2, 1269.
- 2 Rose, G. A., *ibid.*, 1956, 2, 805.
- 3 Jackson, W. P. U., and Linder, G. C., *Quart. J. Med.*, 1953, 22, 133.

Treatment of Habitual Abortion

SIR,—Dr. R. V. Sutton's letter (*Journal*, October 4, p. 858) and your annotation on hormone-induced sex changes (*Journal*, July 26, p. 218) suggest there may now be conclusive evidence that progesterone therapy results in the production of some abnormal foetuses, particularly in regard to the genital tract. This is not our experience.

We have recently completed a series of 50 cases using 17- α hydroxy progesterone 17N caproate ("primolut depot"). There were only two abnormalities. One baby had pyloric stenosis, since successfully treated, and the other was an anencephalic foetus stillborn at 29 weeks. We hope shortly to publish our results. Reifstein¹ presented a comparable series to the New York Academy of Sciences on October 8, 1957. He had two abnormalities in 54 cases, neither of which involved the sex organs. Using large doses of this same hormone from the early weeks of pregnancy he had a foetal salvage rate of 69% in habitual abortion. In our own smaller series the salvage rate was just over 80%. We also agree with Reifstein that there does not appear to be any increase in foetal abnormalities in these cases. The average total dose of long-acting progesterone given by us to these patients was 3.375 g., and in seven cases where the therapy commenced within two weeks of the first missed period the total dose approached 5 g. There were no abnormalities in these latter cases.

What are the reasons for embarking on progesterone therapy? We employ this method of treatment when we

reach the conclusion that there is no other explanation for the abortion, threatened or by habit, or where we find an arborization effect in the cervical mucus. What is the type of case? (1) A woman who has had three successive abortions as her first experiences, in the absence of genital tract abnormality, can reasonably be assumed to have a hormone imbalance—that is, progesterone deficiency. Our results support this assumption. (2) The patient who has an abortion in her first pregnancy and threatens in her second frequently has sodium chloride crystals in the cervical mucus. We use this as an indication for progesterone therapy. (3) We also use this latter method of investigation in patients who threaten to abort in their first pregnancy.

We have no experience in the use of vitamin E in habitual abortion, but are confident some of Dr. Sutton's large series of cases must have been deficient in progesterone. Perhaps this vitamin fortifies the corpus luteum, stimulates the luteinizing factor of the pituitary, or in some way accelerates trophoblastic development, thereby facilitating implantation, but, whatever the reason, this large series should be published so that others can study it. We wish to congratulate Dr. Sutton on his results and to prevail on him to give his reasons for this therapy.—We are, etc.,

Havant, Hants.
Portsmouth, Hants.

JOHN FOLEY,
ARTHUR C. WILSON.

REFERENCE

¹ Reifstein, E. C., *Ann. N.Y. Acad. Sci.*, 1958, 71, 762.

A.I.D. Investigation Council

SIR,—The Eugenics Society has set up an A.I.D. Investigation Council to consider the present status and future potentialities of A.I.D.—genetic, medical, legal, and social. The Council has in mind the maintenance of a permanent committee which will at all times have a record of all available data on A.I.D. cases done in this country, with all available medical and scientific information relevant thereto. The Council would be grateful to hear from any medical practitioner with a contribution to make towards this investigation.—We are, etc.,

69, Eccleston Square,
London, S.W.1.

PHILIP M. BLOOM,
MARGARET HADLEY JACKSON,
Hon. Secretaries, A.I.D. Investigation Council.

Protein Anabolizers

SIR,—In the interesting and timely annotation on tissue building and protein anabolizers (*Journal*, September 27, p. 785) it is stated that: "This good effect [of testosterone therapy for bone metastases due to breast carcinoma] has been attributed to a consequent change in hormonal environment of the cancer, possibly resulting in some depression of oestrogen action by testosterone. If this is so, no good result would be expected from the use of 19-nortestosterone in this disease." Whether in fact the action of testosterone in breast cancer is due to suppression of oestrogens or not is equivocal, but I would point out that norethandrolone, in addition to its other actions, is an antagonist of oestrone-induced uterine growth in intact immature mice, with seventy times the potency of testosterone propionate. This effect of 17-nortestosterone obviously cannot be due to its androgen activity, as the androgen:anabolic ratio of this steroid is 1:15, as compared to 1:1 for testosterone propionate.² However, so far as I am aware, it is not yet known whether norethandrolone reduces the secretion of, or antagonizes, oestrogens in man, but adrenocortical secretion can be suppressed in man by this new steroid.³—I am, etc.,

Bristol.

GEORGE FOSS.

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- ¹ Edgren, R. A., and Calhoun, D. W., *Proc. Soc. exp. Biol. (N.Y.)*, 1957, 94, 537.
² Saunders, F. J., and Drill, V. A., *ibid.*, 1957, 94, 646.
³ Brooks, R. V., and Prunty, F. T. G., *J. Endocr.*, 1957, 15, 385.

Prevention of Lung Cancer

SIR,—I disagree with the suggestion of Mr. Leslie J. Temple (*Journal*, October 4, p. 858) that the coroner should be notified of deaths due to carcinoma of the lung in heavy smokers. He draws a parallel between such deaths and the death of a coal-miner with pneumoconiosis or a mule-spinner with cancer of the scrotum.

The latter are examples of industrial disease and as such are notifiable. There is no significant occupational or industrial link in the case of cancer of the lung, which is basically a natural disease, usually, but not invariably, associated with the habit of smoking over a period of many years. There would therefore seem to be little justification for notifying the death, and, if notified, there is no certainty that the coroner will take further action. If, however, he does hold an inquest, he may put the following questions to the medical witness: Is it possible for a non-smoker to acquire cancer of the lung? Is it possible to smoke 40 cigarettes a day for the whole of one's adult life and escape cancer of the lung? The brief answer to both questions is "Yes," a reply which can only add to the confusion which exists in the minds of the public on this matter.

Certainly our profession should spare no effort to discourage a doubting public from smoking to excess and exposing themselves to the risk of cancer of the lung (and other diseases), but the coroner's court is not, I submit, the proper platform for propaganda directed to this end.—I am, etc.,

Canterbury, Kent.

G. B. FORBES.

SIR,—In the vexed question of the association of lung cancer and smoking, which has evoked much statistical analysis concerning the smoker and the preparations of tobacco smoked, and varying opinions as to their meaning, one wonders whether adequate attention has been paid to methods of igniting the tobacco.

An inveterate pipe-smoker myself, I have for decades refused to use other than a match, as the vapour from a lighter spoils the aroma throughout the entire smoke. Could it not be that pipe-smokers are more free from lung cancer than cigarette-smokers because they seldom inhale the fumes from flint-ignited lighters while those who smoke cigarettes more frequently do so? Lighter fuels consist of petrol and related substances, and, if such could be incriminated, at least a simple and rational link would be provided with the exhaust fumes of internal combustion engines, another frequently cited possible contributory cause.—I am, etc.,

London, W.1.

R. R. WILLCOX.

Informing the Hospital

SIR,—Dr. Norman Gold's letter on the identification of tablets (*Journal*, October 18, p. 978) raises a host of problems. They have naturally engaged the attention of the Joint British National Formulary Committee, to which he refers and of which I am a member, but the following remarks are entirely personal in an attempt to explain some of the points involved.

First of all it must be realized that when B.P. preparations are mentioned in the *Formulary* (or prescribed by the doctor) it is bound rigidly by the provisions of the *British Pharmacopoeia* itself, nor can we get away from this condition by omitting the letters B.P. if we use the same name. And the fact is that the *British Pharmacopoeia* Commission, I think unwisely, has set itself against any distinctive coloration of tablets, specifically stating: "The addition of colouring or flavouring agents, except where permitted in the monographs, is not official." And these permissions are hard to find. They seem to be limited to such things as tabs. mepyramine maleate ("anthisan"), promethazine ("phenegan"), or probantheline ("probanthine") where the substance is only made as a proprietary preparation and where the Commission cannot coerce the maker to its predilection to uncoloured tablets, with all their associated possibilities of confusion. It is true that in a few cases—e.g., tab. butobarbitone—the N.H.S. *Drug Tariff* does say "(may be coloured)," but this is strictly incorrect and, I think, *ultra vires*. In the same way a chemist who

provides pink tablets of stilboestrol, as he usually does, is not dispensing stilboestrol B.P. or B.N.F. and might theoretically be charged with wrongful prescribing, though not likely to incur any penalty. To give "fergon" instead of tab. ferrous gluconate is equally wrong, as fergon is red and the B.P. preparation is white.

The *British Pharmacopoeia* Commission recently replied vigorously to several curiously ill-informed criticisms of the Hinchliffe Committee, but, having participated almost *ad nauseam* in discussions on this question of distinctive coloration of tablets, I do not think that it can escape the conclusion that its present regulations tend to put a premium on doctors prescribing proprietary and avoiding "B.P." as much as possible. I need hardly say that I think this is wrong, and, as the new B.P. chairman was till recently the much-loved chairman of the Joint B.N.F. Committee and has heard all the arguments, we can certainly be sure that the matter will be well considered before the next edition appears.

At the same time there is much to be said for the B.P. It is primarily a book of standards and only secondarily one of preparations. Its aim is to maintain purity, etc., and, although the Commission contains many pharmacologists and practising pharmacists, its bias is more towards maintaining accuracy and stability of products than their sale in shops or use in medicine. This is exacting enough on its own, and it would probably be a mistake to try to saddle it with a lot of manufacturing details as well.

Besides the question of distinctive coloration there are possibilities of circumventing the B.P. regulations by differences in size and shape (though even here the B.P. Appendix XXI C sets strict parameters for its tablets, again excluding proprietaries) or by impressing specific dots, letters, lines, or other markings. Dr. Gold says that his collection contains 49 such specimens, but Bayer's latest handbook gives 33 distinctive marks, while I.C.I., Ciba, and others have long employed similar devices, so I fear his collection is far from complete. It would, I think, be impossible for our hardworking B.N.F. Committee (which for some of us involves about three half-days every month for 9-12 months for each edition) to correlate all these markings and devise new ones for every fresh drug, many of which will never get widely used in this country.

I am sure, however, that this matter is one worthy of serious attention, and that at present it falls between many stools. The B.P. Commission is aloofly concerned; on the B.N.F. we get nearer to the problem if not to the answer; manufacturers and dispensing chemists see their different aspects of it; while hospitals, doctors, and the Government, as the chief consumer, are all involved. One or two conferences of all parties concerned might at least lead to clarification of the main issues, and if they all came with the desire to find a solution and not hold their present ground some progress might be made in alleviating an ever-growing problem.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

REFERENCE

¹ *British Pharmacopoeia*, 1958, p. 655. London.

SIR,—The letter from Dr. N. Gold (*Journal*, October 18, p. 978) suggests that there should be a system for identification of drugs. There is an excellent "Tablet and Drug Identification Guide" published by the *Chemist and Druggist* which we find extremely useful in our hospital.—I am, etc.,

JANE M. FULLERTON.

St. Olave's Hospital,
Lower Road, London, S.E.16.

Convulsions and Epilepsy

SIR,—I was most impressed by the clarity and the good sense of the W.H.O. technical report on juvenile epilepsy.¹ It is because of its excellence in all these respects that I feel moved to protest on a matter of nomenclature. There is a trend among the experts in this field to accept all convulsions as synonymous with epilepsy, and in this report "epilepsy refers to all clinical forms of attacks that are investigations to be accompanied by the characteristic electrical activity of the brain recognized as epileptic." This definition may be scientifically accurate, but if every convulsion is going to be labelled as epilepsy it will prove embarrassing to the general practitioner who has an important role to play in the diagnosis and management of this

disorder. To him epilepsy connotes an episodic disease which can in most cases be controlled by anticonvulsants. The epileptic is thus either a person who has repeated fits of one kind or another, or who needs continuous treatment to keep them under control. The occasional fever fit is not considered to be epileptic, although it is appreciated that in a minority of cases such attacks are the beginning of chronic epilepsy.

Our patients accept the dictionary definition of epilepsy as "a nervous disease in which the patient falls to the ground unconscious, with spasms and foaming at the mouth." It is a term that conjures up the worst possible picture in the mind of the distraught mother of a child who has had a convulsion of any kind. Simple arithmetic shows that fever fits and epilepsy are not in fact the same thing. The report suggests that 6% of the population at one time or another have a convulsive episode. The present accepted estimate for chronic epilepsy is 3-4 per 1,000 of the population. This means that only one in every 15-20 people who have an occasional convulsion becomes a chronic epileptic, and of course only a small proportion of these chronic cases (my own figures suggest 12%) deteriorate: the majority, with their fits well controlled, are gainfully employed. My plea, in which I think most general practitioners will support me, is that scientific accuracy should be met by applying the term "convulsive disorders" to all epileptiform attacks and reserving the term epilepsy to describe the chronic case with repeated attacks either occurring or prevented by therapeutic measures. This differentiation will help the family doctor when he has to reassure the parents of a child who throws the occasional fever fit. While I am all in favour of early and full examinations of such cases by experts with all modern equipment, each case must be judged on its merits, and scientific progress must not be made at the expense of increasing parental distress and anxiety.—I am, etc.,

Ibstock, Leicester.

C. A. H. WATTS.

REFERENCE

¹ *Wld Hlth Org. techn. Rep. Ser.*, 1957, No. 130.

Beds for the Aged

SIR,—Dr. K. M. Tankard can rest assured that the Sunderland Geriatric Unit deals with all the cases he mentioned in his letter to the *Journal* of October 18 (p. 979). He is welcome to visit the department if he would like to see for himself.—I am, etc.,

Sunderland.

E. WOODFORD-WILLIAMS.

Buzzers for Bed-wetters

SIR,—The recent correspondence in the *Journal* has been concentrated on the physical methods of treatment of enuresis. It seems to regard it as due to some physiological dysfunction of the bladder and to ignore the psychogenic factors involved. Enuresis is a source of much unhappiness both to the child and the parents. It is the only symptom which children are ashamed of. The child frequently lacks the support and sympathy which he so desperately needs from his parents, who more often than not administer severe punishment, which nowadays tends to be mental rather than physical. So many parents adopt an attitude of hopelessness accompanied by nagging that the child becomes morose and introverted, and lives his life sodden, sore, odorous, and miserable. The anxiety accentuates the condition. Together with it goes the slacking at school and loss of self-confidence. Some psychogenic factors may complete the vicious circle—a new baby in the family, temporary or permanent loss of a parent, too anxious and worrying parents, illness, and a variety of other causes. Each treatment tried which fails to give permanent results only undermines more the patient's confidence.

The first thing to do, therefore, is to build up the child's confidence in himself and to get the parents to accept the symptom and to understand that their attitude is important. There may be something frightening and worrying the child at home or at school, and the enuresis may be a defensive

mechanism. This has to be discovered and dealt with and the patient's security restored. If the patient can be given confidence that the symptom can be controlled by himself, the anxiety ceases.

Hypnotherapy is by comparison more effective than any other therapeutic method in helping these patients. It makes it possible to deal with the fear, anxiety, and worry and to help them to fight against the habit irrespective of the factors causing it, and to restore their self-confidence. One hears very often from a child after a few sessions of hypnosis, "I don't seem to worry any more; even if I wet my bed I won't worry." By improving the child's confidence in himself one gives him back his self-respect, and one part of the vicious circle is broken. This, coupled with the explanations to the parents, often serves to break the remaining part of the circle. It usually results in a considerable improvement in the child's school progress.

The aim of the buzzer is to establish a conditioned reflex. It acts as soon as the patient passes some urine. It immediately lets the whole household know about it and it makes the unfortunate sufferer still more ashamed and worried. It does not help him to understand and deal with the underlying factors causing his complaint and to break the vicious circle. Dr. Clifford Allen (*Journal*, September 27, p. 799) mentioned in his letter about strong suggestions which he uses when treating enuretics with pituitary snuff. It would be interesting to try some cases giving them similar suggestions but with an inert snuff and see the results.—I am, etc.,

London, S.E.25.

A. FRY.

Coloured Immigrants

SIR,—Racial problems will not be solved by Dr. J. Tudor-Hart's denying (*Journal*, October 18, p. 974) the need for "more research into the results of race-mixing" (*Journal*, October 4, p. 843). Since almost every known species of animal with a wide distribution has differentiated into distinct geographical races, it is hardly surprising that man, who has the widest distribution of them all, should have done the same. A recognition of the differences, physical, mental, and cultural, between the primary races of mankind should go some way towards dispelling the nonsense talked about people simply happening to differ from each other in the colour of their skin and need do nothing to foster any idea of superiority or inferiority. A respect for other peoples' race might be a better basis for mutual co-operation than the rather doubtful compliment of trying to persuade a negro that he is the same as a white man. It has never been suggested in your columns that research should be bedevilled by politics and sentiment as was the case with the German race-scientists and the Russian plant-breeders; provided it is carried out with scientific integrity it can do no more than arrive at the truth.

As to the second problem Dr. Tudor-Hart mentions, it seems fairly obvious that too much money, too little work, no discipline, and less religious training will inevitably breed a generation of cowardly louts.—I am, etc.,

Moreton-in-Marsh, Glos.

E. H. EASON.

Anterior Spinal Artery

SIR,—In their report of a case of anterior spinal artery syndrome Mr. A. Davies, Dr. B. Solomon, and Mr. A. Levene (*Journal*, September 13, p. 654) discuss the anatomy of the arteries of the spinal cord. They state that the anterior spinal artery is virtually an end artery receiving significant collaterals only at the level of T1 and T11. This description is certainly not in agreement with the classic accounts of the circulation of the cord by Adamkiewicz¹ and Kadyj² nor with more recent work.³⁻⁵ The anterior spinal artery presents the appearance of an anastomotic chain made up of ascending and descending rami from a comparatively small number of anterior radicular arteries. In a series of 68 specimens examined by myself these latter vessels were found to range in number from 2 to 12. They were found distributed throughout the length of the

cord, but were most numerous in the cervical and thoracolumbar regions and were usually absent from the mid-thoracic region. The largest anterior radicular artery, the arteria radicularis magna of Adamkiewicz, was found anywhere between T6 and L3.—I am, etc.,

Manchester, 13.

J. B. D. TORR.

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- Adamkiewicz, A., *Die Blutgefäße des menschlichen Rückenmarkes: II. Die Gefäße der Rückenmarksoberfläche*, S.-B. Akad. Wiss. Wien., math.-nat. Kl., 3. Abt., 1882, 85, 101.
- Kadyj, H., *Anat. Anz.*, 1886, 1, 304.
- Suh, T. H., and Alexander, L., *Arch. Neurol. Psychiat. (Chicago)*, 1939, 41, 659.
- Torr, J. B. D., *Lancet*, 1957, 2, 146.
- , M.D. Thesis, 1957, Manchester University.

"On Call to a Nation"

SIR,—In this T.V. documentary (see *Journal*, October 25, p. 1053) a G.P. is consulted by a young man suffering from headaches. He hands him a form without further questioning and tells him to go to an optician to get some glasses. He made no attempt to inform the patient that he could have a medical eye examination or one from an optician.

Fortunately many G.P.s realize that a member of their own profession can advise on the medical as well as the optical aspects of the case, and is in the best position to decide whether glasses are likely to relieve symptoms or not. They consider a medical test preferable if the patient has never had glasses before, in children, and of course if any pathological condition is suspected. However, there are quite a number of doctors who deliberately send their cases to opticians, and evidently this T.V. doctor is one of them. I feel that it is a pity that he should have appeared before the public as a champion of the ophthalmic optician in preference to recommending the patient to an ophthalmic medical practitioner. I hope that the T.V. authorities will grant an interview with a member of the N.O.T.B. Association so that the public will be furnished with the true facts.—I am, etc.,

London, W.14.

C. WATNEY ROE.

Premonition of Death

SIR,—The famous Nostradamus, who died on July 2, 1566, knew in the night about his death and at the end of June of the same year wrote with his own hand, "Hic prope mors est." In the evening of July 2 he told his disciple, "you will not see the living at the new dawn."—I am, etc.,

London, N.W.11.

N. PINES.

REFERENCE

- Ruir, E. M., *Nostradamus*, 1948, p. 99. Paris.

Rhymed Review

SIR,—

How pleasant to the eye and mind
A lucid book review to find,
So apt and pithy with its rhyme,
Saving a column's reading time.
Such verse appropriately used
Would brighten those who have accused
The *B.M.J.* as dull and glum,
Too vague, prolix, and wearisome.
Then with your grace may we all hope
That others follow Zachary Cope.

—I am, etc.,

Basingstoke.

I. ATKIN.

REFERENCE

- Brit. med. J.*, 1958, 2, 958.

POINTS FROM LETTERS

Back-to-School Syndrome

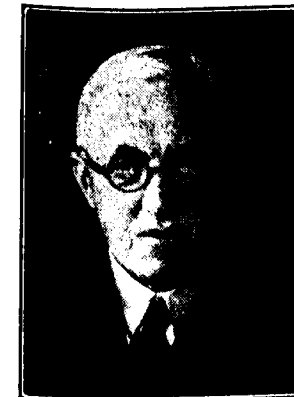
Dr. J. SAPERIA (London, E.10) writes: Recent entrants to general practice may not be aware of the mothers' "back-to-school syndrome." It arises in those who rush to and from school with their young four times a day. Tiredness and recent loss of weight are the presenting symptoms. A rapid cure results from the organization of a rota, or leaving the child to school dinners.

Obituary

J. A. GUNN, C.B.E., M.D., D.Sc., F.R.C.P.

Professor J. A. Gunn, who died in Oxford on October 20 at the age of 76, was the professor of pharmacology in the University of Oxford from 1917 to 1937, director of the Nuffield Institute for Medical Research from 1935 to 1946, and Nuffield professor of therapeutics from 1937 to 1946.

James Andrew Gunn was born at Kirkwall in Orkney on January 26, 1882, and was educated there until he went to Edinburgh University. There he graduated M.A. in 1901, B.Sc. in 1903, and M.B., Ch.B. in 1905, proceeding M.D.



[Elliott & Fry]

in 1907 (gold medallist) and D.Sc. in 1909. Having distinguished himself greatly in scientific subjects, winning numerous prizes and scholarships at Edinburgh, he began to study pharmacology in the laboratory of Sir Thomas Fraser, and he continued in this field until his retirement. In 1912 Gunn was appointed reader in pharmacology at Oxford, and in the same year he was awarded a Beit research fellowship. After a period of service in the R.A.M.C. in the first world war, he was appointed professor of pharmacology at Oxford in 1917, occupying that chair until 1937, when he became the first Nuffield professor of therapeutics at Oxford. The degree of D.M. was conferred on him in the following year. When he retired in 1946 he was appointed emeritus professor. Besides many contributions to medical and scientific journals, Professor Gunn was the author of *An Introduction to Pharmacology and Therapeutics*, which reached its 9th edition in 1958. He also edited Cushman's textbook on *Pharmacology and Therapeutics* and Whittle's *Pharmacy, Materia Medica, and Therapeutics*.

Professor Gunn was a past-president of the Oxford Medical Society and of the Section of Therapeutics of the Royal Society of Medicine. At Annual Meetings of the B.M.A. Society of Medicine. At Annual Meetings of the B.M.A. he first held office as vice-president of the Section of Physiology and Pharmacology in 1920, and was president of the Section of Pharmacology and Therapeutics in 1927, 1932, and 1936. Elected a member of the first Pharmacopoeia Commission, set up by the General Medical Council in 1928, he later became chairman of the Commission, being appointed C.B.E. for this work in 1947. He also was a member of the B.M.A. subcommittee on the British Pharmacopoeia Commission and of the Committee on the Relation of Alcohol to Road Accidents. At the League of Nations in Geneva he served on the Committee on Narcotics. An honorary member of the Pharmaceutical Society, he was for some years a member of the council of that society. In 1935 he gave the Dohme lecture at Johns Hopkins University and four years later the Oliver-Sharpey lectures at the Royal College of Physicians in London, of which he was elected a Fellow in 1931.

J. H. B. writes: Professor Gunn's chair was very suitably attached to Balliol College, which has always had a strong Scottish connexion, and he was well known and greatly liked throughout the university. Extremely modest, with a cheerful and humorous disposition, he spoke quietly in a slightly husky voice which was full of charm. He had the appropriate degree of professorial absentmindedness,

and perhaps the best-known story of his early days at Balliol is how one evening he had gone by mistake to dine in the hall of St. John's. Balliol has long had a reputation for high thinking but austere living, and Gunn, halfway through his plate of soup, looked up and said, "Surely this cannot be Balliol!"

The grant of money available for running a department of pharmacology was very small in the early years, and for such a situation Gunn was an ideal person. He showed great ingenuity in devising simple experimental methods for which expensive equipment was not required, and built up a series of exercises for a practical class with very little expenditure. When the Sir William Dunn trustees invited the heads of some of the departments to submit proposals for expansion, Gunn's proposal, drawn up with a natural Orcadian sense of economy, was the one which they liked best, and their first intention was to build a school of pharmacology. Sir Walter Fletcher then became very active and persuaded them to build a school of pathology, having first secured Gunn's agreement to take over the existing pathology building for pharmacology.

A great blow which Gunn suffered was his very serious illness about 1925, when he had a streptococcal infection and lost his sight in one eye. At one stage the decision had been taken to remove the eye, but on the morning on which the operation was to be performed his small son, coming in to see him, noticed that his eye was better, and as a result the eye was left in its place. There can be little doubt that this illness compelled him to reduce his scientific activity for some years.

Gunn was a very attractive lecturer, both because of his voice, to which it was a pleasure to listen, and because of his skill in presenting his matter and of the care he took in making it interesting. The same success which he had as a lecturer attended his writings. In this respect his *Introduction to Pharmacology and Therapeutics* was a model, for his style was full of grace. On the title-page appeared a quotation from Oliver Goldsmith: "Were angels to write books, they would never write folios," and this showed how clear a grasp he had of the art of teaching.

The main line of research followed by Gunn was laid down by an interest in adrenaline which he gained as a pupil of Schäfer, who had gone to Edinburgh in 1899. Gunn investigated the action of the amines which formed a series beginning with phenylethylamine and ending with adrenaline. In his Oliver-Sharpey lectures given in 1939 he gave an account of this work, which is of greater interest to-day than it has been in the intervening period. In 1914 Bry had shown that phenylethylamine had a central excitatory action because of its effect on respiratory rate and in causing convulsions. In 1932 Gunn with his colleagues Epstein and Virden observed that this central action was almost abolished when an —OH group was attached to the ring in the *para* position (forming tyramine) and disappeared altogether when a second —OH group was added in the *meta* position (forming dopamine). While the introduction of —OH groups removed the central action, Gunn showed that the introduction of an —OCH₃ group restored it, whether the restoration was in the *para* or *meta* position. He also showed that the central action again disappeared when two —OCH₃ groups were introduced. He concluded that central stimulation was likely to be found when the benzene ring was unsubstituted, when it contained a methoxy group or a methylene dioxy group. The compound which was most active centrally was methylene dioxypheylisopropylamine.

The interest of this work to-day springs from the knowledge that the pathway of the breakdown of adrenaline in the body is through the methylation of the —OH group in the *meta* position in the ring, and that the enzyme which effects this methylation is also present in the brain. Gunn's own interest in his experiments lay in the hope of finding a pressor agent more stable and more prolonged in action than adrenaline or tyramine, but lacking the central action of amphetamine or ephedrine. Starting from phenylethyl-

amine he proposed the introduction of a $-OCH_3$ group in the *meta* position and an $-OH$ group in the *para* position to neutralize the central action. Then he proposed substituting a $-CH_3$ group on the α carbon of the side chain to render the substance immune from attack by amine oxidase. This compound was synthesized by Sir Robert Robinson and did indeed fulfil some of the hopes. Its duration of action was five times as great as that of adrenaline, and its toxicity was only one-sixth that of amphetamine. In later papers he studied the cyclohexylalkylamines, and the effect of introducing unsaturated linkages in the side chain.

Professor Gunn was a wise and learned man, courteous and fair to all who knew him, and a sympathetic examiner of medical students. He was regarded with sincere affection and great respect. In his home life he was blessed in having a devoted wife, who survives him, together with a daughter and two sons. His third son was killed in the fighting in Italy.

D. B. McGRIGOR, O.B.E., M.B., Ch.B., D.M.R.E.

Brigadier D. B. McGrigor, formerly consultant radiologist to the Army, died in Colchester Hospital on October 22, aged 73.

Dalziel Buchanan McGrigor was born on January 20, 1885 at Torry, Aberdeen, the son of James McGrigor, a consulting engineer who practised in Calcutta. Educated at Robert Gordon's College, Aberdeen, he went on to the University of Aberdeen to study medicine, graduating M.B., Ch.B. in 1907. After holding a resident hospital appointment in Perth, he entered the R.A.M.C. in 1907 and, having qualified with distinction as a specialist in electrical services at the Indian X-ray Institute, he served in India from 1909 to 1914. During the early part of the first world war he was on active service in France, with the Indian Expeditionary Force, in charge of No. 1 field x-ray section. Returning to India in 1916, he was appointed D.A.D.M.S. of the 9th Indian Division in 1918. In the following year he was promoted major and appointed O.B.E. From 1919 to 1920 he was D.A.D.M.S. of Northern Command at York. Having taken the D.M.R.E. of Cambridge in 1920 he became specialist in charge of radiology at Queen Alexandra Military Hospital, Millbank, and lecturer to the Royal Army Medical College. Retiring from the R.A.M.C. in 1927, he was appointed adviser and examiner in radiology to the Army Medical Services. In the same year he went on a visit to Army Medical Headquarters in Washington to inspect the radiological services there. Four years later he carried out a similar visit of inspection at Army Medical Headquarters in Paris while attending the Third International Congress of Radiology as a member of the British delegation. In 1939 McGrigor was recalled from the reserve, and as an adviser in radiology to the Army Medical Services he organized the Army School of Radiology. In 1941 he was promoted brigadier, and in the following years undertook tours of inspection in N. Africa, the Middle East, and France. Continuing to serve as consultant radiologist to the Army Brigadier McGrigor finally retired in 1952, when 67 years of age. As a result of his work during the second world war he was awarded the Legion of Merit by the United States Government, the Czechoslovak Military Medal (1st class), and the Polish Silver Star.

Brigadier McGrigor was a member of the executive committee of the British Institute of Radiology for many years, and was president of the Institute from 1939 to 1942. In 1946 he received, jointly with Lieutenant-Colonel Eric Samuel, the Roentgen Award of the Institute. In 1935 he was vice-president of the Section of Radiology and Radiotherapeutics at the Annual Meeting of the B.M.A., held in Melbourne that year. Well known and popular among American radiologists, he was elected an honorary fellow of the American College of Radiology in 1952. He was also an honorary fellow of the Society of Radiographers.

Brigadier McGrigor married Dorothy Macgregor Drysdale in 1912, and she survives him with one daughter and two sons, Dr. A. B. McGrigor, senior registrar in the department of diagnostic radiology at University College Hospital, and Mr. R. B. McGrigor, senior registrar in the department of surgery at St. Bartholomew's Hospital.

We are indebted to Dr. R. BOULTON MYLES for the following appreciation: It was at the Royal Army Medical College at Millbank in 1921 that I first met "Mac." He was then the officer in charge of the x-ray and electro-medical departments of the Queen Alexandra Military Hospital, and lecturer in radiology at the College, so to me, a junior officer on a promotion course, he was a big man. And he remained so, big in knowledge as well as stature, and—how important this—big in heart. The fact that he was a senior officer never obtruded itself, which was one of the reasons why he was such an excellent teacher, as I was to discover later when I was privileged to attend the specialist course under him. Very quick to size up a student's general outlook and possibilities, he seemed to know exactly when to be strict and when to relax, when to be present and when to leave us to work out our problems on our own initiative. Before the end of the course I found that in addition to meeting a first-class teacher I had made a new friendship—one which has now been broken by the only possible means. When he retired from the Army he did not sever his connections with Army radiology, but remained as secretary and mainspring of the Army X-ray Advisory Committee until it was finally disbanded after the war. Meanwhile, though not practising as a radiologist, he was taking a more important place in medical radiology outside the confines of the Services. He was treasurer of the British Institute of Radiology for ten years, and relinquished the office then at his own request because he thought it was time for a younger man to take over. The Institute signified its approval by making him president instead, and keeping him there for three times the normal term of office.

On the outbreak of war in 1939 he was immediately called to the War Office to correlate radiological services in the Army—in other words, to put into practice the fruits of his previous labours on the X-ray Advisory Committee. The Army was indeed fortunate to have at its disposal one whose hobby ever since he left the active list had been the study of medical radiology in its broadest aspects, and undoubtedly with particular reference to the possibility of just such an emergency. His knowledge of the technical problems involved and his close liaison with the designers and manufacturers of the essential apparatus enabled him to take the duties of an onerous post in his stride, so that he appeared always to have time for personal consultation regarding the numerous problems which arose. Since the war his radiological activities had lessened, not through loss of interest, but because, in his own words, "We old men should step aside and let the others carry on." Nevertheless, he remained a staunch supporter of the British Institute of Radiology and attended its meetings with great regularity. Another of his important side-lines was his interest in the R.A.M.C. Officers', Widows', and Orphans' Friendly Society, to which he devoted a great deal of time and thought for many years. Its strong position and smooth running are due in no small measure to his efforts. Mac was, in the best sense of the phrase, a good mixer, and he had friends everywhere. He missed no opportunity of visiting hospitals and x-ray engineering works in Britain and in most parts of the world, and wherever he went he was always asked to return. Only last year he toured Canada and the U.S.A. again at the invitation of the American radiologists, who had a very high opinion of his qualities. In addition to being universally popular outside, Mac was very much a family man, and we who are going to miss our occasional contacts with him realize how much more he will be missed at home. He was a great personality, of a type which we can ill afford to lose.

W. S. FLOWERS, M.B., Ch.B.

Dr. W. S. Flowers, formerly a medical missionary in China, died at Harrogate on September 26. He was 60 years of age.

Wilfred Stephen Flowers was born on May 27, 1898, and studied medicine at Leeds University, where he graduated M.B., Ch.B. in 1925. He had already been trained in missionary work, and after graduation went to China as a medical missionary. He left that country in 1939, after being ill-treated by the Japanese in occupied China, and was medical superintendent of the Wharfedale Hospital, Sheffield, for two years. He then went back to China to take charge of a British Red Cross Hospital on the Burma Road. He also assisted the Chinese Government in its task of medical reconstruction after the defeat of the Japanese in the second world war. In September, 1948, he was among the last to leave Tsinan before that city was captured by the Chinese Communists, and the time of his escape coincided with a breakdown in health, which caused him to give up missionary work abroad. At home he became secretary of the Yorkshire Association for the Care of Cripples, an appointment he held until his death. He leaves a widow and two sons, both of whom are in the medical profession.

R. B. writes: Dr. Wilfred Flowers, "Blossom" to his fellow residents at the General Infirmary at Leeds, had first trained at Rawdon Baptist College in preparation for his work as a medical missionary before proceeding to Leeds University for his medical training. While a student he was a member of the universities debating team which toured South Africa in 1924. After graduation he embarked on his life's work in China. He established and was in charge of the Missionary Hospital at Chowtsun, and had a difficult time when it became Japanese occupied territory. After furlough in England he returned to China in 1942 as leader of a British Red Cross unit. He was the first representative of the Allies to enter the Japanese internment camp at Shanghai with news of deliverance. In 1946 he accompanied Sir Clutha Mackenzie on a tour of China primarily concerned with the "non-sighted." In 1948, when the Communists were coming into power, he was about to board an aeroplane to go and see Mao-Tse Tung about the rehabilitation of missionary hospitals, when he had his first coronary attack. Unable to continue his Yorkshire Association for the over the secretaryship of the Yorkshire Association for the Care of Cripples and established training centres for cripples, first at Harlow Grange and then at St. George's, Harrogate.

WILLIAM DAVIES, M.R.C.S., L.R.C.P.

Dr. William Davies, who was medical superintendent of the Sully Hospital, Glamorgan, from 1935 to 1951, died on September 28 at the age of 73.

William Davies's life was very much a triumph over adversity. Starting to earn his living at a very early age, he found himself forced, at the age of 26, to give up his work or risk the possibility of blindness. Deciding to become a teacher, he went to Carmarthen to prepare himself for his new profession. There a friendly medical practitioner recognized his abilities and persuaded him to switch to medicine. While studying in London he came under the influence of Sir Robert Hutchison, and this period of hero-worship did him much good and was to shape his attitude towards his profession. One could detect the insistence on realism, the tendency to "debunk," and the thoughtful approach to problems. This attitude had been superimposed on a nature that was essentially kindly, a nature marked by a desire to help and with an instinctive knowledge of the psychology of his patients. Shortly after qualifying M.R.C.S., L.R.C.P. in 1918 he went to Brecon, and it was from there that he was induced to join the staff of the newly opened South Wales Sanatorium at Talgarth. The appointment was a temporary one, but he soon found that tuberculosis was to be his life's

work. He never left the service of the King Edward VII Welsh National Memorial Association.

In 1924 he was invited to open the recently adapted Cefn Mably Hospital, near Cardiff. At Talgarth he had helped in the rehabilitation of tuberculous patients, but at Cefn Mably Hospital he had to treat patients in a more active stage of the disease. During the eleven years he spent there he extended his knowledge of his subject by visiting Switzerland to see the treatment of bone tubercle by heliotherapy and then to Paris and Berck-Plage to see the treatment by immobilization in plaster. Before completing his stay in Cefn Mably he was appointed to the Sully Hospital, which was in course of construction. He supervised the construction and equipment of the hospital, and during the year before completion his job was a full-time one. The appointment was a unique one and was fully justified by the saving in mistakes, in time, and in money. He had time to consider the different types of equipment and to make a sound judgment. There was a rare understanding between Davies and his chief, Dr. Dan Powell. Their wish to make the hospital up to date was fulfilled. All this was not accomplished without sacrifice. In addition to his eye trouble he had been plagued by migraine and by sciatica—the latter a reminder of his work in earlier days. His great interest was in radiology, and he specialized in this work. Perhaps the threat to his eyesight made him see in x rays a third eye to help him in his work. It was a source of wonder and amusement to his patients that he recognized them by screening them. At Sully he set the pattern and helped to raise it to the international status it now enjoys. He retired in 1951, but, being much too interested to stop work, he joined the Pneumoconiosis Panel, where his previous knowledge of mining was a great asset. His death is a great loss to those who knew him, and sincere sympathy is extended to his widow and children. His son and daughter have followed his example and are members of the medical profession. It is perhaps fitting that we should remember this well-beloved Welshman by a quotation from the language he loved so much. It is a proverb that sums up his life: A dyf dddwg wybodaeth, a gwybodaeth ddoethineb (Adversity brings knowledge and knowledge wisdom).—H. A. R.

J. A. MORTIMER, M.D., F.R.C.P.Ed.

Dr. J. A. Mortimer, consulting surgeon to the Glasgow Eye Infirmary, died at Law Hospital, Carlisle, on October 10. He was 71 years of age.

John Alexander Mortimer was born on May 16, 1887, the son of an Edinburgh law agent, and was educated at George Watson's College and at Edinburgh University. After an undergraduate career of some distinction, he graduated M.B., Ch.B. in 1909. Two years later he proceeded to the M.D. and was elected a Member of the Royal College of Physicians of Edinburgh, being admitted a Fellow of the College in 1943. After graduation he was an assistant in general practice in Dumfries, before beginning his specialist career at the Bradford Royal Eye and Ear Hospital, where he remained until 1921. During the first world war he served in the R.A.M.C. as an ear, throat, and nose specialist at Étaples. In 1921 he gave up the throat and nose side of his practice to become school oculist to the Lanarkshire education authority, and a year later he was admitted to the staff of the Glasgow Eye Infirmary, where he became a full surgeon in 1935. After his retirement from the hospital in 1947 he carried on his school work in Lanarkshire until shortly before his death. In addition to these appointments, he was a certifying surgeon to the Mission to the Outdoor Blind in Glasgow. He carried on a private practice in Lanarkshire, where his name was well known. Taking a prominent part in the work of the West Church of Hamilton, he was for over 30 years an office-bearer there. He was a very good and enthusiastic golfer. A man of pawky humour, he never lost his east coast accent, nor his command of the Doric. His opinions of all forms of government were

freely expressed in terms which left the politicians—medical or otherwise—in no doubt as to his opinions. In spite of these strongly and vigorously expressed views he was, withal, a kindly man, and his patients and colleagues could see the kindly man under the rough exterior.

W. A. A. FAMUYIWA, M.B., Ch.B.

Dr. W. A. A. Famuyiwa, a young Nigerian who had been in the medical profession only a few months, was killed in a car accident near Berwick-on-Tweed on October 19. He was 35 years of age.

Wilson Adelola Alade Famuyiwa was born on January 18, 1923, and studied medicine at St. Andrews University, where he graduated M.B., Ch.B. last July. At the time of his death he held an appointment at the Bridge of Earn Hospital.

A. P. writes from Dundee: The tragic and untimely death of "Famy" as a result of a car crash came as a great shock to those of us who were privileged to have experienced his friendship. His cheerfulness was infectious—he enjoyed life to the full, and those with whom he was in contact enjoyed it with him. His radiant smile was disarming and a source of delight to his colleagues, nursing staff, and patients. He was always ready to perform acts of kindness and service to his friends; he never bore a grudge, nor had he a harsh word to say to or about anyone. "Famy" was a sincere and good man, and a fine ambassador for Nigeria. His death is a great loss, not only to his friends in Great Britain but also to his own people, among whom he ultimately intended to practise.

H. E. HODGE, M.B., Ch.B.

Dr. H. E. Hodge, better known as Merton Hodge, playwright and actor, died recently at Dunedin, New Zealand, at the age of 54.

Horace Emerton Hodge was born at Gisborne, New Zealand, on March 13, 1904, and was educated at King's College, Otahuhu, at Auckland University College, and at Otago University, graduating M.B., Ch.B. from the University of New Zealand in 1929. After house appointments at the Dunedin, Wellington, and Auckland Hospitals, he came to Britain to take a postgraduate course at Edinburgh, and while there wrote *The Wind and the Rain*, a play which subsequently ran for 1,000 performances in London. On leaving Edinburgh he served in the R.A.M.C. for two years, and this was followed by a further year as an anaesthetist at St. George's Hospital, London. In 1935 he gave up medicine to take his play to New York. For the next four years he concerned himself almost solely with authorship and dramatic work. He anglicized the American play, *Men in White*; he wrote his second play, *Grief Goes Over*, which was presented in London in 1935; and in 1936 he published *The Wind and the Rain* as a novel under the title of *The Island*. Three other plays came from his pen up to 1939, when, on the outbreak of the second world war, he returned to London and to medicine. From 1939 to 1944 he was on the staff of the Camberwell House Hospital for Nervous Diseases. After the war he was in practice in London for a few years, and finally in Dunedin. He was unmarried.

HENRY WALLACE-JONES, M.Sc., M.D., F.R.C.P.

The obituary of Dr. Henry Wallace-Jones was printed in last week's *Journal* (p. 1045).

E. N. C. writes: I had the privilege of working with Henry Wallace-Jones on and off for over 35 years. When he was assistant physician to Professor John Hay I acted as their house-physician and later medical registrar. No one could have been more kind to a young man. He was able in a clear and simple fashion to give excellent clinical instruction to his students and younger staff, and always in a spirit of toleration and understanding of our ignorance.

As time passed and Professor Hay retired, Wallace became head of the heart clinic, which had been founded by his chief, a disciple of Mackenzie: he was therefore in direct succession to the pioneers of British cardiology. At this time I became his assistant physician and was again impressed by his quiet modesty and the sense of happiness which he spread among all of us who had the privilege of working with him. Apart from his outstanding clinical ability, he had an inquiring type of mind, with a great zest for the mastery of the modern instruments of cardiology. If his active life had been prolonged 10 years I am sure he would have been in great sympathy with the modern highly scientific approaches to the problems of heart disease. But in his own day he made the best use of the polygraph, the electrocardiograph, and the radioscope. He did not write extensively, but his publications are such as to have stood the test of time. When he retired from the Royal Infirmary, to which he had loyally given the whole of his professional life, he sought the sunnier climate of South Africa and continued for a little while to practise as a consulting physician. Once a year he came back to England, and only recently we had the pleasure of a short visit by him to the regional cardiac centre. He still had family interests in Liverpool, where one of his sons practises as a radiologist, and I know that much of his retired life was devoted to the furtherance of his children's plans. He was a happy man by disposition, and his devoted and charming wife helped him to spread this happiness to all those who had contact with him. There must be many outside the Royal Infirmary who will mourn his loss but who will be grateful for their pleasant associations with him.

CHARLES M. FRIER, M.B., C.M.

The obituary of Dr. Charles Frier was printed in the *Journal* of October 11 (p. 921).

J. B. A. writes: With the death of Dr. Charles Frier the people of Grantham and its surrounding villages have lost an old and a trusted friend. When he retired three years ago he had been in active practice in Grantham for sixty years. He will be missed by a host of patients who had also become his friends, and though his manner at times was abrupt they knew they could trust him. He was typical of the best of the general practitioners of his generation, being efficient in all branches of medicine and surgery, including gynaecology and ear, nose, and throat work. He had his own x-ray apparatus, which he managed himself. He also did refractions. In fact, he was both "Jack" and "Master" of all trades. On coming to Grantham he purchased a small declining practice, and when he retired he was the senior partner in a large firm of six principals. One of his lifelong interests was the welfare of children, and for years he was the secretary of the local branch of the National Society for the Prevention of Cruelty to Children. He was the treasurer and founder of a local fund, known as Dr. Frier's Crippled Children's Holiday Fund, whereby about thirty children—not now, I am glad to say, all cripples—are sent to the sea each year for a fortnight. This year was the first year he was unable to be there in person to see them off. For many years he was an active member of the local bench and chairman of the juvenile court, where his wisdom and understanding were of great value. He was a most generous person, and his name figured prominently in all charitable appeals. I was told a story the other day by an old district nurse, which is typical of "The Old Man." One day, years ago, she saw his bicycle outside a cottage in a village five miles away at about 8 a.m. She went in and found Dr. Frier on his knees setting and lighting the fire. The patient upstairs was about to have a baby, and there was no hot water and no help. He was, of course, looked up to by all the profession in Kesteven. Anyone in trouble or difficulty always turned to him for advice and help, which was unfailingly given.

F. J. J. writes: Dr. Charles Frier was regarded for many years as the doyen of the medical profession of the Kesteven

area of Lincolnshire. He came to Grantham some sixty years ago, and when he retired a few years ago the partnership had risen to one of six doctors. He represented the old school, and his Gladstonian manner of dress lent dignity to his appearance at the meetings of the Representative Body, at which he was a well-known figure. His rugged personality deceived a little, but hid a kindly character. Always ready to help, his charitable acts were known to only a few. Apart from his vast medical knowledge he possessed considerable surgical skill in his younger days and undertook operative procedures under conditions that would test the courage of a modern surgeon. He had untiring energy, and up to the age of 70 would work until the early hours of the morning. He retired from practice only a few years ago, though he continued to visit a few favourite patients. He was one of the early members of the Kesteven Division, and was its representative in the Representative Body, alternately with the Holland Division, before the two Divisions were granted separate representation. He continued to serve in this capacity for nearly forty years, until, in different health made it difficult for him to attend. A former president of the Lincolnshire Branch and chairman of the Kesteven Division, his knowledge of B.M.A. affairs and medical politics was phenomenal. He acted as secretary of the panel committee from its inception and of its successor, the local medical committee, for some years, and he was treasurer of the latter until his death. During the second world war he was for a time chairman of the local medical war committee. He served on the staff of the Grantham Hospital for twenty-five years until 1948, and held the appointments of public vaccinator and Poor Law medical officer. He instituted a local charity for providing seaside holidays for sick children. As a token of esteem the Lincolnshire Branch of the B.M.A. presented him with a pair of antique candlesticks some ten years ago, and his election as a Fellow of the Association this year gave him considerable pleasure. He became a widower fifteen years ago, and the loss of an only son under tragic circumstances while at school left a permanent scar, although assuaged by the loyal and devoted care and companionship of his only daughter. Dr. Frier will be long remembered in his locality as an outstanding figure reminiscent of the Victorian era, a wise counsellor, a friend to everyone, and a practitioner who embodied all that is noble and fine in the medical profession.

Medico-Legal

CERTIFICATION WITHOUT SEEING PATIENT

[FROM OUR LEGAL CORRESPONDENT]

While her husband was a prisoner in Barlinnie Prison Mrs. George Black, of 11, Black Street, Glasgow, got his doctor to certify without seeing him that he was unfit on the usual National Health Service Act form stating: "I certify that I have examined you . . ." Mrs. Black told the doctor, who knew that Black's foot was in plaster and had hospital reports on his condition, that as her husband's foot was swelling he was staying at home. She did not reveal the fact that he was in prison. The doctor was prosecuted for granting medical certificates falsely stating that he had examined his patient. He was found not guilty in the Sheriff Court at Glasgow on July 14, but the Crown appealed. In the Scottish Justiciary Appeal Court the Solicitor-General said that if the Crown succeeded no further proceedings would be taken against the doctor, but the aim was to get the Court's ruling on whether the Sheriff-Substitute had been entitled to acquit him.

In his judgment (*Glasgow Herald*, October 10) Lord Clyde said that to certify that a patient had been examined when he had not was a contravention of the National Health Service (Scotland) Act. In the issue of a certificate authorizing the expenditure of public money laxity was to be

deplored. No doubt partly with this in view the statutory form demanded not only a diagnosis but a statement that there had been an examination of the patient. The Sheriff-Substitute had not been entitled to find the doctor not guilty.

CRIMINAL ABORTION AND MANSLAUGHTER SENTENCE REDUCED ON APPEAL

[FROM OUR LEGAL CORRESPONDENT]

On October 15 the appeal of Louis Aimee Newton against his sentence of three years' imprisonment for manslaughter and two years for unlawfully using an instrument to procure a miscarriage was heard by the Court of Criminal Appeal (*The Times*, October 15). Mr. Justice Ashworth at the trial had ordered the two sentences to run consecutively (*Journal*, May 24, p. 1242).

The Lord Chief Justice said that the consecutive sentences had been given for what was really the same offence, since it was the use of the instrument, and not any criminal negligence apart from that, which had caused the death. It was wrong in principle to give consecutive sentences for what was in effect one offence. Moreover, the judge in sentencing Newton had made it clear that he had it in his mind that Newton was a professional abortionist. There was no evidence whatever of that, and he ought to have been dealt with on the basis that it was an isolated case, although it was a serious offence. Accordingly the Court substituted sentences of 3 years' and 2 years' imprisonment concurrent for the consecutive sentences.

Newton's counsel told the Court that the proposed appeal against conviction had been abandoned on advice that the summing up at the trial could not properly be criticized.

BROADMOOR PATIENT TREATED AS SANE

[FROM OUR LEGAL CORRESPONDENT]

Frank Samuel Mitchell, aged 24, escaped from Broadmoor on July 8 (see *Journal*, July 19, p. 174) and robbed Mr. and Mrs. Peggs, of Wokingham, of clothes and a car and some money in furtherance of his escape, using violence towards them. After being at large for two days he was arrested in a Bournemouth-to-London motor coach at Hartley Witney. He was charged on October 2 at Reading Assizes with robbery with violence and pleaded guilty, asking through his counsel to be treated as a sane man (*The Times*, October 3).

Dr. Francis Brisby, the medical officer of Brixton Prison, said in evidence that although Mitchell was an aggressive psychopath he was not in his opinion certifiably insane. Mitchell at the age of 5 had been found to be of subnormal intellect, and was placed in the care of the L.C.C. He had greatly improved as a result of his treatment in Broadmoor, where he was sent in April, 1957, and was now in the process of maturing slowly, as could be seen from his progress educationally, emotionally, and in the ability to control his impulses. He had worked very hard to overcome the stigma of intellectual subnormality.

In sentencing Mitchell to life imprisonment Mr. Justice Byrne said that the medical evidence had satisfied him that Mitchell was sane and had been sane when he had committed these offences. The sentence of life imprisonment enabled the Secretary of State to review matters periodically and did not necessarily mean Mitchell would be in prison for the rest of his life.

Another Broadmoor patient, Clive Pickering, after being found unfit last June at York Assizes to plead to a murder charge, is now to stand his trial (*Daily Telegraph*, October 21). He is charged with the murder of John Frederick Boucher, aged 45, who died in the River Hull in May. After medical evidence at the Assizes, Pickering, aged 27, was ordered to be detained at Broadmoor. In a statement on October 20, Pickering's solicitor said: "We received two letters from Pickering. In view of the contents of the letters we made representations to the Secretary of State, and as a result Pickering will stand his trial."

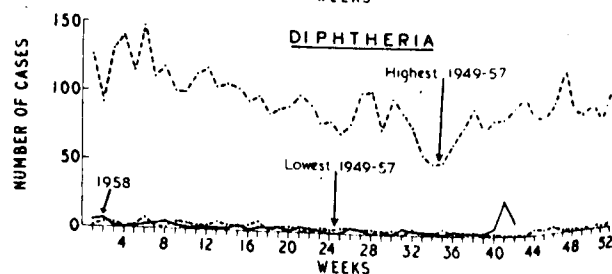
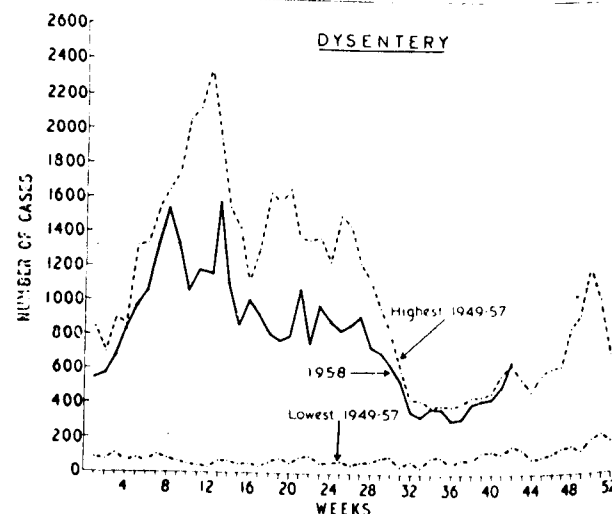
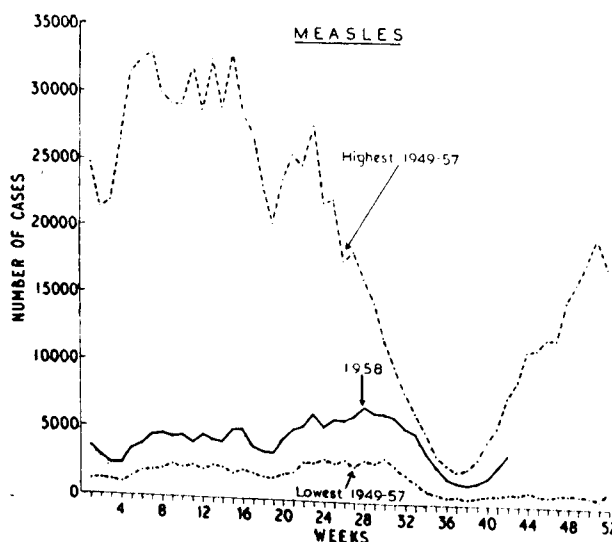
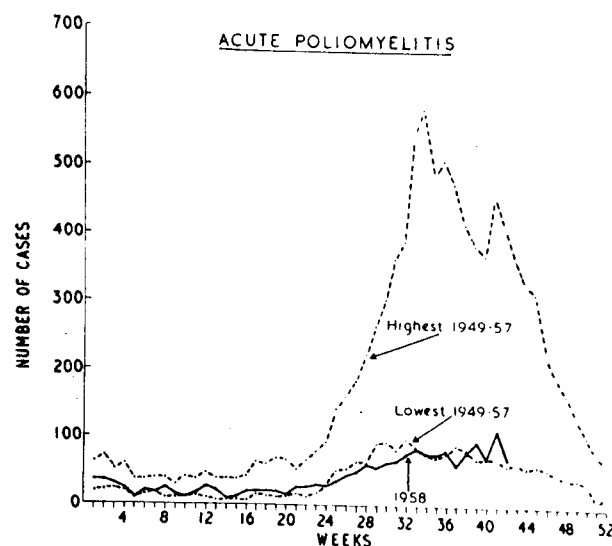
Vital Statistics

England and Wales in Third Quarter

Live births numbered 180,167, giving a rate of 15.8 per thousand population, as compared with 15.9 in 1957 and 15.5 in 1956. Deaths numbered 105,547, giving a rate of 9.3 per thousand population. The rates in the September quarters of 1957 and 1956 were 9.7 and 9.3 respectively. The infant mortality rate, 19.8 per thousand live births, was again a record low figure for the quarter. The previous lowest for this quarter was 20.1, recorded in 1956. In 1938 the corresponding rate was 42.5. The stillbirth rate was 21.4 per thousand live and stillbirths; in the corresponding quarter of 1957 it was 22.4.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus - - - - -, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending October 18

The increases in notifications of infectious diseases in England and Wales during the week ending October 18 included 961 for measles, from 2,778 to 3,739, 147 for scarlet fever, from 648 to 795, 146 for dysentery, from 512 to 658, 35 for acute pneumonia, from 216 to 251, and 30 for food-poisoning, from 229 to 259; the largest decreases were 43 for acute poliomyelitis, from 113 to 70, 24 for whooping-cough, from 500 to 476, and 15 for diphtheria, from 25 to 10.

10 cases of diphtheria were notified, 15 fewer than in the preceding week; 6 of these cases were notified in London (Finsbury 4, Islington 1, St. Pancras 1) and 2 in Barking M.B.

The largest rises in the incidence of measles were 114 for Yorkshire West Riding, from 306 to 420 (Halifax C.B. 104, Keighley M.B. 68); 109 in Yorkshire East Riding, from 110 to 219 (Kingston-upon-Hull C.B. 190), 94 in Middlesex, from 102 to 196 (Harrow M.B. 60), 83 in Kent, from 25 to 108 (Dover M.B. 68), 73 in Buckinghamshire, from 15 to 88 (Bletchley U.D. 87), 73 in Cheshire, from 176 to 249, 68 in Wiltshire, from 90 to 158 (Swindon M.B. 85). The largest increases in the notifications of scarlet fever were 31 in Lancashire, from 105 to 136, 29 in Yorkshire West Riding, from 77 to 106, 23 in London, from 47 to 70. The only large fluctuation in the returns of whooping-cough was a rise of 24 in Lancashire, from 47 to 71.

The notifications of acute poliomyelitis numbered 70, and these were 36 fewer for paralytic and 7 fewer for non-paralytic cases than in the preceding week. The largest returns were Lancashire 15 (Manchester C.B. 5, Liverpool C.B. 3), Yorkshire West Riding 9 (Huddersfield C.B. 3), London 7 (Shoreditch 2), Sussex 5 (Portslade-by-Sea U.D. 2, Shoreham-by-Sea U.D. 2).

The chief centres of dysentery were Yorkshire West Riding 123 (Leeds C.B. 32, Dearne U.D. 28, Ripon and Patley Bridge U.D. 21), London 73 (Islington 23), Hampshire 49 (Southampton C.B. 46), Lancashire 45 (Liverpool C.B. 21), Staffordshire 43 (Kidsgrove U.D. 41), Glamorgan-shire 34 (Rhondda M.B. 24), Northumberland 28 (Newbiggin-by-the-Sea U.D. 19), Warwickshire 28 (Coventry C.B. 18), Gloucestershire 27 (Bath C.B. 26), Nottinghamshire 26, Middlesex 25, Monmouthshire 23 (Newport C.B. 23).

Medical News

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending October 11 (No. 41) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria	25	15	2	0	2	1	0	6	0	1
Dysentery	512	69	213	22	5	210	19	55	12	2
Encephalitis, acute	2	1		0		13	2		0	
Enteric fever: Typhoid	4	3	0	0	1	5	2	0	0	1
Paratyphoid	3	0	10(B)	0	2(B)	5	0	0	0	2
Food-poisoning	229	35	92	2		106	9	7	4	
Infective enteritis or diarrhoea under 2 years				14	31				7	33
Measles*	2,778	164	22	9	53	1,217	24	15	26	28
Meningococcal infection	14	1	13	0	2	38	5	10	1	
Ophthalmia neonatorum	34	7	6	0	1	24	0	3	0	
Pneumonia†	216	9	123	2	1	2,275	116	1047	57	1
Poliomyelitis, acute: Paralytic	83	1		0	7	68	1	15	5	5
Non-paralytic	30	0	22	0		26	1			
Puerperal fever‡	253	36	15	1		354	50	6	10	1
Scarlet fever	648	47	114	20	15	336	27	49	13	27
Tuberculosis: Respiratory	484	62	76	16		494	51	101	12	
Non-respiratory	49	5	14	7		62	2	13	3	
Whooping-cough	500	26	74	58	35	317	17	24	0	19

DEATHS	1958					1957				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	1	0		0		0				
Encephalitis, acute		0				1				
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	1	0	2	1	0	0	0	1	0	
Influenza	7	1	1	1	0	46	90	23	2	
Measles		0	0	0	0	0	0	0	0	
Meningococcal infection		0	0			0	3			
Pneumonia	364	17	21	8	3	62	85	31	6	
Poliomyelitis, acute	5	1	1	0	0	6		6	0	
Scarlet fever		0	0	0	0	0	0	0	0	
Tuberculosis: Respiratory	70	9	7	1	2	7	13	3	3	
Non-respiratory		1	1	0	0	1	1	0	0	
Whooping-cough	1	0	0	0	0	0		0	0	
Deaths 0-1 year	273	27	30	3	11	26	40	6	16	
Deaths (excluding stillbirths)	8,769	696	503	91	142	912	829	169	169	
LIVE BIRTHS	14,960	1239	516	235	388	1165	1021	227	437	
STILLBIRTHS	296	24	28			21	25			

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

Nuffield Orthopaedic Centre.—At Oxford on October 27 QUEEN ELIZABETH THE QUEEN MOTHER opened a new building for teaching and research at the Nuffield Orthopaedic Centre. Professor J. TRUETA, its director, described the Centre in an article in the *Journal* in 1951 (April 28, p. 940). Two years ago Lord NUFFIELD added a further £200,000 to the £50,000 he had already given "to create in perpetuity an orthopaedic teaching centre under the guidance of the Nuffield professor of orthopaedic surgery in the University of Oxford," its main purpose being to offer facilities for training and research to young orthopaedic specialists, mostly from the Dominions, Colonies, and abroad. The new building substantially increases the Centre's facilities by providing a new and larger records office, clinical examination rooms, a department of radiology, and offices for the clinical consultants. But the most important addition is the new university department of orthopaedic surgery. Besides offices for the teaching staff and scholars, the department has laboratories for histology, pathology, electron-microscopy, and x-ray diffraction, together with a museum and an enlarged library. There are also residential quarters for some of the scholars in the grounds. A lecture hall for 140, a dining-room, and a common-room for the medical staff and scholars are among the features of this notable new example of Lord Nuffield's munificence. They combine to give the Centre more the aspect of a college.

Society of Medical Officers of Health.—The president of the Society, Dr. J. A. STIRLING, M.O.H. for Chesterfield, was in the chair at the annual dinner, held last week at the Royal College of Surgeons, Lincoln's Inn Fields. Proposing the health of the Society, Mr. DEREK WALKER-SMITH, the Minister of Health, spoke of two great contemporary social problems, old age and mental health. As to the latter, he said that the Government intended at an early date to introduce legislation to implement some of the recommendations of the Royal Commission on Mental Illness and Mental Deficiency, which would mean some further expansion of the health services of local authorities. The shift of emphasis to community care would result in more active prevention of illness, and in this the medical officer of health could play an important and distinguished part. Thanking medical officers of health for their splendid efforts in connexion with poliomyelitis immunization, the Minister said that by far the greatest share in those arrangements had fallen on the M.O.H., and very rapid progress had been made. Out of the total of 5½m. people who had had two injections, 4m. had had their inoculations this year. The Ministry could really claim that its campaign had succeeded, but a still greater response from parents was needed. Nearly half the parents in this country had not seen fit to register their children for immunization, and there was a good deal more to do if all were to be vaccinated who should be. Dr. STIRLING, in his reply, looked back over the 40 years he had been in the public health service. Giving a word of warning about diphtheria, he said that they must still persevere with the mothers of to-day and see that the children got immunized. The three great public health problems were now atmospheric pollution, care of the aged, and mental health. Dr. G. H. GIBSON, toasting the guests, had hoped a recent annotation in the *Journal* (October 11, p. 904) would help him in his task, but, although he said this hope was not fulfilled, he appeared to have taken its grim warning very well to heart. Sir KENNETH COWAN, replying, struck an optimistic note and sent his hearers away confident that work of importance lay before the M.O.H.

Royal College of Surgeons of Edinburgh.—After the annual meeting of the College on October 15 it was announced that the following would hold office for the ensuing year: *President*, Professor JOHN BRUCE; *vice-presidents*, Professor NORMAN M. DOTT and Mr. WALTER W.

GALBRAITH; secretary, Mr. CHARLES W. A. FALCONER; treasurer, Mr. J. J. MASON BROWN; president's council, Mr. D. Band, Mr. R. S. Barclay, Mr. J. R. Cameron, Mr. I. L. Dick, Professor D. M. Douglas, Mr. E. L. Farquharson, Mr. A. J. C. Hamilton, Mr. J. N. J. Hartley, Professor R. J. Kellar, Mr. J. A. Ross, Professor G. I. Scott, Mr. J. A. Shepherd, and Mr. R. Leslie Stewart; conservator of museum, Professor D. E. C. Mekie; and honorary librarian, Dr. D. Guthrie.

F.R.C.S.Ed.—At a meeting of the Royal College of Surgeons of Edinburgh on October 15 the honorary fellowship was conferred upon Professor CHARLES B. HUGGINS, professor of surgery at Chicago University. At the same meeting the following candidates who passed the requisite examinations were admitted fellows:

J. Abrahamson, W. R. Allan, L. W. Baker, D. B. Berryman, K. S. Bhargava, N. Bhattacharyya, R. Cowley, S. J. Crews, P. J. E. Cruse, B. K. Datta, B. Dawka, N. C. Desai, H. Dovey, G. H. Dunstone, H. M. El-Sayed, K. D. Glass, G. D. Goel, A. J. Grant, P. Gupta, M. Habibulla, P. Harnarayan, F. W. Harrison, E. T. Heath, A. W. B. Heywood, H. K. Ismail, N. D. Jeyasekharan, M. J. Killingback, H. M. Learoyd, J. E. Lorang, M. H. Luntz, M. J. Lyons, M. M. A. Mahran, F. P. S. Marriott, P. R. Mehta, D. N. Menzies, R. E. Mickel, D. M. Millar, M. C. Misra, S. R. Mitra, B. C. Mukerjee, V. G. Muzumdar, D. W. Pfanner, R. Pringle, D. C. Provan, P. A. Rachow, J. A. Ryan, M. Sabetian, C. D. Sagar, K. M. Shah, R. P. Singh, J. G. Smith, J. H. Tait, C. F. Tham, T. T. Thomas, M. Vasudevan, N. H. Welsh, and T. Wilson.

Christmas Cards.—Unicef is once again launching its annual campaign to raise funds for its world-wide activities in the field of child welfare. The funds necessary for the organization's objectives are supplemented by the sale of its Christmas cards. A leaflet illustrating the cards is obtainable from Unicef Greeting Card Fund (Dept. C), 14-15, Stratford Place, London, W.1. These very decorative cards illustrate such themes as "Children Bearing Gifts," "A Time of Joy," and "Festive Times." Their cost is 7s. 6d. for ten cards. The subject of the Deaf Children's Society's Christmas card is "A Gay Winter Scene," designed by a deaf boy aged 11. Packets of six of these cards, with six Christmas seals, may be obtained for 3s. 6d. per packet from 1, Macklin Street, Drury Lane, London, W.C.2. The Muscular Dystrophy Group also offers Christmas cards for sale. They may be obtained in packets of six (from 2s. to 3s. a packet) from 34, Eccleston Square, London, S.W.1.

B.M.A. Clinical Meeting.—Details of the Sunday outings at the B.M.A. Annual Clinical Meeting next month at Southampton are given at p. 189 of the *Supplement*. This is to assist those registering for the meeting in choosing which outing they would like to attend.

R.S.M. Library.—The Royal Society of Medicine has been offered a grant of £24,000 by the Rockefeller Foundation for the general support of its library over the next five years. The Rockefeller Trustees make it clear that the grant is to help provide an adequate budget for the library while endowment for its continued maintenance is sought.

Leeds University.—Dr. D. B. BRADSHAW, lecturer in the department, has been appointed to the chair of public health. Dr. Bradshaw, who graduated in medicine from Dublin in 1932, is also deputy M.O.H. of Leeds. Among other appointments at Leeds are Dr. M. W. ATKINSON as tutor in psychiatry, Mr. R. G. BURWELL as lecturer in anatomy, Dr. A. J. KENNY as lecturer in biochemistry, Dr. N. R. ROWELL as tutor in dermatology, and Mr. F. G. SMIDY as lecturer in surgery.

Professor W. A. Bain has resigned the chair of pharmacology at Leeds University on his appointment as director of the Smith Kline and French Research Institute. The institute, which is expected to be completed next summer, is at Welwyn Garden City.

Professor Ian Aird has been elected an honorary fellow of the Swedish Surgical Society, and has been awarded the society's Olof Af Acrel medal.

Chair of Social Medicine, Otago.—Dr. C. W. DIXON, reader in epidemiology in the department of preventive medicine and public health at Leeds, has been appointed to the chair of social and preventive medicine at Otago University. Dr. Dixon qualified from King's College Hospital in 1935, later proceeding M.D. London. Previously he was an M.O.H. in the New Zealand Government Service and a W.H.O. medical consultant on smallpox.

COMING EVENTS

Institute of Dermatology.—Semi-permanent exhibition, November 5 to 26, on "The Skin and Friction."

Robert Jones Lecture.—Mr. NORMAN CAPENER will lecture on "Spondylolisthesis: Spinal Strain" on November 13 at 5 p.m. at the Royal College of Surgeons, Lincoln's Inn Fields.

Institute of Laryngology.—Annual address will be given by Mr. T. G. WILSON on "The Modern Treatment of Deafness in Historical Perspective" on November 14 at 4.30 p.m. The institute will be "At Home" to medical visitors from 2 p.m. The joint annual dinner of the institute and the associated Royal National Throat, Nose, and Ear Hospital will be held the same evening at University College, Gower Street, London, W.C.1.

Institute of Diseases of the Chest.—Panel discussion for general practitioners on "Virus Infections of the Respiratory Tract," December 2, at 2.30 p.m. at the Brompton Hospital, London, S.W.3. Practitioners wishing to attend should notify the dean.

British Institute of Radiology.—Annual congress and exhibition, December 4 and 5. Details from the general secretary of the Institute, 32, Welbeck Street, London, W.1.

NEW ISSUES

SPECIALIST JOURNALS AND ABSTRACTS

The journals listed below are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Heart Journal.—Issued quarterly (£3 annually). The new issue, Vol. 20, No. 4, includes:

THE ORIENTATION OF THE HEART AND THE APPEARANCE OF ITS CHAMBERS IN THE ADULT CADAVER. Robert Walmsley.
SELECTIVE CINÉ-ANGIOCARDIOGRAPHY WITH IMAGE INTENSIFICATION. Hamish Watson, C. Pickard, K. G. Lowe, and Ian Hill.
THE CORRELATION BETWEEN VARIOUS ASSESSMENTS OF PULMONARY ARTERIAL PRESSURE IN MITRAL STENOSIS. J. F. Boyd, S. D. Scott Park, and George Smith.
THE FUNCTIONAL AND CLINICAL ANATOMY OF THE MITRAL VALVE. J. C. Van Der Spuy.
RESIDUAL LUNG VOLUME IN MITRAL DISEASE. R. Garbagni, P. F. Angelino, A. Brunca, and E. Minetto.
THE ELECTROCARDIOGRAM IN SYPHILITIC HEART DISEASE. Geoffrey Storey.
THE ELECTROCARDIOGRAM IN PECTUS EXCAVATUM. Jorge Martins de Oliveira, Mohinder P. Samghil, and Henry Zimmerman.
MODIFICATION OF VENTRICULAR GALLOP RHYTHM INDUCED BY POOLING OF BLOOD IN THE EXTREMITIES. James J. Leonard, Arnold M. Weissler, and James V. Warren.
THE AORTIC LESION OF ANKYLOSING SPONDYLITIS. B. M. Ansell, E. G. L. Bywaters, and I. Doniach.
THE CEREBRAL BLOOD FLOW IN MITRAL STENOSIS AND ITS RESPONSE TO CARBON DIOXIDE. H. A. Dewar and L. A. G. Davidson.
THE EFFECT OF VALVOTOMY ON THE MURMURS OF PULMONARY AND AORTIC STENOSIS. Bertrand G. Wells.
PULMONARY HYPERTENSION IN CONGENITAL HEART DISEASE. William Evans and D. S. Short.
FOETAL PAROXYSMAL AURICULAR TACHYCARDIA. C. W. Kesson.
THE VASOCONSTRICTIVE FACTOR IN PULMONARY HYPERTENSION. Paul Wood.

British Journal of Venereal Diseases.—Issued four times a year (£3 annually). The new issue (Vol. 34, No. 3) includes:

FIGURES AND FANCIES. S. M. Laird.
GUMMATOUS OSTEITIS OF THE SKULL. W. V. Macfarlane and Ian Rennie.
THROMBOSIS OF THE POSTERIOR INFERIOR CEREBELLAR ARTERY OF LUETIC AETIOLOGY. R. V. Rajam, N. Vasudeva Rao, and P. N. Rangiah.
LYMPHOANGIOMA VENOSUM. A REVIEW OF 61 CASES. David Erskine.
CANDIDA ALBICANS URETHRITIS. REPORT OF A CASE. W. Fowler.
STUDIES ON THE EFFECT OF VARIATION OF CONCENTRATION AND ORIGIN OF LECTHIN (NATURAL AND SYNTHETIC) IN CARDIOLIPIN COMPLEMENT-FIXATION ANTIGEN. Alice Reyn and Michael Weis Benzon.
SACRO-ILIITIS IN REITER'S DISEASE. J. K. Oates.
STUDIES IN PROSTATITIS. Edward Garlman.
DIAGNOSIS OF TRICHOMONAS VAGINALIS URETHRITIS IN THE MALE AS A ROUTINE CLINIC PROCEDURE. C. S. Nicol.
PENICILLIN TREATMENT FAILURES IN MALE GONORRHOEA. Neil L. Dallas.
REITER'S PROTEIN COMPLEMENT-FIXATION TEST. REPORT OF A TRIAL IN 1,000 UNSELECTED CASES. W. D. Foster, C. S. Nicol, and A. H. Stone.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, November 3

DENTAL AND MEDICAL SOCIETY FOR THE STUDY OF HYPNOSIS.—At Trocadero Restaurant, 7.15 p.m., annual dinner, Dr. D. Keir Fisher: Anaesthesia—the Anaesthetist—and You.
GUY'S HOSPITAL.—At Anatomy Lecture Theatre, 5.15 p.m., lecture-demonstration in endocrinology by Dr. P. M. F. Bishop: Hypothyroidism.
LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Heath Clark Lecture by Dr. Karl Evans (Norway): Health Service, Society and Medicine: Present-day Health Services in their Relation to Medical Science and Social Structure—Introduction—Main Types of Existing Health Services.
MARLBOROUGH DAY HOSPITAL.—8.15 p.m. Dr. Louis Minski: Psychosomatic Problems.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. B. Ackner: Psychogenic Pain.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, Gower Street, W.C.1, 5 p.m., Dr. J. R. Postgate: Sulphur Bacteria—Oxidative Stages of the Bacterial Sulphur Cycle.

Tuesday, November 4

FOUNTAIN HOSPITAL.—5.30 p.m., Dr. J. Tizard: Impressions of Work in Mental Deficiency in the U.S.S.R.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. F. Borrie: Cutaneous Vascular System.
●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 3 p.m., Guest lecture by Dr. J. Goodwin: Heart Disease and Pregnancy.
LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Heath Clark Lecture by Dr. Karl Evans (Norway): Health Service, Society and Medicine: Present-day Health Services in their Relation to Medical Science and Social Structure—Role of the Hospital.
MANCHESTER UNIVERSITY: DEPARTMENT OF OCCUPATIONAL HEALTH AND NORTH-WEST ENGLAND FACULTY, COLLEGE OF GENERAL PRACTITIONERS.—At Theatre 1, Clinical Sciences Building, York Place, 8.30 p.m., Radiation Hazards in Modern Industry.
ST. ANDREWS UNIVERSITY.—At Physiology Lecture Theatre, 6 p.m., Dr. G. L. Jackson (U.S.A.): Biologically Based Dentistry.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. Roger de Vere: Fibrinoids and Allied Tumours.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C.1, 5.30 p.m., Professor J. F. Danielli, F.R.S.: Generalized Cell Theory and its Relevance to Certain Problems of Drug Action.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. Colin Edwards: neurological demonstration.

Wednesday, November 5

ASSURANCE MEDICAL SOCIETY.—At Medical Society of London, 5 p.m., Dr. J. Maurice Campbell: Life Assurance for those Applicants with Heart Disease.
COLLEGE OF GENERAL PRACTITIONERS: NORTHERN HOME COUNTIES FACULTY.—At the George Hotel, Enfield, 8.30 p.m., symposium: Research in General Practice.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Subcutaneous Infections due to Fungi.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. Paul Wood: Bedside Techniques in Cardiology.
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—5.30 p.m., Dr. I. Friedmann, Dr. D. A. Osborn, and Dr. A. Jeanes: clinical pathological conference.
INSTITUTE OF UROLOGY.—At Royal College of Surgeons of England, 5 p.m., Clifford Morson Lecture by Professor C. Dent: Metabolic Causes of Renal Stone Formation.
LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Heath Clark Lecture by Dr. Karl Evans (Norway): Health Service, Society and Medicine: Present-day Health Services in their Relation to Medical Science and Social Structure—Role of the General Practitioner.
MANCHESTER MEDICAL SOCIETY: SECTION OF MEDICINE.—At Large Anatomy Theatre, Medical School, Manchester University, 5 p.m., Dr. P. J. D. Snow: The Carcinoid Syndrome. Dr. D. Longson: Adrenal Hyperfunction.
MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 8.15 p.m., Dr. P. H. Davison: Management of Chronic Cardiac Failure.
●NATIONAL COLLEGE OF RUBBER TECHNOLOGY, Northern Polytechnic, Holloway Road, N.—6.30 p.m., Dr. J. T. Scales: Synthetic Materials in Orthopaedics.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Guest lecture by Dr. G. M. McGowan: Potassium Metabolism.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. A. B. Stewart: London County Council Health Services.
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE: EDINBURGH BRANCH.—At West Medical Theatre, Edinburgh Royal Infirmary, 5 p.m., Professor G. W. A. Dick: Tropical Viruses.

Thursday, November 6

FACULTY OF HOMOEOPATHY.—At Royal London Homoeopathic Hospital, 5 p.m., Richard Hughes Memorial Lecture by Dr. D. M. Gibson: Aetiological Aspects of Homoeopathic Materia Medica.
LIVERPOOL UNIVERSITY: FACULTY OF MEDICINE AND LIVERPOOL MEDICAL INSTITUTION.—Surgery Theatre, Old Medical School, 5.15 p.m., Joint History of Medicine Lecture by Dr. W. Brockbank: The Ancient Art of Enema Administration.
LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Heath Clark Lecture by Dr. Karl Evans (Norway): Health Service, Society and Medicine: Present-day Health Services in their Relation to Medical Science and Social Structure—Role of Drugs. At Royal Society of Medicine, 5 p.m., Semon Lecture by Professor L. Rüedi (Zurich): Some Observations on the Histology and Functions of the Larynx.
ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—5 p.m., John Matheson Shaw Lecture by Dr. W. M. Arnott: Climate of Medical Education.
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Bradshaw Lecture by Dr. K. W. Donald: Heart Disease and Exercise.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. Desmond Curran: Postgraduate demonstration in psychiatry.
UNIVERSITY COLLEGE LONDON.—At Anatomy Theatre, Gower Street, W.C.1, 1.15 p.m., Dr. D. Wilkie, Ph.D.: Aims of Sexual Reproduction.

Friday, November 7

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. T. Brain: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. J. N. Pattinson: clinical demonstration.
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., clinical discussion for general practitioners by Mr. G. H. Howells: Sinusitis.
LIVERPOOL UNIVERSITY: FACULTY OF MEDICINE.—At Large Lecture Theatre, New Medical School, Ashton Street, 5.15 p.m., McMurray Lecture in Orthopaedic Surgery by Professor W. P. Blount (Wisconsin): Fractures in Children.
LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Heath Clark Lecture by Dr. Karl Evans (Norway): Health Service, Society and Medicine: Present-day Health Services in their Relation to Medical Science and Social Structure—Public Health Service.
MANCHESTER MEDICAL SOCIETY.—At Clinical Sciences Building, York Place, 4.30 p.m., Sir Roy Cameron, F.R.S.: The Principle of Reversibility in Liver Pathology.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Guest lecture by Mr. A. S. Kerr: Relief of Pain.
●ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS.—4 p.m., William Blair-Bell Memorial Lecture for 1958 by Dr. J. M. Crawford: Study of Placental Growth in Normal Pregnancy and in Erythroblastosis Fetalis.
ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At Royal Faculty of Physicians and Surgeons of Glasgow, 8.30 p.m., (1) Mr. T. Gibson: Domestic Burns—Their Prevention and Treatment. (2) Mr. I. MacGregor: Changing Pattern of Treatment in Hand Infections.
ROYAL SOCIETY OF HEALTH.—At New Lecture Theatre, Newcastle upon Tyne, 10.30 a.m., Symposium on Atmospheric Pollution. Professor G. R. Clemo, F.R.S.: Chemistry of Cigarette Smoking and its Possible Implications. Dr. A. G. Ogilvie: Chronic Bronchitis in Newcastle upon Tyne; Mr. L. Mair: Second Appointed Day on Tyneside.

Saturday, November 8

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—11.30 a.m., Guest lecture by Professor L. Rüedi (Zurich): New Developments in the Surgery of Otolosclerotic Diseases.

APPOINTMENTS

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—B. H. Hand, M.S., F.R.C.S., Consultant Surgeon, Ipswich and East Suffolk Hospital; M. D. Mehta, M.B., B.S., F.F.A.R.C.S., Consultant Anaesthetist, King's Lynn Area; Margaret M. Downes, M.B., Ch.B., M.R.C.O.G., Part-time Consultant Obstetrician and Gynaecologist, Lowestoft and Great Yarmouth Hospitals; M. F. T. Yealland, M.B., B.Chir., M.R.C.P., Consultant Neurologist, United Cambridgeshire Hospitals and Regional Board Hospitals; J. P. Hughes, M.B., B.S., M.R.C.P., Senior Medical Registrar, Ipswich and East Suffolk Hospital; A. R. Walker, M.B., B.S., Registrar in Psychiatry, St. Andrew's Hospital; M. K. Basu Mallick, M.B., B.S., D.Obst.R.C.O.G., Registrar in Obstetrics and Gynaecology, Peterborough Group of Hospitals; Sheila M. Griffiths, M.B., B.S., Registrar in Geriatrics, Ipswich and East Suffolk Hospital Group; M. A. Jafri, M.B., B.S., D.T.M.&H., Medical Registrar, Peterborough Hospital Group; P. R. H. Slade, Ch.M., F.R.C.S., Senior Registrar in Thoracic Surgery, Papworth Hospital; I. B. Munro, M.B., Ch.B., F.R.F.P.S., M.R.C.P., M.R.C.P.Ed., Senior Medical Registrar, United Norfolk Hospitals; J. Ludbrook, M.B., Ch.B., F.R.C.S., Surgical Registrar, Norfolk and Norwich Hospital; S. P. Kumar, M.B., B.S., D.O.M.S., D.O., Ophthalmic Registrar, Norfolk and Norwich Hospital; Miss F. Husain, M.B., B.S., and W. S. Sykes, B.M., B.Ch., Anaesthetic Registrars, Ipswich and East Suffolk Hospital; Hazel M. Wilson, M.R.C.S., L.R.C.P., Registrar in Mental Deficiency and Child Psychiatry, Little Plumstead Mental Deficiency Group of Hospitals, and Child Psychiatry Service.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bexon.—On October 10, 1958, at Dryburn Hospital, Durham, to Muriel, wife of Dr. Wallace H. Bexon, of Grange Farm Cottage, Durham, a sister for Fiona—Alison.
Gordon.—On October 17, 1958, at Sale, Victoria, Australia, to Drs. Nesta and William F. Gordon, a son.
Lovel.—On September 29, 1958, to Joan (formerly D'Arcy), M.D., D.C.H., and Lester Lovel, of 46, The Ridge Way, Sanderstead, Surrey, a son—Paul D'Arcy.
Palfrey.—On October 22, 1958, at University College Hospital, London, W.C., to Ann and John Palfrey, of University College, Ibadan, Nigeria, a brother for Michael and Susan—Christopher Mark.
Perry.—On October 19, 1958, at the County Hospital, Haverfordwest, to Dr. Elizabeth Perry (formerly Thomas), wife of Dr. Lynn Perry, a daughter, sister for William and David.

DEATHS

Chubb.—On September 28, 1958, at Kenilworth, Cape Town, South Africa, Elsie Mary Chubb, M.D., D.P.H.
Clark.—On October 6, 1958, at 6, Henderland Road, Edinburgh, Katherine Jane Stark Clark, M.D., D.P.H., aged 92.
Eaton.—On October 8, 1958, Douglas Arthur Tighe Eaton, L.R.C.P.(S.I.) & L.M., of Whole Farm Cottage, Stone-in-Oxney, Tenterden, Kent, late of South Benfleet, Essex.
Homan.—On September 27, 1958, William Travers Homan, L.M.S., L.M., of Donegan, Portland Road, Greystones, Eire, late of Dover, Kent.
Hughes.—On September 20, 1958, David Morgan Hughes, F.R.C.S., of 24, West End Avenue, Pinner, Middx., aged 82.
Muirson.—On September 28, 1958, at Trotton Old Rectory, Rogate, Sussex, Taylor David Muirson, L.R.C.P.&S.Ed., L.R.F.P.S., Lieutenant-Colonel, I.M.S., retired.
Prager.—On September 29, 1958, Gertrude Anna Prager, M.D., of Manchester, aged 47.
Seingry.—On September 26, 1958, at Llandough Hospital, Heinrich Egon Seingry, M.B., B.Ch., of 4, Danycoed Road, Cardiff, aged 48.
Wanhill.—On September 29, 1958, at Broadstone, Dorset, Charles Frederick Wanhill, M.R.C.S., L.R.C.P., D.P.H., Lieutenant-Colonel, R.A.M.C., retired, aged 86.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Abortion and Bicornuate Uterus

Q.—Is hormonal treatment indicated during pregnancy in a woman who has a bicornuate uterus and a history of repeated miscarriages?

A.—The incidence of abortion, and of premature labour, is raised when the uterus is malformed, probably either because the abnormal organ cannot grow and stretch normally, or because of inadequate placentation (especially if sited on the spur or septum between the horns), or both. Theoretically hormone therapy with oestrogen and progesterone might counter these factors to some degree, for the prognosis for a viable baby seems to improve with successive pregnancies, but in practice such therapy has not yet been shown to be effective. In general the prognosis is better the greater the degree of imperfect fusion (e.g., better in uterus didelphys than bicornis). Nevertheless, gross degrees of bicornuity are sometimes corrected between pregnancies by the reconstructive operation of uteruloplasty, but in minor degrees the operation is difficult and of doubtful value.

Risk of Meningocele

Q.—What are the risks of malformation in further children of a young couple who have already had two children born with a meningocele?

A.—The risks for a further child after a mother has had two children with meningocele are not yet accurately known. The risk after one such child is of the order of 1 in 25,¹ and the risk is probably further increased when two such children have been born. A small personal series indicates a risk of about 1 in 10. The risk is probably somewhat modified by the part of the country in which the parents live, and by the parents' social class.

REFERENCE

¹ MacMahon, B., Pugh, T. F., and Ingalls, T. H., *Brit. J. prev. soc. Med.*, 1953, 7, 211.

Oral Contraceptives

Q.—What is the latest information about oral contraceptives?

A.—Data of a kind which can be appraised critically are available on two oral contraceptive agents. In a trial in Puerto Rico, directed by Dr. Gregory Pincus, and referred to in an annotation in the *Journal*,¹ the steroid known as "enavid" administered in a dose of 10 mg. daily for 20 days, beginning on the 5th day of each menstrual cycle, proved 100% effective in preventing conception in those volunteers who omitted no tablets while under treatment. The mechanism involved is inhibition of ovulation, which some might regard as potentially dangerous if long continued, and particularly if children were desired at a later date. Further drawbacks to this method are its costliness, the need for regular daily treatment in 20-day courses, and the intolerance to the drug which a proportion of women show. None of the patients in the trial had any untoward effects from the treatment.

The second agent is *m*-xylohydroquinone, which Sanyal²⁻⁴ considers to be the antifertility factor of pea oil, acting by virtue of its anti-progesterone and anti-vitamin E effects. This has been tested fairly extensively in India, the patients taking a capsule of 300-350 mg. on the 16th and 21st days of the cycle—that is, twice a month only. A significant reduction in fertility rates has been observed—but to the extent only of reducing them by about half, so that this agent would appear to be far less effective than enavid.

It is encouraging that a good deal of high-quality research into the problem of devising the ideal contraceptive is now being undertaken by first-class investigators, and, though "the pill," in its ideal form, is probably still a long way off, optimism would appear to be not unwarranted.

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High-fat Reducing Diet

Q.—In view of recent work showing the efficacy of high-fat reducing diet, what percentage of fat, carbohydrate, and protein should the average reducing diet contain?

A.—Some of the recent work in relation to high-fat reducing diets has related only to diets suitable for experimental purposes.¹⁻³ Others, notably Pennington,^{4,5} have used similar diets to reduce obese patients, apparently with success. There is at the moment no fixed agreement as to the relevant portions of fat, carbohydrate, and protein, but the usual practice in reducing diets is to diminish the carbohydrate intake and thus to increase the relative proportions of fat and protein. These latter can be increased if the resulting diet is unsatisfactory.

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NOTES AND COMMENTS

Intestinal Hurry.—Dr. IAN STEWART (Keighley) writes: In the advice on intestinal hurry ("Any Questions?" October 4, p. 868) there is the sentence: "In severe dysentery morphine by injection may greatly help the patient, but it can only be used once or twice." In infections with Shiga's bacillus and the presence of a powerful exotoxin, I would have thought that morphine by injection was extremely dangerous. During the 12 years I was working with this group of diseases no form of opium was used until the diagnosis was established.

OUR EXPERT replies: Opium has been used for over 200 years with benefit in the treatment of dysentery. Manson-Bahr¹ says nothing against its use, and morphine is strongly recommended by Strong.² In extensive experience with cases of dysentery I have used morphine as described in patients whose diarrhoea and pain were severe. No ill effects occurred and the patients were always greatly relieved.

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Correction.—In the article on "Sedatives and Tranquillizers" by W. Sargent (*Journal*, October 25, p. 1031) the dose of bromide in the paragraph headed "Bromides" should have been 20-30 gr., not 20-30 mg.

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MEDICINE'S CHALLENGE TO THE EDUCATOR*

BY

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An invitation to speak on the problems of medical education in Britain that would be of interest in the United States is one that offers much freedom of choice. Some would choose to display how most of our doctors, particularly the more energetic and talented, are being submerged by uncontrolled growth of committees; and they would discuss how this strange phenomenon has come about, and perhaps how it could be controlled. Others would take the registrar problem, with its temporary interruption in the flow of men through the training posts. Related to this would be the disparity between numbers of permanent posts in the National Health Service and of those being trained to fill them, and the effect of the monopoly created by the National Health Service on recruitment to medicine. Or he might wish to show how the universities can best utilize their new-found freedom to provide a better curriculum, thanks to the new wisdom of the General Medical Council. All these subjects require more study than I have been able to give, and to do justice to each would require a separate essay. Besides, some of these problems, though not the first and the last, are largely administrative, and therefore of restricted interest to our colleagues abroad.

I propose, therefore, to interpret the invitation liberally and to take three issues that affect our attitude to medicine and the teaching of medicine. These three are, firstly, the issue of instruction versus education; secondly, the importance of the proper use of words; and, lastly, the growing importance of population studies in clinical research. I have to confess that these are three old hobby-horses of mine. But I always find the ride exhilarating, and can only hope you may do so too.

Instruction versus Education

My own introduction to the conflict between education and instruction took place during my undergraduate days at Cambridge. One of my friends, who was a teacher of English, pointed out to me that medical students were not being educated; they were being instructed. He explained that education was a training of the mind; that in education a student is set to work in his own time; and the chief function of his teacher is to appraise his efforts, to cure him of bad mental habits, and to encourage him in good ones. He explained to me that this was what was done in the arts faculties of our ancient universities, where a man attended lectures for not more than two hours a day and spent the rest of his time preparing work for his tutor to criticize. The process of instruction, on the other hand,

was a process of forced feeding, in which nothing was required of the student except to memorize and to reproduce what he remembered. In such a process the student was required to know the conclusions but not necessarily the evidence on which these were based.

It was clear to me that he was right, and this became even clearer to me in the clinical years, when many teachers did not themselves know what the evidence was or where it could be found. We students were receiving not education but instruction. We went to so many lectures and classes and had so many textbooks to read that we learned things by sheer memory. And we learned the conclusions, not how these had been arrived at. The contrast was all the more striking because between the preclinical and clinical parts of the medical course proper it had been my privilege to take Part II of the Natural Sciences Tripos in Physiology. That was true education under a brilliant collection of teachers—Langley, Barcroft, Adrian, W. B. Hardy, Hopkins, Roughton, Hartridge, Marshall, and others. We had very few lectures, all very much to the point and highly critical, and we were expected to read the more important original papers. I personally owe most to Joseph Barcroft, who not only inspired us in his lectures and practical classes but who also made us write essays for him once a week. There were but four of us. It is not difficult to imagine what a contrast there was between this thrilling intellectual exercise and the dreary grind of instruction of the medical course proper.

My first point is therefore this, that in any branch of university education, including medical education, we should aim at using the methods of education rather than instruction. We must teach the student how to collect the facts, to verify them, to assign a value to them, and how to draw conclusions from them and test those conclusions; in short, how to form a judgment. As Karl Pearson said, "the true aim of the teacher should be to impart an appreciation of method rather than a knowledge of facts," for method is remembered when facts have been forgotten, and method can be used in a new situation where there are no, or too few, facts. The student learns how to learn and can go on acquiring knowledge for the rest of his life.

To obtain some insight into the effect of instruction as opposed to education on a sensitive mind, may I quote Charles Darwin's experiences as a medical student in Edinburgh University in 1825: "The instruction at Edinburgh was altogether by Lectures, and these were intolerably dull, with the exception of those on chemistry by Hope; but to my mind there are no advantages and many disadvantages in lectures compared with reading. Dr. Duncan's lectures on Materia

*Adapted from an address given to the Cardiovascular Program Directors of the United States Public Health Service, Williamsburg, Virginia, on June 7, 1958.

Medica at 8 o'clock on a winter's morning are something fearful to remember. Dr. Munro made his lectures on human anatomy as dull, as he was himself, and the subject disgusted me. It has proved one of the greatest evils in my life that I was not urged to practise dissection, for I should soon have got over my disgust; and the practice would have been invaluable for all my future work." In medicine the great difficulty in using the educational approach used to be the small number of teachers and the wide range of subject-matter to be covered. Logistics determined the didactic approach by lectures and large practical classes. This still holds in countries like India, Germany, and elsewhere.

Two Difficulties

In the United States and in Britain two developments have made the educational approach possible—namely, a great increase in staffing of medical schools, and a great development of postgraduate education. The obstacles in our way are now different. They are two. In the first place, knowledge is growing apace. And since man is only one of a very large number of living creatures having many features in common, and since it is believed that ultimately physico-chemical behaviour will be shown to be at the root of all biological behaviour, there is almost no piece of natural knowledge that may not be turned to account in medicine. Our first difficulty is then what limits to set to the fields of knowledge in which to practise the educational method. Our second difficulty is how to teach, whether by lectures, seminars, ward clinics, out-patient clinics, discussion groups, or their variants. My own view is that the ground covered and the precise method used are of less importance than the attitude of mind of the teacher himself.

A true educator must have certain innate characters. He must be intelligent and thoughtful; he must be interested in the material he is using for teaching, and in the minds of those taught. He is more likely to have the right attitude if he has come into close contact himself with a great teacher. Finally, he must be able to detach himself from the ever-increasing pressure of modern life, which tends to crush all individuality from him. Let me quote Fridtjof Nansen, who began life as a zoologist, spent three years of his life drifting across the North Polar ice, one of it with a single companion, and who ended his life as the greatest humanitarian of this century: "The first great thing is to find yourself, and for that you need solitude and contemplation, at least sometimes. I tell you deliverance will not come from the rushing noisy centres of civilization. It will come from the lonely places."

Proper Use of Words

I now come to my second topic, the need for the correct use of language. Of the various points I have to try to make to you I would myself regard this as the most important because the most neglected. The function of language is the transfer of information not only from the mind of one individual to that of another but also, what is often overlooked, to transfer information from one part to another of a single individual's mind. It would seem self-evident that the information that is transferred must be accurate if the action taken is to be closely related to the information received. Electronics, servo-mechanisms, cybernetics, and their amazing products, the automatic machines of great power, versatility, and accuracy; guided missiles; and the like have made us familiar with the importance of transmitting accurate information in order to obtain precise and predictable performance. It is a continuing

source of wonder to me that we doctors are so little concerned with the accurate transmission of information within our own minds, and between other minds and ours.

The chief source of inaccuracy in the transfer of information is, I think, the use of technical jargon. On another occasion, in your country, I devoted a little time to the way in which scientists nowadays fence off their subject with technical terms, so that those who have not first learned the language of the specialty cannot understand what the author is trying to say. Those of us who teach and work in the field of cardiovascular diseases are not entirely blameless in this matter. This is, if you like, a manifestation of the growth of nationalism in science, just as the move to teach in Erse, in Welsh, in Afrikaans, and other tongues is one example of the growth of nationalism within the general cultural life of the British Commonwealth. This is important. Nevertheless, I will say no more of it. I want to deal rather with two other aspects—namely, the transfer of information from the mind of the patient to that of the doctor, and from one part of the doctor's mind to another.

In taking a history of the patient's illness I teach my students that they are eliciting an account of the patient's experience. They must use the patient's own words, provided always that both the patient and the doctor are sure that the information conveyed in these words is so far as possible accurate and unequivocal. They must never use terms, like "chesty," which means nothing at all. Nor must they use technical terms, such as anginal pain, or asthma, bronchitis, haemoptysis, or haematemesis, because these are not terms descriptive of experience but are terms that attempt to interpret that experience. Used by the patient, they are often used wrongly, as also indeed they are sometimes by the doctor, who, in using them, prematurely comes to a conclusion. To my mind a good history is one that is expressed entirely in words that are as simple and well known to us as the words used to describe events in the old and new testaments of the Bible. And I suspect we would all agree that a good history is perhaps the most important part of the evidence that takes us to an understanding of our patient's disability.

I always feel I have great difficulty in persuading my colleagues of the importance of what I have just related, but I have even greater difficulty with the next—namely, the errors that we make our own minds commit by the use of technical terms. To illustrate my point I would ask you to consider four examples from cardiovascular and related pathology—namely, shock, arteriosclerosis, bronchospasm, and hypertension.

"Shock"

Shock was a name that came to be used to describe a failure of the circulation, quite distinct from failure of the heart. It became a problem of first importance in the first world war because so many wounded soldiers died presenting this clinical picture. Many distinguished scientists devoted themselves to it, notably Cannon from your side and Bayliss from ours. And the conclusion that emerged from that war was that shock was a traumatic toxæmia produced by the effects of vaso-active substances like histamine released from the injured muscles. It needed the genius of your Dr. Alfred Blalock and the experience of the second world war to show that this was not so, and was shown that, arising from war wounds, the clinical condition was usually due to loss of blood but could also be due to infection, loss of plasma (as in burns), loss of other body fluids, or due to the vasovagal or fainting attack.

Now, why Cannon, Bayliss, and other distinguished physiologists went wrong was because they were not clinicians familiar with the variety of circumstances in which this clinical picture called shock could arise. They assumed that because the same word was used, therefore the circumstances leading to the final picture were the same; and because in some cases they could exclude the

obvious cause, loss of blood, they assumed that there must be another and more important cause that must operate in all cases. The history of our understanding of traumatic shock is to my mind a most illuminating one. Cannon and Bayliss were most distinguished scientists with a deep insight into the phenomena with which they were dealing. There were few subjects they touched that they did not illuminate. The error came because information was not fully or accurately transmitted in their minds, but was transmitted in the form of a technical term. It is the kind of error that is easily committed where the mind tries to grapple with a problem with which it is not fully and deeply familiar. And too often and to too many of us understanding is limited by the concept consciously or unconsciously conjured up by the technical term to express it.

"Arteriosclerosis"

My second example is arteriosclerosis. As a student this term confused me utterly, and the confusion was worse confounded by its being sometimes used as almost synonymous with hypertension. Cowdrey's book on arteriosclerosis first showed me the light. It became apparent to me that the distinguished authors were equally confused and were talking about different things. In fact, it became apparent that a large number of conditions affecting different coats and different sizes of vessels were there considered, and indeed E. T. Bell said so.

Nowadays our own specialty runs hotfoot to find the reason why increasing numbers of males in the richer countries die young because their coronary arteries become occluded. This is generally described as the problem of atherosclerosis. Now, this term was introduced by Marchand, in a paper given in 1904 to the German Medical Congress, to include both the fatty proliferative nodular change in the intima characteristic of atheroma and the other degenerative, cellular, and calcific changes of intima and media included in the term arteriosclerosis. His paper was indeed entitled "Über Arteriosclerose." He proposed the term not as an alternative to atheroma, but as an alternative to arteriosclerosis, including lesions of both intima and media, but emphasizing the importance of the intimal fatty change. Atherosclerosis is currently used by most to signify atheroma, which is purely an intimal lesion and is the proper term to describe the coronary lesion that produces ischaemia. Others, however, used it, as it should be used, in Marchand's sense. In fact, I have seen a leading pathologist in this field show a group such as this how atherosclerosis might produce a coronary artery that was wider than normal or one that was narrower. To my rather sceptical eye it seemed that in the first the chief change was in the media, in the second in the intima.

A great deal of wealth and a great deal of man-hours of work are now being invested in this arresting problem. I am tempted to wonder whether the greatest hindrance to our understanding of myocardial infarction lies in the term atherosclerosis. And I wonder if a careful and critical review of the types of arterial change that occur in disease, and their bearing on coronary occlusion, is not the first step that will have to be taken before we reach our goal. As I tried to illustrate by the history of shock, the kind of misconception that technical jargon conjures up is one of the most potent causes, and certainly the most insidious cause, of erroneous conclusion. Many of the distinguished scientists now invading this field of arterial diseases, and particularly ischaemic heart disease, are unfortunately not themselves deeply conversant with the clinical and pathological facts. I often wonder if they really understand what they are seeking to explain, and whether they know how much and how little the term atherosclerosis really means. Or are they being misled as Cannon and Bayliss were by a technical term?

"Bronchospasm"

My third example is bronchospasm. This clearly implies to my mind, and I think to most, that contraction of their

muscular walls has greatly narrowed the bronchi. For some years it has been a common practice, even among skilled chest physicians in my country, to describe the association of difficult breathing with rales and rhonchi as bronchospasm. A few years ago I was concerned in a therapeutic trial on the effects of a certain drug on status asthmaticus. As the results came to be set out several of the distinguished doctors wished to refer to the bronchial obstruction that characterizes this state as bronchospasm. This seemed to me to be an intellectual lapse that is characteristic of the age. As every experienced pathologist knows, the characteristic feature of the post-mortem appearances of the lungs in status asthmaticus is the swelling of the bronchial mucosa, and the blocking of the lumen by mucus and other material. To describe this by a term signifying smooth-muscle contraction is surely to reveal a mind that has lost all pretence of being an instrument of precision.

"Hypertension"

My fourth example is hypertension. I will just say this, that the introduction of this technical term, its evolution into the concept of essential hypertension as a disease entity, and the necessity of defining normal blood pressure and hypertension, represent a sequence of events that the readers of Wilfred Trotter's (1941) essays on "The place of general ideas in medicine" and "Has the intellect a function?" will recognize as inevitable. But, as I mentioned earlier, they have made it very difficult for the average doctor to understand the nature of so-called essential hypertension.

Importance of Population Studies in Clinical Research

I would like to leave this rather damaging assessment of a common behaviour of the mind of many who actually lead in medicine to-day and proceed to consider the new importance being given, particularly in Britain, to the study of selected populations with the object of identifying the factors concerned in producing disease and the effects of treatment.

In recent years clinical science has been dominated by what the late Sir James Spence described as phenomenology; that is to say, the application of the methods of physiology and biochemistry to the search for causal sequences in the individual patient. This method has been quite invaluable in showing how the various organs work in disease and what happens when they fail. It has also been invaluable in demonstrating the precise action of drugs which act quickly. Nevertheless, there is no doubt that a great deal of unnecessary effort is put into this form of investigation. I remember the editor of a well-known journal telling me that he had had 53 papers submitted to him in one year on the effects of exercise on the cardiac output in mitral stenosis. Moreover, invaluable as this method is in its proper sphere, it can tell us next to nothing about the genetic and environmental factors producing disease nor how to prevent it or control it. Thus the physiological approach has enabled us to understand the symptoms and signs and electrocardiographic changes in coronary heart disease and assess the effects of vaso-active drugs on exercise tolerance. But it is virtually useless in identifying or measuring the effects of genetic and environmental factors in producing myocardial infarction, or the effects of treatment in preventing recurrence or prolonging life. In other words, the physiological approach is of little value in the prevention or control of disease.

The study of populations to assess the influence of genetic and environmental factors began with Francis Galton, the cousin of Charles Darwin, in his studies in inheritance in man. Galton (1889) found that there were two kinds of inheritance, that of alternative characters such as blue or brown eyes, and that of blended or graded characters such as height. The former type of inheritance was later explained by Mendel's work as representing the effects of single genes, distributed in allelomorph pairs and behaving as dominants or recessives. The latter type of inheritance is believed to be polygenic—that is, to repre-

sent the sum of many genes, each of which probably behaves in Mendelian fashion. Hamilton, Roberts, Sowry, and I (1954), and Miall and Oldham (1955, 1957) have shown, using extensions of Galton's method, that blood pressure is also inherited as a graded character over the whole range. In the field of cardiovascular disease this method has thus shown that the distinction between so-called normal blood pressure and essential hypertension is nothing else but an artifact and that in the production of levels of blood pressure ordinarily termed essential hypertension genetic factors are important but not exclusive; environmental factors as yet unidentified are probably also concerned.

The aim of this method is to study populations that are alike in every respect except for the variable studied. Because of the complexity of factors concerned and the impossibility of assessing and controlling them all, this means the study of large numbers, with the expectation that the influence of these uncontrolled factors will be the same in the two populations, the differences thus representing the influence of the variable factor. This was achieved by us by measuring blood pressure under the same circumstances in three populations—a sample of the general population, the first-degree relatives of subjects with normal blood pressure, and the first-degree relatives of subjects with so-called essential hypertension. The second essential is to be able to measure a character or to assess the presence or absence of a peculiarity with some precision in the population studied. Finally, there is the mathematical analysis which may need to employ devices for allowing for sex, as Galton had to in his study of height, and allowing for sex and age, as we did in blood pressure. May I just mention an aside here, and say that the most important point is the careful planning of the experiment and collection of data. There is a tendency now to under-emphasize the reliability of the data and their suitability for mathematical treatment. As L. J. Henderson once said of a distinguished colleague, "his mathematical ingenuity is such that he can provide a formula for any set of data, however erroneous."

Much use is being made of the epidemiological method to try to identify the genetic and environmental factors concerned in producing coronary heart disease. There are two major difficulties—namely, the identification of coronary disease with precision in the kind of population samples that need to be compared, and the difficulty of obtaining two populations alike in all respects but one. Thus the higher-income groups in Western countries in which ischaemic heart disease is more prevalent usually differ from the lower-income groups in which the disease is less prevalent in at least four factors: the composition of their diet, their consumption of tobacco, their mental life, and the exercise taken. Nevertheless, I cannot help thinking that a correct choice of groups and a more precise index of prevalence, morbidity, and mortality will ultimately lead to the truth.

Assessing the Effects of Therapy

The other great function of the scientific study of populations is to assess the effects of therapy. The method known in Britain as the controlled therapeutic trial, and developed particularly by Bradford Hill (1951), had its roots in biological assay on the one hand and the testing of chemical manures on the other. Curiously enough, the dominant parent of the controlled clinical trial is the method perfected by R. A. Fisher and his colleagues for the testing of chemical manures, and developed theoretically in Fisher's (1951) "Design of Experiments," for the two methods are used to assess differences in behaviour over weeks, months, and years. Thus development of these two techniques showed how it was possible to measure reasonably accurately the effects produced by altering a single environmental factor, or even two or more environmental factors, despite the variability common to all biological systems.

The principles for such a trial are relatively simple. In the first place, the group of patients for study must be

defined as exactly as possible, the reasons for selecting some patients and rejecting others. Secondly, a method must be adopted for allocating about equal numbers of patients at random to the two treatment groups to be compared. Note that allocation of alternate patients to the two groups and allocation by day of admission to hospital are not acceptable, since both give the doctor an opportunity of influencing selection and therefore introducing bias. The two groups selected are then each treated according to the therapies to be compared, by the same doctors in the same institutions, both doctors and patients being, if possible, ignorant of the precise therapy used. The results are finally compared, using objective criteria and eliminating observer error wherever practicable.

I might illustrate the usefulness of the controlled therapeutic trial by contrasting our knowledge of the effects of sympathectomy on the course of hypertensive disease, and the knowledge gained by trial of the anti-tuberculosis drugs. Now, it is an unfortunate fact that, despite the many thousands of patients subjected to sympathectomy by most skilful surgeons, it is still unknown whether this operation affected the prognosis in hypertension, if so how much, and in what groups of patients. Many series of patients were followed and the results analysed and published. But to the best of my knowledge there was not a single series with adequate controls selected at the same time and with the same criteria as the operated group and followed by the same doctors. The control groups were either series such as the well-known one of Keith, Wagener, and Barker at the Mayo Clinic, or patients seen at the same hospital as those selected for surgery but rejected for, or refusing, operation. It is thus quite impossible to judge whether observed differences in mortality were due to treatment or due to initial differences between the groups.

M.R.C. Trial of Anti-tuberculosis Drugs

We may contrast this with the Medical Research Council's therapeutic trial of anti-tuberculosis drugs. The story begins in 1946, when the M.R.C. obtained a small amount of streptomycin to assess its usefulness. Quickly a committee was assembled and a trial arranged (M.R.C., 1948). Six hospitals participated. Patients with acute progressive bilateral tuberculosis of presumably recent origin bacteriologically proved, unsuitable for collapse therapy, aged 15 to 30 years, were selected for study. About one-half (52) were allocated bed rest only, the other half (55) were allocated bed rest and streptomycin. The allocation was made strictly at random. After six months' and one year's treatment the results were compared objectively. At six months in the streptomycin-treated group 69% had improved and 7% were dead, as compared with 33% improved and 27% dead in the control group. At one year the streptomycin-treated group showed improvement in 56% and death in 22%, as compared with improvement in 31% and death in 46% of the controls. By the time this trial had been completed a new anti-tuberculosis drug was available—namely, para-aminosalicylic acid (P.A.S.). The Medical Research Council (1950) therefore decided that this should be tried in the same way as streptomycin. The results with P.A.S. seemed less good than with streptomycin, but much the best results were used with the two drugs in combination.

By the time the trial with P.A.S. was completed another anti-tuberculosis remedy had appeared and had passed with great distinction all the preliminary tests. It was isonicotinic acid hydrazide, hereafter referred to as isoniazid. A new trial was therefore planned by the same Medical Research Council Committee, using very much the same methods but with these differences: (1) The scope of the trial was greatly enlarged; no fewer than 39 hospitals collaborated; (2) the variety of cases included was increased. Thus the following criteria were adopted. The sputum must be positive, and the bacilli must not be streptomycin- or P.A.S.-resistant at the beginning of treatment. The patient should not have had more than 15 g. of streptomycin nor 300 g. of P.A.S. during the previous three months. The patient must not be

undergoing collapse therapy. The records from the proposed patients were examined centrally and the cases classified into three main groups and seven subgroups and allocated at random to the two methods of treatment to be compared. (3) Reports of progress were received at one month, two months, three months, and six months from the beginning of the trial.

The speed with which this trial achieved its objective is one of its most impressive features. In February, 1952, preliminary announcements were made in the American press indicating the effects of isoniazid on clinical tuberculosis. The Medical Research Council trial was initiated the same month and treatment begun on March 29, 1952. The preliminary report of the trial was published the same year (M.R.C., 1952), and it established that isoniazid alone was not superior to a combination of streptomycin and P.A.S. During this time 173 patients had been treated with 200 mg. of isoniazid daily, and 158 with 1 g. of streptomycin plus 20 g. of P.A.S. daily. Improvement in general condition was rather better on isoniazid alone, but radiological changes did better on the combination. Acquisition of bacterial resistance to isoniazid was a severe problem, and occurred in 11% of cases at the end of the first month, 52% at the end of the second month, and no less than 71% at the end of the third month. The trial was therefore modified to compare the results of 1 g. of streptomycin daily plus 200 mg. of isoniazid daily with those of streptomycin and P.A.S. It was concluded that the degree of radiographic improvement was essentially the same on streptomycin and isoniazid as on streptomycin and P.A.S., and better in either than on isoniazid alone. Improvement in general condition and conversion of positive to negative culture were more frequent with streptomycin and isoniazid than with streptomycin and P.A.S. Thus it seemed that a combination of streptomycin and isoniazid was in general the most effective treatment known for pulmonary tuberculosis.

In this account I have omitted many details of method and of the knowledge achieved, and I would refer those interested to the article by the late Dr. Marc Daniels (1951). To whose personal qualities so much of this success was due. But I do want to say that I cannot conceive how so much and so exact a knowledge of the relative efficacies of these drugs could have been got so quickly and with so little expenditure of human life and suffering in any other way. Imagine the fate of the tuberculous patients if these drugs had been prescribed without plan or purpose and their assessment left to "clinical judgment." When I reflect on this I am amazed, stupefied, and I confess rather horrified that some of my colleagues, of unquestioned integrity and of no mean intelligence, adopt the attitude they do to controlled therapeutic trials.

I would also like to add that the controlled clinical trial is to my mind the most important new method introduced into clinical science in recent years. It should not only tell us what drugs can do, but if only the practical details can be overcome it could tell us, for example, whether or not an indulgence in fat, or in a particular kind of fat, is a contributing factor in the pathogenesis of ischaemic heart disease. Patients must be treated, and it would seem only sensible that treatment should be designed so that the results shall add to knowledge and help us in the prevention and control of disease, so long as the trial is not against the best interests of the patients.

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SERUM GLUTAMIC OXALACETIC TRANSAMINASE IN ACUTE MYOCARDIAL INFARCTION

BY

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The estimation of glutamic oxalacetic transaminase in serum (S.G.O.T.) as an aid in the diagnosis of acute myocardial infarction was first introduced into clinical practice by LaDue, Wróblewski, and Karmen in 1954. Since then a fairly extensive literature, most of it American, has developed. Particularly comprehensive papers are those of Chinsky *et al.* (1956), Ostrow *et al.* (1956), Kattus *et al.* (1957), and Ratner and Sacks (1957).

The enzyme is widely distributed in the tissues, and high concentrations are present in cardiac and skeletal muscle and in brain, liver, and kidney. It is liberated into the blood on the death of cells of these organs. It is also present in erythrocytes, so that when samples of blood are collected for its estimation, haemolysis must be avoided and the serum or plasma separated as soon as possible. The enzyme will retain its activity for two weeks if the serum is stored at 0–5° C. (LaDue and Wróblewski, 1955). Its concentration can be estimated by the spectrophotometric method of Karmen *et al.* (1955) or by the colorimetric method of Reitman and Frankel (1957).

The level of S.G.O.T. activity in normal controls varies from 5 to 40 units per ml. of serum, with a mean of approximately 21 units (Wróblewski and LaDue, 1955; Kattus *et al.*, 1956). In a normal person the level does not vary by more than 10 units from day to day and is independent of time of day, meals, or previous exercise (Chinsky *et al.*, 1956).

Agress *et al.* (1955) showed that graded experimental infarction in dogs was associated in all cases with increase in S.G.O.T. Infarction of as little as 10%, and possibly less, of the total myocardium produced a significant rise in S.G.O.T. and there was a linear correlation between the peak S.G.O.T. level and the amount of infarction at necropsy. Nydick *et al.* (1957) found that there was no rise in S.G.O.T. in experimental myocardial ischaemia in dogs unless myocardial necrosis had occurred. The rise in S.G.O.T. begins within three hours after infarction, attains a peak in 9 to 23 hours, and returns to normal in three to six days. Agress *et al.* (1956), in other experiments, made the useful observation that if pericarditis was produced by sand, talc, or bacterial infections the S.G.O.T. would rise only if the underlying heart muscle was involved in the injury.

Since the enzyme is widely distributed in the body it was realized early that elevation of S.G.O.T. would occur after necrosis of tissues other than heart muscle. In man a rise in S.G.O.T. has been found after necrotic

lesions of the liver (Wróblewski and LaDue, 1955, 1956; Madsen *et al.*, 1958); of brain (Lieberman *et al.*, 1957), where the peak concentration is attained rather later than in cases of myocardial damage; of skeletal muscle (Merrill *et al.*, 1956); and of the pancreas (Chinsky *et al.*, 1956; Shabetai *et al.*, 1957). A small rise in S.G.O.T. may occasionally occur after pulmonary embolism (Goldstein *et al.*, 1956; Nydick *et al.*, 1957). S.G.O.T. also rises in haemolytic crises (Ostrow *et al.*, 1956) and sometimes with salicylate therapy, but only if the dosage is heavy and prolonged (Manso *et al.*, 1956).

This paper is an account of the part that estimations of S.G.O.T. have to play in the diagnosis and management of acute myocardial infarction.

Material and Method

Observations were made upon 34 episodes of acute myocardial infarction occurring in 28 patients admitted to the Royal Victoria Infirmary, Newcastle upon Tyne. Of these, 18 gave a preceding history of angina of effort. Four patients died, and necropsies were obtained in three. In addition, three patients with status anginosus or acute coronary insufficiency were studied, as well as a few cases of acute cardiac failure with, or without, severe arrhythmias. The cases of myocardial infarction and acute coronary insufficiency were treated with anticoagulants (heparin and phenindione).

Specimens of blood were collected daily for 10 to 14 days, and in some instances for much longer, and examined by one of us (A. J. S.) for the level of S.G.O.T. by the colorimetric method of Reitman and Frankel (1957), using the standardized reagents produced by the Sigma Chemical Company. Estimations were also made of other enzymes, of which an account will be given separately. The erythrocyte sedimentation rate (E.S.R.) was estimated daily by the Westergren method. Twelve-lead electrocardiograms were taken on the day of admission and not less than twice weekly thereafter. In seven cases the electrocardiogram was taken daily.

Estimation of the level of S.G.O.T. in 25 healthy adults gave a range of 10 to 34 units with a mean of 19.0 units (standard deviation ± 6.0 units).

Time of Onset, Height, and Duration of Rise

In many instances the patient was not admitted to hospital early enough for the time of onset of the rise in S.G.O.T. to be gauged, but from observations from those who were, and those who had further infarction in hospital, the average time of appearance of an abnormal figure was one and a half days, and the average duration of the abnormal elevation was three and a half days from the onset of pain, with a range of one to six days. These figures agree well with those of other authors—for example, LaDue *et al.* (1954), Denney *et al.* (1956), Chinsky *et al.* (1956), and Ostrow *et al.* (1956), who found that the rise may begin as early as three hours after the onset and that the enzyme returns to normal in one to eight days, most often by the end of the third day.

The peak concentration reached in the uncomplicated cases in the present series varied from 24 to 620 units, with a mean of 194 units—that is, nine times the normal level. Two cases of myocardial infarction with congestive heart failure and centrilobular necrosis of the liver at necropsy had peak levels of 950 and 8,400 units.

Relationship to Body Temperature and E.S.R.

Compared with the fever and the rise in E.S.R., which so commonly follow myocardial infarction, the rise in serum transaminase appeared a full 24 hours sooner. It fell to normal again two days before the temperature and at least a week sooner than the E.S.R. Fig. 1 shows curves from a typical case.

It proved also a more dependable index of infarction, since in only three cases where the blood samples were taken early enough was the S.G.O.T. negative (8.8%). In one-third of the infarcts no rise in temperature took place at all, and even the E.S.R. remained normal in one-fifth. Presumably a larger infarct is needed to raise the E.S.R. than the S.G.O.T. and a still larger one to induce fever.

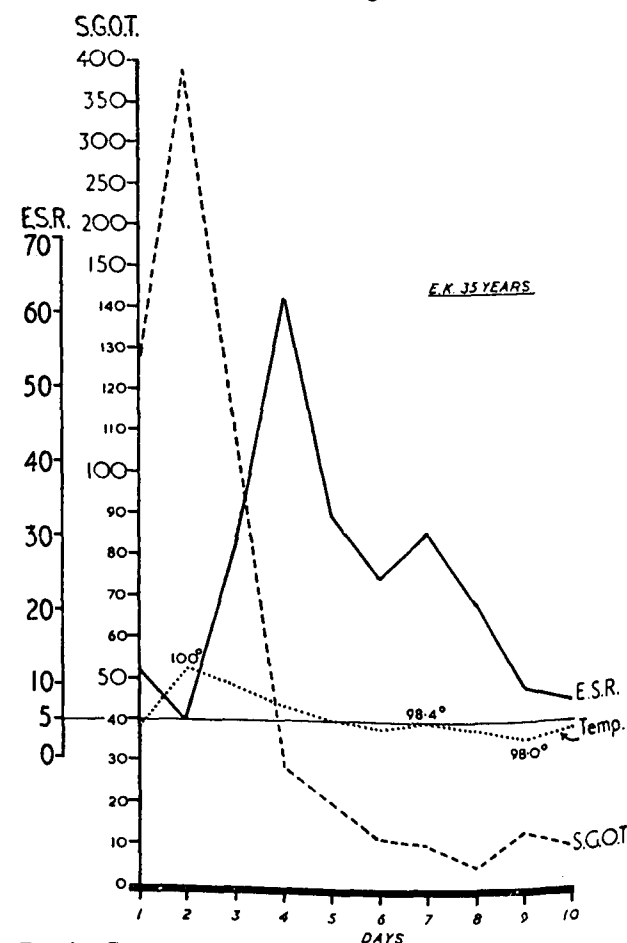


FIG. 1.—Curve showing the relationship between S.G.O.T., temperature, and E.S.R. in a typical case of acute myocardial infarction.

There were in the series several cases where coincidental infections, such as pneumonia, were also responsible for a raised body temperature and E.S.R. as well as a few where the latter was depressed by congestive heart failure. Serum transaminase is unaffected by infections (Ostrow *et al.*, 1956), and, as shown below, rises only in a minority of cases of congestive heart failure. To sum up, the rise in S.G.O.T. is more prompt, more striking, more brief, more sensitive, and more specific than either the body temperature or the E.S.R.

Relationship to the Severity of the Infarct

The size of the infarct has been graded according to the number of leads in which Q wave and T wave changes were detected in the electrocardiogram. In Fig. 2 these have been plotted against the peak levels of S.G.O.T. in the blood of those patients in whom the form of the curve has demonstrated that the peak level had not been missed. It will be seen that there is a linear relationship, although this is a very rough one, not only because the electrocardiographic method of assessing the size of infarct is crude but also because when the S.G.O.T. curves are examined, and are related to the clinical history, a significant number of patients sustain their infarcts in stages over a period of several days. In them, a time-concentration curve would doubtless constitute a much better guide to severity than the single-peak reading, as has already been stressed by Kattus

et al. (1957). Fig. 3 is taken from a good example of such gradual infarction.

Since it has been shown experimentally that an infarct of less than 10% may not produce an elevation of serum transaminase (Agress *et al.*, 1955), it seems likely that in human subjects, too, infarcts may be so small that they do not produce an elevation. This is borne out by experience in the present series, where, on three occasions, pain and electrocardiographic changes in the course of a patient's treatment in hospital suggested that there had been an extension of infarction but no rise of transaminase took place. There was one further and more clear-cut case where the electrocardiogram showed clearly a fresh infarct but the serum transaminase was not elevated. There was also one patient in whom the clinical features were extremely suggestive of fresh myocardial infarction but both electrocardiogram and transaminase remained normal.

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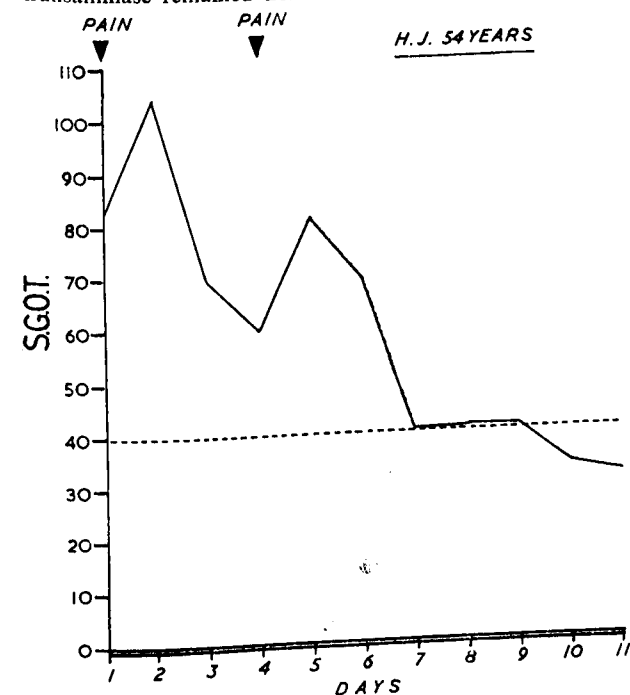


FIG. 2.—Relation of peak S.G.O.T. level and E.C.G. grade of infarct in 20 patients with acute myocardial infarction.

FIG. 3.—Curve of S.G.O.T. showing myocardial infarction occurring in stages over several days.

In some instances, however, the probability is that the elevation of the transaminase above the normal does not attain the arbitrary 40 units which has been set as the upper limit of the normal range. Fig. 4 shows an example where the clinical features and the electrocardiogram strongly suggested a fresh infarct, and the acute rise in serum transaminase is in accord with this even though the maximal elevation is below 40 units.

Cases with Previous Infarction

In nine cases there was a history of previous myocardial infarction, and in five of these, as well as in two others—

that is to say, in 21% of the episodes of definite fresh myocardial infarction—the electrocardiogram was so distorted by the previous infarct that on the single initial tracing alone it was impossible to deduce with certainty that fresh infarction had occurred. In these patients the serum transaminase was abnormally high within 48 hours and proved most helpful. Subsequent electrocardiograms confirmed the diagnosis. There is no doubt that in cases of suspected acute myocardial infarction where there is either a history or electrocardiographic evidence of previous infarction the estimation of serum transaminase has its greatest value in establishing that there has been a fresh lesion. Such cases constitute about a quarter of the fresh infarcts seen.

The serum transaminase is also helpful when patients are already under treatment for an acute myocardial infarct and the occurrence of pain, collapse, or other signs suggests that there has been fresh extension of infarction. In such cases the electrocardiogram is often so distorted by the recent necrosis, and perhaps by pericarditis occurring with it, that it is most difficult and often impossible to decide whether

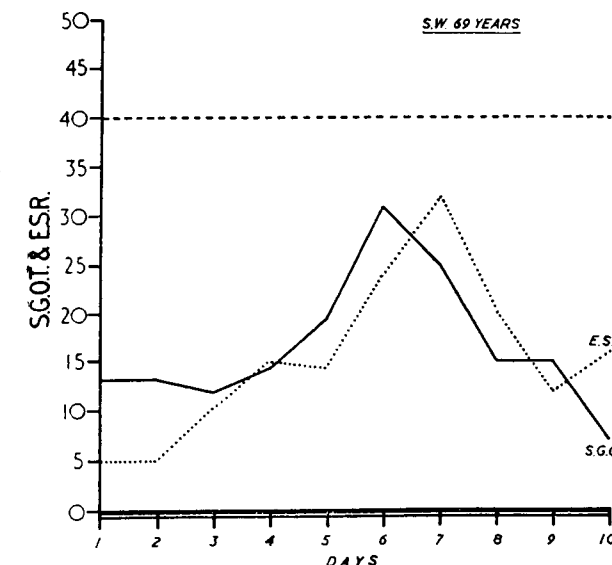


FIG. 4.—Curve of S.G.O.T. and E.S.R. in a patient with acute myocardial infarction, with the peak S.G.O.T. level below 40 units.

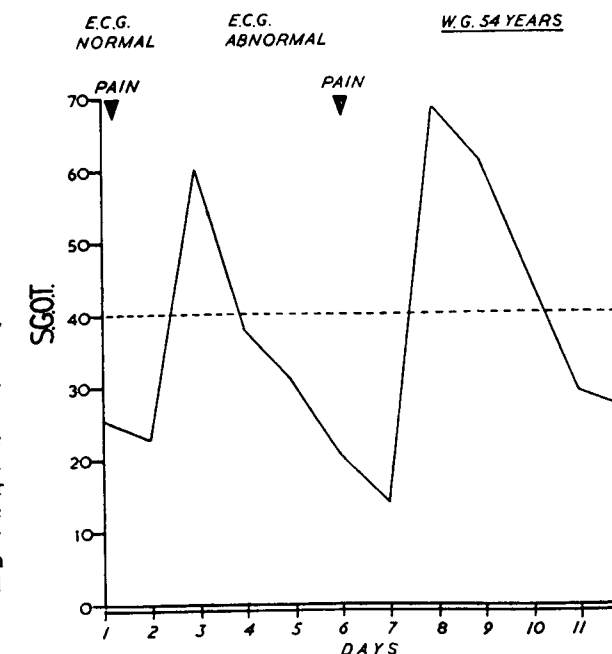


FIG. 5.—Curve of S.G.O.T. in a patient with further myocardial infarction during the course of treatment.

there has been fresh necrosis. It is in these cases that serial estimations of serum transaminase are most likely to be helpful, since they will show the baseline level to which that individual's transaminase falls, and any striking elevation above this closely following upon an attack of pain can be taken as evidence of new damage. Fig. 5 shows such a case.

Other Obscuring Factors in the Electrocardiogram

The diagnosis of myocardial infarction by electrocardiography is less often obscured by arrhythmias, such as the tachycardias and bundle-branch block, by digitalis effects, and by previous left ventricular strain than it is by previous infarction. In the present series there were only two cases in which such factors created serious difficulties compared with five in which previous infarction operated similarly. Nevertheless, the serum transaminase is helpful in this minority, for in both these cases it was normal and the conclusion reached was that there had been no infarction.

Acute Coronary Insufficiency

Other authors (Rudolph *et al.*, 1955; Nydick *et al.*, 1957) have found in experimental narrowing of coronary arteries in animals that unless necrosis is produced in the myocardium a rise of serum transaminase will not be observed, and it has been found in human beings, too, that if the clinical and electrocardiographic picture is solely one of ischaemia without necrosis then the transaminase remains unaltered (Kattus *et al.*, 1956). In the present series there were three such cases of acute coronary insufficiency or status anginosus, all treated with anticoagulants. The usual difficulty in such cases is to distinguish on the electrocardiogram between such ischaemia and limited infarction, often subendocardial. Repetition of the tracings, trying the effects of nitroglycerin upon them, and observing the E.S.R. and body temperature may all help, but sometimes the difficulty remains unresolved. One would expect the serum transaminase to assist in a similarly circumscribed way, for if necrosis is small enough and gradual enough in onset, it would seem likely that no diagnostic curve or level might be observed. Experience of the three cases in this series has borne this out, and has suggested that the enzyme estimation is complementary to, but not necessarily more reliable than, the electrocardiogram in showing whether or not necrosis has taken place.

False Negatives

The S.G.O.T. was elevated in all except three of the cases of definite infarction here described where the blood samples had been taken early enough—that is, false negatives were 8.8%. Denney *et al.* (1956) found false negatives

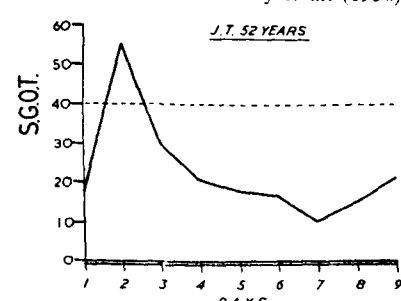


Fig. 6.—Curve showing transient elevation of S.G.O.T. in acute myocardial infarction.

in only 4.75% of definite infarcts, while Kattus *et al.* (1957) had none amongst 111 patients with proved myocardial infarcts, probably because of the frequency with which they took blood samples for analysis. In a review of 264 patients, Ratner and Sacks (1957) had 8% false negatives among 64 patients with definite myocardial infarction, and this will probably prove to be a representative figure in clinical practice, for the S.G.O.T. rise may be very transient, as is shown in Fig. 6, and very frequent sampling is hardly practicable as a routine.

False Positives

Since the enzyme is so widely distributed it is obvious that significant rises in the blood level may be produced by a variety of mechanisms. If care is taken to separate the

serum or plasma of the blood sample from the red cells then false elevation due to liberation of the enzyme from haemolysed erythrocytes should not occur. Its liberation into the blood stream from other tissues is a much more important cause of false-positive results. Destruction of red cells in the tissues is one important cause, and particularly so where there has been some tissue destruction as well as haemorrhage; haemorrhagic pancreatitis is a conspicuous example of this. Where the enzyme content of the tissue is low, as in the brain and in the lung, infarction brings only slight rises. When it is high, as in the liver, the elevation consequent upon tissue damage may be enormous. This does not often cause trouble in diagnosis, although one patient, not included in this series, was admitted under the care of one of us (H. A. D.) with the diagnosis of suspected myocardial infarction, and investigation showed that the rise in his transaminase (109 units) was due to subacute alcoholic hepatitis, his heart being clinically and electrocardiographically normal.

It is apparent that serum transaminase is helpful in the differential diagnosis of myocardial infarction only if one is fully aware of the capacity of other tissues to liberate it. Much more important in cardiology is the possibility of the enzyme being liberated in substantial amounts from a liver congested and necrotic from heart failure. The literature about this is scanty. Conrad (1957) mentions DuToit's (1956) report of an elevation in S.G.O.T. in 16 out of 23 patients in uncomplicated cardiac failure. When it does occur the blood level attained may be very high, as in one case in the present series where a young woman of 29 years with acute cor pulmonale due to emphysema and pulmonary infection was found to have a transaminase level of 710 units; nothing in the history or the electrocardiogram suggested that there had been myocardial infarction. Two of DuToit's cases had S.G.O.T. levels of more than 2,000 units, and one of these had advanced central necrosis of the liver at necropsy. It has been said that in cases of liver disease the serum glutamic pyruvic transaminase (S.G.P.T.) is elevated to a greater extent than the S.G.O.T., in contrast to the findings in myocardial necrosis. In the present series this was occasionally true, but exceptions were too numerous for the double estimation to be worth while as a routine test.

Prognosis

It has been said (Chinsky *et al.*, 1956) that a peak level of S.G.O.T. greater than 200 units carries a poor prognosis. However, the peak level may not be observed, either because the patient dies before the maximum is reached or because the patient is admitted on the downstroke of the transaminase curve. In this series two patients died with S.G.O.T. levels of 57 and 70 units, and in both of these the peak was probably missed. There were eight patients with a peak S.G.O.T. level above 200 units and only two died. Both of these, with S.G.O.T. levels of 950 and 8,400 units, had only moderate-sized recent infarcts at necropsy, but there was marked centrilobular necrosis of the liver.

Many factors are involved in the prognosis of acute myocardial infarction, of which the size of the infarct, reflected in the peak level of S.G.O.T., is only one, and this peak level may in any case be further raised if there is acute heart failure with hepatic centrilobular necrosis, and perhaps also if there is acute haemorrhagic pericarditis complicating the picture.

S.G.O.T. in other Cardiac Conditions

Also of interest in cardiology are the affections of the heart other than acute myocardial infarction in which a raised S.G.O.T. may be found. The role of pericarditis has already been mentioned. The arrhythmias *per se* do not raise the enzyme level, but may do so in occasional instances, including one case of the present series and one case out of 14 in the series of Chinsky *et al.* (1956), where the extremely rapid heart rate precipitated acute heart failure with presumed centrilobular necrosis of the liver. The same is true of acute pulmonary oedema (Chinsky *et al.*, 1956).

Ostrow *et al.* (1956) quote one case of Fiedler's myocarditis in which the S.G.O.T. was elevated as one would expect, and Chesler (1958) reports elevated levels in diphtheritic myocarditis. Nydick *et al.* (1955a, 1955b) give an interesting account of its elevation in acute rheumatic carditis. The latter at any rate cannot often be confused with myocardial infarction, and no such difficulty arose in the present series.

Summary

Serial daily estimations of serum glutamic oxalacetic transaminase (S.G.O.T.) for at least 10 days have been made in 34 acute episodes of myocardial infarction occurring in 28 patients. The results have been compared with changes in erythrocyte sedimentation rate (E.S.R.), temperature, and electrocardiogram.

Estimations of S.G.O.T. are most useful (a) when the electrocardiogram is obscured by previous myocardial infarction, arrhythmias, bundle-branch block, left ventricular strain, and digitalis; (b) when extension of myocardial infarction is suspected; and (c) to distinguish between acute coronary insufficiency and myocardial infarction.

There was no rise in S.G.O.T. in 8.8% of the cases of fresh myocardial infarction.

The maximum elevation of S.G.O.T. roughly corresponds with the electrocardiographic estimation of the size of the infarct only if other causes of a raised transaminase can be excluded. The most important of these in myocardial infarction is centrilobular necrosis of the liver secondary to cardiac failure.

In small infarctions serial estimations of S.G.O.T. may show a characteristic curve even though the peak does not exceed 40 units.

We thank the following house-physicians, Drs. W. S. B. Cherry, R. Hart, J. M. Kendall, and J. King, for their practical help in this investigation. We are also grateful to Mr. D. P. Hammersley for help with the diagrams, and to Dr. A. Latner for facilities in the department of pathology.

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SERUM TRANSAMINASE: ITS CLINICAL USE IN DIAGNOSIS AND PROGNOSIS

BY

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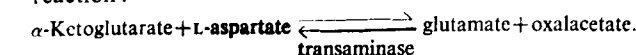
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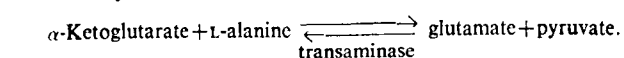
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Human serum contains several enzymes concerned with the reaction of transamination. The one most commonly determined is serum glutamic oxalacetic transaminase (SGO-T), which catalyses the reversible reaction:



Similarly serum glutamic pyruvic transaminase (SGP-T) catalyses the reaction:



Cohen and Hekhuis (1941) showed that transaminase was in highest concentration in cardiac and skeletal muscle. LaDue *et al.* (1954) also found it to be present in the brain, liver, and kidney in lower concentrations.

The serum transaminase level (SGO-T) has been found to be elevated following myocardial damage, hepato-cellular necrosis, pancreatitis, trauma to skeletal muscle, myositis (including dermatomyositis), active rheumatic carditis, and any process associated with active damage to skeletal or cardiac muscle (LaDue and Wróblewski, 1955; Wróblewski and LaDue, 1956; Ratner and Sacks, 1957).

The curve of serial serum transaminase estimations would appear to be characteristic in cases of myocardial infarction, and it has been suggested that a characteristic curve occurring within the normal range of values may be found in some cases of angina (Chinsky *et al.*, 1956) or associated with a very small infarct (Ratner and Sacks, 1957). These authors also found that the serum transaminase level remains normal in patients with cerebrovascular damage, acute or chronic infections, acute phlebitis, uraemia, neoplastic, allergic, or metabolic diseases, unless associated with damage to skeletal or heart muscle. Further, there appears to be no apparent correlation with age, sex, colour, weight, leucocyte count, blood sedimentation rate, the presence or absence of fever, heart failure or shock, or the use of anticoagulant drugs or cortisone.

The above evidence suggests that serial transaminase readings are a possible aid to diagnosis in cases of doubtful myocardial infarction and might prove to be related to the actual size of infarct and, because of this, a possible guide to prognosis. We felt, therefore, that a small series of cases investigating these points was justified.

Technique Employed.—The technique we used was that devised by Frankel and Reitman (1957). In this method the amount of keto-acid formed in one hour is determined colorimetrically by the formation of

a highly coloured "hydrazone," using a spectrophotometer or photoelectric absorptiometer in the range 500 to 520 m μ .

Results

Serum transaminase levels were estimated in 31 cases of myocardial infarction and the typical findings in several cases are described below.

(47) *Case 1.*—Woman, aged 69. Angina three weeks; eight hours' central chest pain. Serum transaminase: 24 SGO-T units 8 hours after onset, 156 units at 32 hours, 27 units at 4 days, 18 units at 8 days. E.C.G.: (a) posterior infarct eight hours after onset; (b) much improved six weeks later.

(21) *Case 2.*—Man, aged 59. Angina two years; eight hours' central chest pain. Serum transaminase: 216 SGO-T units 56 hours after onset, 64 units at 4 days, 54 units at 6 days, 32 units at 7 days. E.C.G.: antero-lateral infarct 80 hours after onset.

(3) *Case 3.*—Man, aged 63. Hypertension; angina one week; four hours' central chest pain. Serum transaminase: 184 SGO-T units 12 hours after onset, 103 units at 36 hours, 49 units at 60 hours. E.C.G.: (a) postero-lateral infarct 24 hours after onset; (b) unchanged seven days later.

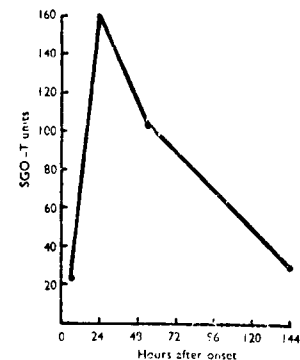


FIG. 1.—Case 4. Serum transaminase readings.

These cases show the typical transiently raised transaminase values in myocardial infarction, the diagnosis in each case being confirmed clinically and on electrocardiography.

(8) *Case 4.*—Man, aged 49. Angina one year; five hours' central chest pain. Serum transaminase: 23 SGO-T units 6 hours after onset, 160 units at 24 hours, 102 units at 54 hours, 30 units at 6 days (Fig. 1). E.C.G.: normal bar Q wave V₁₋₇ 48 hours after onset; antero-septal infarct 10 days after onset (Figs. 2 and 3).

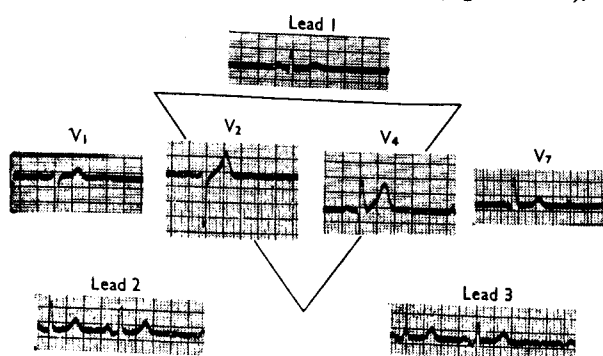


FIG. 2.—Case 4. E.C.G. 48 hours after onset.

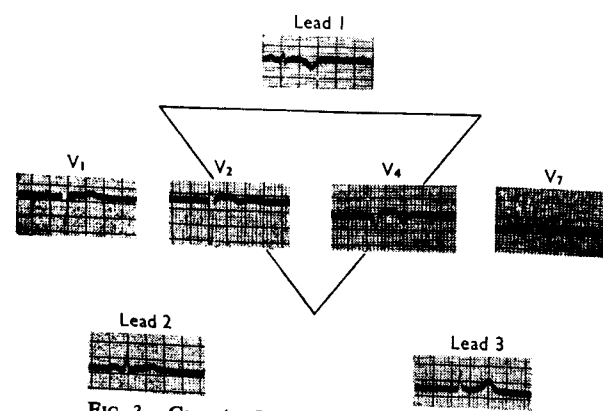


FIG. 3.—Case 4. E.C.G. 10 days after onset.

(44) *Case 5.*—Man, aged 62. Chronic bronchitis; cor pulmonale; jaundice (painless). ? Cardiac cirrhosis. Serum transaminase: 460 SGO-T units day after admission. E.C.G.: left bundle-branch block day of admission. Serum bilirubin, 11.3 mg./100 ml. (total). Necropsy: Enlarged heart; right ventricular hypertrophy; extensive recent septal infarct involving anterior wall of both ventricles; liver showed cardiac cirrhosis.

(17) *Case 6.*—Man, aged 77. Prostatic carcinoma with metastases. Atrial fibrillation. Serum transaminase: 40 SGO-T units 3 days after admission, 30 units at 5 days, 86 units at 6 days, 77 units at 7 days. E.C.G.: auricular fibrillation and right bundle-branch block three days after admission (Fig. 4). Necropsy: Terminal bronchopneumonia; carcinoma of prostate with metastases; recent occlusion of circumflex coronary artery.

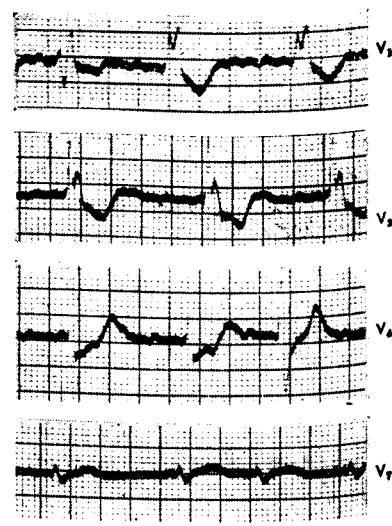
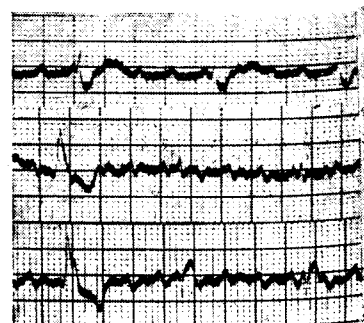


FIG. 4.—Case 6. E.C.G. 3 days after admission.

Case 4 appears to demonstrate transaminase levels confirmatory of recent infarction before fully diagnostic electrocardiographic changes had occurred. In Case 5 the transaminase level again agreed with the proved diagnosis in the absence of confirmatory E.C.G. changes. The raised serum bilirubin level might be expected to cause a rise in transaminase values due to the high transaminase content of bile. However, the results in this case were consistent with the proved diagnosis at necropsy.

Case 6 was also proved at necropsy despite non-confirmatory electrocardiography and in the presence of carcinomatosis.

Case 7 reveals apparently diagnostically raised transaminase values, whereas the electrocardiographic changes are merely suggestive. Although permission for necropsy was not obtained there is felt to be no doubt on purely clinical grounds about the diagnosis.

Cases 4 to 7, therefore, are instances in which transaminase levels proved of greater diagnostic aid than initial electrocardiography.

(15) *Case 8.*—Man aged 76. Diabetic; sudden collapse and death in two hours; no prior history of cardiac pain. Serum transaminase: 36 SGO-T units at onset of collapse. E.C.G.: postero-lateral infarct three days before collapse. Necropsy: fibrotic myocardium; 2-cm. thrombus in right coronary artery proximal part several (? 10) days old, distal part quite fresh.

(28) *Case 9.*—Woman, aged 76. Hypertensive "collapse" 10 days previously. Serum transaminase: 20 SGO-T units 10 days after collapse. E.C.G.: antero-lateral infarct six days after collapse; much improved 13 days after collapse. Recovered.

Cases 8 and 9 illustrate the need for transaminase levels to be estimated at the appropriate times after infarction if they are to prove of help in assessment. Thus in Case 8 the estimation was too soon after the terminal infarction to reveal any change, and in Case 9 the time interval of 10 days after infarction is too long. The optimum times after infarction appear to be from 24 hours to five days.

(7) *Case 10.*—Woman, aged 55. Depressive; hypertension; five hours' epigastric pain. Serum transaminase: 83 SGO-T units 48 hours after onset, 47 units at 3 days, 16 units at 4 days. E.C.G.s taken 48 hours and 10 days after onset are shown in Figs. 5 and 6.

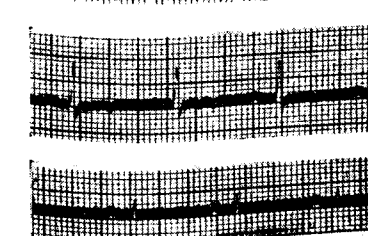
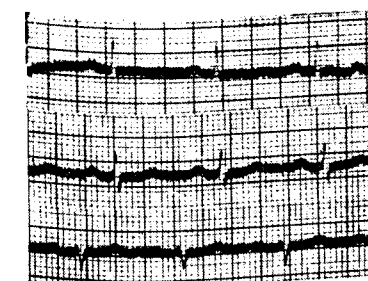


FIG. 5.—Case 10. E.C.G. 2 days after onset.

Of the 31 cases of myocardial infarction, 23 occurred clinically within seven days prior to serum transaminase estimation being obtained. Of the 23 patients with acute infarctions, 16 recovered and 7 died (see Table). The 16 recoveries reveal an average peak transaminase value of 111 SGO-T units. The deaths reveal an equivalent average figure of 576 SGO-T units. These figures are not altogether accurate, as in a few of the recovered cases the transaminase levels

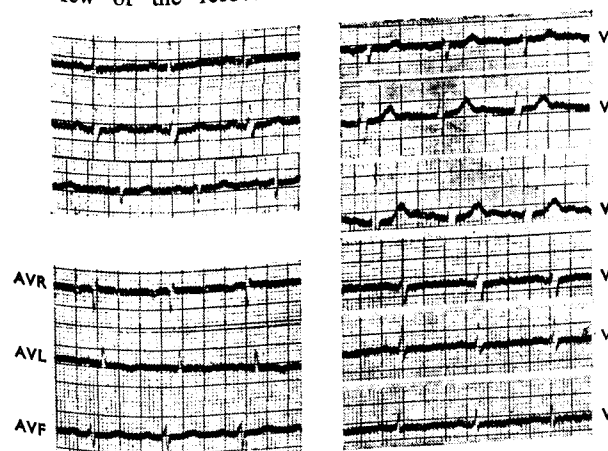


FIG. 6.—Case 10. E.C.G. 10 days after onset.

Results in 23 Cases with Acute Infarctions

Case No.	Observed Serum Transaminase Peak Values	Outcome	Necropsy
2	216 units 56 hours after onset	Recovered	
3	184 " 12 " admission	"	
4	160 " 24 " onset	"	
5	460 " 1 day after admission	Died	Extensive infarct of both ventricles
6	86 " 6 days " "	"	Recent circumflex artery occlusion
7	550 " 5 days after onset	"	No necropsy
8	36 " at the time of infarct	"	Old and recent infarcts
10	83 " 48 hours after onset	Recovered	
12	200 " 36 " "	"	
13	61 " 78 " "	"	
14	120 " 12 " "	"	
15	73 " 5 days after admission	"	
16	43 " 24 hours after onset	"	
17	129 " 12 " "	"	
18	41 " 7 days " "	"	
19	95 " 3 " "	"	
20	900 " 3 " "	Died	No necropsy
21	156 " 32 hours " "	Recovered	
22	24 " 4 days " "	"	
23	280 " 48 hours " "	Died	Extensive infarct
24	114 " 33 " "	Recovered	
25	75 " 48 " "	"	
26	1,720 " 48 " admission	Died	No necropsy

obtained were not necessarily the highest that actually occurred. Similarly in the fatal group, one case reveals a low value as it was too soon after infarction to expect a rise, and one patient with infarction died from bronchopneumonia and carcinomatosis rather than the infarct, and consequently the low value obtained agrees with the necropsy findings of a small infarct.

These points would possibly cause a higher average figure in the recoveries, but also would increase the figure in fatal cases, and it is felt, therefore, that the difference is probably significant.

The average time of peak transaminase level relative to the time of infarction was estimated from cases where serial transaminase levels were known. Where the time of infarction was in doubt it has been accepted as from the moment of admission. The average figure so obtained was 62 hours after infarction in the 18 suitable cases.

Serum transaminase estimations were carried out both during and for several days after attacks of angina in appropriate cases. On each occasion the transaminase value was found to be within the normal range. On several occasions, in two cases of old myocardial infarction with recurrent attacks of angina, we found transaminase value of help in distinguishing prolonged anginal pain from that due to further myocardial infarction, the transaminase values correlating well with subsequent electrocardiography and clinical progress.

In this series the overall average age of the patients with myocardial infarction was 60 years. The average age of the males was 58 years, and of the females 67.

Discussion

It is appreciated that the majority of cases of myocardial infarction can be diagnosed on clinical grounds, but a group remains in which the diagnosis is initially in doubt.

This small series of cases confirms reports in America and this country that recent myocardial infarction can be detected in some cases by a typical rise and fall in serum transaminase values before diagnostic electrocardiographic changes have occurred. The correlation of degree of rise in serum transaminase level with size of infarct and immediate outcome suggests that transaminase values of over 250 units are of serious portent and such cases are unlikely to recover.

The importance of time of transaminase estimation after infarction was well shown in several cases. It is suggested that transaminase values should be estimated at 24-hourly intervals from the time of infarction for at least four and preferably seven days, or until the peak value is passed, if full information is to be obtained from the results.

In differential diagnosis, too, the transaminase levels may be of help. On several occasions we found it useful in assessing whether severe cardiac pain was due to prolonged angina pectoris or actual infarction, the transaminase results correlating in each case correctly with electrocardiographic findings and subsequent clinical progress.

No diagnostic rise in transaminase levels was detected in two cases of pulmonary infarction, two cases of gall-bladder dysfunction, two cerebral catastrophes, and six cases of pneumonia.

It is of interest that one case of active rheumatic pericarditis (not included in this series) revealed a transiently raised serum transaminase level. This suggests concurrent myocardial damage of a temporary nature, and it will be of interest in the future to ascertain whether serum transaminase levels will help in assessing activity in cases of rheumatic carditis where this is in doubt.

In carrying out these estimations of serum transaminase levels the method of Frankel and Reitman (1957) was found to have several inherent disadvantages regarding cost and technique. These seem to be overcome in the method described by King (1958), and the simpler technique and its cheapness should place it well within the scope of all routine laboratories.

Summary

Serum transaminase estimations in a small number of cases of myocardial infarction are related to clinical, electrocardiographic, and necropsy findings. The test's possible value and advantages in early differential diagnosis and prognosis are discussed.

This series reveals close correlation between peak transaminase levels, size of infarct, and immediate outcome.

Evidence is presented which shows that cases in which transaminase values rise above 250 SGO-T units do not usually recover.

We thank Dr. R. Mowbray and Dr. T. A. Grimson for permission to publish this report and for their interest and encouragement, Dr. J. Ennis for his help in assessing the pathological findings, and Miss Haigh for her unstinted secretarial help.

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Rank Precision Industries (B.A.F.) Ltd. has issued a leaflet describing the films and filmstrips on hospital and medical training in the G.B. Film Library. The leaflet lists 44 films and 33 filmstrips which are available from the library. It gives brief details of their length, number of reels or frames, hire rates, and purchase prices. Handbooks containing essential information for the guidance of teachers or film users are supplied with the films and filmstrips. Films are available for either outright purchase or hire; viewing copies will be supplied free of charge on application. Filmstrips are for outright purchase only, but may be previewed under a 14-days "sale or return" approval scheme. Further details from the G.B. Film Library, Aintree Road, Perivale, Greenford, Middlesex.

SCURVY FOLLOWING BILATERAL ADRENALECTOMY

REPORT OF TWO CASES

BY

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During the convalescent period of two patients who had undergone bilateral adrenalectomy and oophorectomy for advanced breast cancer it was noticed that they developed petechial skin haemorrhages on the arms and legs. One of these patients also complained of bleeding gums. A diagnosis of scurvy was made and the vitamin-C saturation test was carried out. In the first patient only 21 mg. of the vitamin appeared in the urine, following an intravenous injection of 1,000 mg. of ascorbic acid, and in the second case only 31 mg. was excreted. The average amount of ascorbic acid excreted during this test in a normal healthy individual varies between 300 and 500 mg.

These findings stimulated us to investigate two other patients in the ward who had recently had their adrenals and ovaries removed, and in both cases the test showed a vitamin-C deficiency. Further patients were investigated and of nine who were subjected to the test similar deficiencies were found in seven. The remaining two patients had been operated upon several months previously; both had progressed well, had good appetites, and had increased in weight, and in them the values were 370 and 570 mg. respectively. The average amount of vitamin C excreted in the seven patients (average age 53 years) in whom the figure was low was 85 mg.

A control series of tests was carried out on nine patients who had recently undergone operations such as radical mastectomy, cholecystectomy, appendicectomy, and colectomy. The average amount of vitamin C excreted by them was 300 mg., their average age being 49 years. None of these patients had been given vitamin C therapeutically.

Although there is some doubt about the reliability of the vitamin-C saturation test, these figures seemed significant and led us to believe that patients who had both adrenals and ovaries removed might be deficient in vitamin C, especially in the early post-operative period.

We record the two case histories of scurvy following bilateral adrenalectomy and oophorectomy, and discuss the possible cause of this, together with the relationship of vitamin C to the adrenal glands.

Case 1

A housewife aged 37 was admitted to hospital on June 17, 1958. Nine months earlier she had noticed a swelling in the left breast which had ulcerated through the skin. She complained of loss of energy, tiredness, and poor appetite. On examination she had a foul-smelling, fungating cancer of the left breast, with an infected carcinomatous ulcer in the left axilla. She was pale and listless, with oedema of the legs and sacrum. A blood count showed a haemoglobin level of 22%, and 16,600 white blood cells, of which 95%

were polymorphonuclears. X-ray examination of the chest revealed secondary carcinomatous deposits in the mediastinum and ribs.

Following a blood transfusion a right adrenalectomy and bilateral oophorectomy was carried out on June 19. The left adrenal gland was removed two weeks later. Her general condition improved after the second operation, but some days later she developed a temperature, and pus from an infected haematoma began to discharge from the wound in the right loin. Culture of the pus from the breast and

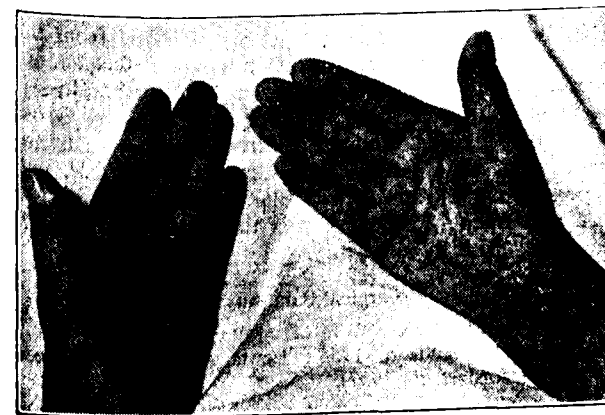


FIG. 1.—Case 1. Petechial haemorrhages of scurvy on the hands following bilateral adrenalectomy.

the loin showed a heavy growth of *Staphylococcus aureus*, sensitive to chlortetracycline and erythromycin.

On the eleventh post-operative day she developed purpuric spots on the hands (Fig. 1), arms, and abdomen, together with sore bleeding gums. At this time she was taking a normal well-balanced diet. A blood count showed a haemoglobin level of 72%, white cells 18,600 with 95% polymorphs, platelets 210,000, and a bleeding-time of 6½ minutes. A diagnosis of scurvy was made, and the vitamin C saturation test revealed a marked vitamin-C deficiency, there being only 21 mg. of ascorbic acid excreted in the urine.

She was given 300 mg. of ascorbic acid daily by mouth, and the rash eventually disappeared. Following a course of deep x-ray therapy to the ulcerating breast, which had become a little smaller and cleaner, she was sent home on August 8.

Case 2

A housewife aged 62 was admitted to hospital on June 28, 1958, having had a radical mastectomy in January, 1957, for an anaplastic round-celled carcinoma of the left breast. She had developed secondary carcinomatous deposits in the skin



FIG. 2.—Case 2. Subcutaneous haemorrhages of scurvy on the thigh following bilateral adrenalectomy.

of the right chest wall, and an x-ray examination showed lung deposits and a pleural effusion. Her haemoglobin level on admission was 82%.

On June 30 a left adrenalectomy and bilateral oophorectomy was carried out. The liver was found to contain extensive deposits of secondary growth. The adrenal gland was infiltrated with carcinoma, and this was confirmed on histological examination. Ten days later a right adrenalectomy was performed, but a week later her right loin wound became infected following the discharge of a haematoma. She also developed multiple bedsores, which became infected. At this stage she was being given a high-protein diet, but was reluctant to eat.

Culture of the pus in the wound revealed a growth of *Staph. aureus*, which was insensitive to all antibiotics except novobiocin, which was given in doses of 250 mg. six-hourly for five days.

On the tenth post-operative day she developed purpuric spots and haemorrhages on the hands, arms, and legs (Fig. 2). The gums appeared normal, but she was edentulous. A blood count showed a haemoglobin level of 71%, white cells 13,300 with 94% polymorphs, platelets 47,000, and a bleeding-time of 3½ minutes. A vitamin-C saturation test was carried out and 31 mg. of ascorbic acid was excreted.

She was given 300 mg. of vitamin C daily and the purpuric spots diminished in number, but did not disappear as in Case 1. Although her wounds became cleaner and began to heal, her general condition deteriorated and she died on August 1.

Discussion

It is possible for most vitamins, an exception being vitamin C, to be synthesized in the body, and we depend entirely on extraneous sources for our essential requirements of it. It can be stored to a limited extent in the body, and this is said to occur mainly in the adrenal cortex, pituitary body, corpus luteum, and lens. Investigations have shown that the guinea-pig behaves in a similar way to man and cannot synthesize the vitamin, whereas the rat, dog, and mouse are able to do so. The site of this synthesis is not known, but it may be in the adrenals, as Dumm and Ralli (1949) observed that the ascorbic acid excretion by rats after bilateral adrenalectomy fell to low values. On the other hand, the synthesis is not entirely dependent on the adrenals, as adrenalectomized dogs and rats can be maintained on a vitamin-C-free diet.

A great deal of experimental work has been carried out to determine the relationship between ascorbic acid and the adrenal cortical hormones. In animals, following stress or the administration of corticotropic hormones, the increased secretion of adrenocortical hormones is associated with a rapid decrease in the amount of ascorbic acid and cholesterol in the adrenal gland. There appears to be considerable doubt about the relation of vitamin C to the synthesis of the adrenocortical steroids. In persons dying after continuous stress the enlarged adrenals were found to contain about 50% less than the normal amount of ascorbic acid and cholesterol (Uotila and Pekkarinen, 1951).

That ascorbic acid is not essential for the actual synthesis of the hormones is seen in scorbutic animals, when cortical hormones are elaborated in the absence of the vitamin. On the other hand, when the adrenals are removed from guinea-pigs, and vitamin C is withheld, the animals die rapidly (Clayton and Prunty, 1953). In classical cases of scurvy in man, the typical findings of eosinopenia and increased 17-ketosteroid excretion are noted after corticotrophin therapy and are not changed after vitamin C administration. After saturation with vitamin C there is a marked increase in urinary ascorbic acid following treatment with corticotrophin.

The effect of corticoid release on ascorbic acid excretion in man is described by Stefanini and Rosenthal (1950) and by Holley and McLester (1951). In each case two male patients with rheumatoid arthritis were treated with cortico-

trophin for periods of six months. In all four patients symptoms of scurvy developed which responded to vitamin C. Holley and McLester have suggested that ascorbic acid plays the part of a reducing mechanism in the production of the steroid hormones. In order to conserve the ascorbic acid content of the adrenal cortex, the body is apparently able to deplete other structures. Corticotrophin therapy reduces the stores of ascorbic acid in the adrenal cortex, and prolonged administration produces a deficiency and symptoms of scurvy.

Kayahan (1952) states that following the taking of large doses of vitamin C by mouth in man, there is an increased corticoid but decreased 17-ketosteroid excretion in the urine, indicating a direct action on the adrenal cortex.

Finally it has been shown that ascorbic acid is used up more rapidly when infection is present.

Summary and Conclusion

The adrenal cortex is the main storage depot of vitamin C in man.

The release of cortical hormones is associated with an increased excretion of ascorbic acid and a reduction of the ascorbic acid content in the gland itself.

Large oral doses of vitamin C appear to increase corticoid but decrease 17-ketosteroid excretion in the urine, indicating a direct action on the adrenal cortex.

It is open to discussion whether or not vitamin C is concerned with the actual synthesis of the adrenocortical steroids, but it is suggested that the power of the adrenal cortex to secrete the hormones is dependent on the presence of ascorbic acid.

In the cases of scurvy described here it is significant that infection was present in each case, and also in another patient with a low ascorbic acid excretion. Infection was not recorded in any other case which had undergone bilateral adrenalectomy. The presence of infection is believed to cause vitamin C to be utilized more rapidly, and thus deplete the limited reserves. We believe that patients who have their adrenal glands and ovaries removed tend to have a lowered reserve of the vitamin immediately after the operation. This belief is based on the finding of a low vitamin excretion in seven patients following adrenalectomy and oophorectomy, and comparing these values with a group of patients who were recovering from other types of operation.

We suggest that these cases should receive an adequate intake of ascorbic acid if they are not to develop deficiency symptoms.

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The National Council of the National Deaf Children's Society held its first meeting on October 18. The constituent societies are the former Deaf Children's Society, which has amended its constitution to become a national organization, and the following affiliated regional associations: the Herefordshire and Worcestershire Association for Parents of the Deaf; the East of Scotland, the Hertfordshire, the Oxford and Districts Regions; the N.-E. and N.-W. Deaf Children's Associations; and the South Wales Parents' Association for Deaf Children. The Society's address is: 1, Macklin Street, Drury Lane, London, W.C.2.

SURGERY OF ATRIAL SEPTAL DEFECTS

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The shunting of significant amounts of blood from the left to the right atrium through a septal defect should in most cases be corrected surgically. Whether this is performed by the closed method, as devised by Gross *et al.*, or by suture under the direct vision with hypothermia, as first practised by Lewis *et al.* (1955), will depend upon the practice of the individual clinic. In this unit open heart surgery is the method of choice, combined with hypothermia.

Surgical Anatomy

This has been dealt with in many communications (Rokitansky, 1875; Hudson, 1955; Lewis *et al.*, 1955; Ross, 1956; Bedford *et al.*, 1957).

Three main types of defect may be found, and any of these may be associated with anomalous pulmonary venous drainage: (1) The high defect, or sinus venosus type, is always associated with some anomaly of pulmonary venous drainage. There is no postero-superior margin, and the upper portion lies within the mouth of the superior vena cava (Fig. 1). (2) The fossa ovalis or ostium secundum defect. These are well-defined anteriorly, and there are a number of variations as seen in Fig. 2, A, B, and C. (3) The ostium primum defects. The anterior margin of the defect in these cases is formed by the ventricular septum. These ostium primum defects are associated with other anomalies, particularly a cleft mitral valve, producing mitral regurgitation, but the tricuspid valve and the upper portion of the ventricular septum may be deficient (Fig. 3).

Clinical Findings and Catheter Studies

Excellent clinical descriptions of the conditions are available (Kjellberg *et al.*, 1955; Wood, 1956; Bedford *et al.*, 1957; and many others). In the uncomplicated cases with a low pulmonary vascular resistance the findings are those that would be expected when many litres of blood escape from the left to the right atrium and pass through the right heart and pulmonary bed. The right ventricle is overactive and the increased blood flow gives rise to a pulmonary systolic murmur audible along the left sternal edge. There may be a thrill associated with the murmur. Characteristically, the second sound is widely split and fixed. In most cases a tricuspid diastolic flow murmur is audible on inspiration. This, like the pulmonary systolic murmur, is due to the torrent of blood flowing through the right heart. The radiograph shows the characteristic findings of an enlarged right atrium and pulmonary artery with varying degrees of pulmonary plethora and in association with a small aorta. In the secundum type the electrocardiogram shows right ventricular hypertrophy and a partial right bundle-branch block type of pattern.

All cases have been subjected to cardiac catheterization with the object of confirming the clinical diagnosis and of determining the pulmonary resistance and the magnitude of the shunt. This has sometimes been useful in determining whether anomalous pulmonary venous drainage is present. A gradient across the pulmonary valve does not necessarily mean that there is associated pulmonary valve stenosis, because a significant gradient can be produced by a large flow across a normal valve. In one case there was a considerable gradient across the valve, the right ventricle pres-

sure being 60/0 and the pulmonary artery pressure 18/6. After closure of the defect the thrill in the pulmonary artery disappeared and the right ventricular pressure dropped to 28/4 with a pulmonary artery pressure of 20/10.

Indications for Surgery

The volume of the shunt has been the indication for surgery, not the presence or absence of symptoms in the patient. Ideally, the shunt should be arrested before the right heart has developed permanent secondary organic changes.

The closure of a proved atrial septal defect can now be regarded in the same light as a persistent ductus; that is, to prevent the ill effects of the shunt on the heart and pulmonary bed. It is quite wrong to wait for the development of symptoms.

In the pre-operative assessment, the presence and volume of the shunt and the level of the pulmonary vascular resistance are all taken into consideration. Shunts of 2:1 or more are considered suitable for surgery, while a raised pulmonary vascular resistance (particularly with a small shunt) makes surgical closure hazardous. The late development of cyanosis as a result of reversal of the shunt is an absolute contra-indication to surgery.

The electrocardiogram must show right ventricular hypertrophy and right axis deviation. Right axis deviation is of some importance, since a tendency to a left axis deviation may suggest an ostium primum defect. In the two ostium primum defects we have encountered, left axis deviation has been present and we do not now operate in such cases.

Cases in failure and those in the older age group should not be excluded provided that the pulmonary vascular resistance is not raised and the agreed indications are present, but a higher operative risk may have to be accepted. On the other hand, this must be set against the unfavourable natural history of the disease. The average age at death in three published series is as follows: Roesler (1934), 36 years; Welch and Kinney (1940), 33 years; and Burrett and White (1945), 39 years.

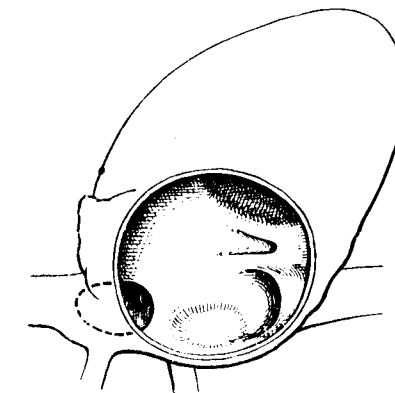


FIG. 1.—Sinus venosus, or high defect. These cases are associated with one or more anomalous veins draining into the dilated superior vena cava.

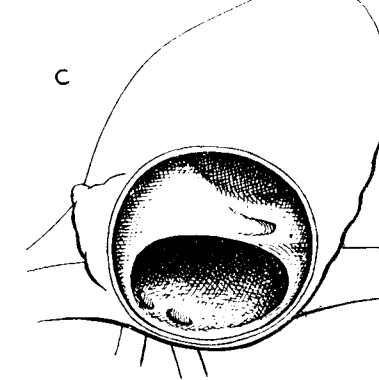
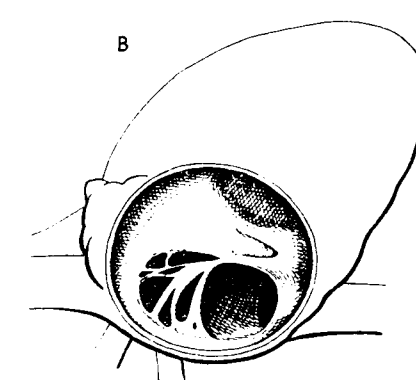
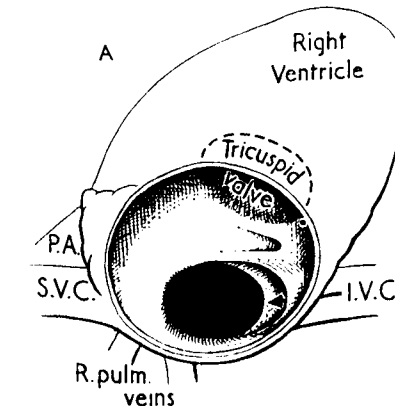


FIG. 2.—A, Typical fossa ovalis or ostium secundum defect. There is a well-defined anterior margin. B, Lacwork type of ostium secundum defect due to incomplete remnants of the septum primum. C, Large ostium secundum defect. Note how the inferior margin is overlapped by the eustachian valve. There are two apparently anomalous pulmonary veins visible.

Clinical Analysis

This surgical series consists of 49 cases—46 secundum defects, 2 primum defects, and 1 sinus venosus defect. The Table shows the age distribution in relation to symptoms. It will be seen that 18 cases in this series had symptoms.

Age Distribution

Age:	0-5	6-10	11-15	16-20	21-30	31-40	41-50	51-60
No. Symptoms	1	2	8	4	5	0	8	1
Symptoms	0	1	3	1	4	0	8	1

The sex distribution consists of 12 males and 37 females. The majority of those with symptoms complained of dyspnoea on moderate exertion accompanied by palpitations. Recurrent chest infection was present in four and two had suffered haemoptysis. Frank cardiac failure had been present in five and their ages were 30, 47, 48, 49, and 56. The patient over 56 had been virtually incapacitated for 18 years. This group survived surgery and has done well, except for the patient of 56, who succumbed during surgery. This was due to a heavily calcified pericardium around the inferior vena cava, which made the dissection of this vessel hazardous. After release of the clamp across the inferior vena cava it was found that the calcium had produced disruption of the vessel wall, with uncontrollable haemorrhage. The patients with symptoms were, in the main, over the age of 20, but those with recurrent chest infection were in the younger age group and had been investigated elsewhere for bronchiectasis. There was one further case in failure; this was in a child with an ostium primum defect.

It has been stated that there is retardation of growth in these cases; certainly in our series there were several patients who were quite definitely undersized.

Anaesthesia is to be fully described elsewhere by Dr. E. S. Machell.

Surgical Technique

This type of surgery must be carried out by a team fully trained in this work, and the operating team must be thoroughly integrated with the anaesthetic and nursing teams. All the steps in the

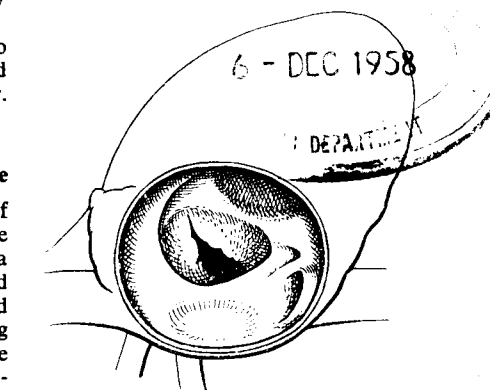


FIG. 3.—An ostium primum defect. It is well defined posteriorly, but the anterior margin is formed by the ventricular septum. The mitral valve is deeply cleft.

Britain or abroad, and it is difficult to escape the belief that the different picture is consequent upon their way of life, as they are never housed. Most of the cases of tuberculosis in sheep are due to the avian type (Griffith, 1925; Creech, 1940). While it is impossible to trace the source of infection, it seems logical to conclude that wild birds, which are frequently infected with avian tubercle bacilli, are responsible for avian tuberculosis in sheep.

The rarity of the disease in sheep is confirmed by the statistics of the Bureau of Animal Industry in the United States. Out of 17 million animals slaughtered, only two were condemned because of tuberculosis. Information concerning tuberculosis in goats is very scanty, and with one or two exceptions tubercle bacilli obtained from tuberculous goats have been of the bovine type. Experimentally, goats and sheep can be readily infected with bovine tubercle bacilli. In naturally occurring tuberculosis in sheep and goats lesions were observed in the liver, lung, spleen, and lymph nodes, and on the pleura and peritoneum.

Tuberculosis in Pigs

The incidence of tuberculosis in pigs is an indicator of the amount of tuberculosis in cattle, people, and poultry in a given community, because pigs are susceptible to human, bovine, and avian types of tubercle bacilli.

Tuberculosis of pigs due to the human type of infection is rather rare. Information concerning percentage of human types varies: Gerbert (1939), in his studies on typing tubercle bacilli isolated from 50 tuberculous pigs, demonstrated 33 cases caused by the bovine type, 5 by the avian type, 3 by the human type, and 9 by mixed infection of avian and bovine types.

When infection of pigs by the human type of tubercle bacilli is known the fact should be of interest to those concerned with the public health. If the dissemination of human tubercle bacilli is occurring in a community in sufficient numbers to produce tuberculous lesions in pigs, it is reasonable to believe that the source of such pathogens is a potential danger to human beings.

Natural infection of pigs with human tubercle bacilli, which often occurs in pigs kept on the farm attached to sanatoria, seldom results in more than localized tuberculous adenitis.

The bovine type of the tubercle bacillus is capable of producing in pigs more severe and more widely disseminated tuberculosis than either of the other two types of the organism. Early spread via the blood is an outstanding feature, with the result that miliary lesions are common in the lungs, liver, spleen, and kidneys, with involvement of the bones and joints. While the incidence of the bovine type of infection in pigs has steadily declined as tuberculosis is being eliminated from cattle, the incidence of the avian type is still high. Pigs may be infected either from tuberculous poultry or from wild birds. Tuberculosis in pigs caused by the avian type is predominantly a localized disease of the lymph nodes of the alimentary tract. However, the disease may become widely distributed, with involvement of the liver, spleen, lungs, and kidneys.

Hermansson (1939) demonstrated that water in which a meat inspector and workers dealing with tuberculous pigs had washed their hands produced tuberculosis in guinea-pigs in 11 samples out of 16; similar results were obtained with towels. These experiments clearly show that working with meat and organs of tuberculous animals entails a considerable risk both for those engaged in the slaughtering and for those examining the meat, and may explain the frequency of skin tuberculosis in meat inspectors and butchers. Tubercle bacilli are also often spread to clean carcasses by using the same knife as for examining slaughtered animals.

Tuberculosis in Horses

Almost all cases of tuberculosis in the horse are due to the bovine type, and about half of the strains are of reduced

virulence. A few cases of tuberculosis due to the avian type are on record, and one case due to the human type has been described by Griffith (1928a). No accurate figures concerning the incidence of tuberculosis in horses in this country are available. This is mainly due to the fact that horses slaughtered in this country because of old age, general disability, or illness are not examined by the veterinary surgeon or even by the sanitary inspector. Nieberle (1931) stated that in German knackeries between 1904 and 1924 0.14% of the horses were tuberculous. Magnusson (1944) reported that, in Sweden, out of 461,436 slaughtered horses in the years between 1921 and 1942, 433 were tuberculous. Statistics of the incidence of tuberculosis in horses in various countries of Europe show that the disease has been very rare in these animals. The disease is often insidious in its onset and protracted in its course, and may be clinically inapparent for a long time.

The chronicity of equine tuberculosis, the proliferative nature of the lesions with the formation of large tumour-like masses, the non-caseating character, and the difficulty of recovering acid-fast organisms are the main characteristics of tuberculosis in a horse. Equine tuberculosis has something in common with Boeck's sarcoid or sarcoidosis, and may even support the view that Boeck's sarcoid and all related lesions are a form of non-caseating proliferative tuberculosis. It is interesting that the tuberculin test in this highly resistant animal is less reliable than in the case of many cattle or pigs. The organs mostly affected include lungs, liver, spleen, and nasal mucosa. Many other organs have been reported from time to time as being affected in individual cases.

Tuberculosis in the Dog

Tuberculosis in the dog is relatively rare. The available figures are highly selective and mainly based on necropsy material. The incidence of tuberculosis in dogs in Great Britain varies between 4 and 6% (Lovell and White, 1941; Jennings, 1949). The disease is most common between 1 and 5 years of age and relatively rare in old dogs. The animal is equally susceptible to human and bovine strains of tubercle bacilli, but it is much more resistant than man or cattle. From the fact that after the experimental intravenous inoculation of moderate doses (0.001 mg. per lb. (0.0022 mg. per kg.) of body weight) lungs will show lesions while other organs often remain uninvolved, it is evident that the lung in the dog, as in most other animals, offers a good soil for the development of tuberculosis. According to most workers the human type occurs in nearly 70%, and bovine in 30% of cases. It is generally agreed that the dog often acquires tuberculosis from a tuberculous person in the household or in restaurants, hotels, workshops, etc. The organs most often affected are lungs 72%, liver 67%, pleura 49%, kidneys 48%, and peritoneum 32% (Hjärre, 1939). Serous membranes in general appear to be more often involved in the dog than in the cat or any other animal.

Many workers found that in the dog the tuberculin test, whether intradermal or subcutaneous, is of little value in the diagnosis of tuberculosis because the animal develops only a low and irregular degree of allergy.

Tuberculosis in the Cat

Cats have a strong resistance to infection with tubercle bacilli of human and avian type, but are susceptible to the bovine type. Although there are a few records of the human type isolated from cats, it is not possible to say whether mistakes were made during typing. Griffith (1926) considers that cats are sensitive only to the bovine type.

Cobbett (1926) and Kuwabara (1938) found cats resistant to the human type of tubercle bacillus. These workers' results were confirmed by me. I was able to infect a cat with a dose of 0.001 mg. of the bovine type, but failed to infect cats with a dose of 10 mg. of the human type. The incidence of tuberculosis in cats varies between 3.6 and 13%. As in the dog, most of the figures are highly selective and mainly based on necropsy material.

Available evidence indicates that in most instances the infection in cats has its portal of entry by way of the digestive tract. Milk containing bovine tubercle bacilli and consumed by cats is the obvious source of most infections in these animals.

Tuberculin reaction in the form of thermoreaction appears to be more reliable than intradermal reaction.

Tuberculosis in Birds

With the exception of pets such as the parrot and the canary, in which the human tubercle bacillus is sometimes encountered, tuberculosis in birds is caused by the avian type of *Myco. tuberculosis*. Practically all species of domesticated birds and wild birds are susceptible to the avian tubercle bacillus. Tuberculous lesions occur most often in the liver, spleen, intestinal wall, and bone marrow. Other organs, including the central nervous system, may also be affected.

Human beings have a high resistance to the organism of avian tuberculosis, and therefore every alleged case of avian tuberculous infection in man must be established by convincing evidence. Even though true avian tubercle bacilli are obtained from materials of human origin, one should be cautious in assuming that the organism was actually responsible for the morbid progress in which it occurred.

Captive Wild Animals

Griffith (1928b) points out that tuberculosis in warm-blooded animals living in the wild state is unknown, but, on the other hand, it is common in animals kept in zoological gardens and menageries. It is an interesting finding of Griffith (1928b) and Lovell (1930) that the proportion of attenuated strains of tubercle bacilli isolated from these animals is much higher than from human or bovine cases.

The Public Health Aspect

The numerous publications presenting evidence incriminating the bacilli of bovine tuberculosis as a cause of tuberculous infections of human beings need no comment. Pasteurization of the public milk supply is now almost universal, except for some rural populations. It is interesting to know that 72 out of 570 milk samples examined biologically by the Veterinary Investigation Centre, Cambridge, during 1957, contained tubercle bacilli. This need cause no surprise, as Cambridgeshire, the Isle of Ely, and neighbouring counties have a very small percentage of attested cattle. In spite of the great advances in control of tuberculosis in cattle, there will be a constant potential hazard so long as only a few infected animals exist.

The gains made in controlling bovine tuberculosis can be maintained only by recognition of the fact that constant vigilance is necessary. It must be realized that not only a tuberculous animal but also a tuberculous person infected with the bovine type may transmit the infection. There are many records of persons who infected herds of cattle. Magnusson (1941) reported an instance where in a herd of 74 cows that had been free from tuberculosis for seven years 49 reactors suddenly appeared. Infection was traced to a woman milker who had assisted on the farm for a few weeks and was later discovered to be suffering from open pulmonary tuberculosis of the bovine type.

The part played by ruminants other than cattle and horses in spreading infection is less certain, since it is not known how far they are potential sources of danger to man. In all probability the horse, sheep, and goat can be disregarded on account of the relatively slight incidence of the disease.

Dogs and cats, however, which are in such intimate contact with man, may be responsible for the dissemination of infection. The public health aspect of tuberculosis in dogs and cats must receive much closer consideration. We may anticipate that with the progress in eradicating tuberculosis in cattle the disease should automatically become extinct in

cats; but in the dog, on the other hand, the reduction of bovine infection will not influence the incidence of tuberculosis to the same extent. The predominant danger for the dog is the human being with an active pulmonary focus from which tubercle bacilli are disseminated in the sputum. For this reason it is important that, so far as is possible, the type of the bacillus responsible for canine cases should be typed.

Stableforth (1929) reported that in four out of six canine cases of tuberculosis there was a history of human infection. Herlitz (1939), carrying out an investigation on transmission of tuberculosis from dogs and cats to human beings, observed that only 13 out of 65 families who had owned tuberculous dogs were affected with tuberculosis. Evidence that infection had passed from animal to man was adjudged as probable in two cases only. Similar investigations were carried out by Hawthorne *et al.* (1957) in Glasgow. They examined not only animals living with tuberculous patients but also human beings living among tuberculous animals. They found nine significant cases of tuberculosis in 14 families living in contact with tuberculous dogs. The dogs and cats owned by 37 patients with active tuberculosis were examined for the isolation of *Myco. tuberculosis*. It was recovered from the alimentary tracts of two dogs and two cats.

In addition to these two large-scale investigations there are several small ones of sporadic cases of transmission of the disease from dogs or cats to man. Urwitz (1949) described five cases of tuberculosis in human beings all infected by one dog; De Kock and Le Roux (1956) recorded one case of tuberculosis contracted from a dog. Lewis-Jonsson (1946) described tuberculosis in a 3-year-old boy who was bitten on the forearm by a tuberculous cat. The wound started to heal, but after 23 days sores developed at one site of the bite. Further examination of the child revealed miliary tuberculosis in the lungs, and he died three and a half months after receiving the bite. These observations seem to indicate that tuberculosis in household animals must be regarded as a possible source of danger, and much more energy should be displayed in attempting to eliminate these cases and drawing attention to the risk of the dissemination of infection by dogs and cats. Unfortunately, at present very little can be done in preventing the spread of tuberculosis from the small animals to man. The following example illustrates the difficulty.

A cat was brought to the veterinary hospital for examination. On examination it showed the clinical picture of tuberculosis, confirmed by a strong positive tuberculin reaction. The owner of the cat was a mother of two children aged 2 and 6, and she was warned about the danger of having the animal in the house. She refused to allow the cat to be destroyed, and it was therefore handed back to her. This situation often occurs, particularly when the animal is a special pet of the family, and legally nothing can be done.

At present the control and prevention of animal diseases, so far as it affects the animal population, is vested in the Ministry of Agriculture and is under the direction of Government veterinary officers. But all questions referring to animal diseases in relation to human health are dealt with by the Ministry of Health in England and Wales and by the Department of Health for Scotland through local authorities. Neither of these health departments employs a veterinarian as an adviser on veterinary matters affecting public health in Great Britain, as is done in many countries on the Continent and in the United States. More and more stress is being placed on animal production; consequently as the density of the animal population increases the incidence of diseases transmissible from animals to man increases also. Therefore the medical and veterinary professions should work hand in hand.

However, let us hope and believe that tuberculosis in animals and man in this country will be reduced to a disease of minor importance, or perhaps to a disease of the past, such as pleuropneumonia in cattle and plague in man.

Perhaps I may fairly sum up by pointing to improvement of living conditions of man and animals as the most

CLINICAL COMPARISON OF METHY- PRYLONE AND QUINALBARBITONE AS HYPNOTICS

SEQUENTIAL ANALYSIS USED

BY

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Methypylone ("noludar"; 2,4-dioxo-3,3-diethyl-5-methyl-piperidine) is a non-barbiturate hypnotic. Stewart (1956) reported that in a dose of 200 mg. it had a hypnotic effect comparable to 100 mg. of either amylobarbitone sodium or butobarbitone. Lasagna (1956) found that 250 mg. of methypylone produced results "essentially indistinguishable" from those of 100 mg. of pentobarbitone or 100 mg. of quinalbarbitone.

The purpose of the present investigation was to compare the hypnotic effects of methypylone and standard doses of quinalbarbitone; ascorbic acid was used as a control.

Method

The patients were in general medical wards and presented a wide variety of diagnoses; there were 92 men and 36 women, and their ages ranged from 24 to 74 years. Only those who required hypnotic drugs were included in the trials. All other sedatives were withdrawn during the period of observation. The plan was similar in each of the four clinical trials. The two drugs to be compared were dispensed as white powders of similar bulk, labelled A or B, their content being unknown to patient, nurse, or clinician.

The Table lists the contents of the powders used in the four trials. If powder A was given on the first night, powder B was ordered on the second, and vice versa. To

Content of Powders A and B in the Trials

Trial No.	A	B
1	200 mg. ascorbic acid	200 mg. methypylone
2	400 " " methypylone	400 " " ascorbic acid
3	400 " " "	200 " " quinalbarbitone + 200 mg. ascorbic acid
4	400 " " "	100 mg. quinalbarbitone + 300 mg. ascorbic acid

avoid bias, the order of giving powder A or B on the first of the two test nights was decided by random selection; after mixing 20 labels marked A and 20 of B, the order in which they were then drawn from a box was listed, and this determined the order of administration. When it was found during a trial that more than 40 patients were required to complete the study (51 in trial 1 and 67 in trial 3), a further list of 40 was compiled by the same method of random selection. The appropriate powder was given with a small draught of water at 10 p.m. Each patient was informed that he was receiving "a sleeping powder"; he was not told that a comparative study was in progress. The nurse was asked to observe the patient during the night and record her opinion of the soundness of sleep in the following terms: "good," "intermediate," or "poor." In the morning after the second hypnotic I asked each patient, "On which of the two nights did you have the better sleep?" Care was taken to use the same form of words, with the deliberate intention of eliciting a comparison.

The results were examined statistically by the method of sequential analysis as described by Bross (1952), and the original paper should be consulted for a detailed explanation of the statistical significance of this sequential plan. The outstanding feature of this method is that observations are charted as soon as they become available. Looking at

Fig. 1 as an example, only a stated preference between A and B is plotted as X; if a patient states that there is "no difference" between the treatments, no entry is made on the chart. If the patient states a preference for A, a mark X is placed in the square to the right of the last entry on the chart; if the preference is for B, the mark is placed in the square above the last entry. When the path of these symbols travels "north" and emerges from the boxed area, "B treatment" is superior; if beyond the "eastern" barrier, "A treatment" is superior. If the data as plotted fall into the zone between the two boxed areas, this denotes "no important difference between treatments." The clinical trial—to compare A and B—ends when the X path crosses any boundary of the boxed areas.

Results

The results are shown in Figs. 1-4, which should be read in conjunction with the Table. The first trial demonstrated no important difference between 200 mg. of methypylone

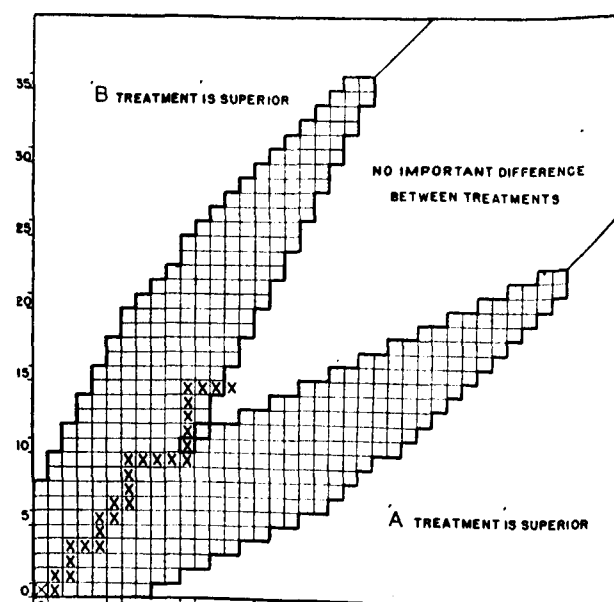


FIG. 1.—Sequential plan in trial 1, showing no important difference between the "treatments."

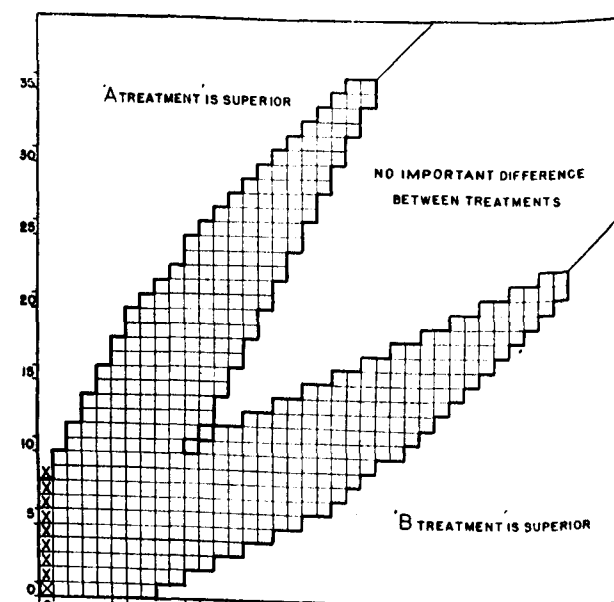


FIG. 2.—Trial 2, in which "A treatment" was superior to "B treatment."

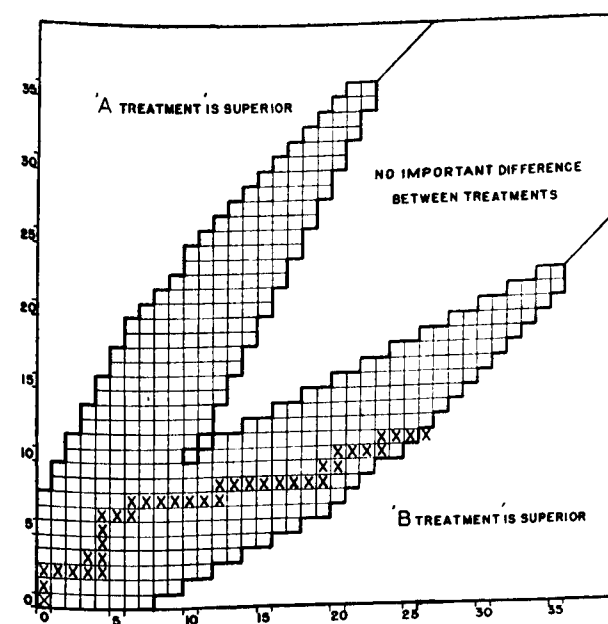


FIG. 3.—Trial 3, showing 200 mg. of quinalbarbitone to be superior to 400 mg. of methypylone.

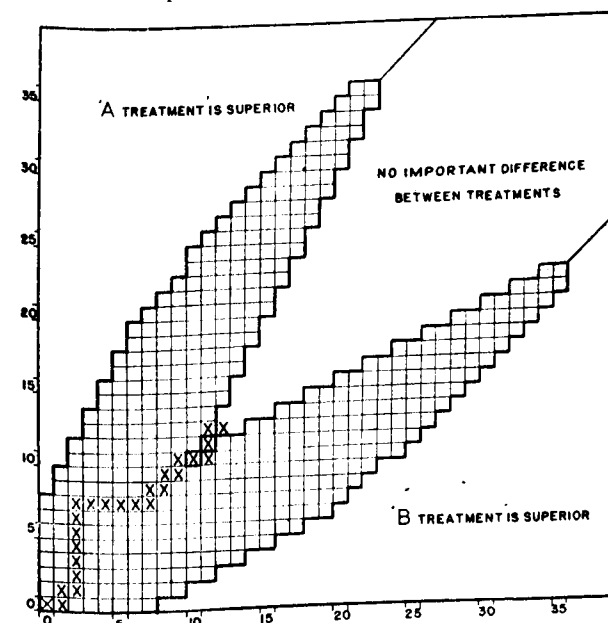


FIG. 4.—Trial 4, in which there was no important difference between 100 mg. of quinalbarbitone and 400 mg. of methypylone.

and 200 mg. of ascorbic acid as hypnotics. To reach this conclusion 51 patients were studied, of whom 24 stated there was "no difference" between the drugs. The second trial (Fig. 2) showed that 400 mg. of methypylone was superior as a hypnotic to 400 mg. of ascorbic acid. This superior study required only 12 patients, as 8 stated a preference for powder A, and 4 "no difference" results were obtained. Trials 3 and 4 were planned to allow a comparison to be made of the hypnotic effect of 400 mg. of methypylone with the hypnotic effect of quinalbarbitone in the commonly prescribed doses of 100 or 200 mg. The results (Fig. 3) indicated that 200 mg. of quinalbarbitone was superior to 400 mg. of methypylone; the "eastern" boundary was crossed after 37 preferences and there were 30 "no difference" results. When the hypnotic effect of 400 mg. of methypylone was compared with that of 100 mg. of quinalbarbitone, no important difference was found; this trial required 40 patients, 16 of whom found "no difference" between the drugs.

Discussion

There are many factors which can be considered while comparing the therapeutic value of two hypnotic drugs. The present trials have not sought to define the time of onset of hypnotic action, or its duration, the presence of disturbing dreams, or toxic effects. In this study, only the patient's judgment of the quality of sleep after different hypnotics has been used. It is interesting to note, however, that the data obtained during these clinical trials also permit of some comment on the degree of correlation existing between a clinician's assessment and that of the nurse. When the preferences for the sequential analysis were based on the nurses' considered opinions, the paths travelled in the same directions as in Figs. 1-4, but more slowly. The latter was due to the greater number of "no difference" results offered by the nurses.

Summary

The hypnotic effect of methypylone (noludar) has been compared with the hypnotic effect of quinalbarbitone, using the double-blind technique. Powders of ascorbic acid were used as a control. The results were assessed by sequential analysis.

No important difference could be detected between the apparent hypnotic action of 200 mg. of methypylone and the control powder. When the hypnotic effects of 400 mg. of methypylone and 100 mg. of quinalbarbitone were compared no important difference was discovered.

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RATIONALE OF ANTIHISTAMINIC THERAPY IN THERMAL INJURY AN EXPERIMENTAL EVALUATION IN THE GUINEA-PIG

BY

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Clinical trials with antihistamines in the early treatment of burns suggest that these drugs, applied locally or given orally, are useful in combating pain, blistering, oedema, and infection, and consequently in accelerating healing (see correspondence in the *British Medical Journal*, cited by Sevtitt, Bull, Cruickshank, Jackson, and Lowbury, 1952). This clinical finding is consistent with Lewis's (1927) observation that the triple response elicited by pricking histamine into human skin is also induced by thermal injury, and with the fact that histamine is readily released *in vitro* by heat from the skin of various species of animal (Rosenthal and Minard, 1939). However, in human volunteers given an oral antihistamine immediately after experimental burns were made, Sevtitt *et al.* (1952) could not confirm the clinical findings; and the increased vascular permeability induced by high-temperature burns in rabbits (Weeks and Gunnar, 1949) and by thermal injury in anaesthetized guinea-pigs (Sevtitt, 1949) is not antagonized by high doses of antihistamines. Evidence of this kind from the rabbit and guinea-pig must be given

considerable weight because in each animal histamine has the same high order of permeability-increasing potency as it has in man (Miles and Wilhelm, 1958a).

In re-examining the possible role of histamine in thermal injury, we investigated the response in guinea-pig skin to a minimal injury that consistently induced a substantial increase of vascular permeability. A minimal injury avoids two factors that possibly complicated the interpretation of the work of Weeks and Gunnar (1949) and of Seivitt (1949): firstly, the pharmacological picture is less likely to be complicated by non-specific breakdown products that almost certainly appear after high-temperature injury; and, secondly, since the stimulus is not painful, it permits the investigation to be made in unanaesthetized animals, thus avoiding the depression which anaesthesia induces in the permeability response of the peripheral vessels (Miles and Miles, 1952).

After establishing the maximal tolerable stimulus first on ourselves and then on guinea-pigs, thermal injury was induced by applying a copper disk, 9 mm. in diameter, maintained at a temperature of 54° C. by flowing water at a constant temperature, to the depilated skin of the back of the trunk of guinea-pigs for periods up to 30 seconds. This degree of heat stimulus is so mild that it can be applied to completely unrestrained animals without their moving away from the disk. The animals, 650–750 g., were previously given intravenous pontamine blue, 50 mg./kg. Such animals are referred to as "blued." Increased vascular permeability at the heated sites, indicated by the local exudation of the blue dye, was graded $\pm$, $+$, $++$, $+++$, up to $++++$; $\pm$ represents the faintest trace, and $++++$ an intense dark blue.

We found at heated skin sites two distinct permeability responses: an immediate response, best elicited by five seconds' heating, which appears in less than one minute, and is almost certainly mediated by liberated histamine; and a delayed response, which appears one hour after 20 seconds' heating and which is apparently not induced by histamine, or in any way dependent on the magnitude of the immediate response to liberated histamine which precedes it.

The Immediate Response

Skin sites heated at 54° C. for five seconds become erythematous in 30–40 seconds, and blue after a further 5–10 seconds; the blueing is maximal ($++$ to $+++$) in five minutes (Fig. 1). Tested by the technique of Miles and Wilhelm (1952), the permeability of the blood vessels in the heated skin returns to its normal low level in 10 minutes (Fig. 2, A). The heated skin neither blisters nor becomes necrotic.

This immediate response is highly susceptible to anti-histamines previously injected locally into the skin or given intravenously. In our hands the preferred antihistamine in guinea-pigs (Mason and Wilhelm, to be published) is triprolidine ("actidil," see Green, 1953). The prior intracutaneous injection of 2 μ g. of triprolidine base in 0.1 ml. of saline into the test site consistently decreases responses of $++$ to $++++$ to less than $\pm$, and even 0.02 μ g. has a substantial effect (Fig. 1). However, the application immediately after heating of lint squares soaked in a 1% solution of triprolidine does not affect the response. Thermal lesions were also compared in the same animal before and after the intravenous injection of triprolidine. Intravenous triprolidine antagonized the immediate response even more effectively than intracutaneous; doses of 100 μ g./kg. decreased responses of $++$ to $+++$ to less than $\pm$, and of as little as 10 μ g./kg. to $\pm$ (Fig. 1).

In unblued guinea-pigs, slight oedema of the heated skin corresponded in onset and development with local blueing in blued animals, and had the same susceptibility as local blueing to intravenous triprolidine. Erythema, however, was not affected by triprolidine.

Eight other antihistamines, in intravenous doses of 1 mg./kg., each substantially antagonized the immediate response in blued animals; but in doses of 0.1 mg./kg. they decreased the response in the following descending order of potency: triprolidine, mepyramine, chlorpheniramine, triphenylamine, promethazine, diphenhydramine, chlorcyclizine, thenalidine, and antazoline, the last two having only a slight effect. These drugs are effective in practically the same order as inhibitors of the permeability increase induced by intracutaneous histamine and by the histamine-liberator 48/80.

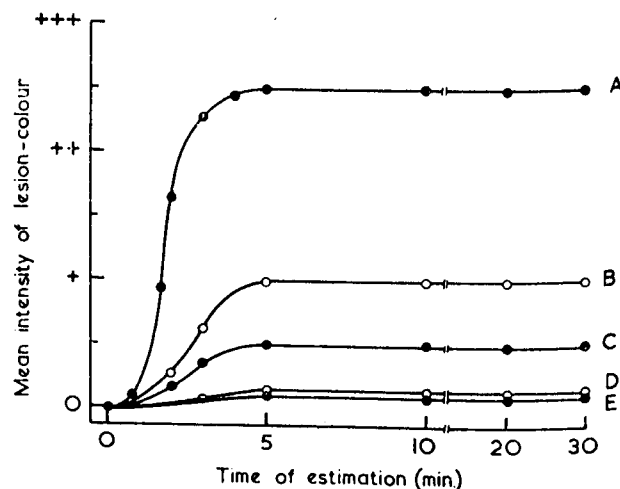


FIG. 1.—Maturation of the immediate permeability effect in the blued guinea-pig during the 30 minutes following a mild heat stimulus to the skin (A); and the influence of prior treatment with the antihistamine triprolidine, 0.02 μ g. (B) and 2 μ g. (C) intracutaneously, and 10 μ g./kg. (D) and 100 μ g./kg. (E) intravenously.

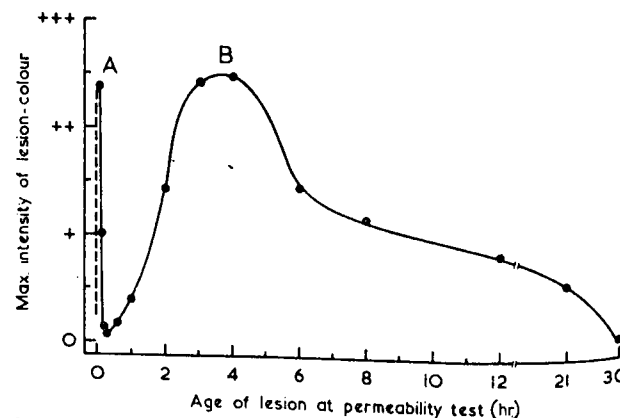


FIG. 2.—The diphasic nature of the permeability effect of a moderate heat stimulus in the skin of the guinea-pig.

The high susceptibility of the immediate response to small doses of antihistamines suggests that only small amounts of histamine are liberated. This is supported by the low histamine content that we found in intercellular perfusates (Miles and Wilhelm, 1958b) from skin strips, 10 by 30 mm., which had been heated *in vivo* (0.015–0.03 μ g. of histamine per heated strip, compared with <0.007 μ g. per control strip). Furthermore, when finely chopped and washed skin from normal animals was heated in Locke's solution at 54° C. for five seconds to five minutes, the Locke's solution contained only 1–5% of the histamine liberated by heating at 95–100° C. for five minutes (cf. Rosenthal, Samet, Winzler, and Shkolnik, 1957). Skin, in pieces 5 by 5 mm., heated at 98° C. for five minutes yielded only 20% of its

histamine (cf. Rosenthal *et al.*, 1957). All the liberatable histamine was, in fact, released at this temperature, because when this heated skin was finely chopped the remaining 80% readily leached into the suspending fluid.

The Delayed Response

Sevitt (1958) records that, in anaesthetized guinea-pigs, heating at 60° C. for 10 seconds induces substantial local oedema maximal eight hours after injury. We induced a similar delayed response in our unanaesthetized animals by heating for 20 seconds at 54° C. The immediate response was now minimal, being represented by only a thin ring of blueing not more than 1 mm. wide at the periphery of the heated site; and, like that to 54° C. for five seconds, it was abolished by prior antihistamine treatment. However, after a half to one hour, additional blueing appeared within the peripheral ring of colour, and the entire lesion became evenly blued ($++$ to $+++$) during the next two to three hours. This delayed response is illustrated by the experiment recorded in Fig. 2, B, in which intravenous dye was given to animals bearing lesions from one minute to 30 hours old.

In anaesthetized animals, heating at 58° C. for 10–20 seconds hastened the development of the delayed response; but, even so, central blueing did not appear until the lesions were 5–10 minutes old, and took 60–90 minutes to mature.

We were unable to identify the permeability factor mediating the delayed response. Intravenous triprolidine, 0.1–1 mg./kg., given before or during the development of the lesions, did not affect the response; and inhibitors of the globulin permeability factor in guinea-pig serum and the tissue fluid of the skin (Miles and Wilhelm, 1955, 1958b; Wilhelm, Miles, and Mackay, 1955) were also ineffective.

The serum-globulin permeability factor in the guinea-pig, as well as in other species, including man (Mill, Elder, Miles, and Wilhelm, 1958), is a protease that is highly susceptible to soya bean trypsin inhibitor (S.B.T.I.) and to the esterase inhibitor di-isopropyl fluorophosphonate to the esterase inhibitor di-isopropyl fluorophosphonate (D.F.P.; see Becker, 1958; Miles and Wilhelm, 1958a). Injected locally into the skin, both before and during the development of the delayed response, relatively large doses of S.B.T.I. and of D.F.P. each failed to affect the response. Intravenous S.B.T.I. also was ineffective; and, contrary to Spector and Willoughby's (1958) finding in the rat, intraperitoneal D.F.P. in our guinea-pigs induced only a non-specific depression of the vascular responsiveness. The immediate response was also insensitive to local S.B.T.I. and D.F.P.

Summary and Conclusions

Mild heat treatment of the skin of the guinea-pig is followed by an immediate and short-lived increase in vascular permeability, which is mediated by histamine. With moderate heat treatment the immediate response is followed by a delayed and more prolonged response, which, so far as our evidence goes, is mediated neither by histamine nor by other recognized endogenous permeability factors.

If it is justifiable to generalize from the guinea-pig to man, then we expect a substantial liberation of effective histamine only in the very mild burn with no ostensible damage to or rupture of the skin; and little or none in moderate or severe burns, owing to changes in the tissues that either inhibit histamine liberation, restrain the movement of liberated histamine to susceptible blood vessels, or otherwise alter the capacity of the vessels to manifest a permeability effect.

Since the histamine effect lasts only 10 minutes, in any efficient treatment of mild burns by an antihistamine, the drug would have to be applied within a few minutes, either locally in a form capable of rapid pene-

tration of unbroken skin or intravenously. Moreover, since the intensity of the delayed vascular response we observed was not diminished when the early histamine effect was neutralized, the antihistamine would do nothing to inhibit these delayed effects, even supposing the burn were severe enough to induce them.

It is possible, however, that histamine liberated and held in the tissue of more severe burns might later be released to the detriment of surrounding tissues and consequently that prophylactic antihistamine might diminish later deleterious responses to the injury. An *in vivo* experimental proof of such an action in severe burns was beyond the scope of this investigation.

As regards the delayed permeability response, the time relation of which is similar to that induced in the guinea-pig by bacterial infection (Burke and Miles, 1958) and certain bacterial toxins (Elder and Miles, 1957), we have as yet no evidence of the nature of the mediating factor and can offer no rationale for its treatment.

We are indebted to Allen and Hanburys Ltd., London; Ciba Laboratories, Horsham; May and Baker Ltd., Dagenham; Parke, Davis and Co. Ltd., London; Sandoz Products Ltd., London; and the Wellcome Research Laboratories, Beckenham, for supplies of antihistamines; and to the Nuffield Trust for financial help in the prosecution of this work.

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Minds Matter: A New Approach to Mental Health is the title of a 62-page booklet published by the Conservative Political Centre on behalf of the "Bow Group." The author, Miss BERYL COOPER, is a 30-year-old Birmingham graduate who is stated to have worked for seven years in the Hospital Service, three of them "as hospital secretary at a teaching hospital in London." After an introductory chapter on the extent of the present problem, Miss Cooper discusses in turn past and present legislation on the care of the mentally ill, the Royal Commission's report, local responsibilities and voluntary sources of help, costs and staffing, the administrative structure, and community services. She ends with a "four-point plan for mental health": (1) Certification to be abolished, with admission to mental hospitals to be voluntary whenever possible and with a procedure as simple as with general hospitals. (2) Most patients to be treated at home so that they do not become cut off from the community. (3) Hostels for milder cases and the old, training-schools for the younger, and more "day" and "night" hospitals to be built. (4) 138 new committees to take over hospital administration now shared between 14 regional boards and 400 management committees, and be financed by five-yearly direct Government grants.

HYPOTHERMIC MYXOEDEMA COMA
THREE CASE REPORTS

BY

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Hypothermic myxoedema coma is an uncommon condition in which interest has grown recently (Lancet, 1956). Only 15 cases have been reported, and those since 1953. Three further cases are reported, each of interest in itself. Case 1 is the first reported case of hypothermic coma in juvenile myxoedema. Case 2 is the oldest reported case. Case 3 is the second reported case to have survived over three months.

Case 1

A youth aged 19 was admitted to hospital in coma on November 21, 1956. At the age of 12 he developed weakness of his legs, and from that time his walking deteriorated, although he remained mentally alert. During the 12 months before admission he became increasingly lethargic, spending most of his time asleep before the fire. On the day of admission he could not be roused.

On examination he was deeply unconscious. Physically he had the appearance of a boy of 12. His skin was soft, dry, and cold; his lips were thick and a large tongue protruded from his mouth. Axillary and pubic hair were present. His genitalia showed normal development. The rectal temperature was 82° F. (27.8° C.); the apex rate 50 a minute; respiratory rate 2 a minute; B.P. 80/60 mm. Hg.

Investigations.—Hb, 98%; W.B.C., 19,000/c.mm., mainly polymorphs; blood cholesterol, 200 mg./100 ml.; serum sodium, 144 mEq/l.; serum potassium, 6.7 mEq/l.; plasma chlorides, 63 mEq/l.; CO₂ combining power, 41 mm./l.; blood sugar, 100 mg./100 ml. E.C.G. twelve hours after admission showed low-voltage complexes in all leads in sinus rhythm at 100/minute. X-ray examination of the chest was negative.

Treatment was begun immediately: (1) Warmth:—He was immersed in a lukewarm bath until the rectal temperature rose to 89° F. (31.7° C.), and then nursed between electric blankets until his temperature reached 95° F. (35° C.), eight hours after admission. He was then maintained at this level by intermittent heating from the electric blankets. (2) L-thyroxine sodium, 0.02 mg. four-hourly, was given sublingually. (3) Cortisone:—100 mg. of hydrocortisone hemisuccinate was given intravenously over the first 12 hours, then 50 mg. of cortisone acetate intramuscularly six-hourly. (4) Penicillin, 500,000 units, was given twice daily.

Twelve hours after admission the pulse rate rose to 100, respirations to 10, and the B.P. to 110/70. Three hours later he regained consciousness and asked for a cup of tea. His voice was deep and his speech slow. He knew who he was and took an interest in his surroundings. Twenty-eight hours after admission he had an epileptiform fit and became comatose. Respiration ceased, and was maintained by intermittent positive-pressure inflation through a cuffed endotracheal tube via a tracheotomy. He died 78 hours after admission.

Post-mortem Findings

External appearances:—The body was that of an adolescent male with thick lips, low receding forehead, and slanting eyes; there was also a recent tracheotomy wound. In some places the tissues were gelatinous. **Central nervous system:**—The brain weighed 1,280 g.; no significant abnormality was seen. **Trachea and lungs:**—The right lung weighed 280 g. and the left 270 g.; both pleural spaces contained large quantities of straw-coloured fluid; both lungs were congested. **Cardiovascular system:**—The heart weighed 240 g.; the pericardium contained straw-coloured fluid; no significant abnormality was found. **Alimentary**

tract:—The liver weighed 880 g.; no significant abnormality was found in the tract. **Urogenitals:**—The kidneys together weighed 250 g. **Reticulo-endothelial system:**—The spleen weighed 100 g. and showed no significant abnormality. **Endocrine system:**—The adrenals were normal in size and appearance; the testes were in the scrotum and showed no significant abnormality; the thyroid was small and rather firm, probably fibrous; the pituitary was not examined as the sella turcica was removed intact.

Histology.—The thyroid gland was dissected off the trachea and found to weigh 27 g. Histological examination revealed that its weight was in fact considerably less, as much of the tissue weighed was voluntary muscle. This muscle contained localized areas of pale homogenous fibres whose appearance suggested focal degeneration or necrosis. Such thyroid tissue as there was looked fairly normal, although there was definitely some increase in the inter-acinar fibrous tissue. There was a fibrin thrombus in one thyroid artery. In the testis there was no active spermatogenesis. The Leydig cells were very scanty indeed and did not stain characteristically. The pituitary was normal in size and histological appearance.

Case 2

A widow aged 80 was admitted to hospital on November 26, 1957, with a fractured neck of femur. Before operation her condition was good; pulse 60, B.P. 130/70, temperature 97° F. (36.1° C.). Smith-Petersen nailing was carried out under general anaesthesia. Post-operatively she became cold and cyanosed, with a systolic B.P. of 95 mm. Hg. Plasma was given intravenously. Later she lapsed into coma with a pulse rate of 50, respirations 4, and a temperature reported as subnormal.

In retrospect it was realized that this was a case of myxoedema. Further information obtained from her brother showed that for three years she had become increasingly tired, sleeping most of the day and night. Her voice was gruff.

Examination now showed her to be deeply unconscious, with a rectal temperature of 91° F. (32.8° C.). Her skin was dry and coarse, her hair and eyebrows were scanty. No other abnormality was detected. Treatment was commenced: (1) warmth by a bed cradle, the patient protected by a blanket; (2) L-thyroxine sodium, 0.05 mg. sublingually four-hourly; (3) cortisone acetate, 50 mg. intramuscularly four-hourly; (4) penicillin, 500,000 units twice daily.

The patient died within 12 hours without regaining consciousness.

Investigations.—Hb, 60%; W.B.C. 2,600/c.mm., 65% neutrophils; serum cholesterol, 280 mg./100 ml. E.C.G. low-voltage complexes in sinus rhythm at 45/minute.

Post-mortem Findings

The body was that of an obese woman aged about 80 and 5 ft. 3 in. (160 cm.) in height. Rigor mortis was present. An old, sound surgical scar was present in the right inguinal region and a fresh surgical incision over the left hip. There was bruising of the right shoulder, right cheek, and right forehead. The skull was not injured. The brain showed no significant abnormality apart from one or two minor localized subarachnoid haemorrhages. The pituitary was small but of normal appearance. The mouth, tongue, larynx, oesophagus, and trachea were healthy. The thyroid gland was small, pale, firm, and fibrous. The lungs were oedematous and there was bilateral basal bronchopneumonia. The heart was dilated. The myocardium was flabby. There was some coronary atherosclerosis but little in the aorta.

The stomach was empty. The bowel was healthy, although the proximal part of the colon was dilated. The liver showed a minor degree of passive venous congestion. The spleen was of normal size but soft. The kidneys were healthy, as was the bladder. The uterus had a fundal fibroid. The pancreas and adrenals appeared normal. The adrenal glands together weighed 13 g. Histological examination showed no significant abnormality in the adrenal glands or in the ovary, breast, and pituitary. The thyroid

gland, which weighed 17 g., was pale, firm, and fibrous. Histological examination showed it to consist almost entirely of fibrous tissue in which there were a few groups of atrophic thyroid acini, each group being infiltrated by lymphocytes. There were a number of large blood vessels in the fibrous tissue, some of which were calcified.

The appearances were those of a primary failure of the thyroid gland and suggestive of a long-standing case of Hashimoto's disease.

Case 3

A spinster aged 79 was admitted to hospital in coma on December 17, 1957. She had remained well until five months before admission, when she became slowly lethargic and intolerant of cold. On the evening of admission she was found comatose in a chair before a warm fire in a well-ventilated room.

On admission she was unconscious, with no response to noxious stimuli. Her skin was smooth and dry, and had a corpse-like coldness. Her body hair was completely absent, and had been from the age of 18. The rectal temperature was 91° F. (32.8° C.), pulse palpable, apex rate 60, systolic B.P. 100 mm. Hg.

Investigations.—Hb, 84%; W.B.C., 10,200, normal differential count; blood cholesterol, 200 mg./100 ml.; serum sodium, 152 mEq/l.; serum potassium, 5.1 mEq/l.; plasma chlorides, 69 mEq/l.; C.S.U., a trace of protein only; liver-function tests, within normal limits; Kahn negative; blood urea, 44 mg./100 ml.; urea clearance, 60% of average normal function. E.C.G. showed low-voltage complexes in all leads.

Treatment was begun immediately: (1) Nursed between blankets, no external heat; (2) L-triiodothyronine, 0.08 mg. intravenously on admission, and 0.02 mg. sublingually four-hourly; (3) cortisone acetate, 50 mg. four-hourly intramuscularly; (4) crystalline penicillin, 500,000 units intramuscularly twice daily.

Twelve hours after admission her temperature had risen to 97° F. (36.1° C.). She spoke occasionally in a slow deep voice. A further 0.08 mg. of triiodothyronine was given intravenously. Thirty-six hours after admission her temperature was 100° F. (37.8° C.) and a few crepitations could be heard at the left base. She was then given cortisone, 50 mg. six-hourly orally. Forty-eight hours after admission she relapsed into coma once more, but recovered 12 hours after receiving a further dose of 0.08 mg. of triiodothyronine intravenously. From that time she made an uneventful recovery, at first on oral L-thyroxine sodium and later thyroid B.P.

Although tests on pituitary function could not be carried out owing to lack of co-operation, the fact that the patient gave a further response to intravenous triiodothyronine after lapsing into coma a second time and that she has remained greatly improved on thyroid alone for three months shows this to be a case of true myxoedema and not hypopituitarism.

Sheehan (1956) states that thyroid given alone has no beneficial effect on the symptoms of hypopituitarism.

Discussion

Hypothermic coma is the natural termination of untreated, uncomplicated myxoedema. Its occurrence has been recognized only within the last five years, although a similar picture presenting in hypopituitarism has been known for longer (Sheehan and Summers, 1952).

In addition to these three cases, 15 cases have been reported to date (Le Marquand, Hausmann, and Hemsted, 1953, 1955; Summers, 1953; Malden, 1955; Reid, 1955; Marshall and McCaughey, 1956; Dyson and Wood, 1956; Anderson and Hausmann, 1956). Of these, only one reported in the series of Malden survived. Karhausen and Zylberszac (1955) described a case without hypothermia.

The rarity of this condition is more apparent than real. Including this series, five series account for 16 patients. Once seen and recognized, the clinical picture is never forgotten. The patient is corpse-like in appearance. Occasional respirations indicate that life is still present. The usual features of myxoedema are present.

Sheehan and Summers (1952), in discussing hypopituitary hypothermic coma, state that a major factor causing the failure to recognize a hypothermic state is that the clinical thermometer records only to 95° F. (35° C.), anything lower being recorded only as subnormal. They emphasize that all patients with subnormal temperatures must have their temperatures measured by a low-reading thermometer. Hypothermic coma has not been reported previously in juvenile myxoedema.

Precipitating Factors.—**Cold:**—The reported cases show a marked seasonal incidence occurring between October and April. **Trauma:**—Case 2 went into coma following the fracture of her femur and the subsequent operative procedures. It is likely that during periods of stress the requirement of thyroid hormone increases like that of the adrenal corticosteroids.

Treatment

The condition is due directly to lack of thyroid hormone. Treatment is to give this. Although this appears simple, 15 of the 17 patients have died.

1. **Thyroid Hormone.**—3:5:3-L-triiodothyronine is the most active thyroid hormone readily available. Dyson and Wood (1956) gave a dose of 1,200 mg. followed by 1,000 mg. 36 hours later. Anderson and Hausmann (1956) described a case given 50 mg. in which anginal pain and cardiac failure developed. Both patients died. Goolden and Burrell (1957) suggest that 10 mg. 12-hourly be used initially. The third patient in this series received approximately 80 mg. of L-triiodothyronine intravenously per 24 hours. This produced a clinical response without untoward effects in a patient aged 79. It is suggested that thyroid hormone acts as a metabolic catalyst at cellular level. As such it would be less effective at low temperature. Hypothyroid patients with low temperatures probably tolerate thyroid hormone better than those at normal body temperature, the tolerance increasing with the degree of body hypothermia. If this is true, as I believe it is, then one should give an amount of triiodothyronine proportionate to the degree of hypothermia, reducing the amount as the body temperature rises to normal, then slowly increasing to the optimum dosage. A suggested scheme would be to give 100 mg. 12-hourly until the body temperature begins to rise, then reduce to 50 mg. 12-hourly or lower, depending on response of temperature and pulse rate. Maintenance dosage could then be worked up gradually when the patient is able to take the triiodothyronine orally.

2. **Rewarming.**—This can be done by immersion in warm water, by nursing between blankets, or by heat cradle. Care must be taken to avoid cutaneous vasodilatation. Rewarming is illogical and probably dangerous. Hypothermia is only a symptom of the disease state and will improve as the latter responds to treatment. Administered thyroid hormone will produce warmth that is diffuse, gradual, and physiological. No external heat was applied to the third patient in this series, who survived.

3. Intravenous fluids should be restricted on three accounts: (1) the danger of myxoedema heart failure; (2) the occurrence of acute tubular necrosis has been demonstrated secondary to hypothermic muscle damage (Marshall and McCaughey, 1956); and (3) the physiological requirement of fluid is small, as fluid loss is reduced and metabolic need low. Our successful case was given no intravenous fluid.

4. Antibiotic cover must be given.

Two further cases of severe myxoedema with marked hypothermia have come under our care. They have not been included in this series, as coma and death occurred rapidly before treatment could be initiated. In the case which came to necropsy no cause of death other than myxoedema was found. This suggests that hypothermia is an indication to start treatment immediately even when coma does not appear imminent.

Summary

Hypothermic myxoedema is an uncommon condition with a high mortality rate, recognized only in the last

five years. Three further cases are presented; one is the first reported case of coma in juvenile myxoedema, another the second case reported to have survived. This patient is still alive nine months after starting treatment.

The treatment is reviewed and discussed. It is suggested that hypothermia in itself is an indication for immediate treatment, that the application of external warmth is unwarranted, and that thyroid hormone be given in a dosage related to the degree of hypothermia.

I wish to express my appreciation of the valuable assistance given by Dr. Peter Harvey, consultant pathologist, who carried out the post-mortem examinations and microhistology. I am indebted to Dr. P. R. Duncan and Dr. I. McD. G. Stewart, consultant physicians, and to Mr. J. K. Wright, consultant orthopaedic surgeon, for permission to report the cases under their care.

Note.—Since this paper was accepted for publication a further case of myxoedema coma has been reported by S. J. Surtees and S. Ginsberg, *Postgrad. med. J.*, 1958, **36**, 443. Their patient was resuscitated but died of cardiac failure a month later.

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Medical Memorandum

Bilateral Polycystic Disease of Kidney Complicated by Intestinal Obstruction

The following case of bilateral polycystic disease of the kidney developed acute large-gut obstruction two days after admission to hospital. The case is reported because of the development of this unusual complication.

CASE REPORT

A Sea Dyak woman aged 38 was admitted to a small out-station hospital in Sarawak, British Borneo, on July 1, 1957, 17 days after delivery of a stillborn child. She complained of cough with white sputum since delivery and frequency of micturition for two days, urine being voided a countless number of times day and night. For the 24 hours prior to admission she complained of a dull aching pain in the left lower chest, left hypochondrium, and left loin, worse on coughing, and a colicky pain in the left loin. She had haematuria for 24 hours, blood occurring throughout the stream.

On admission she was very ill and toxic, with a temperature of 103° F. (39.4° C.), and pulse 112. There was a hard fixed tender mass with an irregular surface in the left loin extending downwards below the level of the umbilicus. The right kidney was palpable, with a soft smooth mass about the size of an orange comprising the lower pole. Air entry was reduced at the left lung base, and there were fine inspiratory and expiratory rales. Blood: Hb, 45% (Sahli); red cells, 2,600,000; white cells, 8,800 (polymorphs 70%, lymphocytes 28%, eosinophils 1%, large monocytes 1%); E.S.R., 137, Westergren. Urine: acid, albumin ++, over 100 red cells per high-power field. Blood urea was 70 mg. per 100 ml.

A clinical diagnosis of bilateral polycystic kidneys with infection of the left kidney was made. Unfortunately further investigation could not be carried out in a small out-station hospital with limited laboratory and no x-ray facilities.

Procaine penicillin, 500,000 units twice daily, and streptomycin, 0.5 g. twice daily, brought little change in her general condition. Two days after admission she complained of generalized colicky abdominal pain. She had passed a very small stool that morning and no flatus all day.

There was moderate distension of the lower abdomen, most pronounced in the right iliac fossa, with marked visible peristalsis. An enema gave a very poor result.

Operation.—The abdomen was explored through a McBurney incision. The lower ileum, caecum, and ascending and transverse colon were greatly distended. The descending and pelvic colon were collapsed. Through the upper part of the wound the lower pole of the right kidney was seen to be covered with cysts up to 1 in. (2.5 cm.) in diameter, varying from blue to brown in colour. The whole right kidney was felt to be involved. The left kidney was greatly enlarged. Details were obliterated by pericapsular oedema. A caecostomy was performed and a Paul tube inserted.

Post-operatively the patient was put on daily washouts through the caecostomy and was given sulphaguanidine to prepare her for any further operative intervention required.

After operation the pains in her left lower chest, left hypochondrium, and left loin started to subside, and had disappeared by July 6, the third post-operative day. The left kidney was correspondingly smaller, softer, and no longer tender. From admission to operation her temperature had shown daily variations between 103 and 99° F. (39.4 and 37.2° C.). It fell rapidly after operation, and she was apyrexial on July 7. On July 8 the Paul tube fell out and she opened her bowels. She continued to have a normal daily motion until discharge from hospital.

On July 12 the caecostomy was separated from the abdominal parietes and closed. Appendicectomy was carried out to avoid future confusion. The abdomen was closed in layers.

She was discharged from hospital on August 2 feeling very well, having refused further investigation and treatment at a larger hospital. Four months after operation she remained well and symptom-free.

COMMENT

Cleland (1951) reported that Dr. W. A. Giles removed a polycystic kidney (side not stated) causing intestinal obstruction in 1905. No other reference to this complication was found in the literature.

The development of acute intestinal obstruction in this patient gave rise to some diagnostic confusion, occurring as it did in a small out-station hospital where diagnosis mainly rests on history and physical examination. It caused a primary inflammatory lesion of the large bowel to be considered as an alternative diagnosis. In view of the limited surgical facilities available, the formation of a caecostomy was decided upon as the simplest way of relieving the obstruction. The decision was not regretted in view of the beneficial effect it had on the course of the illness.

A possible explanation of the clinical picture described is that ulceration of the splenic flexure occurred secondary to infection of the adjacent polycystic kidney. The passage of faeces over the ulcer perpetuated the renal infection and the colon became obstructed by inflammatory oedema. The renal infection and ulceration of the colon resolved rapidly when the colon was defunctioned by caecostomy.

The case reported does not bear out the statement of Duff (1948) that infection of a polycystic kidney affects the prognosis adversely, at any rate so far as the immediate prognosis is concerned. It is possible that the prognosis in this case may be favourably affected by a diet mainly consisting of rice with little added protein.

I wish to thank the Director of Medical Services, Sarawak, for permission to publish.

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Reviews

CANCER

Cancer. Edited by Ronald W. Raven, O.B.E. (Mil.), T.D., F.R.C.S. (Vol. 1—pp. 539+19+x; Vol. 2—pp. 641+24+ix; Vol. 3—pp. 483+18+viii; illustrated. 85s. each volume.) London: Butterworth and Co. (Publishers), Ltd. 1957-8.

The publication of this systematic work on cancer was expected with interest, and the first three volumes which have now appeared are certainly satisfying. The production is all that one could wish; the volumes are of a handy size, the illustrations numerous and apposite, the contributors acknowledged experts, the articles well documented, and the editing careful and efficient. Though all three volumes are of general interest, they will each have their special appeal to different sections of the profession. The first volume will be of great interest to the research worker and biochemist. After a brief chapter on the historical aspects of cancer (by Dr. Bett) there come two articles by the late Sir Ernest Kennaway dealing with the carcinogenic properties of cholesterol and the incubation period of cancer; the latter is a hitherto rather neglected subject. Then follows a chapter on the general question of carcinogenesis and two informative articles on the biochemistry of cell division and its relation to cancer; this section will be invaluable to the research worker, but the uninitiated (such as the reviewer) will have to make their own glossary of initials—for example, D.A.B., A.A.F., D.N.A., 5H.T., and the like. The volume ends with excellent accounts of the relation of viruses, hormones, radiation, and environmental factors to the causation of cancer. A chapter on the genetic control of cancer is also included. The second volume will greatly please the clinician and the morbid anatomist, for it describes with a wealth of illustration the local features of cancer in the different parts of the body. It is a volume to be viewed rather than reviewed.

Volume 3 opens with a thought-stimulating chapter on the immunological aspects of cancer by Professor H. N. Green, who brings evidence to show that "antigenic loss is the *raison d'être* of the cancer cell." The value of comparative pathology is then stressed in a chapter by J. R. M. Innes, who writes on the malignant diseases of domestic animals. The interesting statistical survey by Percy Stocks affords little comfort to those who are fond of cigarette-smoking. There is a section of more than 100 pages on the geography of cancer; both the epidemiologist and the general reader will want to study this. Occupational cancer is nowadays attracting increasing attention, and the hundred pages devoted to this subject are noteworthy; the possible relationship between occupational exposure and leukaemia is well discussed by Ethel Browning. There is a short section on that debatable subject—cancer education. One notes that in the U.S.A. special instruction is given to nurses on the subject of cancer and that a "Cancer Source Book for Nurses" has been distributed gratis to 131,000 nurses and nursing instructors. Volume 3 ends with a short section on some simple methods of value in the diagnosis of cancer; the useful caution is given that when "cytology is used as the only diagnostic aid, false negative reports are very much more serious."

These three excellent volumes whet our appetite for those still to come.

ZACHARY COPE.

LAURENCE-MOON SYNDROME

On Hereditary Digital Anomalies. Part III: *The Laurence-Moon Syndrome*. By Julia Bell, M.A., F.R.C.P. (The Treasury of Human Inheritance, vol. 5.) (Pp. 51-96; illustrated. 20s.) London: Cambridge University Press. 1958.

This full analysis of the literature on the Laurence-Moon syndrome follows the arrangements in the other volumes in the series. The relatively short text of 14 pages is based on 189 papers; the seven plates contain 181 pedigrees, all but

a few being pedigrees of families showing the syndrome. The hard core of the monograph consists of the 26 pages of summaries of the individual papers.

In presenting a critical analysis of the literature, Dr. Julia Bell stresses that adiposity and the ocular defect are the two most constant features, being present in over 90% of cases; mental defect is almost as frequent; the digital anomaly is noted in some 70% of cases, and genital hypoplasia in just over 50%. This latter she regards as an understatement—a view supported by the fact that the incidence recorded for females is considerably lower than that recorded for males. The expectation of life for patients with this syndrome appears to be rather low, whilst the incidence of stillbirths and deaths early in life is probably high. Dr. Bell holds that the syndrome may be even more extensive than is suggested by its bizarre component—malformations of the urogenital tract in particular may be common—and stresses the need for examination of stillborn sibs of affected individuals, especially as post-mortem examinations of patients with the syndrome have so far given only sparse results.

A clarification of the pathology of the syndrome would help in two other directions. On the one hand it has been questioned whether the syndrome is not itself a mixture of two distinct affections—one being the syndrome as usually understood and the other an allied condition with neurological components—the findings apparently present in the original cases recorded by Laurence and Moon and subsequently by Jonathan Hutchinson. On the other hand the status of allied syndromes, such as the cases recorded by Biemond, by Kapuscinski, by Refsum, and by others, also requires definition. It is clear that this recessive affection with its exceptionally high rate of consanguinity—somewhere between 25 and 40%—is not polygenic but pleiotropic in type, but the limits of this pleiotropism are by no means clear. Dr. Bell's review should help matters forward, but it is rather puzzling why this study should appear as part of the volume on hereditary digital anomalies.

ARNOLD SORSBY.

HYPNOTIC PAINTING IN TREATMENT

Hypnography: A Study in the Therapeutic Use of Hypnotic Painting. By Ainslie Meares, M.B., B.S., B.Agr.Sc., D.P.M. (Pp. 271+viii; illustrated. 58s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

In the 4,000 years over which the vast literature on hypnosis extends it has included contributions which have in their time materially changed the trend of psychopathological thinking. But this precious metal lies hid beneath a deep layer of dross—mystical, bombastic, repetitive, and burdened with the alchemistic speculations inevitably stimulated by an unsolved phenomenon of nature, as hypnosis still is. Any part of the annual spate of first and last editions on this subject has, therefore, to be scanned with the question well in mind, "Does it add anything to the sum?" A case can be made out for saying that Dr. Meares has made a modest addition to the technique of using hypnosis as a means of exploring the mental mechanisms which underly psychoneurotic breakdown. The author is a practising psychotherapist bent on finding shorter and more economic ways to therapeutic insight than can be attained by orthodox psycho-analysis. From his previous writings it is evident that he combines great technical experience of hypnosis with an interest in the psychodynamic and symbolic meaning of artistic expression. He claims no more than that the uninhibited symbolism of the drawings made in the hypnotic state is as much of a *via regia* to unconscious motive as is the interpretation of dreams, and that in this condition the patient's distortions and defences are less in evidence. His material, consisting of five chronic psychoneurotic patients with evident constitutional loading, is small, and the subsequent fate of these is not discussed in detail. The technique, however, including the author's methods of passive and non-authoritarian induction

of hypnosis, is most convincingly described, and the results are reproduced in terms of black-and-white paintings. Description and theory are kept apart, so that the reader need not be biased by the author's interpretations. No excessive claim is made for the method, which is presented simply as a projective medium likely to produce material which might not otherwise come to light for a long time and which serves to signpost the progress of insight therapy. The pictures are less decorative than the symbolic paintings in the author's *The Door to Serenity*, and many of them are uninhibited *graphiti* which would arrest the eye of any zealous customs official—were this not Psychiatry. The emphasis is on the revelation of traumatic experiences in the early manner of Breuer and Freud, and one is tempted to think that Melbourne is not far behind old Vienna in producing exotic material.

The book is as well produced as it should be for the price. The pictures and therapeutic dialogue make easy reading marred only, perhaps, by the quotations of set-book banality which precede each chapter.

ALEXANDER KENNEDY.

POPULAR INTERPRETATION OF MEDICINE

Medicine and Man. The Story of the Art and Science of Healing. By Ritchie Calder, C.B.E. (Pp. 256. 16s.) London: George Allen and Unwin, Ltd. 1958.

Science, growing ever more complex and more highly specialized, has become steadily less intelligible to the average man. Accordingly it is desirable, and even essential, that the message of science should be interpreted and rewritten in popular language. The interpretation of science is not an easy branch of literature, as it demands a combination of qualities possessed by only a few authors. Among them Mr. Ritchie Calder takes a high place. He has already delighted many readers with his *Profile of Science*, his *Science Makes Sense*, and other works, and now he has turned his attention to medicine, the science of humanity.

Medicine no less than science demands interpretation, and it is of great importance that the story should be presented in language as accurate as it is attractive. The present author fulfils all our needs for correct statement. In the compass of 250 pages he has packed an amazing mass of detail regarding the art and science of healing. His book contains 12 chapters, and within them no fewer than 139 smaller sections, each of which might be read in isolation, although it forms part of a coherent and fascinating narrative. Taking a wide survey of time and space, the writer scans the pages of history from the days of demons and demi-gods to those of the World Health Organization, and discusses treatment from "eye of newt and toe of frog" to folic acid and penicillin. Naturally, he employs the historical approach, the most logical basis of modern medicine, but his book does not pretend to be either a history of medicine or a work of reference. It is rather a popular account of medical science and practice as it stands to-day and of the varied sources from which modern medical knowledge has been drawn. As is shown in the early chapters, some of these sources were in unexpected quarters. The witch, the monk, the soldier, the dairymaid, and many other folk remote from medicine as we know it, each contributed a share, albeit unwittingly. The early magico-religious attitude towards sickness and disease, however irrational it may appear to us to-day, at least laid stress upon the importance of the whole man and of the interrelationship of mind and body.

The five central chapters of the book deal with "The Great Advances," and include a wealth of information, classified under interesting subheadings, such as "Brain Waves," "Alice-in-Wonderland Drugs," "Rasputin Stomach," "Emotion Buffer," and "Radio-active Mosquitoes." Medical readers will find here not only much food for thought but also assistance in the solution of that daily problem of what to tell the patient. "Victory over Pain" and "Victory over Germs" are the next subjects of

discussion, the former giving a brief but informative history of anaesthesia, the latter a picture of the antibiotic weapons which have been so effective in the microscopic war of recent years. Unsolved mysteries are mentioned, as are "Jungle Moulds" (chloromycetin), "Butterfly Wings," "Smoking and Cancer," "Stroke," and "Allergies," to quote only a few more titles. The treatise ends with the definition of health as "complete physical, mental and social well-being, and not merely the absence of disease or infirmities," and with a quotation from Descartes: "If there is any possible means of increasing the common wisdom and ability of mankind, it must be sought in medicine."

This new interpretation of medicine and of its spectacular achievement deserves to be read thoughtfully by doctor and patient alike.

DOUGLAS GUTHRIE.

PUERTO RICANS IN NEW YORK

80 Puerto Rican Families in New York City. Health and Disease Studied in Context. By Beatrice Bishop Berle, M.D. (Pp. 331+xii. 38s.) New York: Columbia University Press. London: Oxford University Press. 1958.

As American citizens Puerto Ricans can move freely within the United States, and many of them go to New York for the same reasons as Jamaicans go to Birmingham—in the hope of improving their circumstances. Because in addition to their poverty they face language and other difficulties, their arrival in increasing numbers has created serious problems for the city authorities. Dr. Berle's book reports the results of a study of 80 families for whom she provided medical services. These families were living in slum property, and the greater part of the book is concerned with their social circumstances—education, religion, reasons for immigration, family organization, housing, difficulties of language and communication, and welfare. There is also a brief account of medical conditions encountered in the Puerto Ricans, with proposals for their medical care.

T. McKEOWN.

The principal change in the twelfth edition of *Cunningham's Manual of Practical Anatomy* (London, Oxford University Press. Vol. I: Upper and Lower Limbs, pp. 394, 25s.; Vol. II: Thorax and Abdomen, pp. 492, 28s.; Vol. III: Head and Neck, Brain, pp. 520, 28s.) is the use of English equivalents of the Paris Nomenclature approved in 1955. Some of the more familiar terms of the older Birmingham Revision have, however, been retained pending adoption of the new nomenclature in its entirety. Another change, which will appeal to the student, is the use of a new waterproof binding material which will permit cleaning with soap and water after use in the dissecting-room. In this edition, which has been revised by the late Professor J. C. Brash, a number of the illustrations in use since the first edition have been replaced.

Recent Outbreaks of Infectious Diseases (408 pp.; H. K. Lewis and Co. Ltd., 1957, 35s.) is a well-documented account of epidemics of viral, rickettsial, and bacterial infections which have occurred in Britain in recent years, by S. Left, Medical Officer of Health for Willesden. A general description of each disease, with historical background and clinical features, is included, and space is also given to an outbreak of lead poisoning in Rotherham and the "smog" incident in London in December, 1952.

Absorption Spectrophotometry, by G. F. Lothian (2nd ed., pp. 246; Hilger and Watts Ltd., 52s.), is a concise account of the principles, practical applications, and techniques of absorption spectrophotometry. In this edition more detailed attention is devoted to photoelectric instruments, which have largely displaced photographic and visual methods. An extensive bibliography is included.

The second edition of *Systemic Ophthalmology*, edited by Professor Arnold Sorsby (pp. 701+xiv; Butterworth and Co., Ltd., £5 5s.), has been revised throughout; some new chapters have been added dealing with subjects in which particularly rapid advances have been made. The book, which is of composite authorship, deals with the many conditions in which ocular disease is related to systemic disorders. It is fully illustrated, the coloured plates being especially well reproduced.

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DRUGS AND LIVER DISEASE

Drugs may adversely affect the liver in several ways—for instance, by causing hepatic necrosis, intrahepatic biliary obstruction, or fatty change in the hepatic cells. In addition the syndrome of hepatic precoma and coma may be caused or aggravated by drugs given to a patient with pre-existing liver disease.

Acute hepatic necrosis, characterized clinically by jaundice, hepatomegaly, and in severe cases hepatic coma, haemorrhagic manifestations, and rapidly deepening jaundice, may be caused by a variety of toxic agents. The chlorinated hydrocarbons such as carbon tetrachloride, benzene, and quinoline derivatives, muscarine, and various metallic compounds are examples of such agents. Drugs used in the treatment of epilepsy—namely, phenytoin sodium¹ and phenacemide ("phenurone")²—have been similarly implicated, and recent reports^{3,4} show that the use of a derivative of isoniazid, iproniazid ("marsilid"), will cause both abnormal liver function tests and jaundice associated with hepatic necrosis in some patients treated with it.⁵ Originally introduced as an anti-tuberculous agent it has more recently been claimed to be of use in the treatment of myocardial ischaemia and as a "psychic energizer." Fatalities from hepatic necrosis have followed its use and that of another nicotinic acid derivative pyrazinamide,⁶ which also limits this drug's value as an antituberculous agent.

The list of drugs causing jaundice by another mechanism—namely, intrahepatic biliary obstruction—is an ever-lengthening one. At present owing to its common usage chlorpromazine ("largactil") is the most important, for jaundice occurs in 1–2% of cases

treated, but other drugs, including arsphenamine, dinitrophenol, methyltestosterone, norethandrolone ("nilevar"), thiouracil, *p*-aminosalicylic acid (P.A.S.), sulphadiazine, and methimazole, may also produce this syndrome. Clinically, after a latent period of up to three weeks, an obstructive type of jaundice with pruritus, pale stools, and dark urine begins. Usually this condition is clinically mild, but severe cases have been reported following arsphenamine and chlorpromazine. Jaundice of seventeen months' duration with skin xanthomata and gross increase of the serum cholesterol has followed arsphenamine. A similar case of 13 months' duration has followed chlorpromazine.⁷ In a recent communication to the Section of Gastroenterology at the British Medical Association's Annual Meeting, Drs. A. E. Read and Sheila Sherlock reported one case where the jaundice following chlorpromazine had lasted over two years. Cases of jaundice and hepatic dysfunction due to promazine have been described indicating that this drug is not without some risk in this respect.^{8,9} Allied to this problem is that of the treatment of the pruritus associated with jaundice caused by drugs. At least two preparations—namely, norethandrolone and methyltestosterone, which are effective in the treatment of pruritus—also can produce intrahepatic obstructive jaundice.

Fatty change in the liver has recently been produced experimentally in baboons by J. Gillman and C. Gilbert by altering the hormonal balance between insulin, thyroxine, and adrenal corticosteroids.¹⁰ It is possible that to the list of toxic properties of steroid drugs must be added that of fatty change in the liver, a point of clinical importance in view of their widespread use.

The syndrome of hepatic precoma and coma is thought to be due to the entry of nitrogenous products absorbed from the bowel into the systemic circulation via abnormal collateral channels bypassing a damaged liver.¹¹ The level of ammonia in the systemic circulation has been widely used as a measure of these toxic products.^{12,13} Certain diuretic drugs have been shown to bring about clinical and neuropsychiatric deterioration when given to patients with chronic liver damage and fluid retention. Ammonium chloride administered to potentiate the action of mercurial diuretics is toxic, presumably owing directly to its content of ammonia. Acetazolamide ("diamox") can also cause neuropsychiatric deterioration,¹⁴ and this has been correlated with failure of peripheral tissues to remove ammonia adequately from the systemic circulation.¹⁵ Chlorothiazide is similarly toxic to patients with chronic disease of the liver, particularly if a good diuretic

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response is obtained by its use.¹⁶ As the action of chlorothiazide is in part similar to that of acetazolamide, it would seem reasonable to assume that toxic manifestations appear because of interference at a peripheral site with metabolism of the ammonium ion. Other factors, however, including loss of potassium, may be of importance. It is worth keeping a watch for signs of liver damage when patients receive drugs that have been recently introduced.

OPEN DOORS

There has been a great liberalizing move in British mental hospitals in the past ten years. Many ward doors have been permanently unlocked, leave privileges increased, easier discharges allowed, and great efforts made to provide occupational therapy and work for all. The strait-jacket and the padded room have fallen into disfavour. As each old hospital is converted to the new methods, the same improvements are noted: less restraint, with more consideration of patients as individuals, is followed by fewer escapes, fewer fights, less incontinence, and a smaller bill for barbiturates and other sedatives.¹ Now these methods are beginning to spread on the other side of the Atlantic. The Milbank Memorial Fund of New York last year organized a conference² at which D. Macmillan described the work of Mapperley Hospital, Nottingham, and emphasized how it is possible to run a mental hospital without a single locked door, and virtually without the use of certification. This year the president's address³ at the meeting of the American Psychiatric Association at San Francisco called for the abolition of the enormous old-fashioned state mental hospitals—some have 10,000 beds—and a fresh start along the lines already becoming familiar in Britain.

This is not the first decade in which the gospel of "no restraint" and of "occupation" has been preached⁴; indeed, the story of the mental hospital seems to show a perpetual swing back and forth between periods of harsh restriction and therapeutic freedom.⁵ If the present open-door policy is to be a permanent step forward and not just another pause of the pendulum it will have to be proved to do therapeutic good, so that faith may come to be supported

by works, and it will have to overcome a difficulty of communication. At present it is not always appreciated that "the unlocked door is just a symbol and should not be made a fetish."⁶ Some hospitals are not applying the full prescription: either they do not know it, or they have not full confidence in it. It is not sufficient to unlock the majority of doors and provide more occupational therapy. The essential is a change of outlook in the staff, particularly the nurses, who are sometimes inclined to view the patients simply as naughty children. The open-door programme is a way of inducing them to try understanding instead of punishing, because it makes their work easier, more interesting, and possibly more fruitful. Macmillan himself believes that so long as there remains one locked ward in a hospital the nurse can still threaten the patient with imprisonment, the easy but incomplete solution,⁷ and that it is only when all doors are open that the new relationship between staff and patients can begin.

Another important part of the policy is the emphasis on individuality. Every patient must have clothes which are his own, a bed, a locker, a chair, which are recognizably his and respected as such by the staff, and a social role, such as a particular ward duty, which is recognized as his too.⁸ The job of all the staff, ward orderlies, porters, gardeners, as well as nurses and occupational therapists, is to make friends with individual patients, and so influence them and help to understand them. This is the way that a mental hospital changes from an institution into a therapeutic community. But this is still only half the prescription. The other half is in the hospital's external relations. By domiciliary visits, out-patient clinics, and close contact with general practitioners and with the local health authority, the physicians and social workers of the hospital will often be working with the patient and his relatives even before he first comes into hospital, and should continue an affectionate concern for both patient and family after discharge. Long and careful follow-up care is the corollary of early discharge. This may help the patient to avoid further serious breakdown, but it also serves to educate and reassure the public—and this is the crux of the matter. People are sent into a mental hospital only when they can no longer be tolerated by people outside, and they can be discharged again as soon as their behaviour returns within the tolerable limits. Different societies have different tolerances, and what they will stand can be altered by education, and by new modes of treatment or care which serve as guarantees of their security. The patient for early discharge need not be free of psychotic symptoms and

signs: it is sufficient that his behaviour conform to society's minimum demand. It is not whether he hears voices which is the test, but what he does about them. The success of the open-door policy, therefore, in the long run depends on public tolerance.

TRANSFUSION TREATMENT OF RADIATION DISEASE

During the last decade much experimental work has been done on the treatment and prevention of radiation disease. Protection by chemical means^{1,2} has to be given before exposure in order to be effective, and consequently is of no help in treating either radiation casualties or radiotherapy patients who show an unwanted reaction. The most promising experimental treatment in animals is the injection after exposure of spleen homogenates or bone marrow. The injected cells colonize the irradiated animal and supply it with blood for at least some weeks after exposure. Owing to the temporary destruction of the immune response by irradiation of the whole body, the animals accept grafts from genetically different strains and even from other species. Possible human applications of this treatment have awakened interest, particularly in relation to the treatment of leukaemia, aplastic anaemia, and the possible grafting of a kidney in some forms of uraemia.³

Haemorrhage, thrombocytopenia, anaemia, and agranulocytosis are prominent among the killing effects of acute radiation, and naturally various forms of blood transfusions have been used experimentally in animals to combat their effects. American work has shown that in dogs normal whole blood was of little value^{4,5} unless a massive cross-transfusion was undertaken.⁶ Transfusions of leucocyte concentrates in dogs were considered promising, as the transfused leucocytes were found to migrate to sites of infection.^{7,8} Concentrates of platelets when transfused into irradiated dogs and rats were found to correct defects in haemostasis.^{11,12} This response is of interest because dogs resemble man in being very prone to post-irradiation haemorrhage. A rather different

type of transfusion treatment was found to be successful in mice.^{11,12} A particular type of transplantable carcinoma induces a leukaemoid reaction, and blood taken from mice bearing this tumour was given to irradiated (non-tumour-bearing) mice of the same strain: a single injection was found to give protection. The leukaemoid blood contained very large numbers of mature and much smaller numbers of immature granulocytes, but the single injection contained too few granulocytes to combat infection. The most likely explanation of the beneficial effect was that the leukaemoid blood acted in a similar way to marrow injections and repopulated the damaged haemopoietic tissue by means of the immature cells it contained.¹²

Professor Bagdasarov has recently described Russian experience with transfusion therapy in radiation disease.¹³ Platelet concentrates and leucocyte concentrates with some platelet contamination reduced the death rate in dogs subjected to high doses of x rays and also greatly improved their haematological response. Leucocyte concentrates, again with platelet contamination, were also given to patients with low white-cell counts after radiotherapy. Good results were claimed in 80% of 250 cases, but only 3 were described. In the most striking, a post-irradiation white count was raised from 2,600 per c.mm. to 4,900 per c.mm. by means of five transfusions, even though a second course of radiotherapy was given at the same time.

Transfusion treatment probably acts merely as replacement therapy, but, given the correct conditions, the leucocyte concentrates may possibly act in a similar way to bone-marrow grafts and leukaemoid blood transfusions. Recently experiments have been reported¹⁴ in which normal human blood was incubated *in vitro* with tritium-labelled thymidine, a radioactive precursor of D.N.A. Labelling was seen in a small percentage of large mononuclear cells, which were identified as monocytes or large- and medium-sized lymphocytes. This strongly suggests that in normal blood a few leucocytes are actively synthesizing D.N.A. preparatory to mitosis, and the authors were inclined to regard them as totipotential haemopoietic cells in transit. If this conclusion is correct, leucocyte concentrates could colonize damaged haemopoietic tissue if a large enough dose of whole-body irradiation was given to overcome the immune response. This may have occurred in the case of the heavily irradiated dogs,^{7,8,15} but is most unlikely to have taken place in the patients given radiotherapy,¹³ who, having received irradiation to only part of the body, would retain an intact immune reaction.

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¹⁵ Bagdasarov, A. A., et al., *Second United Nations International Conference on the Peaceful Uses of Atomic Energy*, 1958, A/CONF.15/P.2238.

¹⁶ Bond, V. P., Cronkite, E. P., Flidner, T. M., and Schork, P., *Science*, 1958, 128, 202.

SERUM TRANSAMINASE IN MYOCARDIAL
INFARCTION

The important features of serum glutamic oxaloacetic transaminase (S.G.O.T.) in clinical medicine have already been noted in these columns.^{1 2} It is an enzyme which is concerned in the reversible transfer of amino groups, and is therefore present in many tissues, particularly the heart, liver, brain, and kidneys. Damage to these and other tissues results in the liberation of the enzyme into the serum, where it can be estimated by relatively simple biochemical techniques.^{3 4} Care should be taken to avoid haemolysis when obtaining a sample of blood. Interest has centred round the value of S.G.O.T. as a test for myocardial infarction, and there is now enough evidence on which to base an estimate of its place in diagnosis. When an infarct has occurred the level of S.G.O.T. rises quickly during the first day or two and then quickly falls to normal again by about the fifth day. The peak concentration, which may be ten or twenty times the normal level (5-40 units per ml.), is usually reached between 36 and 72 hours after the onset. False negatives—that is, no rise in the presence of a confirmed infarct—are said to occur in 5-10% of cases, but some of these may be due to failure to detect a very transient increase in S.G.O.T. High values, on the other hand, are found in association with liver disease, acute pancreatitis, cerebrovascular accidents, and myocarditis, and after operations, severe trauma, or haemolysis. Neither pericarditis nor pulmonary infarction causes any alteration in S.G.O.T.

The authors of the two papers we publish this week have attempted not only to assess the usefulness of the test but also to define its relation to some of the finer points of diagnosis and prognosis in myocardial infarction. Dr. H. A. Dewar and his colleagues, for example, have found that the rise in S.G.O.T. appears twenty-four hours earlier than fever or a rise in the sedimentation rate. It is a "more prompt, more striking, more brief, more sensitive, and more specific" indication of infarction than either of these signs. Perhaps its greatest value is in patients in whom the electrocardiographic evidence is equivocal because of previous ischaemic episodes or the presence of arrhythmias, bundle-branch block, or the effects of digitalis. Another use is in distinguishing infarction from so-called "acute coronary insufficiency," especially in those already under treatment or with minimal electrocardiographic changes. It may, however, be difficult to decide what to regard as an abnormal level of S.G.O.T. in these patients if single estimations only are done, since it is clear that values within the normal range may not be normal for a particular individual.⁵ For this and other reasons Dr. R. Bruce and his colleagues recommend daily estimations during the first week, not only to follow the course of the acute episode but also to establish a baseline for the individual. They have also tried to base a prognosis on

the peak concentration of S.G.O.T. found in their patients. Thus the average figure in 16 patients who recovered was 111 units, contrasting with a figure of 576 units in the seven who died. Once again such figures may be misleading when applied to the individual patient, for while experimental and clinical data suggest that there is a good correlation between the extent of the infarct and the height of S.G.O.T., many other factors are concerned in the outcome of the illness. Moreover, as Dewar and his colleagues point out, some of the highest titres are found in patients who develop acute heart failure associated with pulmonary oedema or hepatic centrilobular necrosis. Further work on the relation of S.G.O.T. to other factors which affect prognosis may prove rewarding, since the value of the test in the diagnosis of myocardial infarction appears to be firmly established.

HEALTH IN INDUSTRY

The publication of the first separate annual report¹ on industrial health by the Chief Inspector of Factories marks a departure from the long-established practice of presenting all aspects of the work of the factory inspectorate in a single volume. From now onwards these separate annual reports will be the chief source of information in the field of industrial health. While to a great extent this field is within the special sphere of the medical branch of the factory inspectorate, it is also the concern of the general inspectorate and of the other specialist branches, engineering and chemicals. The present report reviews the year's activities, including new legislation, industrial health surveys, advisory panels and committees of inquiry into various subjects, and accounts of certain industrial diseases and accidents. The subject of industrial dermatitis has been selected for a special chapter on its own. The report mentions that the Factories (Ionizing Radiations) Special Regulations, dealing with the use of "sealed sources," are still in draft, having been submitted for comment to representatives of the organizations mainly concerned and to other interested persons. Consideration is now being given to the preparation of regulations for the use of unsealed sources generally. Industrial health surveys were carried out in Halifax² and in the Potteries with a view to obtaining information about environmental conditions, existing medical and nursing services, and the adequacy or otherwise of precautions against general and specific hazards to health. An inquiry into the provisions made for giving first aid revealed some inadequacies, and discussions followed between representatives of various governmental departments and the societies responsible for the recruitment and training of first-aid workers.

Among the industrial diseases on which the report comments, lead poisoning showed a slightly increased incidence, but there were no fatal cases. A relatively new working process, entailing the use of isocyanates, caused an outbreak of acute illness, with asthma as its

outstanding symptom. Industrial dermatitis is still considered one of the principal causes of disability and lost time in industry. Figures recorded by the Ministry of Pensions and National Insurance for 1955-6 showed that the average duration of incapacity was 38 days for males and 51 days for females: the total time lost amounted to 0.86m. days, compared with 0.93m. days for 1954-5. Voluntary notifications to the factory department of the Ministry of Labour and National Service also suggested that the steady decline which has taken place during recent years was continuing. Among the many causes of industrial dermatitis mineral oil holds a prominent place; though this form of dermatitis is not often responsible for absence from work, it carries the risk of epitheliomatous ulceration. The problem presented by skin sensitization is a particularly difficult one, since repeated exposure to skin irritants may result in severe and lasting dermatitis. Once again the importance of thorough cleansing as a preventive measure is emphasized; it is even more important than the use of barrier creams. Separate reviews on selected subjects are to appear in future annual reports, and if they maintain the same high standard as the review on industrial dermatitis in this year's report they should make a valuable contribution to the study of industrial health.

LIVE INFLUENZA VACCINES

In an emergency due to the appearance of a novel and dangerous strain of influenza it would be impossible to manufacture enough conventional vaccine for millions of people in a short time.¹ There simply could not be provided, quickly, enough fertile eggs or egg incubators. In theory an attenuated living virus might be given intranasally in a dilute form and prove far more practicable in that a small number of eggs might provide enormous numbers of vaccine doses. Early attempts to achieve this end were not very promising. Viruses tested either were not sufficiently attenuated or did not produce satisfactory rises in antibody. Workers in the U.S.S.R. have for several years been testing live influenza vaccines, and promising experiments on these lines with the Asian virus grown in tissue culture were lately reported by V. M. Zhdanov² and his colleagues. Small-scale trials in Great Britain have been reported by A. Isaacs and his colleagues,^{3 4} but the results were not very encouraging. However, the matter is being further pursued in this country and there is good contact with Russian workers. Several important questions have to be answered: Will a live vaccine give substantial immunity with a negligible number of untoward reactions? Is there danger of reversion of the attenuated virus to virulence? Can the vaccine be made on a large scale cheaply and rapidly, without the need for a fantastic number of eggs? It can readily be seen that these important questions are not likely to receive quick answers.

COST OF HOSPITAL DEPARTMENTS

Formidable as they are, the hospital costing returns¹ published last week deserve some study, for they claim to be the answer to the criticisms of the old costing returns, which they replaced for some hospitals on April 1, 1957. The old returns raised all sorts of pertinent questions about the comparative costs of apparently comparable hospitals without, however, providing the answers. It was therefore hoped that by means of the new returns, under which the costs would be analysed by departments—wards, works and maintenance, medical service departments, administration, laundry, and so on, each with its own share of a hospital's staff bill—an explanation would be forthcoming of why the cost of maintaining a patient in, say, the London Hospital was nearly £6 a week less than in St. Thomas's (according to the costing returns for 1956-7). In particular, since out-patient expenditure was henceforward to be separately costed, it was hoped that a truer picture of in-patient costs would be obtained than by the old returns, under which out-patient costs were eliminated by assuming that five out-patient attendances represented one in-patient day. In the event, the new returns, which cover some 200 hospitals spending more than £150,000 a year each, show that for the teaching hospitals, both in London and in the provinces, the formula was not far out, although it rather underestimated out-patient costs. In the acute non-teaching hospitals the formula underestimated them even more and should have been more like four to one. But the most interesting point that emerges from the analysis of out-patient costs is the big difference between the cost of a new out-patient in the London teaching hospitals and in other hospitals. The average cost in acute non-teaching hospitals in England and Wales for each out-patient attendance is 17s. 2d.; in provincial teaching hospitals it is 18s. 4d.; and in London teaching hospitals, £1 1s. 9d. The average cost of a new out-patient, on the other hand, in the three groups respectively is £2 12s. 10d., £2 16s. 6d., and £4 5s. 9d. The explanation is not apparently that more elaborate diagnostic techniques are used in the London teaching hospitals than elsewhere, because the analysis of out-patient costs does not include their share of the cost of the x-ray department or pathological laboratory, or indeed any of the medical-service departments—which must surely detract from its usefulness. In fact, the only explanation that can be gathered from these returns is that the proportion of new out-patients to total out-patient attendances is lower in the London teaching hospitals.

Thus tantalizing queries are provoked by the new returns as much as by the old. What the new returns do is to throw the questions a stage farther back. That is, if one hospital's in-patient costs are shown to be noticeably higher than in another similar hospital, one can see from these returns whether it spends more than the average in the wards, or on administration, or on works and maintenance, and so on. St. George's Hospital, for instance, which has the highest in-patient cost

¹ *Brit. med. J.*, 1957, 1, 573.² *Ibid.*, 1958, 1, 568.³ Reitman, S., and Frankel, S., *Amer. J. clin. Path.*, 1957, 28, 56.⁴ King, J., *J. med. Lab. Technol.*, 1958, 15, 17.⁵ Goble, A. J., and O'Brien, E. N., *Lancet*, 1958, 2, 873.¹ *Annual Report of the Chief Inspector of Factories on Industrial Health for the Year 1957*, 1958. H.M.S.O., London. Price 3s. net.² See *Brit. med. J.*, 1958, 1, 764.¹ *Brit. med. J.*, 1958, 1, 447.² Zhdanov, V. M., Ritova, V. V., Orlova, A. V., Sokolova, N. N., and Golygina, L. A., *Lancet*, 1957, 2, 735.³ Isaacs, A., and Roden, A. T., *ibid.*, 1956, 2, 697.⁴ ———, Negroni, G., and Tyrrell, D. A. J., *ibid.*, 1957, 2, 886.¹ *Hospital Costing Returns—Year Ended 31st March, 1958*. Volume 1—Hospitals which Operated the Main Scheme, 1958, H.M.S.O., London. Price £1 12s. 6d. net.

of the undergraduate teaching hospitals (£39 2s. 9d. a week, compared with the London's £28 18s. 8d. and an average for the acute London teaching hospitals of £33 11s. 3d.), has a direct expenditure in the wards of about £1 2s. a week more than the average; it also has a heavy bill for works and maintenance and an occupancy rate for its staffed beds that is lower than the average. But the returns do not, of course, give the reasons for these differences. The unit costs of one hospital's diagnostic x-ray department may be twice as high as another's, so may be those of its boiler-house. But is this the result of inefficient equipment or inefficient management? Does a higher cost for the physiotherapy department represent better service, a swifter rehabilitation of patients, or sheer extravagance? It is to be hoped that the returns will provoke this sort of question among hospital authorities, and that they will insist on getting the answers; otherwise the cost of costing will merely be one more item in the heavy bill that the nation has to pay for maintaining its hospitals.

DISORDERED SOCIETY

The Home Secretary told the House of Commons last week that Britain had half as much crime again as before the war. The increase in indictable offences which began in 1955 was still rising steeply during the early part of 1958. A disturbingly high number of crimes were committed by youths between 16 and 21 years of age, and there had been a recent increase of offences committed by children under 17. Mentioning the grave lack of knowledge which hampered the work of the police and the courts, Mr. Butler said that the new research unit in the Home Office was now well established, and in due course the Institute of Criminology at Cambridge would be getting under way. In the light of Mr. Butler's remarks about lack of knowledge the recently issued annual report of the Institute for the Scientific Treatment of Delinquency is of particular interest, for the first of the objects of the Institute is "to initiate and promote scientific research into the causes and prevention of crime." If, as may be assumed from Mr. Butler's speech, other methods are failing to stop the rise in the number of young criminals, then the scientific study of the causes of crime and of the treatment of offenders should be much more actively encouraged. As the report of the Institute for the Scientific Treatment of Delinquency states: "There is more need now for the I.S.T.D. than at any other time in its existence."

The clinical work of the I.S.T.D. was taken over by the National Health Service in 1948, and its main activities are now research, education, and the publication of the *British Journal of Delinquency*. Research, which is under the directorship of Dr. H. Mannheim, is hampered by lack of funds, and education is "the one direction in which it is possible to make headway without risk of financial loss." The educational activities of the I.S.T.D. have two clear aims: "First, to support the authority of social and psychological science to establish as it were an enclave within the field of penal

method. The second is to show that this can be done only by close study of the actual case-material, by proving in fact that crime is a form of behaviour disorder to be correlated with other social and psychological disorders and treated along similar lines." It is logical therefore for the Institute to press for the establishment of "observation centres" where selected offenders could be diagnosed and treated. By encouraging research on these and other lines the Home Secretary might not in the future have to give such a depressing account of what he called "a deep disorder in society."

NOBEL PRIZE IN MEDICINE

The three American geneticists who share the Nobel Prize in Medicine and Physiology have done their experimental work with organisms which are almost as different from man as living organisms could be. Yet so similar is all life at the cellular level, whether plant or animal, that these workers' researches with fungi and bacteria have contributed greatly to the development of theoretical genetics, and from them a fuller understanding of human genetics may be expected to spring. Professor G. W. Beadle, of the California Institute of Technology, and Dr. E. Tatum, of the Rockefeller Institute in New York, have shown that in the common fungal mould of bread and other substances, *Neurospora crassa*, distinct genetic changes are constantly associated with specific biochemical changes. They are thus getting at the precise mechanism by which the chromosomes in each cell nucleus transmit inherited characters. The advantage of using the somewhat recondite organism *Neurospora* is that the segregation of its genes in sexual reproduction is matched by a spatial separation of the resulting spores. By micromanipulation the spores bearing assorted genes can be plated out separately for growth on the same or different media. Thus the effect of chemical variations in the media can be studied against genetic variations in the spores, and it was found that a single genetic change resulted in a single change in dietary requirements. Professor Beadle, who is at present Eastman Visiting Professor at Oxford, is aged 55, and Dr. Tatum is 48. They share half the Nobel prize.

The other half of the prize goes to Professor J. Lederburg, aged 33, of the University of Wisconsin. With Tatum, Lederburg studied bacteria (chiefly *Escherichia coli*) with genetically altered dietary requirements, and was able to show that at least some of them undergo sexual reproduction. Later he showed, in collaboration with his wife, that bacteria could incorporate in themselves genetic material obtained from bacteriophage, and transmit it to other strains. Instead of more or less homogeneous vegetative cells dividing by simple fission, bacteria are found to be complex organisms showing segregation and recombination of genetic material in reproduction. Lederburg's work is a major contribution to the foundation of bacterial genetics, now a rapidly growing and elaborate branch of science.

Drug Treatment of Disease

DRUGS IN TREATMENT OF EPILEPSY

BY

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This paper is concerned solely with the medical treatment of epilepsy. To conform with the intention of this series of articles the word "medical" is used in its narrowest sense—pharmacological—and "epilepsy" in its widest—to include recurring discrete disorder of sensation, behaviour, or consciousness of any sort due to cerebral disturbances, whatever the prime cause. The treatment is of fits of all kinds, whether symptomatic of brain disease (for example, trauma), of disease elsewhere (for example, vascular disease), or of unknown origin (idiopathic). It would be wise to consider this against the wider, and perhaps more important, aspects of epilepsy which were presented as a symposium in this *Journal* on March 22, 1958.

Kinds of Epilepsy

For pharmacological as well as other reasons the precise form of epilepsy must be recognized on clinical grounds and, if in doubt, with the help of the electroencephalogram, because, for instance, drugs which may benefit one form of petit mal due to local brain damage may aggravate the other form with the characteristic spike-and-wave discharge in the electroencephalogram. For our present purpose epilepsy is divided into:

- The general epilepsies:
 - Grand mal.
 - Petit mal.
- Focal epilepsies.

Grand mal is a pure tonic-clonic fit, which is the same whatever the cause. Petit mal includes the brief, frequent, stereotyped "absences" of childhood and myoclonic jerking. And the focal epilepsies include all other attacks however diverse or elaborate. Treatment of grand mal and focal attacks is so similar that they will be considered together, and the word anticonvulsant will be used generically whether or not an actual convulsion occurs in the attack.

Even after full investigation and medical or surgical treatment of the cause of the fits, medical treatment of the fits themselves is subservient to management of the patient's attitude, his life, and its background. Indeed, continuation of medical treatment may become inevitable because continuing stress in the life perpetuates epilepsy in a predisposed person.

Types of Drug

The most successful anticonvulsants for practical use in the ambulant patient can be listed thus:

- (a) Barbiturates, especially phenobarbitone and methylphenobarbitone.
- (b) Hydantoins—phenytoin ("epanutin") and methoin ("mesontoin").
- (c) Primidone ("mysoline").
- (d) Diones—troxidone ("tridione") and paramethadione ("paradione").
- (e) Others, especially acetazolamide ("diamox"), phenoximide ("milontin"), and phenacemide ("phenurone").

Though they derive from different chemical sources it is remarkable how closely similar the basic molecular formula of each group of the better anticonvulsants is.

Time of Administration

The average time of effective concentration after ingestion of an anticonvulsant is from six to eight hours, but the time of administration must be judged by the time of occurrence of fits. Some people always have them by day, some always by night, and the peak period is within an hour or so of rising. Therefore, the day's dose may be given on retiring, on rising, or spaced through the day. When fits are more frequent at the menstrual period a much larger dose may be given in that week.

Barbiturates

Occasionally, bromides have been given as a last desperate attempt to stop fits when all else had failed. But they are mentioned first to dismiss them with the comment that, though they stopped many fits, they did the epileptic person much harm in turning him into a handicapped, retarded dullard with bromism.

The first drug of choice remains phenobarbitone. This shares with aspirin and alcohol the stigma of abuse, but it remains an excellent anticonvulsant. It is safe, of very low toxicity, with little tendency to sensitivity. Do not, however, discount as neurotic the occasional patient who complains bitterly of sleepiness on a tiny dose, for some cannot tolerate it and many become depressed with it, though most become used to it after a few weeks.

It is always wise to begin treatment with phenobarbitone, $\frac{1}{2}$ gr. (32 mg.) once or twice in the day, but not to use much more than this in the first instance. Children, who will require a smaller dose according to their size, may be very tolerant of it, but sometimes become irritable and difficult while taking it. If so, stop it, for they will not mend. If fits continue in spite of a reasonably small dose of phenobarbitone, do not push it, for the patient will probably become retarded or depressed, and his distress and difficulty in continuing his pattern of life will bring more fits. Instead, go on to the hydantoins.

Phemitone ("prominal"), which is methylphenobarbitone, is converted to phenobarbitone in the stomach. Its anticonvulsant dose is double that of phenobarbitone, and though its pharmacological effect should be the same, patients who are sleepy with phenobarbitone may be content with phemitone (1–3 gr. (65–200 mg.) in a dose). It is worth trying. Long-acting phenobarbitone in an "enseal" is also advised for the same purpose.

Initial sensitivity to phenobarbitone or phemitone is unusual, but the physician is occasionally surprised to see a rash which, developing years after beginning treatment, disappears on withdrawing the barbiturate.

The effects of overdosage are subtle and serious, for the sensitive patient becomes intellectually retarded, slothful, sleepy, and sometimes very depressed. These symptoms are serious because they are insidious, not recognized for what they are, and greatly handicap the epileptic in pursuing his way in life. They should be avoided, even at the cost of an occasional fit; their continuation may lead to a vicious spiral downward, with a return of fits. Never, therefore, push barbiturates or have recourse to the amphetamines to try to offset these effects. Instead, limit the dose of phenobarbitone to the patient's toleration, and add another non-sedative anticonvulsant, of which the hydantoins are the best.

Hydantoins

When phenobarbitone has been given to an adult up to a total of three $\frac{1}{2}$ -gr. (32-mg.) doses in the day and further treatment is needed, add phenytoin sodium (diphenyl hydantoin sodium, epanutin) 0.1 g. twice or three times a day. It may be given in a larger dose at morning or evening if fits are diurnal or nocturnal only. It is a wise generalization that the margin between the effective anti-convulsant and toxic amount is small, so that the hydantoins must be given in fairly large doses, 0.3 g. daily being usual. Most adults will develop toxic effects if they take 0.4 g. daily for a few weeks, for the substance slowly accumulates, and it may be necessary to give 0.3 g. and 0.4 g. on alternate days to control fits without toxicity.

Sensitivity results in a rash with pyrexia and transient adenitis just like German measles or measles, but can be controlled by an antihistaminic such as promethazine hydrochloride, given for 10 days. The drug may also cause the unique hyperplasia of the gums, especially in children, macrocytosis, or rarely macrocytic anaemia, gastric disturbances, and most commonly ataxia, incoordination, and diplopia. It is wise to give patients having phenytoin crude vitamin B as "bemax" or "marmite"; to encourage dental hygiene; and to reduce treatment for two days from time to time if the patient becomes unsteady. Indigestion is relieved by giving the drug with meals, or with sodium bicarbonate. More serious, though rare, complications such as exfoliative dermatitis call for its immediate withdrawal, but there is no need to carry out repeated blood counts.

Methoin (mesontoin, or methyl-phenyl-ethyl-hydantoinate) has the same dose and similar therapeutic effect. It does not cause gum hypertrophy, but may make the patient drowsy, and is more likely to cause blood changes than is phenytoin sodium. It can be given as an alternative when gingivitis is troublesome.

It is so useful to give the hydantoins and phenobarbitone together that they can be obtained in the same capsule—phenobarbitone 0.05 g. and phenytoin sodium 0.1 g., to be given two or three times a day.

Primidone

Primidone (mysoline) has been successful in major epilepsy where other anticonvulsants have failed. It is not often toxic, but it has a sedative action, particularly when given with phenobarbitone, so that I never use these two substances together. Primidone is still much more expensive than the anticonvulsants already mentioned, so it is sensible to use phenobarbitone and phenytoin before trying it. Begin with very small doses indeed, gradually increasing from half a 0.25-g. tablet to three or more a day, because some people tolerate it very badly, are drowsy, ataxic, and may have vertigo and vomiting.

Once established, treatment with primidone seems uneventful. It can, with benefit, be combined with phenytoin, particularly in major epilepsy, but it is unlikely to be so successful with focal attacks, or minor attacks of any kind.

Treatment of Petit Mal

True petit mal is much more difficult to treat successfully than are other forms of epilepsy. Fortunately, however, unless the short attacks are very frequent, they may be no more than a nuisance, and a child may live in reasonable adjustment to them. In consequence, if attacks are resistant to treatment or the patient intolerant of it, it may be expedient to cease, letting the child continue otherwise normally, as an alternative to a drugged life.

The substances so far mentioned are usually of little value in treating true petit mal, though some brief "absences" may really be unrecognized focal attacks, and so respond to phenobarbitone or phenytoin. In general,

sedatives make true petit mal worse, and stimulants improve it. In addition, children with petit mal are apt to become aggressive, surly, and unsocial with phenobarbitone, and so have more attacks. Conversely, amphetamine, dextro-amphetamine, and caffeine may greatly benefit patients with petit mal and improve their behaviour. It is important in view of the specificity of treatment to be guided by the electroencephalogram as well as by the characteristics of the attacks.

Diones

Troxidone (tridione) is sometimes drastically successful in controlling petit mal. When it is successful it seems to work in quite a small dose, and increasing the dose does not improve the therapeutic response. Adults or large children can take three or four 0.3-g. tablets a day, smaller children three or more 0.15-g. tablets according to size.

Many patients have toxic responses, but fortunately these are usually not serious. Most commonly there is glaring vision, when objects glow and sparkle in bright light, while hiccups or nausea also occur; but these symptoms do not often call for withdrawal of the drug. Rashes may be seen initially but often subside; occasionally blood dyscrasias occur—aplastic anaemia and granulopenia. It is much more important to watch the child's health than to do frequent blood counts, because harmless fluctuations in the count may be encountered and a sudden aplasia missed. I give special attention to details of health and do not do serial blood counts, and so far have been able to regulate treatment without harm to the child. If troxidone is moderately successful, see if paramethadione (paradione) in the same dose is better, otherwise stop treatment.

Other Drugs

Amphetamine.—Amphetamine sulphate, methylamphetamine, or dextroamphetamine, 5 mg., may be effective in true petit mal. They may reduce attacks and improve the child's behaviour. They should be tried if petit mal is frequent, and children tolerate them well. Methylamphetamine has the fewest side-effects. Caffeine citrate 5 gr. (0.32 g.) may help children benefited by amphetamine.

Acetazolamide (diamox) has recently been given with other anticonvulsants because, as well as being a diuretic, it is a carbonic anhydrase inhibitor and lowers blood pH. Reports have varied, and results are often disappointing, but occasionally the addition of acetazolamide (0.25 g. once or twice a day) to existing anticonvulsants, has been followed by striking improvement. There are minor toxic effects, and rare serious ones. Acetazolamide is expensive, but a short trial of its effects will quickly establish its value in any one case.

Phenacemide (phenurone) 0.5 g. one to three times a day has serious toxic effects. This is a great pity, because it is a most effective agent in all forms of epilepsy. Frequently, there is improvement in the refractory case, to be followed by anorexia, nausea, liver damage, or blood disorder. It also causes psychosis. It should, I think, be used only as a last resort when attacks are out of control and the patient is under close observation.

Among other substances, **phensuximide** (milontin) 0.5 g. three to four times a day is the most well tried. It is effective in petit mal epilepsy, and can be tried after the substances already mentioned.

A final note of warning. If several drugs have been tried, and more than two are being used, the patient is probably suffering more than he is gaining by them.

Status epilepticus remains a very dangerous complication which must be brought under control as soon as possible. Paraldehyde (5 ml. intramuscularly) repeated every two or three hours until attacks have stopped is probably still the safest drug. Intravenous anaesthesia can also be used, but an anaesthetist with positive-pressure apparatus should be available.

INSTITUTE OF ORTHOPAEDICS**OPENING OF NEW RESEARCH LABORATORIES**

On October 31 Sir HENRY DALE, O.M., F.R.S., on behalf of the Wellcome Trustees, opened a new research block for the Institute of Orthopaedics (London University). The block is at Stanmore, where the country section of the Royal National Orthopaedic Hospital is located. The Wellcome Trustees had given £43,000 towards the building and London University about £20,000. Sir HENRY FLOYD, chairman of the Hospital, presided over a distinguished company which included Lord COTTESLOE, chairman of the North-west Metropolitan Board, Sir FRANCIS FRASER, director of the British Postgraduate Medical Federation, and Mr. H. J. SEDDON and Mr. H. JACKSON BURROWS, director and dean, respectively, of the Institute.

Development of the Institute

The Institute of Orthopaedics was established in 1946, under the aegis of the British Postgraduate Medical Federation. At first, the only accommodation available was that provided by the Royal National Orthopaedic Hospital: one floor of the town section at Great Portland Street was converted into laboratories, a lecture-room, and a library; and laboratories for clinical pathology and bacteriology were provided at the country section at Stanmore, where an animal house was erected. In 1951 a metabolic unit was opened, and London University approved a scheme for the erection of an H-shaped laboratory building at Stanmore. Money was provided for the first wing and a department of biochemistry was opened in 1952. During the next two years the laboratories for morbid anatomy and for clinical research at the town section were extended, and the Wellcome Trustees provided £2,000 for the equipment of an orthopaedic museum.

The opening of the research block at Stanmore represents the completion of the research block at Stanmore represents the completion of the Institute's plan. The new building has four sections. Biochemistry is already well established under the direction of Dr. P. G. WALKER, who is engaged in the investigation of enzymes concerned in the breakdown of hyaluronic acid and chondroitin sulphate. Of the new sections one is for the housing of experimental animals. Another wing is devoted entirely to clinical pathology and bacteriology, where Dr. CHARLES LACK is engaged in a number of investigations which include the preparation of plasminogen, the preparation and characteristics of staphylokinase, serological tests for staphylococcal infection, the action of plasmin on cartilage, and the mechanism of the destruction of cartilage in suppurative arthritis. The fourth wing, for clinical research, contains a combined common-room, lecture-room, and library, a viewing-room for studying series of radiographs, and three laboratories, one of which is already occupied by Dr. ANGUS MCPHERSON, who is working on visceral-somatic spinal reflexes. The old bacteriological laboratory has been converted into a small department of experimental surgery and has been named after Sir Henry Dale. There will now be ample opportunity for registrars and clinical research assistants to carry out modest investigations under the guidance of senior workers.

The department of morbid anatomy at Great Portland Street, under Dr. HUBERT SISSONS, who has made a particular study of bone disorders and of muscle atrophy, will be able to spread a little into the department of experimental surgery at the country hospital. Also at Stanmore, Dr. JOHN SCALES has built up a department of biomechanics and surgical materials. He is concerned with the fate of metallic implants in the body, the design of prostheses, and the applications of plastics in orthopaedics. Finally Dr. REGINALD NASSIM is directing a study of bone disorders, jointly with the hospital, in a metabolic ward.

London as a Postgraduate Centre

Speaking at the opening ceremony, Sir HENRY DALE said it was indeed a pleasure for him and his fellow trustees to see for themselves how much had been achieved with the

grant they had been able to make from the Wellcome Trust. He had no doubt that the decision of the University of London to develop and organize the facilities offered by the great metropolis and its hospitals for medical education at an advanced postgraduate stage was a step of the greatest importance for the progressive use of medical knowledge, now advancing with such impressive rapidity. Orthopaedics had enjoyed during the past half-century, and especially during its more recent decades, at least as great and even dramatic a development in the range of its possibilities, and in the effectiveness of its methods, as had any of the other major departments of medicine and surgery. It had given them, accordingly, a special pleasure to be able to do something to assist the further and even more rapid advance of the subject.

Mr. SEDDON then thanked Sir Henry Dale for opening the building, and proceeded to describe the various departments.

BRITISH ORTHOPAEDIC ASSOCIATION**AUTUMN MEETING AT OXFORD**

The fortieth annual meeting of the British Orthopaedic Association was held from October 2 to 4 at the Nuffield Orthopaedic Centre, Oxford, under the presidency of Mr. NORMAN CAPENER. After the usual instructional course on the first day, a number of papers were read, some of which are summarized here. Sir HARRY PLATT made the meeting memorable by delivering the first Founders' Lecture. Taking the title "Quick, Thy Tablets, Memory!" he described the association's origins and the great figures connected with its foundation forty years ago.

Bone Growth

Professor J. TRUETA (Oxford) said that he and his colleagues had collected data suggesting the main function of the blood vessels reaching the growth-plate from its epiphyseal side was to nourish the repeatedly dividing cartilage cells, whereas the peculiarly arranged vessels underlying the metaphyseal side of the plate were mainly, and perhaps only, concerned with the calcification of the giant cartilage cells. Interruption of these metaphyseal vessels, or their occlusion by pressure, caused a total failure not only of calcification but also of the degeneration of the giant cells. The picture was radiographically and histologically similar to rickets.

Mr. J. D. MORGAN (Oxford) said the epiphyseal plate matured only when ossification of the shaft had extended sufficiently to form the metaphyseal end-plate, subsequent growth being in the direction of the cartilage-cell columns which formed at right angles to the base of the plate. At the upper end of the femur the metaphyseal end-plate was wedge-shaped, growth in length being proportional to the angle formed and probably at first equal to that at the lower end. The two sides of the wedge eventually separated as the epiphyses for the head and greater trochanter developed, but at first most of the growth in length came from the capital side, resulting in the coxa valga normal in infancy which persisted if the trochanteric epiphysis for any reason closed prematurely. If the capital epiphysis closed early from congenital deformity, injury, infection, or paralysis, the trochanteric epiphysis took over control of longitudinal growth, and any operative procedures in such circumstances must therefore avoid damaging the latter. It was only if both parts were closed that gross shortening occurred. At the lower end interruption of growth commonly affected only part of the epiphyseal plate, resulting in both shortening and distortion of the bone. Ischaemia, as in Perthes's disease, promoted growth in circumference of the epiphysis and hence widening of the bone. Disuse of the lesser trochanter, as in iliopsoas paralysis, resulted in failure of this area of the shaft to thicken normally.

Intrauterine Fracture and Congenital Coxa Vara

Mr. E. W. SOMERVILLE (Oxford) discussed congenital coxa vara, basing his argument on an example in which the mother had injured her abdomen six weeks before term. At

eight months of age the capital epiphysal centre had first become visible radiographically, in its normal position, together with a "ghost" of the missing neck, the upper femoral shaft lying at an angle to the bony lower part of the shaft. Arthrogram and exploration confirmed these findings, which he considered to be due to an intrauterine fracture of the cartilaginous femur. As a result primary ossification of the shaft, depending on its nutrient artery and the capillary loops formed from it, had been brought to a halt at the site of the fracture, and the metaphysal region had failed to ossify. In such circumstances an epiphysal plate did not develop, but ossification proceeded normally in the ossific centres of the head and great trochanter where the blood supply was intact, and spread unhindered into the metaphysal region. Here, later, irregular ossification occurred, and growth in length at the upper end of the femur was no longer possible.

Sir REGINALD WATSON-JONES (London) supported Mr. Somerville, and thought that this and similar conditions in this region were all due to birth fractures through cartilage. Mr. DAVID TREVOR (London) asked why, if that were so, the condition was so commonly bilateral, and Mr. J. C. SCOTT (Oxford) asked for an explanation of the frequent association of other congenital defects and of a familial incidence. Mr. SOMERVILLE agreed that many instances were not explicable as fractures, but thought that basically the underlying abnormality was one affecting the local blood supply rather than the cartilage itself.

Tendon Grafts and Tenolysis

Professor PAUL BRAND (Vellore) illustrated his contribution on the principles of free tendon-grafting with a film of outstanding quality showing the removal of a plantaris graft and its use in his operation for intrinsic paralysis of the hand. The principles he so convincingly propounded he summarized as follows: Tendon transfers are more regularly successful than free tendon-grafts because they have no suture line in the length of the tendon to cause adhesions, and because they carry their own blood supply and therefore do not need to grow new blood vessels which attach them to surrounding structures along their length. Frequently, however, it is difficult to spare a muscle with a long enough tendon without causing a secondary disability. In such cases a free tendon-graft from a more proximal muscle may be necessary. Secondary deformities following the Bunnell sublimis operation had led him to use a new operation, taking free grafts from a wrist-moving muscle. During the carrying out of 200 free tendon-graft operations for intrinsic paralysis of the hand they had worked out new methods which had improved the effectiveness of the grafts by minimizing the formation of adhesions. The ideal material for free grafts was the plantaris tendon. After giving the details of his method, Professor Brand then described a new operation for intrinsic paralysis of the hand. This involved the use of the extensor carpi radialis longus or brevis muscle, extended by four tendon-grafts through the interosseous spaces of the hand, anterior to the transverse metacarpal ligaments, which were inserted at the edge of the dorsal expansion of each finger.

Professor J. I. P. JAMES (Edinburgh) described his use of cortisone in tenolysis. Assuming that Carstam's work on the effectiveness of cortisone in preventing tendon adhesions in rabbits might be applicable to man, and after disappointing results with a small series of tenolyses without cortisone, Professor James had used corticotrophin or cortisone, starting treatment two days before operation and continuing it for 14 days post-operatively. The dosage he now used was 150 mg. of cortisone daily, with weaning afterwards and the usual precautions for steroid therapy. Dressings were changed after two days and active exercises then started: sepsis had not been a problem. Although there had been some failures, in a series of 22 patients the results were on the whole strikingly better than in cases done without cortisone. He had not been impressed that cortisone had helped in the few cases of tendon-grafting he had done under its cover.

Bone Grafts for Malposition and Non-union

Mr. R. G. TAYLOR (Oxford) reviewed 72 bone grafts performed between 1950 and 1955 for fractures of the shaft of long bones. Two-thirds were done because of fibrous union, and the remainder early for malunion, at an average period of three weeks after the fracture. If closed reduction failed or needed repeating more than 10 days after the fracture, Mr. Taylor considered open reduction and fixation by grafting to be usually the method of choice. In analysing the causes of fibrous union he noted that no case had occurred in 200 consecutive tibial shaft fractures, both simple and compound, in patients under 17; over this age the age of the patient was not a factor, nor was the site of fracture. Two-thirds of the failures to unite by bone had occurred in compound fractures, although these made up less than one-third of the total fractures seen. The severity of the injury, the amount of bone and skin lost, and infection were all factors making fibrous union more likely. Repeated manipulations after the tenth day were particularly harmful in this connexion, as was also distraction from any cause. He recommended the use of a combined onlay and inlay graft, the latter being firmly fixed with four screws. The fibrous zone was resected only if the bone ends needed realignment. In the 72 grafts there had been eight infections, of which seven occurred in previously compound fractures, and among these were the only two failures to produce bony union. The average period of total immobilization for tibial grafts was 104 days, with a further 40 days in a gaiter for two-thirds of them.

Vascular Occlusion Causing Backache

Dr. DAVID L. FILTZER (Baltimore) discussed vascular insufficiency as a cause of low back pain. He reviewed 50 cases that had been under the care of Dr. Bahnsen at the Johns Hopkins Hospital, of which 43 were in males. All had suffered occlusion of the lower aorta or the common iliac arteries, and 22% had had back pain of major or minor degree. In many a multiplicity of other diagnoses had been made before the correct diagnosis. All 50 had been proved by aortography and/or operation for endarterectomy or replacement by a homograft, procedures which had relieved back pain if it was present. Dr. Filtzer stressed that a tentative diagnosis of vascular insufficiency should be considered in every patient with backache, and emphasized particularly the importance of the history.

Other Contributions

Other papers were read by Mr. D. M. BROOKS (London) and Dr. A. ZAOUSSIS (Athens) on arthrodesis of the shoulder for paralysis of the upper limb, Mr. W. DE WYTT (Dublin) on a review of 45 cases of anterior vertebral fusion, Dr. J. CHALMERS (Chicago) and Dr. H. A. SISSONS (London) on an experimental comparison of bone-grafting materials in the dog, Mr. MICHAEL SQUIRE (Reading) on carpal mechanics and trauma, Mr. G. K. ROSE (Shrewsbury) on correction of the pronated foot, Mr. J. PIGGOT (Exeter) on dislocation of the hip in children, and Mr. J. W. DICKSON (Sheffield) on ectopic ossification in paraplegia. In addition there were clinical and scientific demonstrations at the Nuffield Orthopaedic Centre.

Motoring News

EARL'S COURT MOTOR SHOW

This year's Motor Show at Earl's Court was one of the most disappointing in recent years for the popular-car motorist. Several new models were available for buyers in the luxury class, but for under £1,000 the average family motorist would have found little to excite him, with the possible exception of the Austin A40. It is likely, however, that further popular models will appear within the next three or four months.

One group which showed promise this year was the ultra-lightweight range of two-cylinder models of up to 5 h.p.

The diminutive DAF from Holland, using a two-cylinder two-stroke power unit of 600 c.c., was worth admiring. Its interior was particularly well appointed and gave an atmosphere of comfort which befitted a larger car. Of similar dimensions was the new Goggomobil Royal. A native of Bavaria, the Goggomobil is a popular German economy car produced in large quantities, and this latest model, the Royal, now gives adequate comfort for four passengers for short journeys, and costs £710. It cannot, however, be called good value when compared with other British cars, but this is the price the buyer has to pay for individuality and, of course, economy. Likewise the British Berkeley, now with an alternative saloon model at £725, caters for the family motorist—albeit one with a very tiny family. Some more small newcomers were the N.S.U. Prinz and the Sport Prinz, the latter being a smart 85 m.p.h., 50 m.p.g. close-coupled saloon; the streamlined Frisksprint with 492 c.c. two-stroke engine by Excelsior, giving it a top speed of 90 m.p.h.; and the Stirling Opperman, made by the Unicar concern at Stirling Corner, near Elstree. This last is a new venture by this firm, and at £541 it may well capture one of the few small spaces left in the low-price group for an effective family runabout. With a 424 c.c. power unit it can offer 50 m.p.g. petrol consumption and accommodation for two adults and two children.

Larger models recently introduced and costing over £1,000 were the Aston Martin DB4, Humber Super Snipe, Rover 3-litre, Armstrong Siddeley Star, Bristol 426, Daimler Majestic, Mark IV Jaguar, twin-cam M.G.A., and the Peerless. Of these the Rover retains its characteristics as a "quality" car, although one which has lost some of the dignity of its smaller brothers, especially with regard to interior appointments, the instrument panel in particular. The Humber Super Snipe offers supreme luxury at a moderate price, but it still inherits the traditional Rootes Group body shape. Models with disk brakes are the latest Jaguar, the Mark IX, the twin-cam M.G.A., the Aston Martin DB4, the Bristol 406, the Daimler Majestic, and the Armstrong Siddeley Star, which has them on the front wheels only. All these models were new to Earl's Court on this occasion, having been introduced in the course of the past year.

The Jaguar Mark IX is a more powerful version of the current model, as is the 1½-litre M.G.A. The Aston Martin, the Bristol, and the Daimler are recent introductions. The Armstrong Siddeley Star is similar in appearance to the popular Sapphire but is fitted with a larger engine, now of 4 litres capacity, and incorporates many other detailed improvements.

The Austin A40 was one of the very few really new cars at the Show, being a further addition to the already extensive B.M.C. range. Unique in design, having done away with the external luggage boot, it is a good buy at £676 for the small-car motorist. But it is a small car. Rear seat accommodation is limited, and the headroom barely adequate for a tall passenger. The whole seat folds to allow adequate quantities of luggage to be carried, but the considerable quantities of luggage to be carried, but the opening flap is small by reason of the large fixed window above it, thus preventing bulky objects from being carried.

In the caravan section there were few revolutionary developments with the exception of motor caravans, which are rapidly coming into fashion. Such vehicles obviate the need for towing the conventional caravan at 30 m.p.h., in Britain anyway, and they are no more expensive to transport on boats or trains than conventional cars. They are also easy to manipulate in confined spaces. Martin Walter Ltd., of Folkestone, one of the largest firms in this field, convert Bedford and Ford vans, in particular, into comfortable two- and four-berth sleeping wagons with built-in cooking and washing facilities. Similar conversions are available on Volkswagen, Morris, and Austin chassis. No purchase tax is payable on vehicles of this sort, with the result that they represent excellent value for money.

New in the accessory line were Ward's pistol-grip spotlight for fixing to the windscreen pillar, the Continental-shaped wing mirror, and the folding camp chair by Desmo. the new Lucas S7 battery with one-piece venting system

instead of the customary removable plugs, coloured Dunlopillo cushions which fold, and a range of new small lamps by Marchal which can be used either as flashing indicators, side lamps, or fog lamps. A gayer touch has been given to many of the cars now on the market by the use of new pastel colours and two-tone schemes. Further varieties of leathercloth add more charm to interiors, while ribbed rubber and rubber-backed materials are appearing more and more on the floors of current popular models.

Technically this was not a very interesting exhibition, with most makers sticking to their well-tried power units and chassis layouts. Britain, however, leads the world with the disk brake, and it is likely that within a very few years these will be available on mass-produced models. Improved performance has been achieved by simply enlarging the capacities of present engines instead of redesigning the units to give additional B.H.P. on the same number of c.c.s. This policy of consolidation in the motor industry has certain advantages. The longer a model is in production and the more improvements which are incorporated into it the better it becomes, and the longer it stays on the production line the more money it earns for its company. This in turn allows the designers more time to develop their new models, and we shall look forward to these appearing soon in the low-price markets in time for buyers to take advantage of the recent hire-purchase rearrangements.

IAIN GELLATLY.

Nova et Vetera

"AH, MY OLD FRIEND DR. HARVEY"

The life of William Harvey has been studied for three centuries, and it might be imagined that little new could be said. It is interesting, therefore, to note that within the last few years fresh information has been published on the subject in this country and abroad, stimulated in part by the preparations for the celebration in 1957 of the tercentenary of Harvey's death. Among these contributions the following may be mentioned.

The discovery of the Harveian Oration for 1662, in all probability by Sir Charles Scarborough, records a tribute from a pupil to Harvey's ideals, knowledge, and zeal for investigation.¹ The account of Harvey's knowledge of neurology and psychiatry, gathered by Drs. Richard Hunter and Ida Macalpine,² reveals another side of Harvey's inquiring mind. The recent find among the muniments at Hatfield of the letter, dated 1605, from Dr. Lancelot Browne recommending his son-in-law, Dr. William Harvey, for the post of physician at the Tower of London indicates how early his professional talents were appreciated.³ The letter of Bishop Brian Duppa to Sir Justinian Isham of 1657 relates that Harvey paid attention to dietetics and nutrition and "would sometimes fast two days together"; that the bishop was with him the day before he died; and that Harvey's life "went out like a spark, without any violence or noise at all."⁴ In 1956 Dr. F. N. L. Poynter discovered in the poems of Dr. John Collop, published in 1656, a contemporary poem on Harvey of some merit.⁵ We have had new and better English translations of *De motu cordis* and of *De circulatione sanguinis*—the two anatomical essays addressed by Harvey in 1649 to Jean Riolan, jun.⁶—from the pen of Dr. K. J. Franklin, which only one who is at the same time physiologist, classical scholar, and medical historian could have achieved; and Dr. Louis Chauvois has published simultaneously in French and English a new life of Harvey.⁷ It is an impressive catalogue of biographical information, but the harvest is not yet exhausted.

Sir Geoffrey Keynes, who can equally delight and instruct us in new paths in surgery and in medical history, iconography, and English literature and poetry, is a leading authority on William Harvey. He is also a Fellow of the Royal College of Physicians, and his Harveian Oration⁸

for 1958 to the College is entitled: "Harvey through John Aubrey's Eyes." Sir Geoffrey, in studying Harvey's life, takes up the torch handed from Sir D'Arcy Power, who like him was a surgeon at St. Bartholomew's Hospital, Harvey's hospital. Sir Geoffrey reminds us that Harvey, like many of his contemporaries, practised surgery as well as medicine—he bequeathed to Sir Charles Scarborough all his little silver instruments of surgery. As Sir Thomas Barlow said in his Harveian Oration¹¹:

"I think we may rest content that our Harvey, who was universally admitted to be a great anatomist and naturalist, was also an experienced pathologist, a learned physician, and that he had the qualifications of a good all-round medical practitioner."

Aubrey's Picture

It is John Aubrey (1626-97), that prince of gossiping biographers, "with an unerring instinct for the telling detail," who in the *Brief Lives*¹² gives a vivid picture of Harvey's later years and of his personality. He had seen Harvey at Oxford in 1642, but it was not until 1651 that he became his friend. He is the only recorder of what Harvey looked like, of what he said, of his personal habits and foibles, and of the manner of his death. "Ah, my old friend, Dr. Harvey, I knew him right well!" he wrote. Aubrey was odd, irrelevant, and unsystematic, but he had a talent for description, an excellent memory, and desired to tell the unvarnished truth. Sir Geoffrey emphasizes these qualities of Aubrey as he proceeds to examine his word-portrait of William Harvey. Many writers on Harvey have used Aubrey's account, but in their "pilfering" have thrown doubt on his veracity. "A gossip, inaccurate and irrelevant," are some of the epithets applied to him. Can we trust his account of Harvey?

William Harvey's treatment was considerably in advance of his time. He prescribed the accustomed Galenic remedies, but was often sceptical as to their efficacy. In the case of Prince Maurice, who was suffering from a slow fever, Harvey stated that he and his colleagues resolved to give "very little physic, only a regular diet and cordial antidotes." The Prince made a good recovery. It was this scepticism, suggests Sir Geoffrey, that made Aubrey, while praising Harvey as an anatomist, consider him a bad physician, although he treasured his prescriptions, which are with his other papers in the British Museum. Aubrey certainly erred, after conceding that Harvey understood Latin and Greek pretty well, when he said that "he was no Critique, and he wrote very bad Latin. The *Circuitis Sanguinis* was, I take it, done into Latin by Sir George Ent." Of the truth of this statement there is no evidence, and, as regards Harvey's classical knowledge, Dr. Franklin has conclusively shown that he wrote scholarly Latin and that in translating his Latin into English passages can be discovered which are beautiful in either language. Harvey could write good English too, for in addition to his many great talents he was a man of letters. Sir Geoffrey suggests that it may have been a sight of the manuscript of Harvey's *De Motu Locali Animalium*, rough notes, which in spite of bad handwriting, abbreviations, and additions Dr. Gweneth Whitteridge, at the instance of the College of Physicians, has at length triumphantly translated and interpreted, which led Aubrey to decry Harvey's Latinity.

With the exceptions just mentioned, Sir Geoffrey Keynes finds that most of Aubrey's statements concerning Harvey are supported by additional evidence, such as that of Mrs. Harvey, his great-niece, who told Dr. Heberden of his oddities and foibles. Aubrey observed also Harvey's modesty about himself and his discoveries, his accessibility to younger men and his encouragement of them, which the Harveian Oration of Sir Charles Scarborough corroborates. Doubt has been thrown upon Aubrey's anecdote of Harvey being entrusted with the care of the young princes, Charles and James, at the battle of Edgehill in 1642.¹³ Sir Geoffrey, examining the evidence, shows that the account of the battle by an anonymous writer agrees with Aubrey's

(Continued at foot of next column)

To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in current use.

Aralen (Bayer Products Ltd.).

Avloclor (Imperial Chemical Pharmaceuticals).

Bemaphate (B.M. Laboratories Ltd.).

Resochin (Farbenfabriken Bayer A.G.: distributors, Levmedic Ltd.).

These are preparations of chloroquine phosphate in 250-mg. tablets. Chloroquine is the most rapidly acting schizonticide available for the treatment of acute malarial attacks. For this purpose it is administered in initial doses of 600 mg. (base) followed in 6 hours by a further 300 mg. (base) and by 300 mg. (base) on each of two successive days. (150 mg. base is equivalent to 250 mg. phosphate.) It is also a valuable malarial suppressive, when it may be given in doses of 300 mg. (base) weekly, or 150 mg. (base) twice weekly.

Encouraging results have recently been reported of its value in lupus erythematosus, for which it is given in the relatively large doses of 150 mg. (base) twice daily until nodules disappear, when the dose is reduced to 150 mg. daily. In rheumatism also the high dosage regime of 150-300 mg. (base) daily has been reported to be of some value. When using these large doses, deposits of the drug may occur in the cornea. Unless gross, however, these deposits may be visible only with the aid of a corneal microscope; the co-operation of an ophthalmologist is therefore worth seeking in controlling the treatment of lupus erythematosus and of rheumatism with chloroquine.

N.H.S. basic price: aralen, 100 tabs., 17s. 10d.; avloclor, 100 tabs., 12s. 11d.; bemaphate, 100 tabs., 14s. 3d.; resochin, 100 tabs., 14s. 8d.

(Continued from preceding column)

account; and it is strengthened by the portrait of the two princes at the battle which King Charles I presented to Harvey, no doubt to commemorate the occasion. The picture, for many years in the possession of the Harvey family, is now in the Scottish National Portrait Gallery in Edinburgh. Finally, "Aubrey's description of Harvey's last hours bears the stamp of truth."

After a searching examination, Sir Geoffrey Keynes considers that Aubrey's picture of William Harvey is in the main an accurate one, though his natural inclinations sometimes led him to misinterpret certain of Harvey's qualities. He concludes that Aubrey has bequeathed to us the most lifelike portrait of Harvey that we possess.

In this memorable Harveian Oration, with much learning and investigation, Sir Geoffrey Keynes has brought out for the first time the highlights of Aubrey's portrait of Harvey. In doing this he has not only justified Aubrey's veracity, but has made us see the great and good Harvey through John Aubrey's eyes.

ARTHUR S. MACNALT.

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Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Addiction to Unrestricted Drugs

SIR,—The communication from Drs. C. P. Seager and A. R. Foster (*Journal*, October 18, p. 950) describes seven addicts to chlorodyne, methylpentynol, preludin, or carbromal, all being psychopaths. They state that in three patients taking carbromal there was evidence of physical dependence, but do not describe the symptoms and signs to support this. If carbromal really does cause physical dependence it is of the greatest importance that this should be clearly established, and I hope that the writers will provide the evidence.

Their conclusion that all drugs which have a euphoriant or sedative action should be included in Schedule 4 of the Poisons Rules is alarming. If their view were adopted, to be consistent, we should also include the far more noxious and enjoyable drugs—alcohol and tobacco. We should, I suggest, think very carefully before recommending restrictions to legislators which would inevitably involve the practitioner in yet more work and which would do but little to protect a relatively small number of psychopaths.—I am, etc.,

London, W.1.

A. H. DOUTHWAITE.

SIR,—I read with much interest the timely article by Drs. C. P. Seager and A. R. Foster (*Journal*, October 18, p. 950). The dangers attendant upon the unrestricted sale of "persomnia" are well illustrated by the following case, recently under my care.

An intelligent male, aged 39, suffering from recurrent bouts of depression, had been addicted to persomnia for several years, consuming on an average about half a tin—16-20 tablets daily. Following a suicidal attempt in which he took 56 tablets over two days, he was admitted to an observation ward in a stuporous condition, showing a blood bromide level of 120 mg./100 ml. On becoming rational he expressed the desire to be cured of addiction, and was admitted to this hospital as a voluntary patient. After some two months, during which time he received electroplexy for his depression, followed by intensive supportive psychotherapy, he announced that he felt much improved and no longer had any craving for persomnia. However, while on a pass to seek employment, he procured a further supply of persomnia tablets, taking 14, and just managed to stagger to the hospital gates in a drowsy condition which necessitated a stomach wash-out. He again improved, and expressed appreciation for the opportunity to remain in hospital for a while, without passes and the temptation to obtain more persomnia.

The difficulties in treating this type of case seem to be immeasurably increased when the patient has unlimited access to the drug of his addiction, and it is possible that such people may never obtain relief until this and similar habit-forming dangerous drugs are placed on Schedule 4. Also advertisements in the national press and on independent television appear to have resulted in the widespread use of persomnia, as judged by the numbers of patients encountered in one's psychiatric practice who regularly take this preparation. Under such circumstances their treatment with orthodox medicines is rendered a complex and even dangerous undertaking. I therefore propose a speedy revision of the Poisons Rules whereby persomnia, and indeed some of the other drugs referred to by Drs. Seager and Foster, would not be obtainable without a doctor's prescription.—I am, etc.,

J. C. BARKER.

Banstead Hospital,
Sutton.

SIR,—The suggestion in the paper by Drs. C. P. Seager and A. R. Foster on "Addiction to Unrestricted Drugs" (*Journal*, October 18, p. 950) that "drugs which have euphoriant or sedative action should be placed on the list of Schedule 4 Poisons," and hence be obtainable only on prescription, is wise and timely.

For some time I have noted with concern evidence that a group of hypnotics, the open-chain ureides—carbromal and bromvaletone, and particularly the former—were being increasingly used for self-medication, and that they could produce addiction. Carbromal has long been considered by the medical profession and by pharmacologists to be a safe hypnotic, which indeed it is when administered under medical supervision. A new situation arose when proprietary preparations containing carbromal were widely advertised to the public through the national press as a "safe sedative." These preparations can be bought freely by the public in pharmacies and in some drug stores. It becomes increasingly obvious that the terms "safe" and "hypnotic" are contradictory where self-medication is concerned, for if one tablet is good then half a dozen are so often considered to be six times as good.

Instances of addiction or habituation to drugs such as carbromal are not easy to obtain; and are probably more readily available to the psychiatrist and general practitioner than the general physician. Three instances of carbromal addiction are reported in the paper by Drs. Seager and Foster. In personal communications Professor Aubrey Lewis was able to quote six instances of carbromal addiction under treatment at the Maudsley Hospital, and Dr. L. C. Cook four patients treated for this condition at Bexley Hospital.

A typical instance came under my care recently. Mrs. E. H., aged 51, was admitted deeply unconscious, having taken about 20 "persomnia" tablets (a preparation containing carbromal and bromvaletone). With energetic treatment she regained consciousness in two hours. She subsequently stated that, owing to insomnia and domestic worries, she had been taking the tablets regularly over the past three years. As indicated in advertisements in the national press, she thought they were safe. She admitted purchasing three 2s. 9d. tins of 40 tablets a week from chemists, some of whom had warned her to be cautious in taking them. She had a strong feeling of guilt and hid the tins from her husband, who was concerned about her addiction. A psychiatrist who saw her did not consider her condition psychotic. She also showed a carbromal rash on her legs.

Personal communications from four dermatologists, three on the staff of London teaching hospitals and one in a large London general hospital group, all indicated the increasing frequency of carbromal rashes. One estimated that carbromal eruptions occur three times as frequently as any other type of drug rash, two that it was the commonest drug rash seen, and the fourth that, "with the exception of penicillin, eruptions due to carbromal drug rashes were the most frequently seen in dermatological out-patient departments." E. W. Prosser Thomas¹ has recently drawn attention to the increasing incidence of carbromal rashes and lists fourteen proprietary preparations containing the drug. I had discovered fifteen. P. Borrie² drew attention to the condition in 1955. The rash is very distressing but not dangerous. Its high incidence indicates the extent of carbromal self-medication.

The Pharmaceutical Society of Great Britain have observed the situation with concern and in May last made the following recommendation,³ "That the Poisons Board be informed that in the Council's view there is a prima facie case for open-chain ureides to be included in the First and Fourth Schedules to the Poisons Rules, and suggesting that an inquiry be conducted by the Ministry of Health as to the extent of the abuse of such drugs and preparations containing them." The Home Secretary subsequently announced that the Poisons Board had decided that the matter be referred to the Committee on Drug Addiction for their consideration. Pending this deliberation the Pharmaceutical Society advised pharmacists to exercise the greatest care in the supply of preparations containing these drugs.⁴

Responsible public opinion appears to be aware of the danger of indiscriminate use of sedatives. *The Times*⁵ reports the National Council of Women of Great Britain as having passed a resolution at their annual conference urging the Minister of Health to prohibit the sale of "tranquilizers" to the public without a medical prescription. Tran-

Until recently it was generally supposed that, if a nerve is interrupted by injury or disease, no restitution of function can occur until new fibres grow out from the divided central stump to reach denervated structures. However, the nervous system possesses power additional to that normally understood by regeneration. In this phenomenon known as collateral sprouting, remaining intact nerve fibres, in response to a stimulus from adjacent degenerating fibres, give off side-branches or sprouts. These grow into near-by tracks left by the degenerating axons and are thereby guided to denervated endings.

This phenomenon of collateral sprouting is extraordinarily efficient in the autonomic nervous system. For example, in the cat, preganglionic denervation of the superior cervical ganglion was performed by resection of 3 cm. of the cervical sympathetic trunk. Several months later, histological examination and electrical stimulation of the cervical trunk showed that, whilst classical regeneration across the gap had not taken place, sprouting had occurred from efferent vagal fibres in the region of the nodose ganglion. As a result, the superior cervical ganglion had become partly re-innervated by efferent vagal fibres, thus producing a bizarre situation in which the pupil and micturating membrane became functionally linked with gastric and vascular reflexes.¹

In the case of gustatory sweating following injury or disease of the parotid gland, parasympathetic secretomotor fibres in the peripheral distribution of the auriculotemporal nerve will sprout and may acquire additional functional connexions with sweat glands, as we previously suggested.² Conversely, a cholinergic sympathetic fibre may come to innervate both sweat glands and parotid tissue. In comparable circumstances to these, we have shown that exaggerated responses occur, and are due to the summation of the effects of partial re-innervation and persisting hypersensitivity. It was therefore with particular interest that we noted that Glaister *et al.* had found that, in 8 out of 10 patients with gustatory sweating, the sweat glands showed an increased sensitivity to acetylcholine on the affected side.

The practical importance of considering collateral sprouting as a mechanism becomes evident in the recurrence of gustatory sweating after avulsion of the auriculotemporal nerve. Whether or not re-innervation is due to classical regeneration across the gap can be tested directly. If, however, it is due to collateral sprouting, then the essential therapeutic attack would be not to resect a greater length of nerve but to find the central level at which division of the nervous pathway eliminates from the affected area the supply of parent fibres from which appropriate sprouting can arise.—We are, etc.,

Department of Surgery,
University of Aberdeen.

J. G. MURRAY.

Department of Pharmacology,
Royal College of Surgeons of England.

J. W. THOMPSON.

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- 1 Murray, J. G., and Thompson, J. W., *J. Physiol. (Lond.)*, 1957, 135, 133.
- 2 ——— *Brit. med. Bull.*, 1957, 13, 213.

Sex Education for Students

SIR,—In the *Journal* of October 25 (p. 1029) you published an annotation on sex education for students. Some of the remarks in this are open to severe criticism and show little appreciation of the problems involved in the maturation of the individual or of the place of these problems in clinical medicine. The annotation states that "some students are scarcely sufficiently mature and stable to accept the emotional effort entailed in studying a subject of this kind." If this is true, how can such a person be fit to practise as a doctor? Surely the time to find out if this is the case is before qualification and not when it may well be too late for the doctor to make an adequate adjustment. The statement implies that maturity and understanding of marital problems is something picked up as the years roll by. This Victorian attitude would hardly be acceptable to modern psychiatry, and to ignore the problem amongst undergraduates is evading the responsibility which all teachers concerned should feel.

The second statement—"Not only is the student unaware of the emotional problems involved in marriage but often ignorant of his own ideas, fantasies, and prejudices about the sexual and marital relationship"—shows a considerable ignorance of medical students. One cannot lump medical students together as "the student," nor can one generalize in this way. Surely an average, intelligent medical student of 23 or 24 cannot spend three years among the patients of a teaching hospital and remain unaware of emotional problems of marriage. So much of clinical medicine is, in some way or another, bound up with family life and marital relations. So many illnesses are functional in nature, and so often an organic disease has a profound psychological overlay. How can one justifi-

ably divorce one of the major aetiological factors of modern medicine from clinical teaching?

Your annotation goes on to speak of a voluntary method of teaching, and says that "the drawback to this is the danger that those struggling with their own emotional problems are particularly attracted to the subject, and the resulting strain may precipitate a breakdown." That this is theoretically possible is no doubt true, but if we are to have remarks of this kind in the leading British medical journal then let them be backed up with facts and figures.

It is to be regretted that your annotation obscures the basic issues. Medical students need to have their own problems solved and to receive a good grounding in normal family life and the place of the family in society. If the student is helped with these, the psychiatric and gynaecological problems which occur can easily be dealt with in the proper place.—I am, etc.,

London, W.C.1.

EDWARD J. R. ROSSITER,
Education Officer,
British Medical Students' Association.

Foetal Phonocardiography

SIR,—I note that Dr. C. N. Smyth and Miss Jennifer L. Farrow state in their paper in the *Journal* of October 25 (p. 1005) that they have paid little attention to the acoustic quality of the foetal heart sounds, and have limited their studies principally to time relationships. This is understandable in their case, as they used a moving-iron microphone. Sensitivity and robustness are not of themselves sufficient, especially now that first-class high-sensitivity pickups have been introduced.

I note with surprise that they found it necessary to use a loudspeaker which had to be situated in a different room to the microphone to prevent "howling round" or acoustic instability. Still, they found it fairly essential to have some form of acoustic heart signal in the same room as the patient, but they did this by the inelegant method of converting the foetal heart sounds into—quoting their own words—"plops," which would be heard by the pregnant woman. The foetal heart sounds can be demonstrated in the same room as the patient by the use of a proper pickup and close-fitting, suitable headphones, skilfully used. Acoustic feed-back is prevented as there is no direct acoustic path between the headphones and the proper pickup. This method permits the auscultator or auscultators to hear the foetal heart sounds at the same time as they are being recorded, without the patient hearing them.—I am, etc.,

West Glamorgan Health Division,
Swansea.

G. E. DONOVAN.

Ergometrine with Hyaluronidase

SIR,—I was interested to see Dr. A. H. Labrum's letter (*Journal*, October 4, p. 857) regarding the intramuscular injection of ergometrine with hyaluronidase. He suggests that the addition of hyaluronidase both enhances and speeds the action of ergometrine but that the effect diminishes as the dose of ergometrine increases. The proof may not be adequate, but if his contentions are correct then any advantage of the hyaluronidase method could be achieved by merely increasing the dose of ergometrine alone; though I hardly think Dr. Labrum is suggesting this.

The widely varying figures quoted by Dr. Labrum well illustrate the difficulty of interpreting and comparing the results of different clinical trials; clearly, the incidence of post-partum haemorrhage in a particular series is influenced by other factors besides the type of ergometrine technique employed. Kimbell's results¹ were certainly excellent; but I am not surprised that good results have been reported giving ergometrine and hyaluronidase at the end of the second stage of labour. On the other hand I feel that the plain ergometrine injection is capable of good results too. Comparatively few figures are available, but they are not unimpressive. Thus, I might point out that Daley's² post-partum haemorrhage rate of 9.2% with the plain ergometrine technique (quoted by Dr. Labrum) represented a great improvement on an incidence of 15.7% in the control group, while in primigravidae only the

incidence of haemorrhage dropped from 13.2% to 5.2%. Such results scarcely justify the implication that to omit hyaluronidase from the intramuscular injection of ergometrine is to court disaster.

As I have already pointed out (*Journal*, September 13, p. 692), Mr. W. J. Garrett and I based our opinion of the intramuscular injection of ergometrine with hyaluronidase (*Journal*, July 19, p. 138) on objective measurements of its speed of action compared with ergometrine alone. Our observation showed that while hyaluronidase unquestionably accelerated the action of intramuscular ergometrine the latent period was reduced only by one-third. We readily acknowledged the value of the method as a "stop-gap" procedure; but, having regard to the greater difficulty in making the injection (Dutton³ reports a 19.5% failure rate) and the cost, it seemed to us that there was some doubt as to its superiority over the plain ergometrine technique as a routine method.—I am, etc.,

MOSTYN P. EMBREY.

The Radcliffe Infirmary,
Oxford.

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- 2 Daley, D., *J. Obstet. Gynaec. Brit. Emp.*, 1951, 58, 388.
- 3 Dutton, W. A. W., *ibid.*, 1958, 65, 315.

SIR,—When Dr. J. N. Gale (*Journal*, October 25, p. 1044) advocates giving ergometrine after delivery of the placenta to avoid its retention he is bowing to tradition, not to the needs of present-day practice. The object of giving ergometrine with the anterior shoulder is to prevent post-partum haemorrhage, a condition which causes morbidity and mortality. In the recent Ministry of Health Report Number 97 on Confidential Enquiries into Maternal Deaths in England and Wales 1952-1954 (obtainable from Her Majesty's Stationery Office, price 3s. 6d. net) there were 113 deaths from post-partum haemorrhage, and "almost all the deaths in this group were entirely due to haemorrhage or a combination of shock and haemorrhage." Manual removal of the placenta in a fit patient is without risk; it is the results of manual removal in the exsanguinated patient which formerly brought the procedure into disrepute. It is a proved fact that the longer the third stage of labour the greater is the danger of post-partum haemorrhage. A contracted uterus does not bleed even with the placenta *in situ* and a contracted uterus cannot be inverted by cord traction. For dissertations on the modern management of the third stage of labour, I would refer Dr. Gale to the papers of Norman Kimbell¹ and F. C. R. Picton.²—I am, etc.,

W. G. MACGREGOR.

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University College Hospital,
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Premonition of Death

SIR,—I hope we shall not be losing our sense of perspective on premonition of death. This symptom is more apt to occur when there is some genuine cause for it, whether it be known or unknown to the doctor, and hence is not lightly disregarded. Furthermore it is readily remembered when it proves an accurate forecast. Before we attach any greater importance to it than we do already we should remember that, unless a valid comparison is made with cases in which this premonition has proved false (by no means an easy thing to do), we should do well not to allow ourselves to wander on to the borders of spiritualism.

I have under my care an old lady of 86 who for the past eight years has at intervals of three to four months decided that her end was nigh and asked that her offspring be brought to her that she might bid them farewell. Since they visit her daily I have always felt constrained to treat her seriously every time it happens. One of these days she may be right—but so far she has merely been a cause of alarm to her relatives and anxiety to me.—I am, etc.,

A. LEWIS.

London, W.9.

Buzzers for Bed-wetters

SIR,—A clinic for the treatment of enuresis was started four years ago by the public health department of Croydon. During the past two years electrical anuretic machines have been loaned to those cases that have resisted simpler forms of treatment.¹ Up to date 45 children have used these machines and there have been no failures. (There have been two relapses following domestic upheaval after several months' complete dryness.) The average duration of treatment is two months.

The initial cost of the machines is five guineas, and, allowing for minor repairs and replacement of batteries, one machine will last for years of continuous use. The first machine bought for the clinic is two years old and still in service. The cost of one brand of pituitary snuff is 22s. 6d. for 25 capsules and insufflator. I believe that its use is quite well known, as several children attending the clinic have previously been treated with it unsuccessfully. In my experience the electric "buzzer" is a cheaper form of treatment than the use of pituitary snuff for several months as recommended by Dr. Clifford Allen (*Journal*, September 27, p. 799).—I am, etc.,

MARGARET WHITE.

Public Health Department
Croydon.

REFERENCE

- 1 White, M., *Med. Offr.*, 1957, 98, 125.

Infectious Mononucleosis

SIR,—In your leading article (*Journal*, October 11, p. 899) reference is made to the possible role of *Listeria monocytogenes* and of a virus in the causation of infectious mononucleosis. I would like to add that an organism intermediate between the Rickettsiae and the larger viruses was isolated in three cases of infectious mononucleosis in Japan in the years 1953, 1954, and 1955 (*Rickettsia sennetsu Misao-Kobayashi*). The experimental disease produced in human volunteers by the hypodermic injection of emulsions prepared from lymph nodes and spleens of mice experimentally infected with *R. sennetsu* was in every respect a typical glandular fever.¹

Much remains to be learned about the aetiology of infectious mononucleosis. It must, however, be emphasized that at our present state of knowledge—or lack of knowledge—of the causative agent(s) patients exhibiting the typical haematological picture should be considered as cases of infectious mononucleosis in spite of a negative Paul-Bunnell reaction. Tests for toxoplasma antibodies might, in a very small proportion of such cases, reveal the presence of toxoplasmosis, but the number of toxoplasma-positive cases will be infinitesimal.—I am, etc.,

S. VARADI.

City General Hospital,
Sheffield.

REFERENCE

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Prevention of Lung Cancer

SIR,—Mr. Leslie J. Temple has a peculiar way of bringing home to the public the hazards of excessive cigarette smoking (*Journal*, October 4, p. 858). He believes that holding inquests in cases of death from carcinoma of the bronchus would lead to moderation in cigarette smoking.

I saw this week a young girl in my surgery who is expecting her baby next month. She told me she is smoking 30-40 cigarettes a day and makes them herself, using strong tobacco. I told her that she was smoking too many cigarettes and asked her why. She replied, "I have not seen my husband for four days and I don't know where he is. I am worried and that is why I am smoking heavily." I believe this is the answer why some people smoke excessively—worries, tension, and the tempo of modern life and civilization.

Inquests are held every day in cases of road fatalities, but has that led to reduction in road accidents? What we need is not more inquests but a more and more psychiatric approach as to why people smoke excessively.—I am, etc.,

H. J. PRATAP.

Liverpool, 18.

Obituary

Sir JOHN MEGAW, K.C.I.E., D.Sc., M.B., B.Ch.

Sir John Megaw, a former Director-General of the Indian Medical Service, died at his home at Hawkhurst, Kent, on October 24 in his 85th year. He was known throughout the world as an authority on the rickettsioses, as a zealous advocate of population control by family planning, as a pioneer of air-conditioning in the tropics, and as the *fidus Achates* of Sir Leonard Rogers, who, now in his nineties, survives him.

Born on February 8, 1874, in Ballyboyland, not far from Ballymoney in Co. Antrim, John Wallace Dick Megaw was educated at the Belfast Royal Academical Institution and at Queen's College, Belfast, and graduated M.B., B.Ch., B.A.O., with first-class honours, at the Royal University of Ireland in 1899.



He had a brilliant student career, being Dunville student at Queen's and winning several scholarships and exhibitions, but after graduation he never took any other degree, being doubtful of the usefulness of time spent in acquiring "higher qualifications." His own university honoured him by conferring on him the D.Sc. (*hon. causa*) in 1934. He entered the Indian Medical

Service in 1900, and after a brief spell of military duty, during which he saw active service in China, he was transferred to civil employment in Bengal in 1903. During the ensuing ten years he spent much of his time in the varied employment undertaken by district medical officers in India. When resident medical officer in the Medical College Hospital, Calcutta, he helped Leonard Rogers with the clinical side of his cholera researches—the commencement of a life-long bond. Developing a special interest in pathology and bacteriology, Megaw underwent training in pathology and bacteriology when on furlough and study leave. In 1914 he was appointed professor of pathology at Lucknow University—a post which he later combined with that of principal. While in Lucknow he undertook and directed research on beriberi and dengue and sandfly fevers, and, as a result of a personal illness, on non-epidemic typhus fevers, a subject in which he took the liveliest interest throughout the rest of his life.

Founded by the drive and energy of Sir Leonard Rogers, through whose persuasive powers the necessary money was raised, the new Calcutta School of Tropical Medicine and Hygiene was fortunate in its first director, John Megaw, who took it over in 1931. He surrounded himself with an outstanding group of research workers and teachers: driving his colleagues hard, he encouraged them by his own example. During his term of office the output of research work of real worth was very striking. He commenced then his studies on the effects of heat and humidity on efficiency and did pioneer work on air-conditioning in the tropics. From 1921 to 1928, in his spare time, he edited the *Indian Medical Gazette*, and from 1928 to 1930 he was president of the South Indian and Madras Branch of the B.M.A.

Appointed C.I.E. in 1926, he became Inspector-General of Civil Hospitals in the Punjab in 1928, but a few months later he was promoted Surgeon-General with the Government of Madras. While in Madras he made his famous observation: "There is no quinine-resistant malaria—there

is much dispenser-resistant malaria." With Hawley he devised improved simple methods for estimating quinine in liquids, and many petty pilferers were dismayed.

In 1930 Megaw became Director-General of the I.M.S., and on his retirement in 1933 he was promoted K.C.I.E. During his tenure of that high office his statesmanlike qualities became apparent to all who met him or read his writings. The question of over-population of India was constantly in his thoughts; he strove unceasingly for the improvement of medical education—especially in the field of hygiene—and the need for training Indians to "take over" was keenly appreciated by him. On leaving India he succeeded his old friend Sir Leonard Rogers—with whom he had written a successful book entitled *Tropical Medicine*—as medical adviser to the Secretary of State for India and president of the India Office Medical Board. While in London he became a part-time lecturer at the School of Tropical Medicine and Hygiene. He gave up office in 1939 on reaching the age limit. He was Honorary Physician to the King from 1930 to 1934.

After retirement Megaw devoted his days to practical scientific farming in Kent, working with both hand and brain to make a success of his estate. His evenings and nights were devoted to his literary labours for the *Tropical Diseases Bulletin* and to the development of a new international language which, he hoped, might make the task of future abstracters of foreign literature less bothersome. He remained to the end modest and simple, but critical of loose arguments and mental woolliness. He was intensely interested in every branch of medical science, and on his death-bed suggested better ways of inserting the muscles of the lower limb so that a fallen invalid could get into bed more quickly before his nurse could discover that he had crept out.

In 1912 he married Helen Esmée Ward, who survives him. There were no children.

Dr. CHARLES WILCOCKS writes: Sir John Megaw did not end his association with research in tropical medicine when he retired from the Indian Medical Service, but his later interest was literary, and it was in this field that he made a very notable reputation after retirement. For several years he served on the honorary managing committee of the Bureau of Hygiene and Tropical Diseases, and from 1941 onwards he undertook to review papers on the rickettsial diseases and other fevers for the *Tropical Diseases Bulletin* and the *Bulletin of War Medicine*. His interest in these diseases had been stimulated in India by an attack of what he recognized as tick typhus, and he had built up a system of classification by vector—louse, flea, tick, mite—which certainly simplified and clarified our conception of these diseases, and which, he maintained, fitted in remarkably well with the results of the specific rickettsia-agglutination test and the complement-fixation test. He preferred this though that test is, because with the Weil-Felix test, useful for louse-borne and the flea-borne diseases cannot be distinguished, and in the tick-borne group the reactions are highly irregular.

The rickettsial diseases became very important during the second world war, when epidemics of louse typhus swept North Africa and Italy, scrub typhus was a major complication of the Far Eastern campaigns, and Q fever was for a time something of an enigma round the Mediterranean. Megaw took very seriously the work of reviewing papers on these subjects, written in many languages (none of which seemed to give him any trouble), and his cool and critical scrutiny of these papers, and his faculty of giving in few words the essence of their information, was widely appreciated throughout the world. His comments were quoted and discussed by the most eminent of research workers, and his opinions were constantly sought. It was always a pleasure to receive his manuscript. His facts were correct and there were no wasted words, and his language was clear and definite and characteristic. His writing was always

interesting, and it had a certain graceful quality which came, I think, as an unconscious by-product of the clarity of his thought. *Nullum quod tetigit non ornavit*.

Megaw kept up to date with medicine, and was as familiar with the work on dengue and the related fevers, and on plague, as he was with typhus. When we asked him to do something outside his usual line the reply would always be, "Send it along and I'll see what I can do," and the result would be superb. He was a statesman, as could be seen from his published appreciation of the Bore Report on medical services for India, published in 1946, and he was generous. We have lost a great man.

IVOR J. DAVIES, C.B.E., M.D., F.R.C.P.

Dr. Ivor Davies, consulting physician to the Cardiff Royal Infirmary and the Ministry of Pensions hospital at Rookwood, Cardiff, died at his home at Aberystwyth a few days after his 78th birthday.

Ivor Jones Davies was born on October 22, 1880. Beginning his medical studies at University College, Cardiff, where he won several scholarships, he went on to St. Bartholomew's Hospital, graduating M.B., B.S. of London University in 1906. After holding a number of resident appointments at the Royal Free Hospital, including that of house-surgeon to Sir James Berry, he took the M.R.C.P. and proceeded to the M.D. in 1911. Returning to practice in Cardiff, he soon became established as a consulting physician, though his work was interrupted by service in the first world war. He was a pioneer in pulmonary diseases caused by dust, though essentially a general physician, and his contribution to the literature included a paper on goitre in South Wales, a subject which had particularly interested him since his association with Sir James Berry. One of his earliest papers, published in this *Journal*, was on the subject of carbon monoxide poisoning after an explosion in a coal mine. Dr. Davies was appointed first assistant to the first professor of medicine (Dr. A. M. Kennedy) in the newly established medical unit at the Cardiff Royal Infirmary. In 1922 he became a full physician there, and three years later he was elected F.R.C.P. When the B.M.A. held its Annual Meeting in Cardiff in 1928 he served as a vice-president of the Section of Medicine. For his work at the Ministry of Pensions hospital at Rookwood he was appointed C.B.E. in 1953.

L. R. writes: Dr. Ivor Davies had recently attended the meeting in Cardiff of the Fellows and Members of the Royal College of Surgeons, where he had met many old friends and had been in good spirits. He was always a vivid, cheerful, kindly character with a keen sense of humour which made him one of the best of raconteurs. A lifelong supporter of the best interests of the Cardiff Medical School and of his profession, he paid frequent visits to London to keep in touch with the Royal College of Physicians, to which he became an examiner, and with his former associates at St. Bartholomew's. His practice soon became one of the busiest in South Wales, for it was generally realized that he was not only an able physician but one who had a lovable character which inspired confidence in both patients and practitioners. Perhaps his outstanding contribution to medicine in Wales was his staunch loyalty to the young medical school during its formative years; he frequently had to play an unpopular part at a time when birth pangs were sometimes acute through the obstruction of established custom. He was a devout Churchman, a Rotarian, and a keen student of both Welsh and medical history. In 1943 he retired from the Cardiff Royal Infirmary and six years later went to live in Aberystwyth, his wife's home town, but from time to time he visited Cardiff to see his old friends and his patients at the Ministry of Pensions hospital. He leaves a widow and two daughters, to whom we extend our sympathy.

J. V. LANDOR, M.D., M.R.C.P., D.P.H.
D.T.M.&H.

Dr. J. V. Landor, who spent the greater part of his professional life in the Colonial Medical Service, died at the Royal North Shore Hospital, Sydney, New South Wales, on September 12.

Joseph Victor Landor (formerly Landau) was born in 1897. He received his medical training at St. Bartholomew's Hospital and graduated M.B., B.S. from London University in 1920, taking the London Conjoint diploma in the same year. Proceeding to the M.D. in state medicine in 1925, he took the D.P.H. of the English Royal Colleges in the following year and the D.T.M.&H. in 1927. He was elected M.R.C.P. in 1932. After holding the appointment of house-surgeon at the Royal Northern Hospital, Holloway Road, London, he entered the Colonial Medical Service in 1927 and served until 1946. He was chairman of the Southern Division of the Malaya Branch of the British Medical Association in 1935-6. In 1947 he went to Australia and became assistant chief medical referee to the Government Insurance Office in Sydney, New South Wales. He leaves a widow.

A former colleague writes: In the Colonial Medical Service Dr. J. V. Landor worked as a medical officer in Singapore, Lahore, and Penang before being promoted to the post of physician to the General Hospital, Singapore, where he remained until his retirement. While in Lahore his duties included the medical care of prisoners in the gaol, among whom he observed symptoms of an ill-defined nutritional disorder. Working in collaboration with the medical officer of the Singapore gaol, where a similar condition occurred, the symptoms were described and the aetiology of them was studied. At the time of this work vitamin B was known to consist of the anti-beriberi factor B₁ and a heat-stable factor B₂. The "prison disease" was considered to be due to a deficiency in this latter part, and later, when riboflavin was discovered, it became evident that part of the syndrome that had been described resulted from lack of this vitamin. When the Japanese invaded Malaya Dr. Landor was interned in Singapore for three and a half years and was himself exposed to the dangers of the deficiency conditions he had helped to describe. During those years of internment he worked in the camp as dermatologist, and his special experience in dietetic disorders was put to good use in the service of his companions. Ariboflavinosis, pellagra, and other obscure skin conditions, probably nutritional in origin, became increasingly common as the years of confinement passed. The quiet skill and care with which he diagnosed and attempted with inadequate means to treat his patients was appreciated by all who were interned with him, and his work was a valuable contribution to the maintenance of the morale of the camp. He kept careful records of the dermatological lesions that he had seen, and as soon as he was released he published an account of his observations in the *British Journal of Dermatology* in 1948. After the war had ended he returned to his post of physician in Singapore, but, owing to ill-health, was soon forced to retire. He then settled in Australia, where he lived until his death.

C. M. OCKWELL, M.D., F.R.C.S., D.P.H.

Dr. C. M. Ockwell, who formerly practised in Dartford and was medical officer of health for Crayford, Kent, for over a quarter of a century, died at Guy's Hospital on October 17. He was 74 years of age.

Charles Melton Ockwell received his medical training at Guy's Hospital, qualifying M.R.C.S., L.R.C.P. in 1906. He was admitted to the F.R.C.S. in 1919, took the Cambridge D.P.H. in 1920, graduated M.B., B.S. of London in 1930, and proceeded to the M.D. in 1934. After qualification he was in general practice at Burgh, Lincolnshire, for a few

years before joining Dr. M. W. Renton in partnership at Dartford in 1914. During the first world war he was a surgeon at a base hospital at Fécamp for a year, and thenceforward until the end of the war ophthalmic specialist at the Royal Herbert Hospital, Woolwich, and at Paddington military hospital. After the war he became interested in preventive medicine. Appointed medical officer of health for Crayford in 1921, his duties were extended a few years later to include the Swanscombe urban and Dartford rural districts. Later he was appointed venereologist under the Kent County Council. Ultimately he became a full-time medical officer of health. In Crayford he developed the maternity and child welfare services, and was one of the first medical officers to offer diphtheria immunization to the children in his area. When the National Health Service came into being in 1948 he was graded consultant dermatologist and venereologist. A member of the British Medical Association for 40 years, he was chairman of the Dartford Division in 1924-5 and again in 1934-5, and president of the Kent Branch in 1937-8. He was also a member of the Library Subcommittee at Headquarters from 1933 to 1943. He resigned his appointment of medical officer of health for Crayford in 1947, and retired almost completely four years later. He kept up his interest in medicine to the end, however, and since his official retirement had acted as locum tenent on numerous occasions. In 1951 he married Miss Kathleen Keirle and moved to a new house on the Pilgrim's Way at Kemsing. His death has caused keen distress among his many friends and colleagues, for he was very popular and his reputation as a doctor was deservedly high.

RICHARD COLBY, M.R.C.S., L.R.C.P.

Dr. Richard Colby, who had been in general practice at West Wickham, Kent, for the last 14 years, died at Farnborough Hospital on October 2. He was 47 years of age.

Richard Colby (formerly Kobylinski) was born in Berlin on February 24, 1911, and studied medicine there and at Heidelberg. He was within three months of qualification in 1933 when he was forced to leave Germany on account of Nazi oppression. He came to England, where he had to begin his studies (including those for matriculation) all over again. After receiving his clinical training at St. Bartholomew's Hospital he qualified M.R.C.S., L.R.C.P. in 1940. He then held appointments at Warlingham Park Hospital, Poplar Hospital, and Mayday Hospital, Croydon, before entering general practice at West Wickham in 1944. He was chairman of the Bromley Division of the British Medical Association in 1955-6, and was a member of the Kent local medical committee and medical adviser to the Bromley branch of the Marriage Guidance Council.

K. B., a local colleague, writes: For the past ten years Dr. Richard Colby was associated with the work of the Bromley branch of the Marriage Guidance Council and was its special representative at the yearly and half-yearly conferences arranged by the London headquarters. It was because of his sympathy for all unhappy people that he tackled the work with tremendous enthusiasm and spent many hours both with the couples who came to him and in giving talks so that the work of the council became known. He will be greatly missed by his colleagues and patients.

M. S. writes: Twelve years ago I was invited by Richard Colby to join him in partnership in general practice in West Wickham and Hayes, Kent. During these years I grew to know his personality intimately and to admire his work. He was a man of great zest and enthusiasm for many extra-medical activities. Despite his knowledge that his vascular system was suspect, he spent many of his off-duty hours in working for such causes as refugee relief, the "Save the Children" Fund, the Marriage Guidance Council, and the personal problems of patients and friends. To him the protection and preservation of the welfare of children were of

paramount importance, and he was willing to give of himself for such causes. His own family life was undoubtedly the most happy and united that I have ever met. He leaves a courageous widow, two sons, and a daughter. They will miss him, as shall I and my family, my other partner and his family, and all our patients.

E. C. BEDDOWS, O.B.E., M.C., M.R.C.S., L.R.C.P.

Brigadier E. C. Beddows, who had had a distinguished career in the R.A.M.C., died at Gullane, East Lothian, on October 3. He was 72 years of age.

Edward Charles Beddows was born at Wolverhampton on April 27, 1886, and studied medicine at Birmingham, qualifying M.R.C.S., L.R.C.P. in 1911. After qualification he held house appointments at Birmingham General Hospital before entering the R.A.M.C. as a lieutenant in 1913. Serving in France throughout the first world war, he was awarded the Military Cross in 1915, and in the same year was mentioned in dispatches. Between the two world wars he served in India, Gibraltar, and Shanghai, as well as at home. By the time the second world war broke out in 1939 he had attained the rank of lieutenant-colonel, and was with the British Expeditionary Force in France soon after the war began. Later he took part in the landings in Italy and Sicily. Promoted colonel in 1940, he was assistant director of medical services at No. 6 Base Area in 1943-4; deputy director of medical services for the North Africa District in 1944-5; and assistant director of medical services for the Berlin District in 1945-6. He was wounded at Bari in 1943. He was appointed O.B.E. in 1944 for distinguished services in Italy, and an Officer of the Legion of Merit of the United States of America in 1947. When he retired in 1946 he was granted the honorary rank of brigadier. He leaves a widow.

Medical Notes in Parliament

NEW SESSION'S EMPHASIS ON SOCIAL REFORM

In the new session—possibly the last of the present Parliament—the legislative stage has been set to focus attention on social reform. The Queen's Speech, on October 28, set forth the objective—"It will be the special care of my Government to introduce measures to promote the social well-being of my people"—and some of the method. If the Bill to provide pensions related to earnings is likely to be the most controversial, that to give effect to many of the recommendations of the Royal Commission on Mental Health and to replace the existing law on mental health is likely to occupy the most time. The PRIME MINISTER has indicated that it will be a "large" Bill; and the leader of the Opposition has expressed the hope that there will not be any great controversy about it.

Financing Mental Care

That there will be controversy about the financing of the new arrangements, however, seems certain. In the opening debates of the session two Opposition speakers, Mr. JAMES GRIFFITHS, the deputy leader, and Mr. ARTHUR BLENKINSOP, a former Parliamentary Secretary at the Ministry of Health, have voiced their concern at the likely effect of the block grant system of Exchequer aid on local authorities' resources for this purpose. Mr. Griffiths, with this reservation, promised constructive help and co-operation with the Bill when it comes to the House early next year. But later on the same day (October 29) Mr. Blenkinsop adopted a much sharper approach. To him, the Government were making an "empty promise" unless they produced a better

statement of their intentions about finance than any so far given. The Royal Commission, he said, had made clear their own view that their recommendations could not be carried out effectively unless additional funds were available to enable local authorities to establish community care for the large numbers who ought not to be in mental hospitals and institutions. Some suspected, from what they knew of the discussions that had taken place, that the financial provision would not be present; and they believed that the introduction of the block grant system had destroyed the hope of effective progress in mental health and the care of the aged.

Factories Acts

The promise of legislation to amend and strengthen the Factories Acts, while welcomed, has also revived the Labour Party's grievance about the Government's failure to do anything about the the Gowers Report and so improve the conditions of shop and office workers.

Prison Reform

The increase in crime also received mention in the Speech. "My Government view [it] with gravity. In the light of the most up-to-date knowledge and research they will seek to improve the penal system and to make methods of dealing with offenders more effective." This is a subject on which the HOME SECRETARY has more than once indicated that he proposes to make haste slowly, in order to ensure that the changes shall be soundly based. The first lines of advance are to be drawn—probably in a White Paper, or some similar document—which Mr. Butler will present in a month or two, giving a full picture of what he has in mind. Thereafter there will be a process of testing public opinion, and obtaining the authority and guidance of those engaged in the administration of justice. Early legislation would not be advisable, but some would eventually be necessary.

This emerged from a debate on the subject to which the Commons devoted their time on October 31. The broad indications Mr. BUTLER gave point to an endeavour to secure more adequate treatment of the prisoner as an individual. For this, he said, there was needed a much more precise method of classification, and means to remove the jumbled grouping together of prisoners of all kinds, particularly the young with the old, so that they could be treated in suitable units. This entailed a considerable building programme. In dealing with young offenders the first rule was to preserve elasticity of judgment and diversity of treatment. He had put some ideas, which would in due course require legislation, to the Advisory Council on the Treatment of Offenders. The essential element was that, after sentence, more discretion should be left to the Prison Commissioners, Borstal governors, and others to handle young people as suited to their nature. This would mean for some a quicker period of training, education, redemption, and cure; and for the more obdurate the threat of longer detention. Figures Mr. Butler gave can be briefly summed up: Britain has half as much crime again as before the war. In spite of spectacular peaks and troughs in the statistics, the ground lost since 1939 had never been recovered. This was no sudden crisis, but a deep disorder in society. What was serious was the high rate of crime among young men between 16 and 21, for offences of all kinds. What was encouraging was that children under 14 had a better record than their predecessors, who as adults were now causing such anxiety. These severe problems of society could not be dealt with by the Government alone. They must enlist the co-operation of the whole country, the family, the churches, the schools. He refused to operate on insufficient information, but proposed to do a thorough and lasting job.

Prescription Charges

The speech in which Mr. HAROLD WILSON moved the Opposition amendment on November 3 criticizing the

Government's economic policy, including "taking the lid off" measures against inflation, was barbed with a direct challenge to the Prime Minister on prescription charges. Two years ago, he recalled, when Mr. Macmillan was playing his "Mac the Knife" role as Chancellor of the Exchequer, he introduced a series of mean and vicious cuts of which the worst was the individual prescription charge. They were told at the time that this was essential for fighting inflation. Now the fight was off. The real enemy was recognized as a lack of spending power, not a surplus. To test the sincerity of the Prime Minister—that was how Mr. Wilson introduced his question—would the Government now remove the restrictions?

Rebuilding of Teaching Hospitals

Mr. A. BLENKINSOP (Newcastle upon Tyne, East, Lab.) asked the Minister of Health on November 3 what consultations took place with regional hospital boards regarding plans for the rebuilding of teaching hospitals. Mr. D. WALKER-SMITH.—I rely on boards of governors to consult the appropriate regional hospital boards, who are moreover represented by their own nominees on the boards of governors. Mr. BLENKINSOP, emphasizing that there should be full consultation to avoid wasteful decisions, asked him if he would look into the particular case of the North-east Metropolitan Board, to see if they were consulted about the changed plans for the new Charing Cross Hospital. Mr. WALKER-SMITH accepted the desirability of full consultation in all cases. If Mr. Blenkinsop had any question relating to a specific project he should put a question about it.

Medico-Legal

"INCURABLY OF UNSOUND MIND"

[FROM OUR LEGAL CORRESPONDENT]

By section 1 (1) of the Divorce (Insanity and Desertion) Act, 1958, a person is deemed to be under "care and treatment" for the purposes of section 1 (2) of the Matrimonial Causes Act, 1950, when receiving treatment for mental illness as a resident in hospital without certification. What was said to be the first case under the new section was heard before Mr. Commissioner Latey, Q.C., in the High Court recently, and judgment was given on October 28 (*The Times*, October 29).

The facts were that the parties were married in 1926, and had three children. The wife became a chronic alcoholic, and her condition became so bad in the colonial territory where her husband worked that in March, 1951, after being sent home to England, she was admitted to a mental hospital where she became a voluntary patient. She was transferred to Tone Vale Hospital, and there her condition improved so that in 1952 it was suggested that she might return home under supervision, but her husband, who had the children to look after, did not agree. Accordingly she remained in Tone Vale Hospital as an in-patient. The medical superintendent's evidence was that she was suffering from dementia and that no further improvement was possible, though he did not think she ought to be certified. It was therefore apparent that she had the volition either to stay in the hospital or to leave it.

Meanwhile after some years the husband began to live with his housekeeper, and, wishing to marry her, he petitioned for a dissolution of his marriage on the ground that his wife was incurably of unsound mind and had been under care and treatment continuously for the last five years for her condition.

In his judgment the Commissioner said that with the consent of counsel he had seen the specialist's report on the

wife which, as in all such cases, had been obtained by the Official Solicitor in his capacity of the wife's guardian *ad litem*. This was to the effect that the wife had become feeble-minded and childish, needed much nursing attention, and was in the light of present medical knowledge incurably insane. The Commissioner held therefore that the wife was incurably of unsound mind within the meaning of the section. He added that, in view of the recent policy of extending the range of voluntary patients and de-certifying certified patients, it might be that a large proportion of mental patients whether certified or voluntary would not come under the category of persons incurably of unsound mind within the Act, but each case must be considered on its merits.

The husband in this case got his decree, the Court exercising its discretion in his favour notwithstanding his adultery.

Vital Statistics

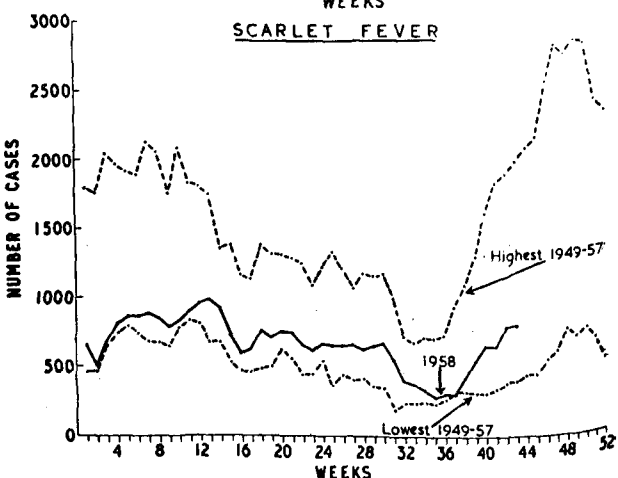
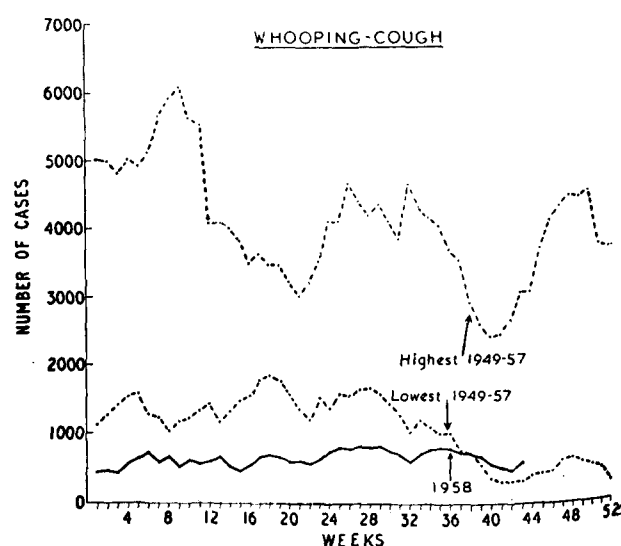
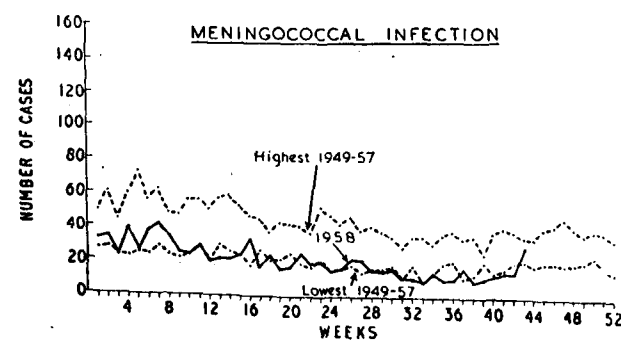
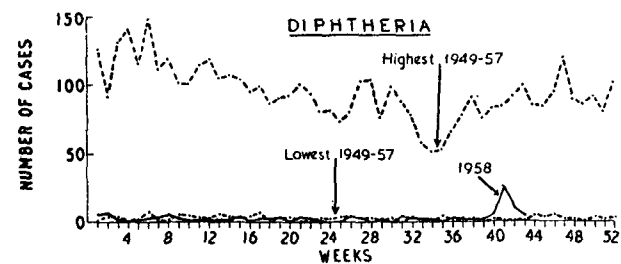
Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in September was 104, compared with 55 in the previous month and 96 in September, 1957.

The numbers of cases of industrial diseases in the United Kingdom reported during September, 1958, were as follows: lead poisoning 4, aniline poisoning 3, compressed air illness 1, epitheliomatous ulceration 14, chrome ulceration 16; total 38. There were 2 deaths from epitheliomatous ulceration, 1 due to pitch and tar, and 1 to mineral oil.—*Ministry of Labour Gazette*, October, 1958.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus - - - - -, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending October 25

The largest fluctuations in the notifications of infectious diseases in England and Wales during the week ending October 25 were increases of 493 for measles, from 3,739 to 4,232, 118 for whooping-cough, from 476 to 594, and decreases of 133 for dysentery, from 658 to 525, and 31 for food-poisoning, from 259 to 228.

The largest rises in the incidence of measles were 88 in Lancashire, from 456 to 544 (Liverpool C.B. 108); 63 in Derbyshire, from 78 to 141 (Chesterfield R.D. 46); 63 in Lincolnshire, from 102 to 165 (Gainsborough U.D. 72); the largest exception to an increasing trend was a fall of 59 in Buckinghamshire, from 88 to 29. The notifications of scarlet fever, 803, were 8 more than in the preceding week, and no large fluctuations were reported in the local returns. A small rise in the incidence of whooping-cough was reported from many areas, but the largest variation in trend was a fall of 24 in Lancashire, from 71 to 47. 4 cases of diphtheria were notified, 6 fewer than in the preceding week, and 3 of these cases were from the outbreak in London.

The notifications of acute poliomyelitis numbered 75, and these cases were 15 more for paralytic and 10 fewer for non-paralytic cases than in the preceding week. The largest returns were in Lancashire 19 (Manchester C.B. 3, Blackpool C.B. 2, Padiham U.D. 2, Burnley R.D. 2); Yorkshire West Riding 11 (Leeds C.B. 4, Bradford C.B. 3, Ripon M.B. 2); London 6 (Fulham 2, Islington 2).

The largest returns for dysentery were Yorkshire West Riding 113 (Huddersfield C.B. 43, Dearne U.D. 28, Huddersfield C.B. 11, Mexborough U.D. 10), London 61 (Islington 17, Battersea 12), Glamorganshire 55 (Rhondda M.B. 23, Barry M.B. 19), Lancashire 47 (Liverpool C.B. 23), and Warwickshire 36 (Coventry C.B. 28).

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending October 18 (No. 42) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	10	6	2	0	3	1	0	2	0	1
Dysentery	658	73	170	9	3	175	14	118	8	7
Encephalitis, acute	2	0	0	0		3	1		1	
Enteric fever:										
Typhoid	4	1	0	0	1	2	0	0	0	0
Paratyphoid	6	1	0	0		7	0	0	0	0
Food-poisoning	259	35	24	1		90	17	57	2	
Infective enteritis or diarrhoea under 2 years				11	34				6	36
Measles*	3,739	198	38	12	139	1,310	27	19	105	12
Meningococcal infection	14	2	7	0		31	1	10	0	1
Ophthalmia neonatorum	19	3	9	0		26	4	3	0	
Pneumonia†	251	18	144	3		2,280	147	957	32	20
Poliomyelitis, acute:										
Paralytic	47	6	12	1	7	64	3	2	4	4
Non-paralytic	23	1				16				
Puerperal fever‡	215	36	16	0		307	40	7	3	1
Scarlet fever	795	70	117	20	27	382	29	34	20	30
Tuberculosis:										
Respiratory	507	70	68	17		529	70	107	16	
Non-respiratory	74	5	14	7		57	5	8	2	
Whooping-cough	476	15	83	49	32	318	20	29	1	14

DEATHS	1958					1957				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0		0	0	0	0
Dysentery	1	1		0			0		0	
Encephalitis, acute		0			0		0		0	
Enteric fever	2	0	0	0			0	0	0	0
Infective enteritis or diarrhoea under 2 years	8	0	1	0	0		0	0	0	1
Influenza	6	1	0	0	0		66	39	26	6
Measles		0	0	0	0		0	0	0	0
Meningococcal infection		0	0				0	0	0	
Pneumonia	345	23	15	14	4		77	61	32	6
Poliomyelitis, acute	6	0	1	0	0		0		0	0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	67	6	3	0	3		4	5	2	2
Non-respiratory		1	0	1	0		0	0	1	0
Whooping-cough	0	0	0	0	0		0	0	0	0
Deaths 0-1 year	255	21	30	6	8		31	26	7	8
Deaths (excluding stillbirths)	8,630	692	543	95	161		958	694	168	154
LIVE BIRTHS	14,208	1182	1092	221	405		1147	1041	212	417
STILLBIRTHS	271	20	24				28	17		

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

Medical News

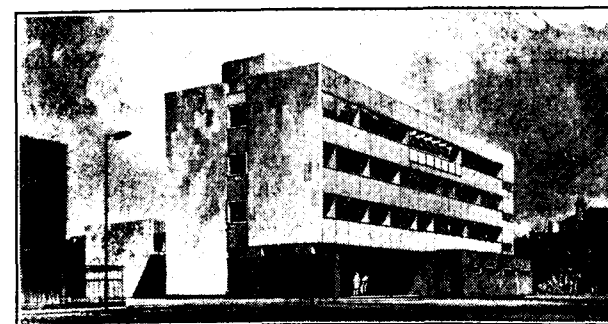
P.R.F.P.S.—Mr. A. H. JACOBS, surgeon-in-charge of the urological department at Glasgow Royal Infirmary, was elected president of the Royal Faculty of Physicians and Surgeons of Glasgow at the annual meeting on November 3. He succeeds Professor STANLEY ALSTEAD.

Royal College of Physicians.—At the quarterly comitia held on October 30, with the president, Professor ROBERT PLATT, in the chair, it was announced that THE QUEEN had accepted the invitation to become Visitor to the College. The following were elected councillors of the College: Dr. W. D. W. BROOKS, Dr. M. I. A. HUNTER, Dr. G. E. GODBER, and Dr. W. H. McMENEMEY. Dr. C. E. NEWMAN was elected to the committee of management of the Conjoint Board. Professor R. PLATT, Sir HAROLD BOLDERO, Dr. R. R. BOMFORD, Dr. G. W. HAYWARD, and Dr. S. R. F. WHITTAKER were elected to the standing joint committee of the three Royal Colleges. The appointment of Dr. L. G. NORMAN as Milroy lecturer for 1960 was announced: his subject would be "The Medical Aspects of the Prevention of Road Accidents." The award of the Gilbert Blane medal to Surgeon Commander W. E. CROCKER, R.N., was announced.

M.R.C.P.—The following, having satisfied the censors' board, were elected Members of the Royal College of Physicians of London:

H. B. Anstall, N. A. Beardwell, D. R. Bell, P. Blackledge, J. H. Briggs, W. C. Cockburn, J. E. Cooper, M. A. Cowan, S. G. Elkington, M. G. Gelder, H. B. Griffith, J. H. Highman, J. R. Hobbs, A. D. Isaacs, Y. K. Lee, W. A. Lishman, M. S. Losowsky, P. E. S. Loubser, T. McKendrick, P. Markman, R. D. Montgomery, P. D. Mulcahy, S. Naimi, K. R. Norton, R. D. G. Peachey, S. Posen, D. D. Reid, P. A. Russell, E. A. Ryan, J. Schneider, D. G. Smith, J. R. Smythies, G. M. Stern, D. W. Sumner, J. R. Tighe, A. E. P. Twort, P. G. Wallis, M. F. R. Waters, D. J. Weatherall, D. N. Whitmore, and F. W. Wright.

Department of Virology, Glasgow.—We reproduce here the architect's drawing for the building of the new department of virology at Glasgow University, of which Professor M. G. P. STOKER was recently appointed as its first head (*Journal*, April 26, p. 1013). This is stated to be the first university department to be devoted solely to the study of



viruses. The institute, designed by Messrs. Basil Spence and Partners, will be at the intersection of Church Street and Moy Street, Glasgow, and is expected to be finished in 1960. The cost is being met from a £225,000 grant from the Scottish Hospital Endowments Research Trust. The institute, besides providing for the department's teaching and research on viruses and virus diseases, will also house a Medical Research Council unit and part of the university department of genetics. The building will be sealed and have a full plenum system of ventilation to facilitate sterility. The basement will be equipped with an electron microscope, dark-rooms, and instrument workshops. On the ground floor there will be an animal block, media and glass-washing rooms, etc. The first and second floors will

provide biochemical and other laboratories, including facilities for chromatography, cytology, and work with radioisotopes, and a classroom. On the top floor there will be a library, offices, and rooms for quiet study.

Gairdner Foundation Awards.—Among the seven recipients of the Gairdner Foundation's first international awards for work on arthritis and heart diseases are Professor W. D. M. PATON (Royal College of Surgeons) and Professor ELEANOR ZAIMIS (Royal Free Hospital). They receive an award of \$5,000 for their discovery of the methonium compounds, "the first drugs to be proven practical and effective in treatment of high blood pressure." The Foundation's award of merit (a prize of \$25,000) is shared between Dr. ALFRED BLALOCK and Dr. HELEN B. TAUSSIG (Johns Hopkins University) for their contributions to cardiac surgery. Other awards of \$5,000 go to Drs. H. M. ROSE and C. RAGAN (New York) for their laboratory test for rheumatoid arthritis, and to Dr. W. G. BIGELOW (Toronto) for his use of hypothermia in cardiac operations. The awards will be presented next May in Toronto, the home city of the Gairdner Foundation.

Human Relations in Industry.—The joint M.R.C.-D.S.I.R. committee on human relations in industry has issued its final report (H.M.S.O., London, price 3s. net). In it the committee reviews the research it has sponsored and indicates the lessons that may be drawn from its experience. Published under the same cover as the "final report" is the report of the joint committee on individual efficiency in industry. This committee, under the chairmanship of Sir FREDERIC BARTLETT, F.R.S., was appointed in 1953 to advise on research in this field.

Norman McAlister Gregg Prize.—The Ophthalmological Society of New South Wales announces that the Norman McAlister Gregg Prize will be awarded in 1959. The prize, which consists of 100 guineas and a bronze medallion, will be awarded to the British subject whose submitted original work, on any subject, is deemed to be the most valuable contribution to knowledge of ophthalmology. Intending candidates should notify Dr. JOHN HORNBROOK, 147, Macquarie Street, Sydney, at least two months before the closing date, which is October 31, 1959.

Christmas Seals.—N.A.P.T. and the National Spastics Society are selling Christmas seals this year. The National Association for the Prevention of Tuberculosis and Diseases of the Chest and Heart offers seals in sheets of 100 different designs illustrating familiar British flowers, price 4s. for 100. The seals are obtainable from Tavistock House North, Tavistock Square, London, W.C.1. The National Spastics Society offers sets of 120 seals in 12 designs, asking 1d. a seal. The seals are obtainable from 28, Fitzroy Square, London, W.1.

Sheffield University.—Dr. M. W. PARTINGTON has been appointed a temporary lecturer in child health. The University also announces a grant of \$8,000 from the Rockefeller Foundation to the department of biochemistry. This will enable the department to buy a refrigerated centrifuge.

London University.—The title of reader in biology in the University of London has been conferred on Dr. H. KALMUS in respect of his post at University College.

U.S. Air Force Surgeon General.—Major-General OLIVER K. NIESS will succeed Major-General DAN C. OGLE as surgeon general of the United States Air Force on December 1.

Sir Harry Platt left on October 30 for a lecture tour in India, Pakistan, and Ceylon arranged by the British Council. He expects to be back early in January.

"Family Doctor."—The November issue includes articles on sleep by Drs. F. R. C. Casson and W. H. S. Wallace, winter clothes by Dr. O. G. Edholm, and the common cold by Dr. K. C. Hutchin. There is also a description of the endocrine glands.

COMING EVENTS

London Medical Exhibition.—At the New Hall of the Royal Horticultural Society, Greycoat Street, Westminster, London, S.W.1, November 10-14 (11 a.m.-6.30 p.m.; on November 13 the time of closing is 7.30 p.m.).

Allergic Disorders.—The British Society for Immunology and the British Association of Allergists will hold a joint symposium on "Immunological Aspects of Allergic Disorders" at the Wellcome Building, Euston Road, on November 14 and 15. Further details from Dr. R. G. WHITE, London Hospital, London, E.1.

Fellowship for Freedom in Medicine.—Annual general and extraordinary general meetings will be held at Caxton Hall, Westminster, at 2 p.m. on November 15.

Charles West Lecture.—Dr. E. MILDRED CREAK will lecture on "Child Health and Child Psychiatry—Neighbour or Colleagues?" on November 18, at 5 p.m., at the Royal College of Physicians, Pall Mall East.

Faculty of Radiologists.—Fourth Crookshank Lecture on "The Contribution of X Rays to the Basic Medical Sciences" will be given by Lord COHEN of BIRKENHEAD on November 21, at 5 p.m., at the Royal College of Surgeons, Lincoln's Inn Fields.

College of General Practitioners.—Symposium on Dyspepsia, November 23, at 10 a.m.-4 p.m. at the Wellcome Building, Euston Road, London, N.W.1.

NEW ISSUES

SPECIALIST JOURNALS AND ABSTRACTS

The journals listed below are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Archives of Disease in Childhood.—Issued six times a year (£4 4s. annually). The new issue, Vol. 33, No. 171, includes:

SEVERE INFANTILE HYPERCALCAEMIA, WITH SPECIAL REFERENCE TO THE FACIES. M. C. Joseph and D. Paton.
CONGENITAL ABSENCE OF THE INTRAHEPATIC BILE DUCTS. Leonard Haas and Richard H. Dobbs.
REPLACEMENT TRANSFUSION AS A MEANS OF PREVENTING KERNICTERUS OF PREMATURITY. V. Mary Crosbie, Patricia G. Wallis, and Anna M. Walsh.
SERUM TRANSAMINASE VARIATIONS IN CHILDHOOD. Paolo Tolentino and Marcella Rossi.

A TEST FOR COELIAC DISEASE. W. W. Payne and V. Jenkinson.
A LONGITUDINAL STUDY OF THE GROWTH AND DEVELOPMENT OF PREMATURELY AND MATURELY BORN CHILDREN.
PART I. INTRODUCTION. Cecil Mary Drillean.
PART II. PHYSICAL DEVELOPMENT. Cecil Mary Drillean.

PANCREATITIS IN YOUNG CHILDREN. J. Collins.
HERPES ZOSTER OPHTHALMICUS IN CHILDREN. S. M. Tucker.
OBSERVATIONS ON THE BROMIDE PARTITION TEST IN THE DIAGNOSIS OF NON-PURULENT MENINGITIS. V. S. Nicol and H. T. Fawcett.
PNEUMATOSIS INTESTINALIS IN CHINESE CHILDREN. C. S. Muir.
PHYSICAL DEVELOPMENT OF SCHOOLGIRLS IN UPPER BURMA. C. V. Foll.
THE PREVALENCE OF DENTAL CARIES IN RELATION TO MATURITY. J. N. Mansbridge.

FAMILIAL DYSAUTONOMIA. T. McKendrick.
AUTOPSY FINDINGS IN A CASE OF PITUITARY DWARFISM. A. T. Sandison.
INSUFFICIENT GLUCURONIDE FORMATION IN THE NEWBORN AND ITS RELATIONSHIP TO THE PATHOGENESIS OF ICTERUS NEONATORUM. M. Vest.
THE FIRST ARCH SYNDROME. J. McKenzie.

British Journal of Industrial Medicine.—Issued four times a year (£3 annually). The new issue (Vol. 15, No. 4) includes:

CANCER OF THE LUNG AND NOSE IN NICKEL WORKERS. Richard Doll.
SOME OBSERVATIONS ON THE INCIDENCE OF RESPIRATORY CANCER IN NICKEL WORKERS. J. Gwynne Morran.
THE PATHOLOGY OF THE LUNGS IN FIVE NICKEL WORKERS. W. Jones Williams.
CHRONIC CHLOROFORM INTOXICATION. P. J. R. Challen, D. E. Hickish, and Joan Bedford.

COUNTING ERRORS DUE TO OVERLAPPING PARTICLES IN THERMAL PRECIPITATOR SAMPLES. S. A. Roach.
RESPIRATORY FUNCTION OF WITWATERSRAND GOLD-MINERS. Saul Zwi and Margaret R. Becklake.
A STATISTICAL STUDY OF COAL-MINING ACCIDENTS. F. D. K. Liddell and Joan May.

ASEPTIC NECROSIS OF BONE IN CAISSON DISEASE. John D. Thomson and Andrew B. Young.
SOME NOTES ON THE EFFECTS OF EXCESSIVE NOISE ON THE HEARING OF A GROUP OF WORKERS. G. F. Keatinge and S. Lancr.
AN INVESTIGATION OF SOME HEALTH HAZARDS IN AN INERT-GAS TUNGSTEN-ARC WELDING-SHOP. P. J. R. Challen, D. E. Hickish, and Joan Bedford.

THE ESTIMATION OF GASEOUS ACID IN DOMESTIC PREMISES. J. J. Phair.
R. J. Shephard, G. C. R. Carey, and M. L. Thomson.
QUARRY BANK MILL: I THE STORY OF THE MILL. Robert Murray.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, November 10

GUY'S HOSPITAL.—At Anatomy Lecture Theatre, 5.15 p.m., lecture-demonstration in endocrinology by Dr. P. M. F. Bishop: Hypothyroidism. Guest speaker, Professor D. Hubble.

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Chelsea Hospital for Women, 4.30 p.m., Guest lecture by Miss G. Hill: Menorrhagia.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. B. Ackner: Psychiatric Aspects of Organic Cerebral Disease.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, Gower Street, W.C.1, 5 p.m., Dr. J. R. Postgate: Sulphur Bacteria—Reductive Stages of the Bacterial Sulphur Cycle.

Tuesday, November 11

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—8 p.m., Dr. Edward Glover: Psycho-analysis and Modern Social Medicine.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. F. Borrie: Circulatory and Vascular Reactions.

MANCHESTER MEDICAL SOCIETY: SECTION OF SURGERY.—At Clinical Sciences Building, York Place, 7.30 for 8 p.m., Dr. J. K. Steward: Tumours in Childhood.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—4 p.m., Blackham Lecture, 1958, by Brigadier Sir John Boyd, Kt., F.R.S.: Yellow Fever and its Prevention. (Illustrated.)

ST. ANDREWS UNIVERSITY.—At Physiology Department Lecture Theatre, 5 p.m., Dr. H. D. Allwood: Investigation of Pulmonary Embolism.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Dr. George Crosby: Gynaecology in General Practice.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C.1, 5.30 p.m., Professor J. F. Danielli, F.R.S.: Generalized Cell Theory and its Relevance to Certain Problems of Drug Action.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. G. A. D. Gordon: Neuro-radiological Investigations.

Wednesday, November 12

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Virus Diseases.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. A. M. C. Macpherson: Some Chest Diseases in Childhood.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. J. D. Fergusson: Prostatic Cancer.

MANCHESTER MEDICAL SOCIETY.—At Physiology Theatre, Manchester University, 4.30 for 5 p.m., Dr. A. F. Rogers: A Doctor in Antarctica.

● NATIONAL COLLEGE OF RUBBER TECHNOLOGY, Northern Polytechnic, Holloway Road, N.—6.30 p.m., Professor C. G. Rob: Synthetic Materials in Vascular Surgery.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Guest Lecture by Professor C. H. Gray: Role of the Endocrine Organs in Diabetes Mellitus.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Weild Lecture by Professor D. W. Smithers: On the Pathogenesis of Cancer.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Mr. H. Beric Wright: Environmental Medicine in Industry.

Thursday, November 13

HONEYMAN GILLESPIE LECTURES.—At Anatomy Theatre, University New Buildings, Teviot Place, Edinburgh, 5 p.m., Professor G. I. Scott: Optic Nerves.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Robert Jones Lecture by Mr. Norman Capener: Spondylolisthesis: Spinal Strain.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION: PSYCHOTHERAPY AND SOCIAL PSYCHIATRY SECTION.—At 11, Chandos Street, Cavendish Square, W., 8 p.m., Dr. E. B. Strauss: Value of Narcoanalysis in Psychiatric Practice.

Dr. W. A. H. Stevenson and Dr. R. A. Sandison will take part in the discussion.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—At Royal Society of Medicine, 2.15 p.m., Maudsley Lecture by Dr. Leo Kanner (Baltimore): Trends in Child Psychiatry.

ST. ANDREWS UNIVERSITY.—At Physiology Department Lecture Theatre, 5 p.m., Professor H. Gruneberg, F.R.S.: Causes of Congenital Defects.

Friday, November 14

BIOCHEMICAL SOCIETY.—At National Institute of Medical Research, Ridge-way, Mill Hill, N.W.1, 2 p.m., 377th meeting.

HILL END HOSPITAL CLINICAL SOCIETY.—At Hill End Hospital, St. Albans, 8.30 p.m., talk by Dr. R. Robertson. Members of Mid-Herts Division, B.M.A., are invited.

● INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. S. C. Gold: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. E. H. Hudson: clinical demonstration.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—4.30 p.m., Annual Address by T. G. Wilson: Modern Treatment of Deafness in Historical Perspective.

PLYMOUTH MEDICAL SOCIETY.—At Freedom Fields, 8.30 p.m., joint meeting with Plymouth Division, B.M.A. Mr. T. Holmes Sellers: Thoracic Surgery.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 10 a.m., Guest lecture by Professor W. C. Wilson: Ins and Outs of Surgical Practice. (2) 4 p.m., Guest lecture by Professor W. M. Arnott: Regional Distribution of Blood Flow in Low Output Syndromes.

Saturday, November 15

KENT PAEDIATRIC AND CHILD HEALTH SOCIETY.—At Children's Department, Farnborough Hospital, Kent, 3 p.m., Dr. Peter Scott: Crime and Adolescence.

Sunday, November 16

MANCHESTER UNIVERSITY: FACULTY OF MEDICINE AND NORTH-WEST ENGLAND FACULTY, COLLEGE OF GENERAL PRACTITIONERS.—At Theatre 1, England Sciences Building, York Place, 11 a.m., Mr. Gordon Jack and Dr. F. W. A. Turnbull: Influence of Modern Advances on One's Approach to Chest Disease.

APPOINTMENTS

BIRMINGHAM REGIONAL HOSPITAL BOARD.—T. L. Pilkington, M.R.C.S., L.R.C.P., D.P.M., Whole-time Consultant Psychiatrist and Deputy Medical Superintendent to Lea Colony, Bromsgrove, and Lea Castle Colony, Kidderminster; N. K. Shinton, M.B., Ch.B., M.R.C.P., Whole-time Consultant Pathologist to the Coventry Group of Hospitals; W. N. Boyd, M.B., Ch.B., F.R.C.S.Ed., D.M.R.D., Part-time Consultant Radiologist to the Stoke-on-Trent Group of Hospitals; J. A. Litchfield, M.D., M.R.C.P., Part-time Consultant Physician (Geriatrics) to the Mid-Worcestershire Group of Hospitals; A. V. Jenkins, M.B., B.S., F.F.A.R.C.S., Whole-time Consultant Anaesthetist to Birmingham (Selly Oak) group of hospitals; W. Sewell, F.R.C.S., Part-time Consultant Surgeon (seven notional half-days weekly) to Stoke-on-Trent group of hospitals; H. S. Trafford, M.B., Ch.B., F.R.C.S.Ed., D.Obst.R.C.O.G., Whole-time Consultant Surgeon to Stoke-on-Trent group of hospitals.

FREED LOUIS F., M.A., M.D., D.Phil., D.P.M., F.R.S.S.Afr., of Johannesburg, South African Editor of *Vita Humana*, international journal of human development. Dr. Freed is lecturer in the Department of Psychiatry of the University of the Witwatersrand.

FRIZELLE, G. M., T.D., M.D., D.P.H., Medical Officer of Health, East Hertfordshire Combined Districts.

GATHERER, ALEXANDER, M.B., Ch.B., D.P.H., Deputy Medical Officer of Health and Deputy Principal School Medical Officer to the County Borough of Warrington.

HOARE, E. D., M.D., Director of Department of Clinical Pathology at the London Clinic.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—Marion V. Miles, M.R.C.S., L.R.C.P., D.C.H., House-physician; E. J. Guthrie, M.B., B.Ch., House-surgeon to Orthopaedic and Plastic Departments; D. Y. Mackenzie, M.D., M.R.C.P., D.C.H., Registrar to Departments of Physical Medicine; A. Birch, M.B., Ch.B., F.R.C.S.Ed., Registrar Medical Registrar; Dorcen A. Birch, M.B., Ch.B., F.R.C.S.Ed., Registrar to Ear, Nose, and Throat Department; D. E. Sturdy, M.B., B.S., F.R.C.S., Surgical Registrar; Alice E. M. Van Waterschoot, M.B., B.S., D.Obst.R.C.O.G., D.A., Junior Anaesthetic Registrar.

LIVERPOOL REGIONAL HOSPITAL BOARD.—J. K. Wilson, M.D., M.R.C.O.G., D.Obst.R.C.O.G., Part-time Consultant Obstetrician and Gynaecologist for two sessions per week at Ormskirk County Hospital; A. S. Woodcock, M.D., Consultant Pathologist (whole-time or maximum part-time sessions) at M.D., Consultant Pathologist; H. E. Parry, M.B., B.S., M.R.C.P., Whiston and Ranshill Hospitals; P. B. O'Neill, M.B., B.S., F.R.C.S., D.C.H., Whole-time Consultant Physician and Deputy Medical Superintendent (Resident) at Fazakerley Hospital; P. B. O'Neill, M.B., B.S., F.R.C.S., D.L.O., Part-time Consultant Otorhinolaryngologist for seven sessions at D.L.O., Part-time Consultant Otorhinolaryngologist for five sessions at St. Helens, Warrington, Ormskirk, and Runcorn areas; W. M. Owen, M.B., B.S., F.R.C.S., D.L.O., Part-time Consultant Otorhinolaryngologist for two sessions at Clatterbridge and Wirral Hospitals; J. Siegler, M.B., B.S., F.R.C.S., D.L.O., Assistant Consultant Otorhinolaryngologist for two sessions at Bootle, Walton, and John Bagot Hospitals; C. M. Ogilvie, M.D., M.R.C.P., Part-time Consultant Physician for four sessions in the Regional Thoracic Surgery Unit at Broadgreen Hospital; E. Walker, M.D., D.P.H., D.M.R.D., Part-time Consultant Radiologist for four sessions at Sefton General Hospital; I. M. Cuthill, M.B., Ch.B., M.R.C.P.Ed., Whole-time Assistant Chest Physician in the Chester and District area.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Durber.—On September 16, 1958, at the City General Hospital, Stoke-upon-Trent, Staffs, to Phyllis (formerly Walton), wife of Dr. C. E. Durber, a sister for Peter and David—Penelope Joy.

Mitchell.—On October 26, 1958, at Scunthorpe Maternity Home, to Drs. W. P. and Jane (formerly Higson) Mitchell, of High Street, Belton, Doncaster, Yorks, a son.

O'Kelly.—On October 10, 1958, at Farnborough, Hants, to Dorothy Mary, S.R.N., S.C.M., wife of Captain Frank O'Kelly, R.A.M.C., a brother for Margaret and Julie.

DEATHS

Chapman.—On October 16, 1958, at Hastings, Sussex, Donald Poyntz Chapman, M.R.C.S., L.R.C.P., of Wingarth, Tydehams, Newbury, Berks, Surgeon Commander, R.N. (retired), aged 82.

Dobson.—On October 12, 1958, at The House, Warrington Hospital, Appley Bridge, near Wigan, Lancs, Jonathan Dobson, F.R.C.S., aged 51.

Druitt.—On October 12, 1958, Daniel Cuthbert Druitt, M.R.C.S., L.R.C.P., of Glencables, Petworth, Sussex, aged 74.

Fraser.—On October 14, 1958, in a nursing-home, Bournemouth, Hants, Sarah Louise Fraser, M.B.E., M.D., late of York, aged 84.

Fridjohn.—On October 14, 1958, at Ellaston, Ham Common, Richmond, Surrey, Maurice Henry Fridjohn, M.D., aged 54.

Hill.—On October 8, 1958, at Rosedene, 56, Buckingham Way, Wallington, Surrey, Robert McCowan Hill, D.S.O., M.B., Ch.B., aged 75.

Julian.—On August 19, 1958, Frederick Bennett Julian, M.C., M.B., B.Ch., M.Sc., of Hatton House, Mather Avenue, Liverpool, aged 65.

Lamont.—On September 3, 1958, at Seaton, Devon, Charles Antony Lamont (formerly Lavery), M.B., Ch.B., F.R.F.P.S., late Squadron Leader, R.C.A.F.

Lewin.—On October 16, 1958, at Mole Cottage, Great Molewood, Hertford, George Lewin, M.B., B.S., late of 1, Haling Park Road, South Croydon, aged 82.

Mackenna.—On October 16, 1958, at Mansion House Road, Paisley, John George Mackenna, M.B., Ch.B., D.P.H.

Miller.—On October 11, 1958, at 34, Clarendon Court, London, W., Arthur Alphonse Miller, F.R.C.S.Ed., D.L.O., of 20, Harley Street, London, W.

Ockwell.—On October 17, 1958, at Guy's Hospital, London, E.C., Charles Melton Ockwell, M.D., F.R.C.S., D.P.H., of The Coppice, Pilgrim's Way, Kensing, Kent, aged 74.

Paterson.—On October 2, 1958, at 140, Mugdock Road, Milngavie, Glasgow, Robert Lamb Paterson, M.B., Ch.B., D.P.H., late of Suienkama, South Africa.

Popham.—On October 9, 1958, Cyril Popham, O.B.E., L.R.C.P.&S.I., L.R.F.P.S., Colonel, late R.A.M.C., of Centre Oak, Blackwater, Camberley, Surrey.

Wakefield.—On October 4, 1958, at Birklands, Kendal, Westmorland, Roger William Wakefield, M.B., B.Ch., J.P., aged 92.

Widdup.—On October 6, 1958, in Australia, Alec Harley Widdup, M.B., B.Chir., formerly of Thornton-in-Craven, Skipton, Yorks.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

P.A.S. and Pulmonary Tuberculosis

Q.—Is calcium B-P.A.S. as effective in the treatment of pulmonary tuberculosis as sodium P.A.S.?

A.—The most important effect of P.A.S. and its analogues in the treatment of pulmonary tuberculosis consists in its ability, when given in combination with streptomycin or isoniazid, to diminish the liability to the emergence of strains of tubercle bacilli resistant to the other drugs. The therapeutic effect of P.A.S. alone is considerably less than that of the other two commonly used drugs. There is good evidence that tolerable doses of sodium P.A.S. are effective in this respect.^{1,2} The best way of estimating the effectiveness of any alternative preparation to the sodium salt of P.A.S. is therefore to determine whether, when given in combination with streptomycin or isoniazid to patients whose organisms are known to be sensitive to the drugs used, it prevents the emergence of drug-resistant organisms. Evidence on this point is difficult to obtain, but Lewis³ has reported 39 patients who were admitted to hospital with pulmonary tuberculosis and were treated with calcium benzamidosalicylate (Ca B-P.A.S.) with streptomycin or isoniazid for a period of at least two months. Of these, at least 20 subsequently produced tubercle bacilli with impaired sensitivity to one or more of the standard drugs. Since some of these patients had been treated as out-patients, it was possible that not all of them had taken the prescribed drugs conscientiously, and drug sensitivity tests had not been done in most of them before treatment was begun. However, seven of them were known to have taken the drugs conscientiously and to have had sensitive organisms before Ca B-P.A.S. was given. In three of these bacilli resistant to isoniazid or streptomycin emerged, and in two more sputum remained positive after six or eight months of treatment, although sensitivity tests were not done. These results indicate that, in the commonly used dose of 14 g. a day, Ca B-P.A.S. is ineffective in preventing the emergence of organisms resistant to streptomycin or isoniazid. Undissociated B-P.A.S. is very much less active than P.A.S.⁴ and its therapeutic activity therefore depends upon its conversion to P.A.S. Lewis points out that, assuming complete hydrolysis of Ca B-P.A.S. and with the knowledge that only about 60% of an oral dose is absorbed from the gut, the dose of Ca B-P.A.S. which would correspond with the dose of sodium P.A.S. known to be effective in preventing emergence of resistance to streptomycin is no less than 48 g. daily. This is far above the customarily used dose, and it is doubtful if it would be tolerated any better than the normal dose of sodium P.A.S.

REFERENCES

- 1 Medical Research Council, *Brit. med. J.*, 1953, 2, 1005.
- 2 — *ibid.*, 1955, 1, 435.
- 3 Lewis, D. O., *Tubercle (Lond.)*, 1958, 39, 247.
- 4 Schönholzer, G., Laeuner, H., and Hurni, H., *Schweiz. med. Wschr.*, 1955, 85, 222.

Oedema in Pre-eclampsia

Q.—Is it necessary to restrict the fluid intake in the control of oedema in pre-eclampsia?

A.—The best method of controlling the oedema of pre-eclampsia remains in doubt. Indeed, it is not established that the control of oedema *per se* by any method is of value. It is, nevertheless, usually attempted.

If the oedema is associated with sodium retention, as is generally believed to be the case in pre-eclampsia, the complete elimination of sodium from the diet is theoretically all that is necessary. In fact, however, a sodium-free diet is impracticable. It is therefore usual to compromise by

restricting both sodium and fluid. The avoidance of fluid to the extent of causing dehydration could be harmful and even result in uraemia. This is unlikely to happen in a waterlogged patient, in whom experience shows it to be safe to reduce the intake of fluid to 20 oz. (0.6 l.) in 24 hours. Moreover, no harm can result when the amount of fluid allowed is related to the output of urine, this being the usual clinical guide. The recently introduced orally administered saluretics (e.g., acetazolamide and chlorothiazide), unlike the older mercurial diuretics given by injection, do control the oedema of toxæmia. Chlorothiazide acts by increasing chloride excretion and this in turn raises the sodium output. It also has a less important action as a carbonic anhydrase inhibiting factor. This new drug is therefore being used without restricting the patient's intake of either fluid or sodium. However, in the presence of liver damage (and especially if the sodium intake is restricted) chlorothiazide can produce dangerous hypokalaemia.¹ There is, therefore, some reason to question the advisability of using this drug in the treatment of pregnancy toxæmia unless the patient is having potassium supplements and is in a hospital, where the electrolyte balance can be constantly controlled. Even then its value is doubtful. Although it may improve maternal oedema it does not—as judged by foetal survival rates—benefit significantly the underlying disease.²

There is at present probably no better method of controlling the oedema of pre-eclampsia than by physical rest (which is indicated on other grounds and which in itself promotes elimination of fluid), by reasonable restriction of the intake of fluid and sodium, and possibly by administering a simple sodium replacement diuretic such as ammonium chloride.

REFERENCES

- 1 Read, A. E., Haslam, R. D., Laidlaw, J., and Sherlock, S., *Brit. med. J.*, 1958, 1, 963.
- 2 Bayliss, R. I. S., *Practitioner*, 1958, 181, 216.

Treatment of Rabies

Q.—Where may supplies of rabies vaccine and serum be obtained in England and Wales?

A.—A Ministry of Health memorandum (H.M.(58)66), August, 1958, lists the following centres as holding supplies of rabies vaccine (for active immunization) and serum (for immediate passive protection) for the treatment of rabies.

London.—Central Public Health Laboratory, Colindale Avenue, N.W.9 (Colindale 7041).

Newcastle.—Public Health Laboratory, or Institute of Pathology, General Hospital, Westgate Road, Newcastle, 4 (Newcastle 38811).

Liverpool.—Public Health Laboratory, 126, Mount Pleasant, Liverpool (Royal 3636).

Wales.—Public Health Laboratory, Institute of Preventive Medicine, The Parade, Cardiff (Cardiff 29110 and 23967).

Collected Articles from the "British Medical Journal"

The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

- Emergencies in General Practice* (26s. 9d.).
- Refresher Course for General Practitioners*, Volumes 2 and 3 (26s. 9d.).
- Clinical Pathology in General Practice* (22s. 3d.).
- Any Questions?*, Volumes 2 and 3 (8s. 3d. each).

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Alitology, Westcent, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. ADVERTISEMENTS should be addressed to the Advertisement Director, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Westcent, London*. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra, Westcent, London*. B.M.A. SCOTTISH OFFICE: 7, Drumshugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 15 1958

LATE RESULTS OF OPERATIONS FOR FALLOT'S TETRALOGY

BY

MAURICE CAMPBELL, D.M., F.R.C.P.

From the Cardiac Department, Guy's Hospital, and the Institute of Cardiology, London

Fallot's tetralogy is the most common form of morbus caeruleus: its frequency was mentioned by Peacock in his excellent account in 1866. Its surgical treatment is therefore of great importance, and three methods are now available: (1) subclavian-pulmonary anastomosis or some modification of this; (2) Brock's direct operations of pulmonary valvotomy or infundibular resection or both; and, more recently, (3) open operation with closure of the ventricular septal defect and relief of the stenosis.

This paper describes the results of the first two methods, but I am able to mention my first patient, on whom Sir Russell Brock used the third method in October, 1956. A girl who was aged 4 at the time of her operation, and who was deeply cyanosed and could walk only 30 yards, is now acyanotic and can run about freely with other children, so that symptomatically she could hardly be better. The result, however, is not ideal, for, though her ventricular septal defect seems to have been closed, she still has some stenosis, with a larger heart and right bundle-branch block.

Clearly this third method is the only cure, and will become standard treatment when the present difficulties have been surmounted. The results of anastomotic operations may then be mainly of historic interest, but will serve as a comparison with the results of open operation after another ten years. Valvotomy and infundibular resection will, of course, remain an essential part of any surgical treatment, so that the success they can achieve is of great interest.

Inevitably, as time passes, the child who has had a successful operation for Fallot's tetralogy tends to be compared with the normal child of his age and less with the severely disabled child he was, both by the patient and his parents and by the physician as well. To this extent there is less enthusiasm than at first, and sometimes it needs to be remembered how many patients are leading normal quiet lives at school or at work who previously had no such prospect. This change of attitude is even more important when the patient was only somewhat improved; parents who were delighted at first think mainly of the great disability that remains after a few years.

ANASTOMOTIC OPERATIONS

All types of morbus caeruleus were included in our previous report of the results of 200 anastomotic operations (Campbell and Deuchar, 1953). This makes the conclusions less precise and less easy to follow, so here we are considering only those diagnosed as Fallot's tetra-

logy: this still includes some where necropsy revealed more complex lesions, but it excludes those with pulmonary atresia or tricuspid atresia where the results are not so good.

After this modification there are 130 patients who obtained good or very good results—127 from the start and 3 from later who were originally classed as "improved" only (see Table I). Those in whom the results

TABLE I.—Early Results of Anastomotic Operations

	No.	Died at Operation	No Op. Possible	No Im-provement	Slight Im-provement	Good	Very Good
Fallot's tetralogy	165	14	4	5	15-3*	33+3	94
Pulmonary atresia	19	6	5	0	3	3	2
Other conditions	16	4	2	1	1	3	5
	200	24	11	6	19	39	101

* Three of these subsequently achieved good results, making 130 (94+33+3) whose further progress is considered.

of operation were good and those in whom they were very good have behaved in much the same way, and it is simpler to take them together.

During the period covered in our previous report, up to four years after operation, few of the patients with good results had relapsed. During the subsequent four years we became less satisfied, for several returned to hospital having lost all their improvement. A further follow-up has been more reassuring, for we had seen nearly all those who were doing badly but few of those who were doing well, as they had felt no need to attend hospital.

Of the 130 who obtained good results, we have seen 126 recently or have had reports from them or their doctors. Eight of these (6%) have died and 17 (14%) have lost much or all of their improvement, but 101 (80%) are as good or nearly as good as they were. These have been followed for an average period of over seven and a half years: 11 are well after ten years, 10 after nine years, 28 after eight years, 36 after seven years, and 16 after six years.

Good Results Maintained

Most of these 101 patients have kept all their improvement, though seven have lost some of it—enough for the results to be called good rather than very good. The first 10 patients, most of whom were very disabled before operation (Campbell, 1948), have their cases described briefly to illustrate the results, which were very good in the first five but more varied in the second five. None of them, except Case A5, has an unduly large heart, and all show less

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anoxaemia and lower haemoglobin percentages (see Table II), the average of the first five being 104 instead of 136%, though generally they are still a little cyanotic. It is only fair to add that Mr. Alfred Blalock was working at Guy's Hospital and performed some of these first operations, lest others feel that their start was not so successful. The

TABLE II.—Changes in Heart Size and Haemoglobin Percentage in Patients Who Have Done Well for 9 or 10 Years After Anastomotic Operations

Case No.	Heart Size (Cardiothoracic Ratio)						Haemoglobin (%)		
	Before Op.	1 Yr.	3 Yr.	5 Yr.	7 Yr.	9 or 10 Yr.	Before Op.	After 4 Yr.	After 9 or 10 Yr.
A1	50	53	53	54	55	55	126	91	110
A2	44	52	53	53	54	53	120	95	98
A3	51	55	55	54	53	52	133	85	114
A4	44	56	55	53	54	54	152	84	103
A5	52	60	65	67	66	65	150	80	95
A13	45	47	48	49	49	50	150	120	122
A16*	52	53	53	52	53	52	130	90	98
A20	47	52	53	53	53	50	110	100	105
A23*	43	48	48	49	50	51	130	85	95
A24	45	53	53	52	52	51	148	95	105
Average	47.3	52.9	53.6	53.6	53.9	53.3	135	93	104
Average of 50 cases	49.8	—	53.9	—	—	53.7	132	104	111

* A = anastomosis.

These two patients were in good health after 9 years but died in the tenth year from cerebral abscess.

ages given are those at the time of operation unless otherwise stated. The prefix "A" indicates anastomotic operations.

Case A1.—A boy aged 7 was enabled to lead a normal life at school except for games. After ten years he can walk five miles and get about his father's farm most of the day, but would find it difficult to earn his living on a farm and is still a little cyanotic.

Case A2.—A boy aged 13; now leads a normal quiet life and is married. For two years he worked long hours in a garage but found this hard, and is now in an accountant's office. His colour looks normal.

Case A3.—A boy aged 3; is now leading a normal school life, except for football. He can walk five miles and can run and play cricket. He has minimal cyanosis.

Case A4.—A boy aged 11 could not walk more than 50 yards, but now walks 10 to 15 miles and his colour is almost normal.

Case A5.—A girl aged 6 could not walk more than 25 yards.

After ten years she attends school regularly but has to take things at her own pace. The heart became much larger, but not progressively so.

Case A6.—A girl aged 3 lost her improvement when the anastomosis closed in the seventh year (see below).

Case A7.—A boy aged 7 was very well when his family emigrated to Canada after two years.

Case A8.—A student aged 25 was less disabled than most. He has done well as regards his heart, but has been handicapped by the effects of a cerebral thrombosis after operation and by tuberculosis of the lungs.

Case A9.—A girl aged 5 was greatly improved and the operation probably saved her life, but four years later she was still disabled enough to need a second operation.

Case A10.—A boy aged 3 has continued to do well. In the tenth year he had bacterial endocarditis, but has not lost any ground after it.

Most of these patients were children, who on the whole do best after operation, but some adults do very well. Generally, if patients over 20 can earn their living the obstruction to the pulmonary flow cannot be great, and I have thought it better for them to carry on without operation. However, one man aged 20 who had never worked is now employed regularly as a painter and decorator, and can walk as far as he wants; another, aged 26, is so much better that he sometimes plays football in addition to doing his regular work; both have remained well for six years.

Some patients included among the good results are not as good as the best of these. They cannot do so much and show obvious cyanosis: a doctor seeing them for the first time would diagnose Fallot's tetralogy and might think they needed surgical treatment. Of three such patients, the first is not as well as he was and the other two are still examples of fairly severe Fallot's tetralogy (see bottom of Table II), but it is difficult not to call the results good when two who could not walk 50 yards before operation can now earn a living and the third can attend an ordinary school and walk much further than before.

Case A62.—A boy aged 6 lost some of his improvement after six years and the haemoglobin rose again; but after nine years he is earning his living and can walk a quarter of a mile, instead of 50 yards before operation.

Case A55.—A boy aged 11 was deeply cyanosed and could walk only 50 yards. Nine years later he is doing clerical work and can walk two miles, although his haemoglobin has risen again. He would be better if he had a larger blood flow to the lungs, but his heart might not be able to cope with this, as it has always been rather large.

Case A83.—A girl aged 6 had severe cyanotic attacks and could walk only 400 yards. After operation she could walk two

miles and attend an ordinary school, but her colour and her haemoglobin did not improve much. After nine years she is almost as well, but is less contented because she cannot keep up with her friends.

Some patients who obtained a good result as regards their heart are handicapped in other ways. For example, one has some residual disability from post-operative cerebral thrombosis, another from a cerebral abscess, and a third from bronchiectasis. Two are dissatisfied because they are unable to work since leaving school, but this is because they are not intelligent enough to overcome their lack of schooling, and not because the heart has become worse.

Many of the patients are better in summer and can do much less on cold days in winter. Apart from this, any suspicion of deterioration has generally been confirmed by the subsequent course. However, two patients who were thought to be losing ground in the third and fourth years—a period of rapid growth—are as well as ever after seven years.

Good Results Lost

These patients have been divided into three groups: (a) those who have died, (b) those who have lost all their improvement, and (c) those who have lost much of it. The loss is not always due to the anastomosis closing.

Eight Patients Who Have Died

In our earlier report three had died (the fourth included there had tricuspid atresia). When we started this longer follow-up only two more had died, but during the tenth year three who were in excellent health after nine years have died. This may be chance, but shows the need for a long follow-up to get a reliable picture.

Of the three first, a woman aged 20 died suddenly in the street 18 months after operation, no obvious cause being found at necropsy; a girl aged 7 died unexpectedly from pulmonary oedema while on holiday 37 months after operation; and a boy aged 3 died with a cerebral abscess in the third year after.

Of the next two, a boy aged 11 remained well until he had acute nephritis in the sixth year; he recovered, and his blood pressure, which had risen to 170/130, returned to 120/90 mm., but five months later he died at home, probably from a recurrence of the nephritis. Our oldest patient, aged 35, did well for seven years, but then died with carcinoma of the bronchus.

The last three are particularly disappointing, for they had been leading active lives with few symptoms, and when examined nine years after their operation only one had signs that caused any anxiety—anaemia and a large heart; yet they died within a year. Two of them, boys aged 6 and 19, died from cerebral abscesses, both in the tenth year (Cases A16 and A23): the latter had made a good recovery after operation for a cerebral abscess at a different site seven years previously. The last, a girl aged 6, did very well, but her heart became much larger than usual (c.t.r. 47–60%). After nine years it was still larger (Fig. 1), but we hoped part of this was due to her anaemia (haemoglobin 71%) and might be reversed by

treatment. Nine months later, however, she was admitted with sudden severe dyspnoea, congestive failure, and anaemia: she seemed to be recovering, but became more breathless and vomited, and died suddenly a few hours later. At necropsy the immediate cause was a mesenteric thrombosis, but she should be regarded as dying from heart failure (Case A25).

Rather surprisingly, none of these patients showed any cardiac deterioration until their terminal illness; we have no reason to think that the anastomosis had closed, and have necropsy proof that it was open in five of the eight. One death from carcinoma of the bronchus was quite incidental and one from nephritis may or may not have been, for we find nephritis rather common in these patients; three were from cerebral abscess; and only three from some form of heart failure.

As the average period of follow-up for all our patients is over seven years, this is a mortality of about 1% per annum. In those who have died the average period after operation was just over three years in four and just under nine years in four.

Loss of All Improvement

Ten other patients have lost all their improvement. When the loss has taken place fairly suddenly—though sometimes in more than one stage—and the continuous murmur can no longer be heard, the reason is clear and in several operation or necropsy confirmed that the anastomosis had closed. This happened in the first five patients shown in Table III, and they reverted to the same state as before operation.

When the loss is gradual it is more difficult to explain in this way, and Case 45 was becoming worse for four years before there was any noticeable change in the continuous murmur: it seems that the stenosis was becoming more severe and that only towards the end was the anastomosis nearly closed. In the last four patients, however, the continuous murmur could be heard as well as before: we think they were showing the natural tendency for the stenosis of Fallot's tetralogy to become more severe, though in some the anastomosis was probably carrying less blood than it had originally.

In all these patients the haemoglobin percentage had risen again—in all but one to about its original level (see Table III). In four of the six where we know about the heart size, it had become smaller again, and in three of these the anastomosis was known to have closed. When the haemoglobin rises to its original level and the heart becomes smaller the anastomosis has probably closed. Short descriptions of these patients follow: four of them have obtained good results after subsequent direct operations.

Case A6.—A girl aged 3 lost nearly all her improvement suddenly after pneumonia in the seventh year. The anastomosis was thought to have thrombosed.

Case A15.—A boy aged 10 did well till he had three epileptiform fits in the fifth year: during the next two years he lost ground and the continuous murmur became inaudible. He died after pulmonary valvotomy, with cerebral softening; at necropsy the anastomosis had closed.

TABLE III.—Some Details of Patients who Lost All the Improvement Produced by Anastomotic Operations

Case No.	Anastomosis	Time of Deterioration	Hb Percentage			Heart Size (c.t.r.)			Remarks
			Before Op.	After Op.	Final	Before Op.	After Op.	Final	
A6	Closed	7th year, after pneumonia	157	110	141	49	54	51	2nd op. Good
A15	"	5th and 6th years	142	109	150	48	50	45	" Died
A44	"	7th partly; 9th year all	142	102	130	Erratic			" Good
A143	"	5th year during 5 months	100*	105	130	46	48	—	" "
A147	"	5th year slightly; 6th mainly	143	90	119	41	43	—	" "
A45	Nearly closed	5th to 7th years gradual	117	103	139	54	55	42	" Died
A40	Open	6th year partly; 7th all, after pneumonia	140	104	148	51	54	57	" Good
A47	"	5th and 6th years	136	—	—	50	—	—	" "
A54	Open	7th year mainly	100*	101	129	53	56	53	" "
A82	"	5th to 7th years, after nephritis	130	108	120	47	47	57	" Died

* Presumably anaemic.

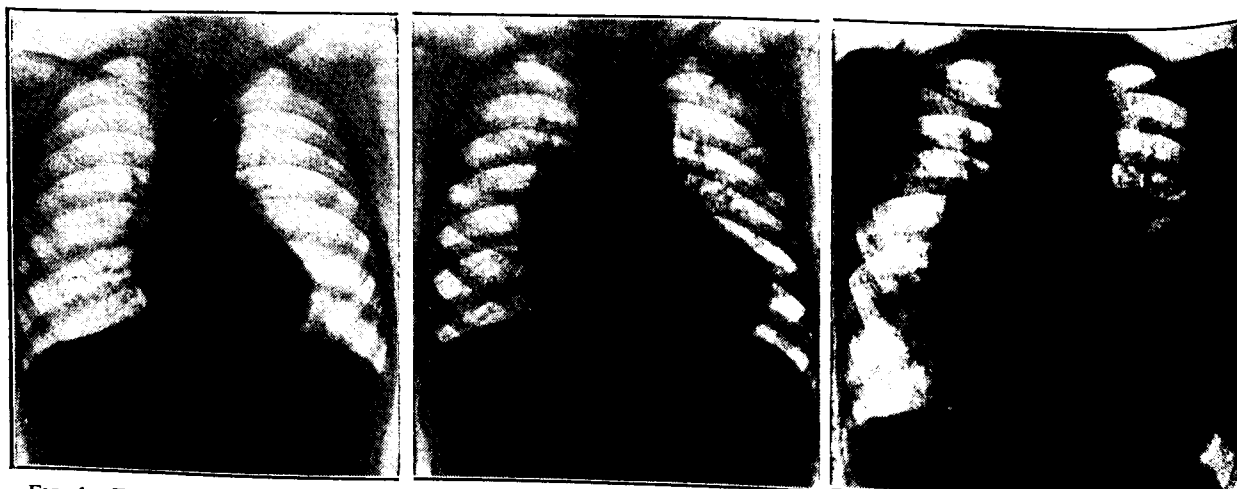


FIG. 1.—Exceptional enlargement of a small heart of a patient with Fallot's tetralogy. Left: Before operation (c.t.r. 48%). Centre: One year after operation, a larger heart (c.t.r. 57%), with lung fields that are much better filled. Right: Nine years after with a very large heart (c.t.r. 70%). She was then well, but died later that year with congestive heart failure. Slight rib-notching can be seen on the fifth right rib from the anastomotic channels from the aorta to the right arm after division of her right subclavian artery and, in retrospect, very slightly even in the radiograph one year after operation. Case A25.

Case A44.—A girl aged 10 lost some ground in the seventh year. In the ninth year she had to give up her work, having become cyanotic again and having lost all her improvement within a few months: the continuous murmur could no longer be heard.

Case A143.—A girl aged 10 became almost acyanotic and could walk three miles. During the course of five months in the fifth year she lost all her improvement and the anastomosis had closed without any obvious reason.

Case A147.—A girl, aged 16, remained well for five years. After this she became bluer and more short of breath, and some months later had to give up her work: no continuous murmur could be heard.

Case A45.—A boy aged 3 obtained a very good result. In the fourth year his mother thought he was not as well, and by the sixth year there was no doubt about this: the haemoglobin was higher (123%) and the heart was smaller (c.t.r. 48%). His continuous murmur was still as loud, but this was not so in the seventh year, when he had become as disabled and as cyanosed as ever: the heart was even smaller (c.t.r. 42%) and the haemoglobin 139%. A severe high infundibular stenosis was resected, but he died two days later. At necropsy the lumen of the anastomosis admitted a probe only.

Case A40.—A boy aged 8 remained well for six years. Then he could do rather less and his headaches recurred; some months later he had "pneumonia," after which he lost all his improvement and resumed squatting. It seemed likely that the anastomosis had closed, but the heart had not become smaller and the murmur was as loud as before. There must, I think, have been increasingly severe stenosis, though a year later, when admitted for a direct operation, which was very successful, the continuous murmur could no longer be heard.

Case A47.—A Cypriot boy aged 11 did well for five years. In the sixth year he lost most of his improvement, but we do not know if the continuous murmur can still be heard.

Case A54.—A girl aged 5 lost some ground in the fourth year after a cortical thrombophlebitis, but the result was still good. She lost most of her improvement in the seventh year, mainly in one month. Her smaller heart and higher haemoglobin suggested the anastomosis was closing, but the continuous murmur remained quite loud.

Case A82.—A girl aged 5 remained very well for five years, but then lost ground after scarlet fever and nephritis, and more so during the next two years though the continuous murmur was still loud: her heart became steadily larger, and she often complained of swelling of the ankles and had some albuminuria. She died after an infundibular resection. At necropsy there was nothing to suggest occlusion of the anastomosis before its recent ligation. Her deterioration seems to have been due to increasingly severe infundibular stenosis, the passage having become almost atresic.

Loss of Much Improvement

The anastomotic channel had not closed in any of these seven cases, but, certainly in the first and probably in others, it was carrying less blood to the lungs. In the first two the continuous murmur was less easy to hear. In all except the last, the haemoglobin had increased, and in two (Cases A41 and A120) the heart had become smaller; by analogy this made us think the anastomosis was closing, but in both it proved to be open at operation. We think, therefore, that many of them were worse because the stenosis was becoming more severe. Some details are given in Table IV. Only two are described briefly, the first as an example of partial thrombosis of her anastomosis at necropsy, and the second as evidence of increasingly severe stenosis.

Case A46.—A girl aged 16 could walk three miles and worked as a telephonist for six years, though before operation trivial

exertion provoked cyanotic attacks with unconsciousness. During the sixth to ninth years she lost much of her improvement. Her continuous murmur was heard less easily and her haemoglobin had risen again. She died from cardiac arrest a day after infundibular resection. At necropsy the anastomosis was only partly occluded by a firmly adherent thrombus.

Case A120.—A boy aged 3 lost much, but not all, of his improvement in several stages during the seventh and eighth years. Recently he was taken to America for operation by Mr. Kirklin with an extracorporeal circulation. In spite of the small heart and rising haemoglobin percentage, the continuous murmur was well heard and the anastomosis was found to be functioning well. There was a very severe infundibular stenosis, with an orifice that was almost pin-point, and the ventricular septal defect was large and at the usual site. So far, he is doing well.

Second Operations

Ten of the 17 who lost all or much of the improvement have already had direct operations: six obtained very good results, but the other four died. For some time a direct operation after an anastomotic one that had failed proved disappointing, and the mortality is still much higher than for primary direct operations.

Two other patients have had second operations because their original disability had been so extreme that even after great improvement they still needed more. One has improved greatly, but the second has not benefited.

Progress of 21 Patients who Obtained Little or No Benefit

The four patients in whom no operation was possible, five who were not improved, and 12 only somewhat improved, making 21 in all, can to some extent serve as a control. Eight of these 21 have died. Two proved to have a single ventricle and pulmonary stenosis; a third died with meningitis, and a fourth with a pulmonary abscess, all within 18 months of operation. These four were reported in our previous paper, and four have died since. One boy who was very disabled and had frequent fits died three years later. One boy, who after two years had a second anastomotic operation that did not help much, died suddenly five years later. One woman, aged 29, gradually relapsed and died five years later. The eighth was in hospital several times with congestive failure, and died with this six years after: her heart was large for an uncomplicated Fallot's tetralogy, and we think she had some additional lesion.

Four patients lost even the slight improvement they had gained at two to six years after operation. This was due to the anastomosis closing. Four others were much the same for three or four years, when they had second operations; and second operations may be needed in the remaining five, who are much the same after from six to nine years.

In summary, the prognosis of these 21 patients has proved poor. Eight (38%) died after an average period of three years, only three living longer than this. Seven are much the same as before, and six had a subsequent operation, so that the period of follow-up was abridged: two of these had anastomotic operations that did not help much and four had direct operations, of which two proved fatal and two produced good results.

TABLE IV.—Patients who have Lost Much of the Improvement

Case No.	Anastomosis	Time of Deterioration	Hb Percentage			Heart Size (c.t.r.)			Remarks
			Before Op.	After Op.	Final	Before Op.	After Op.	Final	
A46	Less	Gradual 6th to 9th years	135	108	122	47	52	52	2nd op. Died
A153	? Less	Gradual 4th year	120	95	118	48	49	50	
A41	Open	6th and 7th years: severe infundibular stenosis	128	114	130	50	51	46	2nd op. Good
A61	"	6th year, after transient hemiplegia	151	116	166	49	51	53	
A108	"	Gradual 6th and 7th years	157	105	120	54	60	57	Recent op.
A120	"	7th and 8th years	150	110	145	51	54	51	
A132	"	8th year, more dyspnoeic and syncopal attacks	154	100	90	54	55	55	

It would not be fair to take these as representative of untreated Fallot's tetralogy, because some of them had more complex lesions, and this may have been partly why they did not benefit much from their operations. They do, however, show a striking contrast with the patients who obtained good results.

DIRECT OPERATIONS FOR FALLOT'S TETRALOGY

The results of pulmonary valvotomy and infundibular resection in the first 100 patients operated on by Sir Russell Brock have been reported (Campbell *et al.*, 1954). The operative mortality was 15%; there was little or no improvement in 14%, and a good result in 71%—figures that were not very different from those after anastomotic operations, except that the operative mortality was higher. Our conclusions were based mainly on the 61 patients that had been treated at Guy's Hospital.

We are now reporting a longer follow-up of these 61 patients and adding another 50 operated on in 1953-6, making 111 in all. The operation was mainly infundibular resection in 47, mainly valvotomy in 42, or both procedures in 22 cases. Infundibular resection, which at one time had a higher operative mortality, has now become about the same; but perhaps rather surprisingly it is followed by a good result more regularly; otherwise there was not much difference in these groups, so they have been considered together for most purposes.

Of the 111 patients, 19 died at or soon after operation, 13 obtained little or no improvement, and 79 (71%) obtained good results. None of these 79 has been lost sight of, and they have been followed for an average period of nearly five years—32 for from six to nine years, and all but seven for two years or more.

The operative mortality was higher than for anastomotic operations—17% for all, but 12% for those operated on since 1952. If we exclude 11 who had second operations in which the mortality has been twice as high, it is further reduced to 15 and to 10% respectively. The number with slight or no improvement is 12%—about the same as in the other series. Sometimes this may be because there are other abnormalities that have not been diagnosed or because of some feature that makes surgical correction difficult. Here, too, however, the proportion has been falling in recent years, especially since the fuller realization of the importance of infundibular stenosis even when at first the stenosis appears to be mainly valvular.

Good Results Maintained

Of the 79 who obtained good results, 70 (89%) have remained well during the subsequent years, including most of the earlier patients.

Infundibular Resection

The first eight who had successful results after infundibular resection were given in detail in our previous paper, and, partly because I know them so much better than the later ones and know what they can do, their present condition is given briefly (see also Table V).

Case IR1.*—A girl, aged 13, has kept well for nine years and is now working as a dressmaker, but does not attempt more than this, and leads a quiet home life.

Case IR2.—A young woman, aged 20, is much more active, but her heart is larger (c.t.r. 58%) and she is limited by paroxysmal tachycardia if she does too much.

Case IR3.—A young man aged 19 could do very little, but now is very active and earns his living in Rhodesia. In the ninth year he had bacterial endocarditis, but is able to do just as much after it, though we do not know if his heart, which was still of normal size, has become larger.

*The case numbers are the same as in our previous papers and are the consecutive operations of that particular type. Thus, IR2 indicates the second patient who had infundibular resection without valvotomy. The consecutive V numbers indicate all who had valvotomy with or without infundibular resection as well: they include those with a closed ventricular septum, who are not discussed in this paper.

TABLE V.—Changes in Heart Size and Haemoglobin Percentage in Patients 7 to 9 Years After Direct Operations

Case No.	Heart Size (c.t.r.)			Haemoglobin Percentage		
	Before Op.	After 3-4 Yr.	After 7-9 Yr.	Before Op.	After 3-4 Yr.	After 7-9 Yr.
<i>After Infundibular Resection</i>						
IR1	45	49	49	142	110	105
IR2	56	60	58	120	112	102
IR3	47	47	50	130	112	90
IR6	48	52	—	116	93	—
IR7	48	57	54	133	95	102
IR8	47	53	53	128	111	—
IR10	51	54	53	130	95	90
IR20	45	49	48	115	95	85
IR21	49	63	60	105	84	85
IR22	50	53	55	100*	95	100
Average	48.6	53.7	53.2	122	103	101
<i>After Pulmonary Valvotomy</i>						
V2	49	56	58	129	126	126
V3	49	53	53	156	110	104
V10	52	53	50	180	110	111
V20	46	52	53	121	128	142
V25	51	56	53	122	105	—
V32	44	48	53	120	105	103
V34	48	52	51	138	118	103
V35	50	54	50	109	85	97
V42	46	50	47	112	95	94
V48	55	57	55	131	96	100
Average	49.0	53.2	52.3	132	110	110
<i>Two Patients Who Have Lost their Improvement</i>						
V22	44	46	46	124	108	117
V29	45	49	48	113	97	116

* Presumably "anaemic."

Case IR4.—A boy aged 14 has kept as well for eight years and is prevented from greater activity more by his mental backwardness than by his heart.

Case IR6.—A boy aged 14 is now working as a shop assistant and cycles and plays tennis.

Case IR7.—A boy aged 12 is now working as a telephone operator and can cycle and play cricket.

Case IR8.—A young woman aged 20 was rather slow in getting her full improvement, but now works in a shop and can walk two miles and go dancing.

Case IR10.—A girl aged 7 is exceptionally good after eight years and leads an active life with no obvious cyanosis.

Case IR21.—A girl aged 15 had an exceptionally good result and lost all her cyanosis, but we feared that the pulmonary flow and the heart were too large. Six years later, however, she is leading a very active life and the heart is smaller (c.t.r. 49 to 66%, but 62% after six years).

The results of recatheterization in Cases IR3, IR7, IR8, and IR21 were included in our earlier paper, and the arterial oxygen saturations had risen to 86, 90, 95, and 98% respectively, and the pulmonary flows to 80, 120, 156, and 208% of the systemic flow. It has been suggested that successful direct operations would convert the condition into Eisenmenger's complex. If the underdeveloped outflow tract became completely unobstructed this would be so, but it still provides enough resistance to prevent this; and the last of these four patients is the only one in whom the pulmonary arterial pressure has risen above normal, and then only to 38/12 mm.

Pulmonary Valvotomy

The early patients who obtained good results after pulmonary valvotomy, with or without infundibular resection as well, are nearly as good.

Case V2.—A girl aged 18 is earning her living as a musician though she still shows obvious cyanosis and has to walk slowly.

Case V3.—A girl aged 11 is more active and leads a normal life without obvious cyanosis after nine years. Looking to the future, however, she has T inversion from V₁ to V₄, suggesting right ventricular strain.

Case V10.—A man aged 22 has kept well and at regular work. Even more significant, his haemoglobin has remained about 111% for eight years, although it was 180% with the consequent risk of cerebral thrombosis.

Case V20.—A boy aged 11 was much improved and later could earn his living and walk four miles, although his haemoglobin did not fall. This, as so often, was a correct guide, for in the sixth year he lost some ground and the haemoglobin rose higher than before (see Table V), but he can still work and walk a mile.

Case V25.—A boy aged 9 does everything at school except the more energetic games which he would like to play, but he developed pulmonary regurgitation after operation and the heart became larger. After seven years the regurgitant murmur is still loud, but he is able to do as much and the heart has become smaller again (c.t.r. 51 to 56 to 53%).

Case V32.—A girl aged 18 has maintained all her improvement: she has married and can carry out her household work.

Case V34.—A boy aged 10 has kept well and is working as a laboratory technician.

Case V35.—A boy aged 14 was improved enough to start as a medical student, and, though delayed by tuberculosis of the lung, he is well and working after seven years.

These patients give a representative picture of the results of direct operations. Case V20 has certainly lost some of this improvement, but, like Cases A55 and A83, not enough to prevent one still calling the result good. With increasing experience the surgeon may succeed in producing good results more regularly, but it seems remarkable how often he did so from the start. I do not think many of the later patients are better than these, and indeed it would be hard to be much better than Cases IR3 or V3 or several others. After recent operations there are, however, fewer of the disappointing results that show some improvement but not enough to be called good.

Good Results Lost

Patients Who Have Died

Only 2 of the 79 patients have died. A woman aged 31 was much improved, but died nine months later with Landrey's acute ascending myelitis (Case IR19). A boy aged 9 could walk two miles instead of 100 yards, but in the fifth year he became ill and was thought to have hydrocephalus. At necropsy the brain was flattened by gross dilatation of the ventricles, and the hydrocephalus was attributed to the attack of basal meningitis two years before his valvotomy (Case V51).

Loss of All or Much Improvement

Only two patients have lost all their improvement, but five have lost much of it. Those who have had direct operations are not, of course, exposed to the risk of the anastomosis closing and there is little evidence of re-stenosis at the site of the operation. We think that some patients who have lost ground in both groups are examples of the natural tendency in Fallot's tetralogy for the stenosis to become more severe as the patient gets older.

Short notes about the patients who have lost their improvement follow. The first of these patients, one of the only two who had lost it all, is reported on more fully because the infundibular stenosis must have increased after operation in spite of the larger flow through her pulmonary valve. The sixth girl was beginning to show the effects of her large left-to-right shunt in the same way as Case A25, who died in the tenth year after an anastomotic operation. The seventh and last patient who lost ground (Case V91) seems to have done so because of pulmonary regurgitation.

Case V29.—A girl aged 17 could do a full day's work and go dancing after it: her haemoglobin fell and her heart became larger (see Table V). After "influenza" in the third year she could manage only half-time work. Catheterization showed that the gradient was mainly between the right ventricle (110/0) and the infundibulum (30/0) and only slightly between this and the pulmonary trunk (12/3)—figures much the same as those found at her second operation three years later. She still kept some of her improvement, but in the fourth year she had to give up work and was as bad as ever. Clearly the failure to relieve her infundibular stenosis meant that the operation had been incomplete, but the great improvement for three years and its subsequent loss show that this must have become worse and it was found to be very severe when subsequently she had a successful infundibular resection.

Case V22.—A girl aged 12 had an excellent result and could lead a normal life, sometimes walking as far as nine miles. After "influenza" in the fifth year she could walk no more than a mile. In the sixth year she became worse again and was little, if any, better than at the start.

Case IR25.—A boy aged 9 could walk a mile and attend school regularly. In the fifth year he could not get about so well, and his haemoglobin had risen from 104 to 119%.

Case IR41.—A boy aged 2 was so disabled with frequent attacks of unconsciousness that pulmonary atresia seemed likely. He became much better, both in colour and in capacity, and this lasted for two years. After this he could not walk more than 50 yards and squatted more often, though the attacks of unconsciousness did not recur.

Case V113.—A boy aged 5 was much improved, though he still squatted sometimes. After five years he could not do so much and his heart was smaller (c.t.r. 52 instead of 57%), but this may have been due to the growth of his chest. This patient and the next one had infundibular resection as well.

Case V117.—A girl aged 9 could walk only 50 yards. After open cardiomy she was greatly improved and lost all her cyanosis, but the heart enlarged more than usual (c.t.r. 48 to 60%). Four years later she still seemed well, but her lungs were pleon-aemic with a hilar dance and the heart was still as large. She was more dyspnoeic, and sometimes after doing too much was orthopnoeic at night.

Pulmonary Regurgitation

This has proved a less important complication than was feared—much less important with pulmonary than with aortic valvotomy, presumably because the relevant pressures are so much lower and the valve is rarely calcified. Pulmonary regurgitation of significant degree has occurred in three patients. In the first (Case V25) and in the second it did not seem very important, but in the third it was.

Case V60.—A boy aged 7 has maintained his good result for six years, but his heart has stayed larger (c.t.r. 48 to 57%).

Case V91.—A girl aged 12 was greatly improved after operation, but developed pulmonary regurgitation. A year later, after pleurisy, she became increasingly dyspnoeic. After another year she was readmitted with a loud pulmonary diastolic murmur, a raised venous pressure, and a greatly enlarged liver; her heart had become enormous (c.t.r. 51 to 71%). With rest, salt restriction, digitalis, and mersalyl she improved, but it seemed that she would be permanently disabled. She gradually improved, however, and a year later was able to stop all treatment except digitalis and to resume work as a dressmaker, though her liver was still palpable: her heart has become smaller again (c.t.r. 64%). In retrospect it seems that she might have had some infection with a pericardial effusion, but there was no other evidence of this.

OBJECTIVE EFFECTS OF BOTH OPERATIONS

The success of these operations has been judged subjectively by the improvement in the patient's capacity and colour. This is the best way when the doctor knows his patients well, for it measures the essential change. In our earlier follow-up there was good correlation between this subjective judgment and the objective changes in the polycythaemia and haemoglobin percentage. The more important findings—the continuous murmur, squatting, the haemoglobin percentage, and the size of the heart—are now discussed. All these, except the first, apply equally to anastomotic and to direct operations.

Physical Signs.—An easily heard continuous murmur indicates a good flow through the anastomosis. If it becomes more difficult to hear, the flow to the lungs is smaller and it is likely to become inaudible: then there are generally other reasons for thinking that the anastomosis has closed. A large flow will often produce some increase in the pulse pressure, but a patient may obtain a very good result without this, and an easily heard continuous murmur is generally a more useful sign. The auscultatory signs are not much use in judging the results of direct operations, and it is still possible to diagnose some stenosis in most of the successful cases; further, a loud murmur may be due to the irregularity of the outflow tract after operation rather than to the severity of the obstruction.

Squatting.—When the result is good the patient ceases to squat: it is surprising that a habit so long-established should be stopped so suddenly. Patients forget about it and may seem surprised when they are questioned on it. Older patients may, however, force themselves to stop squatting for social reasons, so its absence is not always reliable. Resumption of the habit always means that the patient has become worse and often that he has lost all his improvement.

Haemoglobin Percentage and Polycythaemia.—A fall towards normal in the haemoglobin percentage and in the red-cell count is generally a reliable sign of a better blood flow to the lungs and of less anoxaemia. They will, of course, fall if the patient becomes anaemic from loss of blood or otherwise, and then he is worse off. Sometimes the real degree of anoxaemia is more severe than is suggested by the relatively small increase of haemoglobin, because the patient is "anaemic": a red-cell count that is high in relation to the haemoglobin percentage will often give an indication of this. Otherwise, any subsequent rise is a reason for thinking the patient is not as well as before.

In our earlier series the mean haemoglobin of all the patients with good results fell from just under 130 to 103%, and the fall was almost the same for anastomotic as for direct operations. The percentage was generally between 120 and 159 before operation and between 90 and 119 after it, though there was, of course, a wide range.

Most of the patients with good results have maintained this improvement in their colour and in their blood count. In some, however, who have not lost their improved capacity the haemoglobin has risen above the lowest level to which it had fallen. There is more evidence of this after anastomotic than after direct operations. In 50 cases of the former the average haemoglobin fell from 132 to 104% after three to four years, and had risen to 111% after eight to ten years. In 20 cases after direct operations it fell from 127 to 107% after three to four years, and was still 106% after seven to nine years, but the difference is small. It could be explained by the anastomosis becoming somewhat smaller or even by its failing to grow as much as the patient.

A rise of haemoglobin to near the original level is one of the most reliable signs that the patient is not doing well, and often means that the anastomosis has closed (see Table III).

The electrocardiogram is not very useful in judging the result. The right ventricular preponderance is not likely to diminish, for the right ventricle is still working against the same high pressure, and the patient's increased activity must increase the work of the right side, and, sometimes perhaps after anastomotic operations, of the left side of the heart as well. There is some tendency, as the years pass, for the T inversion and the signs of right ventricular strain to increase, but the patients with these signs are not showing any harmful effects from them so far. If patients escape the other hazards of Fallot's tetralogy, right-sided failure seems likely to follow some time in the near future, but over the ten-year period this has not been important.

Changes in the Size of the Heart

The increase in the size of the heart after anastomotic operations was noticed almost at once, and at first there was some

fear that this might be progressive and lead to heart failure. The same increase occurs after direct operations. We found that the average change in the cardiothoracic ratio was from 50 to 53% after anastomotic operations and from 48 to 52% after direct operations, with the same wide range of variation after both, and that the increase had generally reached its maximum a month or two after operation and was not progressive (Campbell and Deuchar, 1953; Campbell *et al.*, 1954).

Our observations on the size of the heart in this longer follow-up are not so complete, but include nearly all those who have been followed for from 8 to 10 years. Many of the figures given in Tables II and V show that up to 10 years the increase is rarely progressive and the average size after 8 to 10 years is much the same as after three to four years. Where figures are available the average increase in the cardiothoracic ratio is rather less than one-tenth (from 49 to 53.5% after three to four years and to 53% after 8 to 10 years), and this is the same after anastomotic and after direct operations. These average figures hide large individual variation, as is shown in the Tables, and even in patients with very good results the increase may be less than this or much more.

In Fallot's tetralogy the heart is often small and undeveloped, partly, perhaps, from lack of use. Some increase in its size must be expected if the patient is to have an

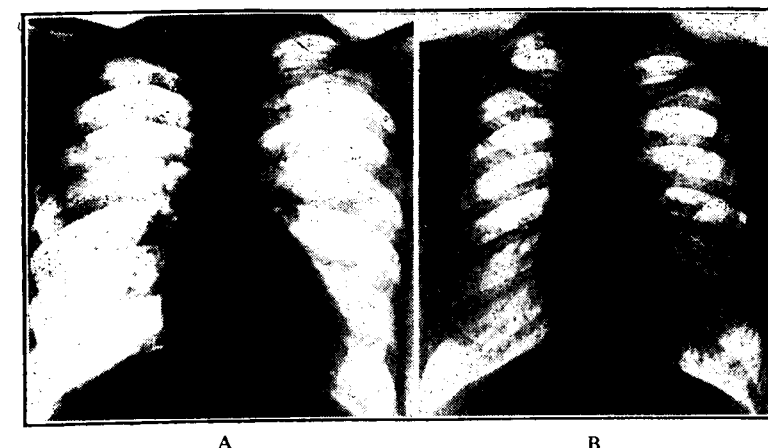


FIG. 2.—More usual heart size in two patients nine years after successful operations for Fallot's tetralogy. Both had equally good results clinically, but the increase in the blood flow to the lungs is more obvious in one than in the other, where the lungs are still oligoemic. (A) C.t.r. 51% (12/23.5 cm.) Case A24. (B) C.t.r. 51% (13.5/26.5 cm.) Case A23.

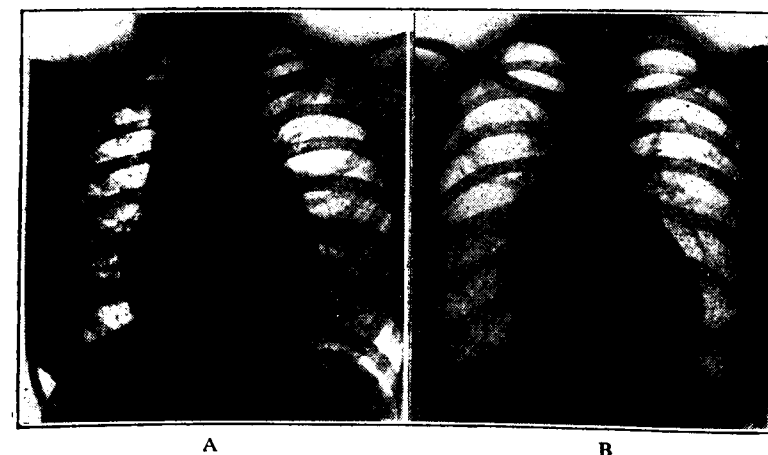


FIG. 3.—Teleroadiograms of two patients eight years after anastomotic operations for Fallot's tetralogy. Generally the two lungs seem equally filled, but from the better filling of one lung it is easy to see that the operation was on the left side in one (Case A133) and on the right side in the other (Case A34). The left pulmonary artery was unusually large in A before operation. Both results are extremely good, and the hearts are not unduly enlarged (c.t.r. 54%).

adequate pulmonary blood flow and is to lead a more active life. An increase of one-tenth in the cardiothoracic ratio where it was 45% before operation leaves it of normal size and has no drawbacks, and where it was 50% the same increase leaves it still only slightly enlarged. Examples of both these degrees are given in Figs. 2 and 3. We have no anxiety about an increase to 55 or even 57% unless, as is unusual, it is progressive. With figures over 60% we are more anxious, and such a size is, of course, reached more easily if the heart was large before operation. Patient A25, who was notable from the start as showing pleonaemic lungs and one of the largest hearts (see Fig. 1), illustrates the risk, for she died in the tenth year with congestive heart failure, and we are anxious about the outlook for Case V117. Sometimes, however, the heart may become rather smaller as it becomes habituated to the new conditions, both after anastomotic and after direct operations (see Cases A5 and IR21).

DISCUSSION

Many authors have published their results after operation, but there are few long follow-up studies. The recent one of Taussig and Blalock's cases by White *et al.* (1956) is most valuable, but only 73% of the 500 cases had been traced. Of the 212 patients with Fallot's tetralogy who obtained a good result, 69% have kept this for from five to eight years, 20% have lost ground, and 11% have died during this period, but this is reduced to 9% if second operations are excluded. The great value of successful operation is shown by the contrast of this mortality with one of 44% among those who obtained only fair results from operation. In our series there is a similar contrast with rates of 6 and 38% respectively.

The best age for operation seemed to be between 8 and 12 years, for here the number who had maintained good results reached over 80%. The effect of age, however, is not great in our series, for the figure was 80% in each five-year period except in infants and in those over 20, where the results were less good originally and less well maintained afterwards.

Bacterial endocarditis had occurred in 6% of their series, about 1% per annum, but only 1 in 15 of these patients died. This incidence is higher than in our series, but for cerebral abscess it is much lower than ours. Few of the 33 deaths were due to heart failure; seven were after a second operation and the remainder from a variety of causes.

Potts's Aorto-pulmonary Anastomoses.—The immediate results are not very different from other anastomotic operations—an operative mortality of 9% and a good result in 68%. Only three of my patients have had this variety. Potts *et al.* (1955) have followed up their first 100 cases for about the same period as we have, and find that good results have been maintained at least as well as after other anastomotic operations: there were five deaths—one from a heart attack, one from a brain abscess, one from rheumatic fever, and two from "pneumonia" which may have been partly pulmonary congestion from too large a flow. Though it is not easy to compare the exact degree of enlargement of the heart, it seemed generally to be rather greater, but again was not often progressive.

Comparison of Anastomotic and Direct Operations

No other follow-up study of a large series of patients after direct operations has been found, and in any case it seems better to compare our own patients, who have so far as possible been assessed in the same way. Scientifically, it would have been better if direct operations had been started at the same time and done alternately, but this was not possible. All these anastomotic operations were done in 1947–51. Most of the direct operations were done in 1949–52, but some up to 1956. The selection depended mainly on Sir Russell Brock's view of what was the best surgical procedure at the time, but the earlier patients were, I think, generally the more severe.

The results of direct and anastomotic operations were very similar in our earlier reports, except that the former had a higher operative mortality. This longer follow-up makes them more equal, for there are fewer deaths and fewer complete relapses after direct operations. We thought from an early stage that they more often relieved all the cyanosis, and this is also the view of Wood (1956), but the average reduction in the polycythaemia and haemoglobin level was the same at first and is only a little better maintained after direct operations. The degree of improvement is, however, more varied, from slight or moderate improvement to good or very good results according to the degree of success of the pulmonary valvotomy or infundibular resection. Successful anastomotic operations, on the other hand, tend to produce a more uniform degree of improvement, since the extrapulmonary blood flow through the subclavian anastomosis will generally be proportional to the body size.

The patients who obtained good results but later died or lost ground after each type of operation have been described. Good results have been maintained in 80% after anastomotic and in 89% after direct operations, and this means that the patients were able to work or attend an ordinary school. Allowing for the different length of the follow-ups, the figures for direct operations are not much better, but the real advantage is greater, for the annual death rate and the proportion losing all improvement are only half those after anastomotic operations, the totals being made nearer equality by the larger number who lost only some improvement (see Table VI). It is,

TABLE VI.—Results of Anastomotic and Direct Operations Compared

Operation	Total No. With Good Results Traced	Subsequent Progress				Annual Loss (Percentage)			Total
		Good Results Maintained	Died	Lost All Improvement	Lost Much Improvement	Died	Lost All Impr.	Lost Much Impr.	
Anastomotic	126	101	8	10	7	0.9	1.1	0.7	2.7
Direct	79	70	2	2	5	0.5	0.5	1.4	2.4

however, a more severe test for the latter, because there have been several relapses and deaths during the tenth year, a period that has not yet been reached by many who had direct operations.

The loss of all improvement after anastomotic operations generally occurred because the anastomosis had closed. Sometimes, however, and more often when only some improvement was lost, it seemed due to the natural tendency for the stenosis to become more severe; and this is probably the main reason for the deaths in childhood of those who have not had operations.

None of the deaths was due to the anastomosis closing, except indirectly, when it led to their needing second operations. About one-third were due to heart failure in some form, and probably this was at least hastened by the increased activity of the patients; about one-third were due to incidental causes; and the remaining third to cerebral causes, mainly cerebral abscess.

Cerebral abscess is a well-known complication of Fallot's tetralogy, and we have discussed the reasons (Campbell, 1957). Even so, among 130 patients, three dying from cerebral abscess* and three others making good recoveries after operations for it is a high proportion. We do not think it has any connexion with the anastomosis, except in the broad sense that the patients could lead more active lives with the consequent exposure to fatigue and infection. It is all the more remarkable since during the same period of follow-up only four of these patients suffered from

*Since this was written, two more patients, a boy aged 15 and a girl aged 4, both of whom did well for seven years after anastomotic operations, have died with cerebral abscesses and both in the eighth year after operation. Of the 10 patients who have died, five died with cerebral abscesses.

bacterial endocarditis: all recovered and were no worse afterwards.

So far, no patient who had a successful direct operation has died with a cerebral abscess. A girl aged 3 who was only improved died with convulsions in the second year after pulmonary valvotomy; at necropsy the posterior cusp of a valve that was bicuspid had been split, and a large area of the brain supplied by the middle cerebral artery was necrotic (Case V96). This supports the view that a cerebral abscess may develop from a primary thrombosis (Campbell, 1957), but in this case the thrombosis was so extensive that it led to her death before this could happen.

Future Outlook

Even after a successful operation there is still Fallot's tetralogy, though in a slight rather than a severe form. A larger proportion will reach the stage that one sees occasionally without operation, subjects who can lead a quiet life up to 40 or 50 years. Bedford (1956) reported two such patients whom he had observed for 27 years. One, who died when she was 52, had got on tolerably well until the last four years of her life, when she developed slight congestive failure and cerebral symptoms with increasing cyanosis and dyspnoea. The other was still without failure when she was 52: her haemoglobin had been up to 170% and her cerebral symptoms were relieved from time to time by venesection. White and Sprague (1929) described the well-known example of longevity—the composer Henry Gilbert, who died when he was nearly 60. Marquis (1956), in an important paper on the longevity and the early history of the tetralogy of Fallot, described the case of a woman who lived to the age of 64.

Our oldest patient is now 53: though cyanosed from birth and squatting frequently as a child, she could lead a quiet life at home but could not go to work. Since the age of 48 she has been more breathless and can walk only 100 yards, and, though she has had a large heart (c.t.r. 63%) and gross right ventricular strain with T inversion from V1 to V4 and congestive failure, is losing ground only slowly.

It is possible now to estimate how many of the patients who have had a successful operation are likely to be reasonably active till middle age. Assuming that the number losing ground will continue at the same rate and that the mortality among those who have lost their improvement will be much higher (38% in seven years), a rough forecast of the position after 7, 14, and 21 years, based on our figures for anastomotic operations, is given in Table VII.

TABLE VII.—Estimated Condition of 100 Patients Who Have Had a Successful Operation for Fallot's Tetralogy

	Patients Who Will Have Died	Patients Severely or Moderately Disabled	Patients Leading a Satisfactory Quiet Life
After 7 years	6	14	80
" 14 "	17 (6+6+5)	19 (14-6+11)	64 (80-16)
" 21 "	29 (17+8+4)	20 (19-8+9)	51 (64-13)
31.5 years (average age)			

We think that half the patients who obtained good results will be reasonably well after 21 years, but the average age will still be only about 31 years. Perhaps one-quarter will be able to carry on in this way till they are 50; but this is even more speculative, and is mentioned only in the hope that someone will prove or disprove it by following the patients for another twenty years. The proportion maintaining their good results after direct operations should become relatively higher as the years pass, for, so far, fewer have died or lost all their improvement. The number of these patients who are able to work and enjoy life in a way that was impossible before is even more important than the prolongation of life.

SUMMARY AND CONCLUSIONS

Some of the patients who obtained a good result after an anastomotic or after a direct operation for Fallot's tetralogy have lost all or part of their improvement during the subsequent 8 to 10 years. Often this is due to the inevitable risks of the condition, for all these patients still have Fallot's tetralogy, though the stenosis has to some extent been relieved, directly or indirectly. These causes, especially cerebral complications, were responsible for more than a third of the deaths; the heart could not support the increased pulmonary flow and the increased activity that it allowed in another third; but in the final third the cause was not directly related to the heart condition or to the operation. In many patients who lost all their improvement after anastomotic operations, however, this was due to the anastomosis closing. In others, and in most of those who lost some of their improvement after both sorts of operations, it seemed to be due to the tendency for the stenosis to become more severe.

Of those who obtained good results, 80% have maintained them for an average period of seven years after anastomotic operations and 89% for five years after direct operations. The long-term advantage of the latter is greater than appears from these figures, for there were only half as many deaths and half as many who lost all their improvement with direct as with anastomotic operations. We think that perhaps half of those who obtained good results may be reasonably well 20 years after operation.

After anastomotic operations, increasing difficulty in hearing the continuous murmur is a bad sign, and if it cannot be heard the anastomosis has probably closed. The auscultatory signs after direct operations are not so much help.

The reduction in the anoxaemia and resultant polycythaemia and high haemoglobin percentage that was found three or four years after operation has been maintained in most patients for the six to ten years of this longer follow-up, but not, of course, in those who had lost their clinical improvement.

The heart increases in size within a few weeks after a successful anastomotic or direct operation. On the average the cardiothoracic ratio increases by one-tenth (49 to 54%) and remains at this level for 8 to 10 years. There are no drawbacks to some increase in the size of the smaller hearts. The ideal is a limited increase, large enough to indicate a reasonable pulmonary flow that will enable the patient to do more, but not large enough to throw an undue strain on the heart, and this is generally about 10%: it is unlikely to be progressive and there is no reason to be anxious about it. In fact, if a heart that has become larger returns to near its original size, especially if the haemoglobin returns to its original level, the anastomosis has probably closed or the increased pulmonary flow has been lost by the stenosis becoming more severe.

Neither of these operations for Fallot's tetralogy is curative, for, of course, the ventricular septal defect remains and the right ventricle is working against the systemic pressure. These results show, however, that generally they produce great improvement that lasts for many years. The good results after direct operations suggest that when the ventricular septal defect can be closed it should not be difficult to relieve the infundibular or valvular stenosis.

It is a pleasure to thank Sir Russell Brock, not only for his outstanding work in developing these direct operations, but for allowing and even encouraging me to judge the success of his results; also Dr. Charles Baker for his help and for the inclusion of some of his patients; and Mr. Holmes Sellors and Mr. Ian Hill for operating on some and for keeping me so well informed about what they had done. I also thank Drs. S. S. Suzman, Geoffrey Reynolds, and D. C. Deuchar for help at different stages in the follow-up of so many patients for up to ten years, and Drs. Deuchar, R. J. Shephard, and L. Brotmacher and the registrars at the National Heart Hospital for the results of catheterization.

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VACCINATION AGAINST POLIO-MYELITIS WITH LIVE VIRUS VACCINES

4. A REVIEW OF THE PRESENT POSITION

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In a report recently published by the World Health Organization (1958), the Expert Committee on Poliomyelitis strongly recommended that controlled field trials of live attenuated poliovirus vaccines should be carried out. The committee suggested suitable circumstances and populations for the trials and specified the strains of virus which it considered should be used. Trials are now in progress in many parts of the world, and a preliminary report of one of them has already been published (Courtois, Flack, Jervis, Koprowski, and Ninane, 1958). The purpose of this review is to give the reader who is unfamiliar with the subject some idea of the progress that has been made in the development and testing of attenuated poliomyelitis vaccines.

The possible advantages of living attenuated poliovirus vaccines over formalinized vaccines (Salk type) are that they can be given by mouth, that they are cheaper to produce, and that they may give a better immunity. They certainly give a broader type of immunity which will for a time prevent or modify subsequent infection of the alimentary tract with poliovirus. This is in contrast to the immunity at present produced by vaccination with formalinized vaccines which does not modify subsequent alimentary infection, at any rate to the same degree. The difference in the immunity produced by the currently available formalinized vaccines and attenuated virus vaccines is important because the use of attenuated virus vaccines in a community might interfere with the natural spread of virus, and so far there is no evidence that formalinized vaccine is capable of doing this (Langmuir, 1957; Fox, 1957a, 1957b).

In the last few years there have been a number of small laboratory-studied trials of attenuated poliovirus

vaccines, and there has been much progress in their development (Sabin, 1957a, 1957b), but the rapid emergence of a successful formalinized vaccine in 1955 removed some of the urgency which might have led to their earlier trial in the field. This delay allowed time for cautious progress, which may have been a good thing because attenuated poliovirus vaccines have certain novel features not previously encountered in human vaccines.

The poliovirus strains incorporated in current living vaccines developed by Sabin (1957b), by Cox and his associates (see da Silva, McKelvey, Bauer, Prem, Cooney, and Johnson, 1957), and by Koprowski (1957) have all been grown in monkey-kidney-tissue culture and selected for their comparative lack of neurotropism when inoculated into the C.N.S. of monkeys in large amounts. The vaccine viruses are given orally and cause an inapparent infection. They multiply in the alimentary tract like natural polioviruses, and the vaccinated subjects develop an immunity which is probably similar to that following an infection with one of the less invasive naturally occurring strains.

Attenuated poliovirus vaccines, like any other vaccines, require testing in the field for safety and effectiveness, both to the individuals vaccinated and to the community as a whole. For reasons of clarity these different aspects are considered separately.

Safety to the Vaccinee

The safety of attenuated poliovirus vaccines to vaccinees has been assessed both by direct clinical observation and, indirectly, by studying alterations which may occur in the character of the vaccine virus after multiplication in the human host.

To the best of our knowledge no illness definitely attributable to the use of attenuated poliovirus vaccines has so far been reported among thousands of persons who were observed carefully after vaccination in different trials with several different attenuated virus vaccines. This is a most encouraging fact, but we must bear in mind that nearly all natural poliomyelitis infections are mild or inapparent, especially with types II and III poliovirus, and that many of the people vaccinated in these trials have either been immune before vaccination or have been selected in a manner which has been far from ideal.

The indirect assessment of safety is made by testing the properties of the virus excreted by vaccinees. While there is a wide spectrum of monkey neuropathogenicity among naturally occurring or wild polioviruses, markedly neurotropic strains have always been recovered from the faeces of paralysed patients. If the excreted vaccine virus remains considerably less neurotropic for monkeys than wild polioviruses, which have been isolated from the faeces of paralytic cases, then it is usual to presume that the vaccine virus will do no harm to the vaccinee.

So far only one vaccine virus has been shown to change greatly in its neurotropism after growth in the human gut (Dane, Dick, Connolly, Fisher, and McKeown, 1957). This was the rodent-adapted TN type II poliovirus (Koprowski, Norton, Jervis, Nelson, Chadwick, Nelsen, and Meyer, 1956), and there is general agreement that it is unsuitable for further trial (Dick and Dane, 1957; World Health Organization, 1958). All the other vaccine viruses which have been grown in monkey-kidney tissue culture and have been tested have shown some change towards greater neurotropism, but these changes have been insufficient to cause anxiety for the safety of vaccinees. If safety for the individuals receiving vaccine were all that was required of a vaccine, then there would be few problems in planning progressively larger trials of the currently available attenuated strains, though opinions would vary on the relative importance of direct clinical assessment and the indirect laboratory

study of excreted virus; and they would also vary on the degree of neurotropism theoretically permissible in the attenuated virus.

Unfortunately the vaccine viruses now undergoing trials have been shown on numerous occasions to spread from vaccinees to their associates. Spread has not always occurred, but neither does it always occur with natural polio-virus infections. Because of this ability to spread by contact infection we have to consider carefully the safety of the vaccine viruses to the community in which they are used.

Safety to the Community

The spread of a poliomyelitis attenuated vaccine virus from vaccinees to their contacts was first demonstrated by Koprowski *et al.* (1956) with SM type I virus. His subjects in this trial were incontinent institutional children. Later we demonstrated that SM virus could spread in a normal household (Dick, Dane, Fisher, Connolly, and McKeown, 1957). With the more recently developed attenuated polio-viruses spread of virus from vaccinees to their contacts has been shown (Paul, Horstmann, Melnick, Niederman, and Deutsch, 1957; da Silva *et al.*, 1957; Smorodintsev, Drobitshevskaya, Gorev, Iliencko, Kluchareva, and Kurnosova, 1958; Smorodintsev, personal communication). To date no significantly greater change towards neurotropism has been reported for virus recovered from infected contacts than has been observed in the excreted virus of some vaccinees. This finding is satisfactory, but the number of observations has necessarily been limited by the number of monkeys which are required for this type of test.

The basic problem we have to consider is the safety of the virus which is excreted by vaccinees and which will probably spread to other members of the community. As stated earlier, there is a broad spectrum of neurotropism among wild polioviruses. From the evidence so far published we do not consider that the virus excreted by some vaccinated subjects in recent trials can be differentiated from the less neurotropic strains of wild poliovirus. This opinion is based on our own interpretation of results from other laboratories, and we realize that not everyone will agree with it. Further work may show that there has been an irreversible change in the vaccine virus and that the excreted viruses are in fact unlike wild polioviruses and are never likely to change sufficiently to become dangerous. At the moment we consider that the irreversibility of the change is not proved.

If we accept that excreted vaccine polioviruses are similar to wild avirulent polioviruses, then how safe are they? Because neurotropic strains of virus have always been isolated from paralytic cases we may presume that the avirulent wild strains are probably safe provided that they are stable and cannot change to a more neurotropic form. Unfortunately there is little information on the stability of wild polioviruses, and for this reason we have been attempting to discover more about the problem by comparing the monkey neurotropism of polioviruses isolated from the faeces of paralytic patients and their close contacts. This method of approaching the problem is open to the criticism that, how-

Comparison of the Monkey Neurotropism of Viruses Excreted by Paralysed Children and their Contacts

Serial Letter of Pair	Initials of Children	Type of Infection	Monkeys Paralysed when Inoculated with the Following TCD ₅₀ of Virus				
			10 ⁶	10 ⁵	10 ⁴	10 ³	10 ²
A	D.D. P.B.	Paralytic ..	3/3*	3/3	3/3	1/3	0/3
		Asymptomatic ..	1/3	1/3	0/3	0/3	—
B	J.A. R.Y.	Paralytic ..	—	—	3/3	3/3	3/3
		Asymptomatic ..	3/3	3/3	3/3	—	—
C	W.N. K.S.	Paralytic ..	—	—	2/2	—	—
		Minor illness ..	—	—	2/2	—	—

The techniques used in these tests are fully described elsewhere (Dane, *et al.*, 1957).

* Denominator=number of monkeys inoculated. Numerator=number of monkeys paralysed.

— Indicates not tested.

ever carefully one may select a case and a contact, there is never absolute proof that both were infected with the same virus strain. The results of tests on three pairs of viruses are shown in the Table. Faecal virus was given one passage in monkey-kidney-tissue culture and then inoculated intracerebrally into rhesus monkeys in various amounts.

With two pairs (B and C) the viruses isolated from both the contact and the paralytic case were probably equally neurotropic. But in pair A, though the virus from the paralytic case (D.D.) was highly neurotropic, the virus from the contact (P.B.) was only slightly neurotropic and fell into the group of naturally occurring avirulent strains. The virus from P.B. resembled in monkey neurotropism (as judged by intracerebral inoculation) the virus excreted by subjects vaccinated with SM 100 type I poliovirus vaccine (Dick *et al.*, 1957; Koprowski *et al.*, 1956) and by subjects vaccinated with more highly attenuated poliovirus strains in a recent Minnesota trial (da Silva *et al.*, 1957). If other currently used vaccine viruses had been subjected to the same type of trial that was conducted at Minnesota similar results might have been obtained.

We do not consider that the small piece of circumstantial evidence we have given above is in any way conclusive proof that wild polioviruses are unstable in their neurotropism, but we do think that these preliminary results might serve as a reminder to those planning attenuated vaccine trials of the sort of problems they have to face in evaluating vaccine safety.

The W.H.O. Expert Committee on Poliomyelitis (World Health Organization, 1958), in its review of present knowledge about live poliovirus vaccines and in its recommendations for trials, virtually ignores the problem of spread. It points out "that preliminary tests on attenuated polioviruses in the hands of several investigators have failed to reveal signs of illness or other harmful effects in the vaccinees or their associates" (our italics). Apart from this one oblique reference to spread there is no indication to the reader that it might be important. Whether the committee considered the spread of these vaccine viruses potentially dangerous or not, it was odd that it dismissed the whole problem with such brevity. The uncontrolled spread of poliomyelitis vaccine virus in a community must either be beneficial or potentially dangerous. If spread is dangerous this will be discovered only if field trials are planned with the object of answering this most important question. If spread is beneficial then it would be useful to know this. A new concept in the use of attenuated virus vaccines might be evolved which could be of great value in combating such diseases as influenza, mumps, and measles.

Effectiveness in the Vaccinee

The ultimate test of the effectiveness of attenuated poliovirus vaccines must await controlled field trials if these are in fact possible. In the meantime it seems reasonable to judge likely effectiveness by measuring the levels of neutralizing antibody in vaccinated subjects.

In the trials where virus grown in monkey-kidney-tissue culture has been used the proportion of vaccinees developing neutralizing antibody has usually been over 90%, and the levels of antibody appear to have been satisfactory. With the TN type II rodent-adapted virus we found that a smaller proportion of children developed antibody (77% of 124), but the levels of antibody in children who did so were broadly similar to those reported following vaccination with viruses grown in tissue culture. Information about the persistence of neutralizing antibody comes mainly from trials with strains of vaccine virus no longer in use. Our own follow-up study on children vaccinated with TN type II virus (Dane, Dick, Briggs, and Nelson, 1958) is open to this criticism, but we consider that the results obtained with TN type II virus are likely to be at least as good as, or better than, those which will be found with the less virulent current vaccine viruses that do not undergo such a marked change after growth in the human gut. We found that about two months

after vaccination 77% of children had developed neutralizing antibody at levels comparable to that found by others following two injections of formalized virus (Report, 1957a), and that in a proportion of the children there was a marked decline in antibody level over the next year, which again was like that reported after two injections of formalized virus (Report, 1957b).

Very high levels of neutralizing antibody have been shown to develop following a third booster injection of formalized vaccine (Report, 1957b), and it is doubtful whether refeeding with live virus vaccines would have such a marked effect. Furthermore, in view of the alimentary resistance to reinfection which follows vaccination with live virus vaccine, it would be difficult to predict whether or not, or when, reinfection would occur. This does not mean that refeeding would not be a possible way of maintaining immunity induced by live virus vaccines, but only that certain problems would arise which have not arisen with formalized vaccine.

The alimentary resistance to reinfection which follows vaccination with live virus is often presumed to be some sort of local gut immunity. Little is known about the nature of this immunity or how long it will last, and, although it is of obvious benefit to the individual vaccinee, it may have more far-reaching consequences to the community as a whole.

Effectiveness to the Community

The resistance or comparative resistance of people vaccinated with live attenuated polioviruses to reinfection with these viruses gives hope that they will be similarly resistant to infection with wild polioviruses. If this proves to be the case, then there is a real chance that wild polioviruses might disappear from a community where sufficient numbers had been vaccinated with live virus vaccines. This does not appear to have happened in the U.S.A. following the use of formalized vaccine, but until a high proportion of the susceptibles in a country have been adequately vaccinated with potent formalized vaccine the possibility that the elimination of polioviruses from a community can be achieved with this type of vaccine cannot be excluded. Experimentally, Howe (1957) has shown that there was a significant reduction in the amount of virus excreted by chimpanzees fed a virulent strain of poliovirus if they had previously been vaccinated with formalized virus. Poliovirus infection in chimpanzees is characterized by a greater pharyngeal multiplication than occurs in man, and for this reason a direct comparison may not be valid.

Use and Testing of Current Attenuated Strains

There appear to be four possible uses of attenuated poliovirus vaccines. They could be used (a) instead of formalized vaccines; (b) to supplement formalized vaccines; (c) to halt epidemics; and (d) in countries whose financial resources do not permit the use of formalized vaccines.

In the first case, it seems unlikely that any country with the finances available to undertake a vaccination programme using formalized vaccines would use, or switch to, attenuated virus vaccines until it has been shown that they are as safe as, or safer than, formalized vaccines and produce as good or better levels of immunity.

In the second case, attenuated virus vaccines might be used to supplement formalized vaccines in the hope of eliminating wild viruses from the community. Before undertaking such a programme one would like to know whether virulent polioviruses may not in fact be largely eliminated from communities which are efficiently immunized with potent formalized vaccines. Enough time has not elapsed from the introduction of formalized vaccines, and sufficiently thorough immunization has not yet been achieved to answer this question.

The use of attenuated vaccines to control epidemics at the present time involves the employment of a contagious virus whose safety and effectiveness during non-epidemic periods

has been inadequately studied. It cannot be predicted how avirulent viruses would behave if they were introduced into a community in which conditions are ripe for an epidemic, and in many areas it would be difficult to organize voluntary immunization of a whole population as was done recently in Africa (Courtois *et al.*, 1958). The problems involved in attempting to evaluate the results of vaccinating a community during an epidemic are great enough to deter some authorities from introducing a largely unproved vaccine in this manner.

There remains the possibility that live virus vaccines might be used in countries in which formalized vaccines cannot be afforded. In our opinion carefully conducted trials of attenuated virus vaccines should be undertaken in such countries if there is a genuine need for vaccination, and they should be done during non-epidemic times of the year. The previous epidemic history of poliomyelitis should be available, and should be carefully considered before initiating the trials. Such trials would be the most valuable first step in gaining information in the field, but it must be appreciated that there are great difficulties in planning trials of a vaccine virus which spreads from vaccinees to their contacts. Any trial of safety must take this factor into account and must attempt to evaluate the harm or good which has been achieved by the uncontrolled spread of a living virus. The information so far published about the currently available attenuated vaccines does not suggest that they will necessarily be either dangerous or completely safe. It is important that trials should aim at defining the limits of safety of these vaccines, rather than at sidestepping the possible dangers which accompany the use of a contagious vaccine.

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"The meat arriving at Smithfield Meat Market has presumably been inspected at the time of slaughter in this country or abroad. Evidence of disease which has escaped notice at the primary inspection is nevertheless found: in some cases it has been overlooked, in others it has only become apparent when the carcass is cut up. Condemnations of meat at Smithfield are to a considerable extent due not to disease but to deterioration during transport, decomposition, bone-taint, brine-staining, etc. The total amount of meat delivered at Smithfield Market was 422,607 tons, of which 497 tons were found to be diseased or unsound and were voluntarily surrendered."—From the *Report of the Medical Officer of Health for the City of London for the Year 1957*.

VACCINATION AGAINST POLIOMYELITIS WITH LIVE VIRUS VACCINES

5. NEUTRALIZING ANTIBODY LEVELS ONE YEAR AFTER VACCINATION

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During the first half of 1956 small laboratory-studied trials of TN type II and SM type I oral attenuated poliomyelitis vaccines (Koprowski, Norton, Jervis, Nelson, Chadwick, Nelsen, and Meyer, 1956) were made in Northern Ireland (Dane, Dick, Connolly, Fisher, and McKeown, 1957; Dick, Dane, Fisher, Connolly, and McKeown, 1957). Neither of these vaccines fulfilled what we considered to be the necessary theoretical requirements of safety (Dick and Dane, 1957), but the results of investigations into the duration of immunity following their administration are reported here because they may be of some value in predicting the sort of immunity which is likely to follow the use of the more attenuated virus vaccines now available.

Materials and Methods.—The materials and methods used were as described previously (Dane *et al.*, 1957). Comparative results for levels of neutralizing antibody in any individual are given only when paired sera were titrated in the same test.

Results

Persistence of Neutralizing Antibody After Vaccination with SM type I Poliovirus

A number of volunteers who were fed SM type I virus in 1956 were bled at frequent intervals after vaccination in order to estimate the highest titre of antibody which they would develop. The serum with the highest titre from each of six adult volunteers was tested again with another serum taken about a year later. The results of these tests are shown in Table I.

TABLE I.—Levels of Type I Neutralizing Antibody in Adults at Various Intervals After Vaccination with S.M. Type I Virus

Serial No.	Age	Sex	Pre-vaccination Titre	Weeks After Vaccination	Titre	Weeks After Vaccination	Titre
193	41	M	<4*	7	22	67	<4
218	39	M	<4	6	22	68	11
353	24	F	<4	4	16	68	4
284	20	M	<4	3	179	99	64
212	20	M	<4	5	359	62	89
235	25	M	<4	9	8	72	256

* Reciprocal of serum antibody titre.

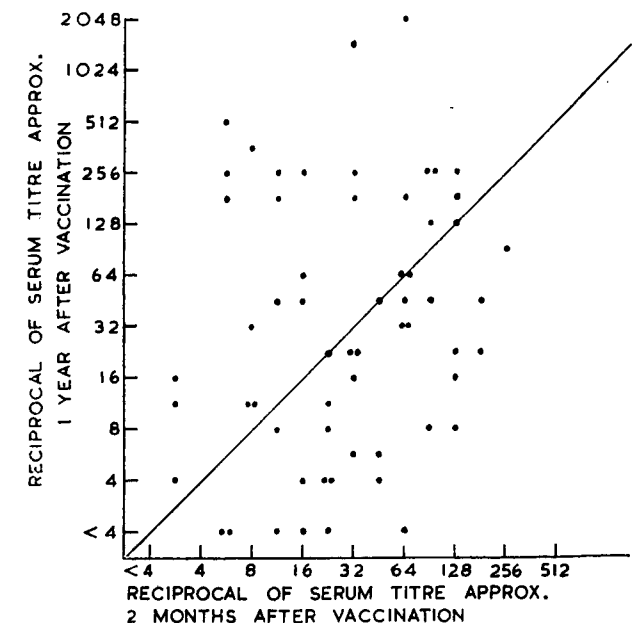
The antibody titre had fallen in five of the individuals, but had risen significantly in the other (No. 235). A number of serum specimens taken from No. 235 over the study period were tested in an attempt to explain this rise in anti-

*Technicians paid with grants from the National Fund for Poliomyelitis Research and the Medical Research Council.

body. It was found that between the ninth and the fifteenth month after vaccination he had developed a significant rise in neutralizing antibody to both type I (from 1:4 to 1:256) and type II poliovirus (from <1:4 to 1:96). It appears, therefore, that during this time he had had at least one natural poliovirus infection.

Persistence of Neutralizing Antibody After Vaccination with TN type II Poliovirus

Blood samples from 60 children vaccinated orally with TN type II poliovirus in 1956 were taken approximately one year later. The comparative levels of neutralizing antibody in this specimen and one taken about two months after vaccination were estimated by testing the two sera at the same time. The variation in antibody levels during this period is shown in the Chart.



Individual variation of type II neutralizing antibody titre in 60 children following vaccination with TN type II poliovirus. All the children were without type II antibody at the time of vaccination.

In a proportion of the children a significant antibody rise occurred after the first post-vaccination blood specimen had been taken. It is impossible to prove that the antibody rises in these children were not the result of infections with naturally occurring type II polioviruses, but the most satisfactory explanation is that vaccine virus multiplication in the gut (and therefore the antigenic stimulus) continued in these children beyond the date when the first post-vaccination blood sample was taken (approximately the ninth week after vaccination). We have no laboratory data to support this hypothesis, because the trial was originally planned on the basis of observations by Koprowski *et al.* (1956) that TN type II vaccine virus was excreted in scarcely detectable amounts over a short period, and for this reason collection of faecal specimens was not continued long enough. However, a number of children were excreting faecal virus during the fourth week after vaccination, when specimen collection ceased, and there seems to be no reason why they should not have continued doing so for several months, as was the case in children vaccinated with SM type I virus (Koprowski *et al.*, 1956).

The possibility that some of the rises in type II antibody might have been due to natural infections with heterologous poliovirus types was also considered. Serum specimens taken at the time of vaccination and one year later were tested at a 1:4 dilution against types I and III poliovirus to find out whether any children had developed antibody against

these poliovirus types. Titrations of the paired sera from children found to have developed antibody showed that six natural infections had occurred—three with type I poliovirus and three with type III poliovirus. In the course of another investigation type I poliovirus had in fact been isolated from two of the children who showed serological evidence of a type I infection.

We conclude that heterotypic poliovirus infections could only have contributed to the late rise in type II antibody in these six instances.

After testing the first post-vaccination blood sample (taken after about two months) we reported that only 77% of 124 children had developed neutralizing antibody following vaccination with TN type II virus (Dane *et al.*, 1957). We were able to obtain blood samples one year later from 15 of the 28 children who did not develop antibody. None were found to have developed type II antibody during this interval, thus confirming our original conclusion that the vaccine had failed to "take" in these individuals.

Influence of Heterotypic Antibody on Vaccination with TN Type II Virus

Because of the possibility that previous natural heterotypic poliovirus infections might have influenced the response of children to vaccination with TN type II virus, pre-vaccination samples of blood from 110 children who had been vaccinated with TN type II virus were tested for neutralizing antibody at a 1:4 dilution against types I and III poliovirus. The pre-vaccination antibody patterns found are shown in Table II. Children possessing different pre-vaccination heterotypic antibody patterns showed no significant difference in their response to vaccination.

TABLE II.—Poliomyelitis Neutralizing Antibody Patterns at the Time of Vaccination in 110 Children Fed TN Type II Virus in 1956

No. of Children	Type I Antibody	Type II Antibody	Type III Antibody
63	—	—	—
20	+	—	—
19	—	—	+
8	+	—	+

— = Titre of < 1 in 4. + = Titre of > 1 in 4.

Discussion and Conclusions

The neutralizing antibody levels which we found in children one year after vaccination with TN type II virus were of the same order as those reported in non-immune children who had received two injections of formalized vaccine a year before (Report, 1957). A number of the TN-vaccinated children were found to have had a marked decline in their neutralizing antibody level over the year, and our previous finding that 23% of children failed to develop antibody after vaccination was confirmed.

One of the advantages claimed for oral attenuated poliomyelitis vaccines is that they will produce a more durable immunity than formalized vaccines. We can find no evidence that this was true in a proportion of children vaccinated with TN type II virus. Admittedly our yardstick for the measurement of immunity has been circulating neutralizing antibody. Some sort of local gut immunity follows infection with oral poliovirus vaccines, but in the absence of more precise information about this local immunity it would be unwise to assume that it is more durable than circulating antibody.

Further trials of Koprowski's TN type II vaccine have been abandoned because the virus is liable to change its character and become virulent after growth in the human gut. If it can be shown that the recently developed more highly attenuated poliovirus vaccines do not suffer from this drawback, then it would seem desirable to show also that they can produce a reasonably durable immunity in the majority of vaccinated subjects before they are used on a large scale. On the basis of the results reported here we do not think that durability of immunity should be considered as an automatic benefit associated with living vaccines.

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A SMALL-SCALE TRIAL OF TYPE III ATTENUATED LIVING POLIOVIRUS VACCINE

BY

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The purpose of this small-scale trial of a single strain of living attenuated poliovirus vaccine was to obtain information concerning the capacity of the virus to induce infection in children previously immunized with inactivated Salk-type vaccine, to measure the antibody formation after the feeding of the virus, and to compare the virulence for monkeys of excreted virus with that of the strain composing the vaccine. In addition, evidence was sought concerning the spread of virus from vaccinated children to their contacts. The virus vaccine selected for use was the type III attenuated poliovirus from culture of monkey-kidney tissue developed by Dr. Albert B. Sabin and obtained as virus-containing culture fluid from Dr. J. D. Verlinde at Leyden. The virus was the highly purified Leon strain previously subjected to many kidney-tissue-culture passages and plaque-selection, and designated the 12a,b (KP4) virus (Sabin, 1957). The strain pool was freshly titrated by one of us (A. P. G.) upon receipt and found to have a titre of $10^{7.55}$ 50% tissue-culture infective doses per ml.

Control Period of Study

The test was carried out in a long-stay orthopaedic institution where the children were under treatment for lesions such as those due to Perthes's disease or tuberculous arthritis. A control period of study began in September, 1957, when immunization with two doses of British-type Salk vaccine was given to certain boys whose parents volunteered for their inoculation. Nineteen boys aged 6 to 15 years received vaccine intramuscularly after a preliminary withdrawal of 10 ml. of blood. The second dose of vaccine was given one month after the first dose, and all inoculations were completed by December 4, 1957. A second specimen of blood was obtained two weeks after the second

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dose of vaccine, and the neutralizing antibody contents of the pre- and post-immunization sera were estimated by titration in monkey-kidney-tissue cultures against each of the three types of poliovirus (Tyrrell *et al.*, 1956).

Permission to use live poliovirus as a boosting vaccine was sought from the parents of those who had received Salk-type vaccine and was given in 14 instances. The children were housed in two wards prior to the trial. One of these contained 12 children aged 6 to 8, of whom five eventually went into the trial, while the remaining nine children in the trial came from a second ward of 12 children aged 9 to 15. Faeces were obtained once weekly for 17 weeks from all children in the first ward and for a further three weeks from all children who were to receive live virus in both wards. In no instance was a strain of poliovirus obtained from the faecal suspensions tested in pools of three to four specimens which were inoculated into monkey-kidney-tissue cultures. This preliminary period of testing was considered desirable because patients convalescent from poliomyelitis were nursed in the same hospital. But their wards were in a separate building situated at least 200 yards (180 m.) from the main block of the hospital. Segregation of the patients in the respective sections was complete. The only natural virus strains recovered in Sheffield at any time from September, 1957, to April, 1958, had been obtained by Dr. J. E. M. Whitehead at the Public Health Laboratory, Sheffield, during the acute phase of illness prior to the transfer of patients with poliomyelitis to the orthopaedic hospital. All were of type I poliovirus. No case of type III poliomyelitis was in fact encountered in Sheffield during the entire period of the trial, and the last case of type III virus isolation had been in December, 1956.

Period of the Trial

The 14 boys aged 6 to 15 years who were to receive live virus vaccine were collected together and were the sole inmates of one ward on February 16, 1958. They were attended by nurses who had been previously immunized with two doses of Salk-type vaccine. All but three of the boys were confined to bed, and some were immobilized on frames during the period of observation.

Virus was fed orally in hard gelatin capsules containing a dilution of stock vaccine virus in sterile synthetic medium 199 mixed with polyethylene glycol 400 so as to contain $10^{4.5}$ TCD₅₀ infective doses of virus in a volume of 0.2 ml. A third sample of blood was obtained from each boy prior to virus feeding, which was carried out in two stages.

On February 17 seven boys received capsules containing virus and seven received capsules filled with uninfected culture medium. Faecal specimens were obtained daily or when passed from all the boys during the ensuing weeks, and occasional specimens were obtained from the nurses in contact with the boys.

The second stage of the feeding of virus took place on March 10, 1958, when 11 boys, including all those previously fed dummy capsules, received a capsule containing live virus similar in amount to that previously used. Faecal specimens continued to be obtained at frequent intervals from all children found to be excreting virus, until the specimens were negative. A fourth sample of serum was collected from all the boys on April 1, six weeks after the first virus feeding and three weeks after the second administration of virus. These serum samples, together with the third samples, were titrated for neutralizing antibodies to the three types of poliovirus as before. The results obtained with these sera and also with the faecal specimens are described after details have been given of the technical methods which were used.

Technical Methods: (a) Sheffield

Isolation of Poliovirus from Faeces

Faeces were stored at -25°C . until tested. Emulsions of 10–30% were then made in Hanks's saline, which contained 1,000 units of penicillin and 1,000 units of streptomycin per ml. Each emulsion was centrifuged at 3,000 r.p.m. for one

hour, and 0.5 ml. of the supernatant was inoculated into each of four monkey-kidney-tissue culture tubes containing 1.5 ml. of medium. Trypsinized monkey-kidney-tissue cultures were prepared as described by Balducci *et al.* (1956) from rhesus and cynomolgus monkeys. The maintenance medium consisted of 2% calf serum and 0.25% lactalbumin hydrolysate in Hanks's saline to which three times the normal amount of 1.4% NaHCO₃ solution had been added. Three to six hours after inoculation the emulsion was removed from the cultures and fresh medium added. When specific cytopathogenic changes appeared the medium and cells were harvested and stored at -25°C . If no cytopathogenic change appeared after 12 days' incubation the cultures were harvested and a second blind pass was made. This was also incubated for 12 days, and if any suspicious cytopathogenic effect appeared a third pass was made. The faeces collected during the control period were tested in pools of three or four specimens, and only one pass in monkey-kidney-tissue culture was made unless suspicious cytopathogenic effects appeared. Throughout the period of the trial, when faeces were collected and examined no live poliovirus of any type was used in the Sheffield laboratory and no faeces from other sources were examined. The neutralization tests on the serum specimens were done before and after this period.

Titration of Faeces

Accurate 10% emulsions were made from most of the virus-containing faeces. Tenfold dilutions of these emulsions were made in Hanks's saline, and 0.2 ml. of each dilution was inoculated into each of two monkey-kidney-tissue culture tubes containing the medium as used for isolation. End-points were calculated by the method of Reed and Muench (1938).

Neutralization Tests

Sera previously stored at -25°C . were inactivated at 56°C . for 30 minutes and serial fourfold dilutions made in Hanks's saline. The same pools of virus were used in each batch of tests. They were diluted in Hanks's saline, so that 50 TCD₅₀ were inoculated into each of the tissue-culture tubes. Equal volumes of serum dilution and virus dilution were mixed in screw-capped bottles and allowed to stand at room temperature for one hour. Into each of two monkey-kidney-tissue culture tubes 0.5 ml. of each mixture was then inoculated. The tests were read daily and the end-points calculated for the day after full degeneration had occurred in the control tubes (usually the fifth day after inoculation). The titres were expressed as the reciprocals of the serum dilutions before the addition of virus. The titre was estimated as "2" when the end-point was less than 4 on the final day of reading the test but where some antibody had been detected at readings on earlier days. The titre was expressed as "less than 4" if no neutralization was apparent when a cytopathogenic effect first appeared in the control tubes. However, the technique was not sensitive enough for detection of very small amounts of antibody. The specimens taken before and after Salk vaccination or before and after feeding the live vaccine for each child were tested at the same time. A control serum was included in each batch of tests.

Technical Methods: (b) Beckenham

Virus Titrations

Each virus pool inoculated into monkeys was titrated for tissue-culture infectivity. Trypsinized rhesus or cynomolgus monkey-kidney cultures in roller tubes were used when an abundant healthy monolayer of epithelial cells was present. Cultures were maintained on a protein-free medium devoid of inhibitors which had been shown to be of optimum sensitivity for demonstrating the cytopathic effect of poliovirus; it consisted of 5% horse-liver digest ultrafiltrate in Earle's balanced salt solution (S. E. Smith, personal communication, 1958). Serial tenfold dilutions up to 10^{-8} of each virus were made in this medium, and 0.5 ml. of each dilution was inoculated into 10 cultures each containing

1.5 ml. of freshly changed medium. Cultures were examined up to the seventh day after inoculation, when final readings were taken and the 50% tissue-culture degeneration end-point (TCD₅₀) was calculated by the method of Kaerber (Irwin and Cheeseman, 1939). Each pool selected for virulence study was titrated on the day it was inoculated into monkeys, and again on a subsequent date together with all other virus pools using one tissue-culture batch. Differences between the two titrations varied between zero and 0.5 log₁₀. In Table III the quantities of virus are expressed as TCD₅₀ per ml. of culture fluid and are derived from the mean of the titrations.

The vaccine virus has been titrated four times. It was received frozen at -70° C. and was thawed and titrated; smaller lots were distributed into ampoules and refrozen at -70° C. Three ampoules have been thawed for titration subsequently. The first titration gave a value of 7.55 log TCD₅₀ per ml. Three titrations of the refrozen material gave values of 6.7, 6.8, and 6.9 log TCD₅₀ per ml., indicating a fivefold loss by this procedure. Since twice-thawed material was used for both feeding and virulence tests the value of 10^{6.8} TCD₅₀ per ml. has been used.

Virulence Tests

A test for virulence, semi-quantitative in nature, was done on the vaccine, as fed to the children, and on two samples of excreted virus from each child proved to be a virus carrier. The first and the last virus strains isolated from the faeces during the study period were tested, except in one child where the virus excreted on the second day after feeding was tested because the first-day specimen contained very little virus. Tissue-culture fluids of the first passage from cultures inoculated with faecal suspensions were pooled when a full cytopathic effect was apparent, and these fluids were used for the virulence experiment.

Each virus pool was inoculated undiluted into two or three monkeys and diluted 1 in 100 into two or three monkeys. Normal cynomolgus monkeys, between 1.2 and 2.9 kg. in weight, received 1 ml. of sample intracerebrally under thialbarbitone, 0.5 ml. being placed in each thalamic region (Bodian, Morgan, and Schwerdt, 1950). Monkeys were observed for up to 30 days after inoculation, during which time they were isolated in groups of two or three in cages measuring 3 ft. (90 cm.) high by 2 ft. (60 cm.) square, and were not removed unless obviously paralysed. It became apparent during the experiment that this method of observation had a high threshold; minor grades of paralysis were almost certainly missed through not exercising monkeys in an open run. Monkeys showing severe paralysis were sacrificed immediately; those showing minor paralysis were watched over for one or two days for further spread; one monkey showing only moderate involvement of both legs on the 14th day was kept until the 29th day with a fair degree of recovery. All surviving monkeys were killed between the 28th and 30th days after inoculation. At post-mortem examination, samples of blood and lumbar enlargement of spinal cord were taken for recovery of virus, after which the whole animal was fixed by perfusion with 10% formal-saline. Selected lengths of lumbar, thoracic, and cervical cord were processed for histological examination.

Results of the Trial

Clinical

No clinical reactions which could be related to the administration of the live vaccine were detected in the boys or in their contacts. Virus excretion which was believed to signify actual infection therefore occurred in the absence of those clinical phenomena, such as pyrexia, minor illness, and so on, which may accompany the non-paralytic form of clinical poliomyelitis.

Virus Excretion

Excretion of the virus was detected in 6 of the 14 subjects who received live virus by mouth, and in five cases was prolonged and quantitatively considerable in amount. Virus strains were recovered from 2 of the first 7 boys fed virus and from 4 of the 11 fed virus on the second occa-

sion. Four who were fed virus on two occasions and who did not excrete virus on the first occasion also failed to excrete virus on the second occasion. Nor were viruses recovered from the seven boys given dummy capsules during the first stage of the trial, when two other boys were actively excreting virus, or from nurses at any phase of the trial. No evidence of spread of virus to contacts was thus obtained, but it happened that all the boys who excreted virus were immobilized on Jones frames during the entire period of the trial.

The amounts of virus detected in the stools of five of the six boys who excreted virus are shown in Table I. The

TABLE I.—Amount of Virus in Faeces (Log₁₀TCD₅₀/G.) from Five Children who Excreted Virus

Day After Feeding	Case No.				
	1202	1203	1201	1205	1308
1	1.1				1.1
2	4.2			3.0	
3	4.7				
4					4.7
5	4.2	5.0			
6	5.2				3.2
7	5.2		2.2	2.2	
8	4.2	1.7			
9					3.2
10	5.2		+		
11	3.7				
12		2.7	+	1.7	
13	3.2	3.2			
14	2.2	2.2		1.7	
15					
16					
17			2.2		
18					
19				+	
20					
21			3.0		
22			+		
23					
24					
25					
26					
27					
28					
29					
30					
31			+	1.3	
32					
33					
34					
35					
36					
37					
38					

— No poliovirus isolated.

+ = Poliovirus isolated but insufficient specimen for titration.

sixth boy (1311) excreted a very small amount of virus for only 24 hours after oral feeding. As this virus was detected only after three tissue-culture passages it seems likely that it represented vaccine virus which had passed through but did not multiply in the intestinal tract. The five boys shown in Table I excreted quantities of virus varying from 1.1 to 5.2 log₁₀ 50% tissue-culture infective doses of virus per gramme of stools. Excretion occurred for periods from 9 up to 30 days including the day on which virus was first detected. It is certain that multiplication of virus had taken place in the alimentary tract of these five children. The viruses recovered from each of two specimens of faeces from each child were typed by neutralization techniques. All were found to belong to type III poliovirus.

Antibody Response

The results of serum neutralization tests on all 14 of the boys in whom the trial was made are shown in Table II. The rise in antibodies after the two doses of Salk-type vaccine were of the same order as those found by other workers (M.R.C. Committee, 1957; Russell, 1958). Good antibody responses were obtained in most of the boys, but one boy (1203) failed to respond to the type III antigen and one (1200) to the type I antigen. After the feeding of the live vaccine children who did not excrete virus and the

one boy with transient excretion showed no increase or a twofold decrease in antibody to type III virus and variations with a twofold increase or decrease in antibodies to the other types. Of the five children who excreted virus for prolonged periods one showed no change in antibody levels and one showed a twofold decrease in antibody to type III virus. The remaining three children all showed a fourfold or greater increase in type III antibody without any significant alteration in antibodies to the other poliovirus types. The two children who showed no antibody response after the live virus vaccine had received the second dose of inactivated vaccine 2½ and 4½ months previously. This relatively short interval of time may have been responsible for their failure to develop a further increase in antibody.

In such a small number of subjects it is clearly impossible to discern correlations between the ability of the oral vaccine to establish infection and the antibodies pre-existing in the blood. Of the five who became infected, two had no antibodies to type III virus before the administration of Salk-type vaccine, and only one of those who failed to become infected was similarly devoid of such antibody. On the other hand, the geometric mean titre of the type III antibodies just prior to feeding was 42.2 in those who developed infection compared with a mean titre of 351.8 in those who proved resistant to infection. Finally, four of the five boys who became infected were among the youngest subjects in the trial, so that it is possible that age is as important a factor in determining the likelihood of infection as is naturally or artificially acquired antibody.

Neurotropism of Excreted Viruses

The comparative virulence for monkeys of the vaccine virus and of the strains of virus excreted by the five boys considered to have developed an alimentary infection is shown in Table III.

None of the monkeys inoculated with vaccine showed either paralysis or other evidence of neurotropic activity. On the other hand, each child in whom the vaccine virus multiplied excreted at some stage a virus of increased virulence. The viruses included in Table III show a graded spectrum of neurotropic activity which bore a distinct relationship to the length of time that the virus had had to multiply after the original feeding. Thus Case 1308 on the first day and Case 1205 on the second day showed viruses of similar behaviour to the vaccine. Cases 1203 and 1202 on the second day showed some slight increase in paralytic activity. Every strain after the second day showed paralytic activity at the lower concentration of virus inoculated. With the exception of Case 1201, in whom the 7th-day and 31st-day virus both showed strains of intermediate virulence, all cases showed an increased virulence in the strain of virus excreted later compared with that excreted in the earlier phase of infection. On the 14th day Case 1203 showed a degree of neurotropism similar to that of field strains of type III virus from paralytic cases. Eight thousand tissue-

TABLE III.—Intracerebral Virulence Test in Monkeys

Case No.	Days after Feeding	Virus Titration*	Estimated TCD ₅₀ Inoculated	Paralytic Rate	Day of Onset Paralysis	Histological Infection Rate	Virus Recovery from Cord
Vaccine (diluted and refrozen)	—	6.8	6,400,000 64,000	0.3 0.3	—	0.3 0.3	0.3 0.3
1201	7	7.95	89,000,000 890,000	1.3 2.3	15 6, 22	3.3 2.3	1.3 2.3
1201	31	8.15	140,000,000 1,400,000	2.2 1.3	4, 9 16	2.2 3.3	2.2 2.3
1202	2	7.65	45,000,000 450,000	2.2 0.3	9, 9 —	2.2 2.3	2.2 1.3
1202	14	6.85	7,000,000 70,000	1.3 1.3	8 29	3.3 3.3	1.3 2.3
1203	2	7.1	12,000,000 120,000	1.3 0.3	19 —	1.3 0.3	1.3 0.3
1203	14	5.9	800,000 8,000	3.3 2.3	6, 7, 8 8, 10	3.3 3.3	3.3† 2.3
1205	2	6.8	6,400,000 64,000	0.2 0.3	— —	0.2 0.3	0.2 0.3
1205	31	6.9	8,000,000 80,000	1.3 1.3	16 28	3.3 1.3	0.3 1.3
1308	1	7.2	16,000,000 160,000	0.3 0.3	— —	0.3 0.3	0.3 0.3
1308	9	6.95	8,900,000 89,000	2.2 1.2	7, 16 15	2.2 1.2	1.2 0.2

* Mean of two titrations. Log₁₀TCD₅₀ ml.

† Monkey paralysed on sixth day also showed viraemia.

culture doses given intracerebrally caused severe paralysis of relatively rapid onset in two monkeys and extensive histological lesions in a third monkey. One monkey had viraemia at the onset of paralysis on the sixth day after receiving the lower dilution of virus.

As will be noted from Table III, the extent of involvement of the spinal cord revealed by histological examinations was greater than that shown by clinical assessment of the monkeys from outside their cages. The lesions in some cases were indeed extensive and severe, as can be seen from Figs. 1, 2, and 3. All the viruses recovered from the spinal cords of these monkeys were type III. No other strain of poliovirus was being used in the unit housing the monkeys during the period of these experiments.

Discussion

The use of living attenuated viruses for immunization against poliomyelitis is now being actively pursued by several different groups of observers. There are, however, few recorded observations concerning the use of such vaccine as an agent for reinforcing the basic immunity acquired by immunization with Salk vaccine. Paul *et al.* (1957) reviewed the argument for such a use of an attenuated live virus vaccine and suggested that it might be desirable to obtain a planned exposure to an attenuated virus by mouth rather than to rely upon natural infection with an unpredict-

TABLE II.—Neutralizing Antibody Titres in 14 Children

Case No.	Age	Type III Virus				Type I Virus				Type II Virus			
		1	2	3	4	1	2	3	4	1	2	3	4
(a) Children who excreted virus after feeding type III virus vaccine													
1201	7	<4	256	128	128	32	512	128	128	512	2,048	2,048	2,048
1202	6	16	64	64	256	128	512	512	512	8	512	512	512
1203	6	4	4	8	512	512	2,048	4,096	4,096	<4	128	64	128
1205	6	<4	32	8	2,048	<4	8	2	<4	2	128	16	32
1308	10	8	256	256	128	32	512	1,024	512	<4	128	128	64
(b) Children who did not excrete virus after feeding vaccine													
*1200	6	32	1,024	512	512	2	2	<4	<4	<16	64	8	16
1203	15	<4	8	16	16	<4	64	64	128	>4	4,096	8,192	4,096
1304	15	32	512	2,048	2,048	8	1,024	512	1,024	<16	256	128	64
*1305	12	16	2,048	2,048	1,024	512	1,024	256	512	128	1,024	256	512
1306	10	4	1,024	4,096	2,048	128	512	256	256	16	1,024	512	256
*1307	14	8	256	512	512	8	64	128	128	128	512	2,048	1,024
*1310	11	2	8	8	8	<16	512	512	512	128	2,048	2,048	2,048
1312	9	128	512	512	256	32	1,024	1,024	512	<4	128	128	128
(c) Transient excretion virus after feeding vaccine													
1311	9	2	2,048	1,024	1,024	<4	8	8	8	8	1,024	2,048	2,048

1 = Before Salk-type vaccine. 2 = After Salk-type vaccine. 3 = Before feeding type III virus vaccine. 4 = After feeding type III virus vaccine.

* Fed virus on two occasions.

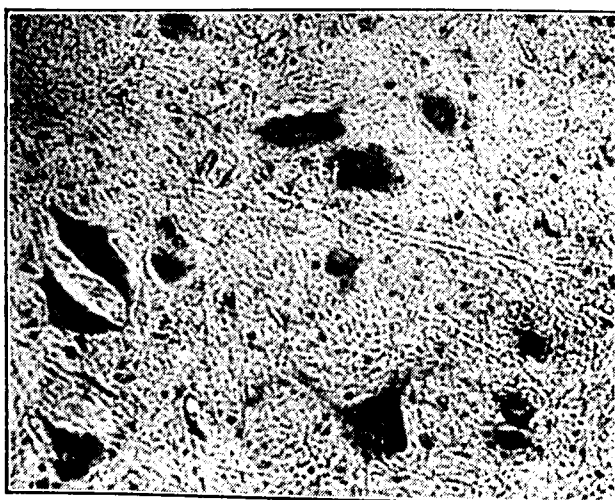


FIG. 1.—Photomicrograph ($\times 170$) of lumbar cord of monkey killed 28 days after intracerebral inoculation of $10^{4.5}$ TCD₅₀ of vaccine virus. No paralysis, normal histological appearance. Nissl stain.

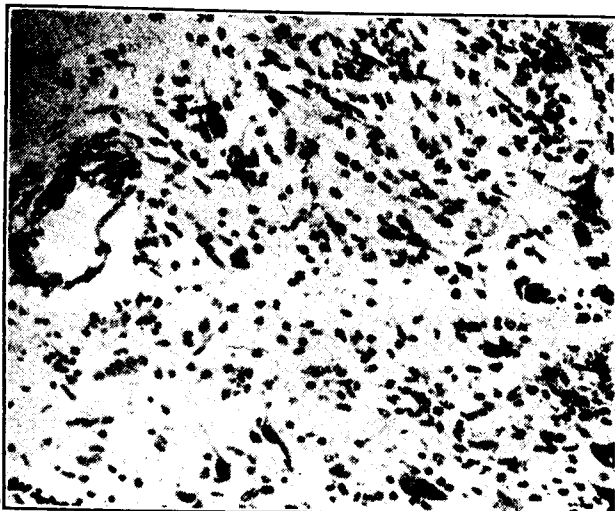


FIG. 2.—Lumbar cord of monkey paralysed eight days after intracerebral inoculation of $10^{3.5}$ TCD₅₀ of virus from faeces of Case 1203 on the 14th day after vaccine. Typical lesions of acute poliomyelitis. Type III virus isolated.



FIG. 3.—Lumbar cord of monkey killed 29 days after intracerebral inoculation of $10^{4.5}$ TCD₅₀ of virus from faeces of Case 1202 on the 14th day after vaccine. Extensive lesions typical of convalescent poliomyelitis. Type III virus isolated.

able dose of wild possibly virulent poliovirus. They showed (Horstmann *et al.*, 1957b) that a child of 9 vaccinated previously with Salk vaccine was readily infected by live attenuated type III virus (Leon—KP34) fed by mouth. In a later trial of type I virus (L.Sc. strain) under conditions where spread of infection readily occurred to contacts, Horstmann *et al.* (1957a) found that children immunized with Salk vaccine acquired alimentary infection in 10 out of 10 instances after virus-feeding by mouth and in 12 out of 13 instances by natural exposure. These observations are paralleled by the occurrence of alimentary infection under natural circumstances in previously vaccinated children who were family contacts of cases of poliomyelitis (Lipson *et al.*, 1956; Gelfand *et al.*, 1957; Davis *et al.*, 1958). It thus appears likely that children who have received Salk-type of inactivated poliomyelitis vaccine can readily become infected under natural conditions or after deliberate feeding of poliomyelitis virus. Yet the observations of Sabin (1956) and of Horstmann *et al.* (1957a) showed that persons whose blood contained naturally acquired antibodies frequently resisted infection by live attenuated viruses fed by mouth, thus suggesting that the alimentary tract does acquire immunity after exposure to poliovirus.

Our own study has confirmed the fact that it is possible to infect the alimentary tract of children previously immunized with two doses of Salk-type vaccine in spite of the presence of antibodies in the serum at the time of infection. Too few of the children lacked type III antibody prior to immunization with Salk-type vaccine for us to throw any light on the relative protective power of natural versus artificially acquired antibody, though the data suggested that age of the subject may be a factor in this question of immunity. The circumstances of our trial were also too restrictive for the observation that spread of virus did not take place from carriers to contacts to have much significance. No spread of infection was in fact observed by Horstmann *et al.* (1957b) in the study of a similar attenuated type III virus in a ward of 13 mentally defective children and adults. On the other hand, the L.Sc. type I attenuated virus fed in the later study of Horstmann *et al.* (1957a) to mentally retarded children spread widely, so that strain differences as well as the circumstances of the trial may be important in determining whether or not contact infection will occur.

The antibody-boosting capacity of infection with attenuated poliovirus proved less uniform than was expected. One explanation of the failure of two of the five infected children to react may be that the recent boost of antibody consequent upon the injection of Salk-type vaccine had interfered with the capacity of the alimentary infection to raise the antibodies to a still higher level (Sabin, 1957). However, Dick and Dane (1957), who worked with the rodent-adapted type II strain developed by Koprowski *et al.* (1956), similarly recorded a failure of uniformity in antibody response after oral feeding.

Probably the most important of our observations are those relating to the comparative virulence of the vaccine virus which was fed and that of the strains of virus recovered from the stool. Tests on the vaccine virus fully confirmed Sabin's opinion concerning the high degree of attenuation of this virus for the brain and spinal cord of the monkey. However, all the children whose faeces contained virus for several days after oral feeding excreted strains with a capacity to induce paralysis in monkeys inoculated intracerebrally. Sabin (1957) found that the viruses excreted by persons fed attenuated poliovirus strains had an altered neurotropism in that they would sometimes produce paralysis after direct intraspinal inoculation into monkeys. Some increase in intracerebral activity was also

recorded, more frequently for type III than for types I and II, but less consistently and of a lower order than that recorded above. However, the majority of viruses examined by Sabin were isolated early in excretion; in common with our finding, increased neurotropism was found most often at a later stage of excretion. Nevertheless, Sabin considered that such excreted viruses were less highly neurotropic than wild polioviruses disseminated by healthy children during non-epidemic periods.

It is a matter of opinion whether all the viruses excreted by the children in our trial were less virulent than strains encountered in nature. But the degree of alteration from the original vaccine strain appeared to be considerable. In this regard our observations seem to be similar to those recorded by Dane *et al.* (1957) with rodent-adapted type II virus and by Dick *et al.* (1957) with modified type I virus (Koprowski *et al.*, 1956). It will be recalled that Dick and Dane (1957) stated that these virus strains were unacceptable for mass immunization because of their alteration in virulence during passage through the alimentary tract. In spite of the mass use of living attenuated poliovirus vaccine in the Belgian Congo (Courtois *et al.*, 1958) it is our opinion that further research concerning the properties of the viruses excreted by those receiving such vaccines is desirable in order to reconcile the conflicting evidence.

Summary

Fourteen children who were patients at a long-stay orthopaedic hospital were immunized with two doses of British inactivated poliovirus vaccine and were later given living attenuated type III virus vaccine (Sabin) by mouth in gelatin capsules. No adverse clinical reactions were observed. Five of the children developed an alimentary infection, as shown by excretion of virus in the stools for from 9 to 30 days, and in three instances by a further increase in antibody titre. No instance of spread of excreted virus to contacts was detected. The vaccine virus and some of the viruses excreted early in the course of infection did not produce paralytic effects in monkeys inoculated intracerebrally. All five infected children excreted strains of virus possessing enhanced neurotropic properties for monkeys at a late stage of the infective process.

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COMBINED GASTRIC AND DUODENAL ULCERATION

A SURVEY OF 157 CASES

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From the time Sir David Wilkie (1926) first reported on combined ulceration of the stomach and duodenum there has been a considerable divergence of opinion in respect to its incidence. This is revealed in the recent observations by Feldman (1953) and by Johnson (1955). From their papers it would appear that surgeons as a rule observe a much higher proportion than is found in either post-mortem or radiological studies. Johnson also drew attention to gastric retention as leading to gastric lesions in patients suffering from chronic duodenal ulcer. The present study shows the incidence of combined ulcers as encountered in a general hospital, and gives some additional information on duodenopyloric stenosis causing secondary ulcer of the stomach. It also reveals the increased danger of bleeding, making surgical treatment more advisable than with a single ulcer.

Material

The 157 cases reported here were collected from the files of the in-patient and out-patient clinics of the Central Middlesex Hospital, London. Only cases with combined ulcers first diagnosed in the years 1947 to 1954 were included. Definite radiological, surgical, or post-mortem evidence of chronic ulceration was required. Acute ulcers were excluded. In all doubtful cases the x-ray films were reviewed. While the work proceeded, it became increasingly obvious that cases with antral, prepyloric, and pyloric ulcers were not suitable for analysis. There would often arise considerable doubt about the exact location of the ulcer. Extensive scarring due to prepyloric lesions will sometimes lead to secondary duodenal deformity, particularly after perforation. For this reason, only gastric ulcers at or above the angulus were included.

Incidence

During the eight-year period from 1947 to 1954, 157 cases showing both gastric and duodenal ulcers or ulcer scars were observed. In 139 of these, both ulcers were diagnosed radiologically. During the same period 3,744 duodenal and 1,352 gastric ulcers were detected by x-ray study in the hospital, excluding the combined lesions. Based on x-ray findings, the observed incidence is 2.7%. As mentioned above, cases with prepyloric ulcers were not included in the combined ulcer group. Ihre and Müller (1943) observed 26% of all benign gastric ulcers to be prepyloric. Many authors give figures lying between 15 and 20%, but Gott,

TABLE I.—Incidence of Combined Ulcers Based on X-ray Investigation (Central Middlesex Hospital, 1947–54)

No. of Cases With Single Ulcers	Combined Ulcers (Prepyloric Ulcers Excluded)		Combined Ulcers (Estimated 25% Prepyloric Ulcers Included)	
	No.	Incidence	No.	Incidence
D.U. ... 3,744	139	$\frac{139 \times 100}{3,744 + 139} = 3.6\%$	185	$\frac{185 \times 100}{3,744 + 185} = 4.7\%$
G.U. ... 1,352*		$\frac{139 \times 100}{1,352 + 139} = 9.3\%$		$\frac{185 \times 100}{1,352 + 185} = 12.0\%$
All ulcers 5,096		$\frac{139 \times 100}{5,096 + 139} = 2.7$		$\frac{185 \times 100}{5,096 + 185} = 3.5$

* Including prepyloric ulcers.

Shapiro, and Kelty (1954) found 42% of gastric ulcers below the angulus. If an estimated 25% of prepyloric ulcers are added, the number of combined ulcers would increase to 185 and the incidence to 3.5% (Table I). Thus one in every eight hospital patients suffering from an ulcer of the stomach and about 1 in 30 patients having a duodenal ulcer or ulcer scar may be expected to have an associated ulcer of the other organ as well.

It has been suggested by Johnson (1955) that many combined ulcers may be missed on x-ray examination, thus decreasing their apparent proportion. In this series, 18 cases were not diagnosed by x-ray examination. In six of these no barium-meal study was performed at any time before surgery or necropsy disclosed the ulcers. In most cases an emergency situation such as bleeding or perforation was responsible for this omission. In another six cases the last radiological investigation had taken place two to six years before gastric surgery revealed an additional ulcer not shown before. Judging from the symptoms during the interval, the presence of combined ulcers at the previous examination is unlikely. In only five patients was one of the ulcers certainly missed. There were duodenal scars in four of these patients, and an active duodenal ulcer in one, accompanied by a considerable degree of pyloric stenosis. In addition, one gastric ulcer was possibly not detected two months before it was found at an emergency operation for bleeding. In no case examined radiologically were both ulcers missed. Thus the x-ray findings were incomplete in less than 5%. It is believed that careful x-ray examination provides reliable data for estimating the incidence. The high proportion of positive diagnoses reflects the particular care taken in the hospital's x-ray department in respect of barium-meal studies as well as the awareness of the frequent concomitance of ulcers. In the majority of cases the radiological diagnosis was confirmed by surgery or gastroscopy or both.

Time Sequence of Ulcer Appearance

The sequence is of some importance in aetiological considerations on combined ulceration. Previous observations by Feldman (1953) and Johnson (1955) showed that a proved chronic duodenal ulcer preceded the appearance of the gastric ulcer in most patients. This sequence took place in 91 patients (group 1), of whom 20 were women (Table II).

TABLE II.—Sequence of Ulcer Appearance and Sex Incidence

Group	Sequence	Total	Men	Women	Sex Ratio
1	D.U.→G.U.	91	71	20	3.6:1
2	"Simultaneous" G.U.+D.U.	25	19	6	3.2:1
3	Sequence unknown	20	17	3	5.7:1
4	D.U.→G.E.→G.U.*	13	11	2	5.5:1
5	G.U.→D.U.	8	7	1	7:1
	All groups	157	125	32	3.9:1

* Including one vagotomy without gastro-enterostomy.

In 25 others the ulcer history was remarkably short, rarely exceeding two months. Still the first x-ray examination or surgery performed for complications showed both active duodenal and gastric ulcers (group 2). No sequence could be established in 20 patients with incomplete records or in cases where a long ulcer history preceded the first x-ray study which showed combined ulcers (group 3). Twelve patients underwent gastro-enterostomy for duodenal ulcer 1 to 25 years before a gastric ulcer at some distance from the anastomosis was discovered (group 4). Another patient also included in this group had submitted to a vagotomy without gastro-enterostomy for duodenal ulcer two years before an ulcer of the stomach appeared. Similar cases have been reported by Johnson (1955).

Evidence for a gastric ulcer preceding a duodenal ulcer was obtained in eight patients (group 5). The early x-ray films of these patients were reviewed by the radiologist, and the duodenal cap was found to be normal in the presence of a gastric ulcer in all instances.

Sex and Age Incidence

Of the 157 patients with combined ulcers, 32 were women, giving a sex ratio of 3.9:1 (Table II). This figure lies between the ratios of 2.4:1 in respect to gastric and 6.8:1 in respect to duodenal ulcers found during a somewhat earlier period at the Central Middlesex Hospital (Avery Jones and Pollak, 1945). There was little variation of this ratio in the different age groups in either this or the present study. Deviations in the small groups may be due to an inadequate number of cases.

The age incidence is represented in the lower half of the Chart, which shows the distribution at the time both ulcers were recognized. For comparison, the age distribution of duodenal and gastric ulcers at the same hospital is included in the upper half (Avery Jones and Pollak, 1945). It is readily seen that the age distribution in combined ulcers is very similar to the gastric ulcer group.

In patients with duodenal ulcer preceding gastric ulcer (group 1) the mean age at which the combined lesion was diagnosed was 54 years, with little variation between the sexes. Symptoms of peptic ulcer appeared at the much earlier age of 39 years on the average. However, the diagnosis of duodenal ulcer usually was established much later, after an interval averaging almost eight years. Many of the patients showed no free interval before the gastric ulcer appeared, making it impossible to date the onset of the latter. In some, however, there was either a relapse following a prolonged remission or a definite change in the character of the disease, and in these the interval between onset of symptoms and x-ray or surgical confirmation of gastric ulceration was quite short.

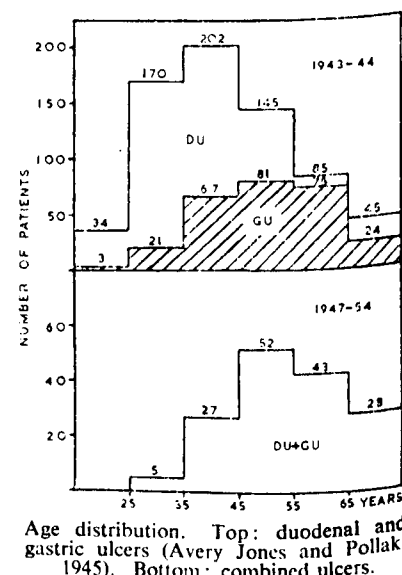
In the other groups the mean age at the time both ulcers were discovered similarly lies between 50 and 55 years. In group 5 the gastric ulcer was diagnosed on the average six years before the duodenal ulcer. Intervals ranged from some months to 14 years.

Characteristics

Activity.—As judged by definite x-ray demonstration of an ulcer crater or by surgery, both ulcers were active together at any one time in 98 of the 157 patients. This incidence of almost two-thirds may reflect the severity of the disease in this series.

Free Interval.—A symptom-free interval lasting more than one year was present in 41 patients. This figure applies to the 112 patients with a known sequence only (groups 1, 4, and 5). In the eight cases showing the gastric-duodenal ulcer sequence (group 5) any free interval was always shorter than one year.

Change in Symptoms.—Most symptoms besides pain were too indefinite to allow investigation. Excluding groups 2 and 3 ("simultaneous" appearance or unknown sequence) as well as cases with incomplete records in this respect, enough notes on pain were available in 89 patients. Some definite change was noted in 42 of these, being a change in character of pain only in 29, a shift in site only in another 3, and a change in site as well as character in 10 patients. It appears



that in a minority only can combined ulceration be suspected on the basis of change in symptoms. The significance of vomiting is discussed below.

Site of Gastric Ulcer.—The ulcer was located at the angulus in 45 cases, at the middle third of the lesser curve in 82, and at the upper third in 30. In the presence of multiple ulcers the lesion appearing first was taken into account. No relation of the ulcer site to either age or sex could be established.

Multiple Ulcers.—These were present in 22 cases, with two gastric ulcers in nine cases, three gastric ulcers in three, and four gastric ulcers in one. Kissing duodenal ulcers were observed in nine instances.

Gastric Retention

With regard to pyloric stenosis, the following groups were established. (A) Occasional or no vomiting; no x-ray evidence of delayed emptying. (B) Frequent but transitory vomiting; little vomiting with considerable loss of weight; no x-ray evidence of delay. (C) Delayed emptying, later followed by normal emptying on x-ray investigation. (D) Pyloric stenosis, predominantly organic in nature, as a rule treated surgically.

Table III shows the respective distribution. Not included among the 131 cases are the patients with a former gastro-enterostomy. In these no delay in emptying appeared to be present, and some factor other than retention might be

TABLE III.—Incidence of Gastric Retention

Presence and Degree of Gastric Retention	No. of Patients	Incidence
A. No or rare vomiting; normal emptying	94	71.7%
B. Frequent vomiting or weight loss; normal emptying	12	9.2%
C. Transitory delay in emptying	13	9.9%
D. Organic pyloric stenosis	12	9.2%
Total (cases with gastric-duodenal sequence and G.E. or vagotomy excluded)	131	100%

responsible for gastric ulcer formation. Also excluded are the eight cases with the unusual gastric-duodenal-ulcer sequence and five cases with insufficient details. In group A gastric retention was presumably never present, and thus would not appear to play any part in the appearance of the gastric ulcer in more than 70% of the series. Even this figure may represent a conservative estimation, because it is by no means certain that frequent vomiting or loss of weight is indicative of decreased emptying. Severe pain and even fear of pain may give rise to both.

Other Complications

Of the 157 patients, 59 had a total of 89 haemorrhages. This incidence has to be considered in relation to duration of the disease as shown in Table IV. In the group of 91 patients with the known duodenal-gastric-ulcer sequence, nine suffered from haemorrhages while they had a duodenal ulcer only, the disease lasting on the average 12½ years. At

TABLE IV.—Incidence of Bleeding in Single and Combined Ulcers Related to Duration of Disease

	No. of Patients	Patients with Haemorrhage		No. of Haemorrhages	Average Duration of Disease in Years
		No.	%		
Duodenal ulcer (Group 1 only*)	91	9	10	11	15 {with haem., 12.5 without haem., 16.4
Combined ulcers (Group 1 only*)	91	27	30	36	1.4 {with haem., 1.1 without haem., 1.6
Combined ulcers (all groups)	157	45	29	64	
Total	157	59	38	89	13

* See Table II.

the time combined ulcers appeared there were 36 instances of bleeding in 27 patients. The haemorrhages then took place in a period barely exceeding one year. The gastric ulcer was proved to be the source of bleeding in 16 of these patients, while the others may have bled from either stomach or duodenum. Thus the incidence of bleeding appears much higher in the presence of combined ulcers in spite of their short coexistence.

In many instances the combined ulcer disease was terminated by partial gastrectomy, often after the first haemorrhage. This would alter the proportion of haemorrhages in respect of time. To obviate this difficulty a special group of 49 patients was investigated. These 49 cases could be followed for a period of at least one year after the diagnosis of gastric ulcer following duodenal ulcer was established by x-ray examination. Six patients suffered from a total of eight haemorrhages while they supposedly had a duodenal ulcer only, the disease lasting 722 patient-years in the 49 cases. On the other hand, during the period of combined ulceration with 130 patient-years, the number of haemorrhages was 12, with 10 patients bleeding. Thus there was one haemorrhage for 90 patient-years with single as compared with one for 11 patient-years with combined ulcers in this group. These findings correspond reasonably well with the data of all patients with the same sequence.

Age was not responsible for an increased incidence of bleeding, the patients with haemorrhages being on the average four years younger at the time both ulcers were discovered.

In all groups taken together there were 89 haemorrhages in the 157 patients, and at least every third patient bled at one time or another. Although in several instances it was difficult to correlate the bleeding accurately with the presence of either single or combined ulcers, in 45 patients at least the haemorrhage took place when both gastric and duodenal ulcers were present. Here again the much higher incidence is apparent, inasmuch as the bleeding took place during a period averaging little more than one and a half years. Some patients, however, may have bled from a lesion other than a gastric or duodenal ulcer, particularly in the group with a previous gastro-enterostomy.

The 24 perforations in 22 patients were with one exception duodenal. There were nine cases of hourglass deformity of the stomach.

If pyloric stenosis is included, 92 of the 157 patients thus suffered from one or more major complications—again a striking proportion. The complications are listed in Table V.

TABLE V.—Complications, Operations, and Deaths in 157 Patients With Combined Ulcers

	No. of Patients	Incidence
Gastric retention { Possible	12*	9%*
Proved	25*	19%*
Haemorrhage	59	38%
Perforation	22	14%
Hourglass stomach	9	6%
One or more complications	92	59%
Operations { Partial gastrectomy	68	43%
All types	82	52%
Deaths	5	3%

* Of 131 patients (see Table III).

Deaths

During the eight-year period there were five known deaths more or less directly due to the ulcer disease. The causes of death were as follows. One patient died from bronchopneumonia after a successful partial gastrectomy for active duodenal and gastric ulcers at the age of 68. Subacute bowel obstruction four months after gastrectomy required another operation, from which the patient did not recover. A second fatality related to surgical treatment occurred in a man aged 53 operated on for both gastric and stomal ulcers

after a gastro-enterostomy established 15 years earlier for duodenal ulcer. Death took place following reoperation necessitated by bleeding shortly after partial gastrectomy. Another patient, aged 69, had well recovered after suture of a perforated duodenal ulcer, but died suddenly from massive bleeding due to chronic gastric ulcer. A fourth male patient with a 30-year history of peptic ulcer died two years after a successful partial gastrectomy. At necropsy, renal disease suggestive of Burnet's syndrome due to prolonged alkali medication was found. The fifth patient, a man of 60, died 24 hours after emergency admission for a bleeding gastric ulcer accompanied by a duodenal scar.

Operation

Of the 157 patients, 82 underwent one or more operations for peptic ulcer, including simple suture for perforation and gastro-enterostomy. Several patients were operated on twice. In 68 partial gastrectomy was performed. In at least eight cases this was done as an emergency measure for bleeding. Forty patients undergoing gastrectomy were over 50 years of age, and, among these, 24 were more than 60 years old.

Gastric Secretion.—The available data on 79 patients could not be compared, because gastric secretion had been assayed by different methods.

Discussion

A radiological diagnosis of combined gastric and duodenal ulcers was made in 2.7% of more than 5,000 ulcer patients in the eight-year period 1947–54. Inclusion of an estimated 25% of prepyloric ulcers would raise this figure to 3.5%. This is in fair agreement with the findings of Morrison and Feldman (1951), who in a special investigation observed clinical and radiological evidence of combined ulcers in 4.2% of 500 peptic ulcer patients. A considerably lower proportion was reported in most general x-ray and post-mortem series reviewed by Feldman (1953). Papers not mentioned by this author include those by Needham and McConachie (1950), Shapiro and Schiff (1952), and Stewart, Sanderson, and Wiles (1952) indicating that 1.8 to 4% of bleeding gastric and duodenal ulcers show combined lesions. Smith, Boles, and Jordan (1953) found a concomitant duodenal deformity in 19.7% of patients with benign gastric ulcers of all sites. Glenn and Harrison (1951) reported 12% and Rauch (1952) 3.2% of combined ulcers in their surgical patients. Johnson (1955) personally observed concomitant lesions in one of seven duodenal and one of four gastric ulcer patients. He suggested a general incidence of about 5%, including asymptomatic cases. There is reason to believe that the higher incidence generally reported by surgeons may be caused by the selection of patients.

No doubt the most reliable figures on combined ulcers are to be found in Watkinson's (1958) analysis of the necropsy findings in the late Professor Matthew Stewart's department at the University of Leeds. The incidence reported here is by far the highest with the exception of Sir David Wilkie's findings in 1926. This is explained by the painstaking care taken in the department in the detection of all ulcers and ulcer scars. Of a total of 1,848 chronic ulcers found between the years 1930 and 1949, 227 were combined gastric and duodenal ulcers, 174 in men and 53 in women. The calculation of the incidence is best based, however, on the findings in patients who died from causes other than ulcer disease. There were 1,232 of these patients, and 142 showed combined lesions. This gives an incidence as high as 11.5%. In the same group there were 799 duodenal and 284 gastric ulcers. The proportion of combined lesions among gastric ulcers (284+142) thus reaches 33.4%, and among duodenal ulcers (799+142) 15.1%. The sex ratio of combined ulcers in patients not dying from their ulcers was found to be 1.58 compared with 1.97 in the duodenal and 1.09 in the gastric ulcer groups, the male patients always predominating. The greatest incidence was found between the ages of 45 and 74 in males and above the age of 75 in females.

Admittedly a study based on hospital in- and out-patients will not allow any conclusions as regards the incidence of the disease in the general population. In hospital patients at least, the incidence is certainly high. As already pointed out by Johnson (1955), this is surprising, because many features of duodenal and gastric ulceration are to some extent mutually exclusive. The differences in gastric secretion between duodenal and gastric ulcer patients are well known. Differences in the motor activity of the stomach and duodenum are not as well documented as the secretory aspects. Most patients with uncomplicated duodenal ulcer are found on gastric biopsy to have a normal stomach mucosa. On the other hand, the incidence of gastritic changes in the ulcer-bearing stomach is high. Such features may appear compatible in cases where the gastric ulcer follows a healed duodenal ulcer after a long interval. However, almost two-thirds of the present cases showed active lesions of both stomach and duodenum. Moreover, in at least eight cases the reverse sequence occurred. On occasion the evolution was quite striking, the gastric and duodenal ulcer appearing to be independent of each other.

Thus in a man aged 40 with a short history of dyspepsia a large ulcer was found at the middle third of the lesser curve. He was successfully treated as an in-patient and four x-ray series did not reveal any duodenal crater or deformity. A few days after he left the hospital he was readmitted for a perforated duodenal ulcer, which was sutured. No active gastric lesion was found at the operation. The duodenal ulcer healed, but the gastric ulcer relapsed within three months. One year later the duodenal ulcer had also recurred, accompanied by two gastric ulcers. When partial gastrectomy was performed after another two months, the gastric ulcers had healed. At no time was there any evidence of delayed emptying. The pattern of gastric secretion did not change markedly when concomitant ulceration followed the gastric ulcer.

That even the pattern of gastric secretion may change is shown in observations reported by Watkinson (1951). In one 42-year-old male patient the healing of a gastric ulcer was followed within five months by the appearance of a duodenal ulcer, both confirmed at operation. In another man aged 33 a gastric ulcer appeared six months after a duodenal ulcer had healed. In both patients there was a definite change in gastric secretion from the gastric ulcer type to the pattern found in duodenal ulcer, and vice versa.

Gastric retention is one factor thought to be responsible for combined ulceration (Johnson, 1955). In less than 30% of the 131 patients analysed in this respect were there any possible signs of pyloric stenosis. Even in cases with delayed emptying it may be questioned whether gastric retention is the cause rather than the effect of chronic gastric ulceration. Retention is present in a similar proportion of gastric and duodenal ulcers. The importance of pyloric stenosis arising from duodenal ulcer may also be questioned on the basis of the sex ratio, which was nearer to the figure found in gastric ulcer. Again the age distribution is more or less the same as in gastric ulcer. It is thought that a factor common to both gastric and duodenal ulcer disease may be at work to cause combined ulcers. Unfortunately, there was insufficient material for a detailed analysis in respect of ulcer inheritance. In several instances, though, the family history was most striking, with proved cases of both gastric and duodenal ulcers in near relatives of the patients. The work of Doll and Kellock (1951), which includes cases with combined ulcers, is most suggestive of a common hereditary background. They observed that 6 out of 11 patients with combined ulcers had near relatives with the same disease.

It is reasonable to expect that combined ulcer disease runs a more severe course than either duodenal or gastric ulcer. Although no conclusive proof can be offered, the present study bears out this impression. The proportion of patients with perforations is not unexpected in view of the findings of Martin and Lewis (1949). On the other hand, the risk of bleeding is certainly high, particularly if

the period before the appearance of combined ulcers is taken as a basis for comparison. According to Balfour (1932) about 25% of peptic ulcer patients followed for an average of 10 years will show one or more episodes of bleeding. Emery and Monroe (1935) found an incidence of 26.7% in patients observed for an average of 3.5 years. Gastric ulcers are thought to bleed more often than duodenal ulcers (Ivy, Grossman, and Bachrach, 1950). However, Martin and Lewis (1949), in their follow-up of peptic ulcer patients for more than 10 years, observed bleeding in 26.8% of gastric and 35.2% of duodenal ulcers. In the present series the incidence of bleeding in 59 of 157 patients—that is, 37.6%—followed for a similar length of time, is somewhat higher. Moreover, three-fourths of the haemorrhages took place during the period which represented on the average one-eighth or less of the total ulcer history. It is therefore not surprising that conservative treatment was abandoned in favour of partial gastrectomy in 68 of these patients. In fact, the present findings would suggest that surgical treatment is indicated more often in combined ulcers than in single ulcer, whether gastric or duodenal.

Summary

The combination of chronic gastric and duodenal ulcers or ulcer scars was found in 157 hospital patients during a period of eight years. Cases suffering from prepyloric gastric ulcer were excluded owing to the uncertainty of location.

The observed incidence of combined ulceration was 2.7% based on x-ray investigation. With the inclusion of an estimated 25% of prepyloric ulcers the incidence would reach 3.5%. Thus about one in every seven hospital patients suffering from ulcers of the stomach and 1 in 30 patients having a duodenal ulcer or ulcer scar will be found to show combined ulcers.

With due awareness of the frequent occurrence of combined ulcers, the radiological examination represents a reliable means of their diagnosis.

Combined ulcers run a higher risk of bleeding, making surgical treatment more often advisable than in either gastric or duodenal ulcer occurring alone.

Pyloric stenosis does not appear to be a major factor in the pathogenesis of combined ulcers.

I wish to thank Dr. F. Avery Jones, Dr. R. Doll, and Dr. T. D. Kellock, in whose department this work was done, for much encouragement and advice. Dr. F. Pygott kindly made his files available and reviewed several x-ray films. I am also indebted to the clerical staff of the Central Middlesex Hospital. The work was done during the tenure of a fellowship of the Swiss Foundation for Fellowships in Biology and Medicine.

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RECTAL TEMPERATURE IN THE NEWBORN AFTER BIRTH ASPHYXIA

BY

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In a previous investigation (Cross, Tizard, and Trythall, 1955) it was shown that if normal babies were given 15% oxygen to breathe there was a fall in oxygen consumption which was so large that the energy loss would be greater than the energy gain from any anaerobic metabolism which might be taking place. From this indirect calorimetry it was suggested that energy production fell under these experimental conditions, and this seemed to be confirmed when Brodie, Cross, and Lomer (1957) showed that infants breathing 15% oxygen heated the plethysmograph in which they were placed less than when they breathed air, though a consistent fall in rectal temperature was not found when the 15% oxygen was given for periods up to 50 minutes. Young kittens and puppies show a fall in temperature directly after oxygen consumption is reduced in anoxia (Moore, 1956a, 1956b).

In babies the absence of this immediate fall in body temperature along with their fall in oxygen consumption in an atmosphere of 15% oxygen might be connected with a relative thermal inertia compared with the smaller animals. Vascular reactions might also play a part, since skin pallor was noticed in the babies. The probability that factors such as these influenced the findings in short-term observations is supported by Sjöstedt and Rooth's (1957) report that in full-term babies the temperature is "a little lower than normal if kept in 15% oxygen for a week."

Although suggestive, these results might not apply to the infant showing apnoea or cyanosis at or after birth. While cyanosis is evidence of anoxia, it is unlikely that the natural condition is ever a pure "anoxic anoxia." CO₂ retention will probably, although not necessarily, be present. An investigation which would in some measure test whether naturally occurring anoxia causes a fall in heat production of the newborn infant was undertaken. We wished to make the investigation as simple as possible so that it could be fitted into the activities of a busy maternity unit, and decided to divide the babies into those that did and those that did not show asphyxia at birth, and to follow their rectal temperatures. As it became apparent that maternal sedation was a complication the scope of our investigation had to be widened slightly, and finally four groups of infants were studied, but the general scheme was not made more complex in any other way.

Material and Methods

Babies were delivered at a labour-room temperature of 78–80° F. (25.6–26.7° C.), wrapped in a towel, and, after they had been held by their mothers, were transferred to the nursery after a period that varied from 10 to 30 minutes. Resuscitative measures used after birth were oxygen, which was given for a few minutes at the discretion of the obstetrician or midwife in charge, and 1 mg. of N-allyl

morphine by intramuscular injection if delay in breathing could be attributed to maternal sedation with pethidine; some mothers who had received pethidine were given 10 mg. of N-allyl morphine an estimated 30 minutes before delivery. In the nursery, where the temperature was kept between 70 and 74° F. (21.1 and 23.3° C.) throughout the investigation, the infant was covered with two blankets, and after a further interval varying between half an hour and one and a half hours was bathed and dressed.

The rectal temperature was taken two-hourly for 24 hours by the nursing staff with thermometers graduated from 85 to 105° F. (29.5 to 40.6° C.), the thermometer being inserted an inch (2.5 cm.) beyond the anus. A complete record was not always obtained, as will be apparent from inspection of the individual totals in Figs. 1-3. So far as possible, all the babies born in a four-months period were examined, but at busy times the taking of temperatures had to lapse.

The infants were born at term, or possibly later in a minority. None received any special treatment apart from oxygen for the few minutes before the establishment of normal breathing. Babies who needed oxygen for some hours after birth have been excluded from this report.

Asphyxia in this paper means failure to establish respiration within three minutes of birth. While the observations were being made it became clear that maternal sedation with pethidine was a frequent cause of apnoea, and a division was therefore made into the following groups: A ("normals"), 53 babies whose breathing began within three minutes and the mother had received only chloral; B ("pethidine and apnoea"), 29 babies in whom normal breathing was not established within three minutes, the mothers having received pethidine; C ("pethidine, no apnoea"), 35 babies who were breathing normally within three minutes, all the mothers having received pethidine. Group D ("pure asphyxia") is made up of 15 babies. The need for sedation in difficult labour rendered apnoea after birth without maternal pethidine an uncommon event, and explains the small number of observations in this group.

The dosage of pethidine and the time between administration to the mother and birth varied considerably. In order that an infant should qualify for groups B or C it had to be born within three hours of a single dose of 200 mg. or within five hours after 400 mg. (2 × 200 mg.) or more.

The accompanying charts show the mean temperatures for each group, and the vertical lines indicate the 95% confidence limits for each set of two-hourly observations. When

there is no overlapping of these lines the odds against the difference between means being due to chance are greater than 20 to 1.

Results

In Fig. 1 the means of groups A and D are compared. Asphyxia is seen to result in a significantly lower rectal temperature from the second to the sixteenth hour.

In Fig. 2, group B is compared with the normal, and a significant lowering of temperature over the same period is apparent. In group C, however, the fall in temperature occurred after pethidine without the intervention of apnoea (Fig. 3), and it is for this reason that we were careful to exclude the possibility of a drug effect in collecting the data for Fig. 1.

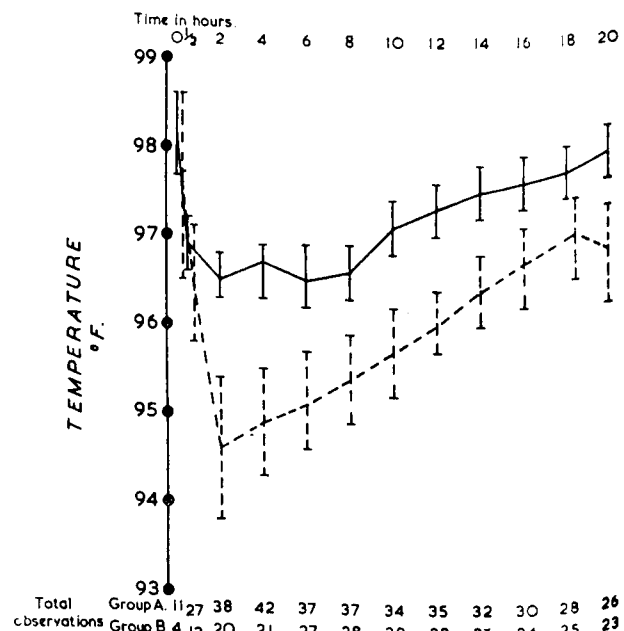


FIG. 2.—Mean rectal temperatures after maternal pethidine and apnoea at birth. Conventions as in Fig. 1. — Group A (normals), 53 babies. - - - Group B (pethidine and apnoea), 29 babies.

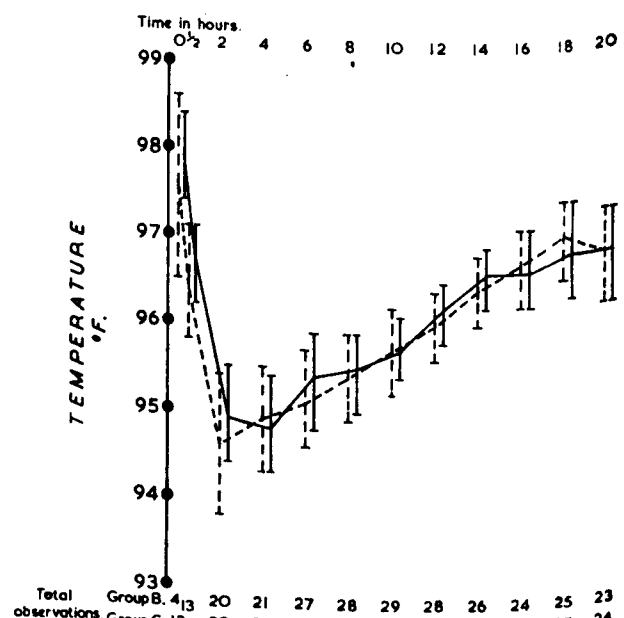


FIG. 3.—Comparison of mean rectal temperatures after maternal pethidine with and without apnoea at birth. Conventions as in Fig. 1. - - - Group B (pethidine and apnoea), 29 babies. — Group C (pethidine, no apnoea), 35 babies.

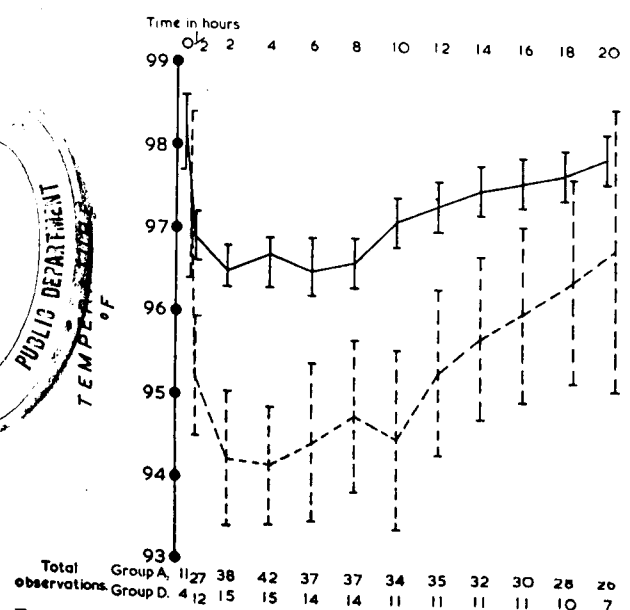


FIG. 1.—Mean rectal temperatures after normal birth and after birth asphyxia. The vertical lines are the 95% confidence limits of the means. — Group A (normals), 53 babies. - - - Group D (asphyxia, no pethidine), 15 babies.

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TREATMENT OF RHEUMATOID ARTHRITIS WITH CHLOROQUINE

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The fact that there is a significant difference in temperature over several hours between group A and group D suggests that asphyxia causes a fall in oxygen consumption and energy production as in the experiments on pure anoxia (15% oxygen) already quoted. It is worth speculating on the degree of anoxia our subjects had met, as Brodie *et al.* noted no fall in rectal temperature in infants breathing 15% oxygen for 50 minutes. The pronounced fall in heat production suggested by the low rectal temperature points to an incident of considerable severity.

There is no apparent difference between the temperatures of the two groups of babies whose mothers had received pethidine (B and C), whether the babies were apnoeic for three minutes after birth or not. Their pattern of temperature change after birth is very similar to that of babies with pure asphyxia. Either the initial asphyxia or mild persistent respiratory depression from the drug could explain the similarity to the group D babies. A second possibility is vasodilatation, since J. Ginsburg (1958, personal communication) has found an approximate doubling of skin-blood flow in the human subject for periods up to an hour after 100 mg. of pethidine intramuscularly. Thus the temperature of babies after maternal pethidine might be lowered both by diminished heat production and by increased heat loss.

To some extent the absence of a difference between groups B and C may be due to artificial selection, because severely asphyxiated babies who were felt to need oxygen for a number of hours after birth have not been included in the series, although some of them had much lower temperatures and these would have enlarged group B.

When the babies in group C were divided according to whether or not they had received N-allyl morphine, the fall in temperature was the same in each subgroup. While the drug proved a very effective antidote to pethidine in the initiation of breathing (Paterson and Prescott, 1954) it did not appear to have any subsequent effect on the course of the temperature. Roberts *et al.* (1957) similarly found that the reduction of the baby's minute-volume after maternal pethidine was not influenced by this antidote.

We conclude that a somewhat reduced rectal temperature is a natural phenomenon in babies suffering from asphyxia at birth. It seems probable that this lowered temperature is the result of a period of diminished metabolic rate, caused by the anoxia. If this is so, then the lower temperature may have survival value.

Summary

Neonatal rectal temperature was measured at two-hourly intervals in 53 infants after normal delivery and in 15 after birth asphyxia. Asphyxia was found to cause a significantly lower temperature for 16 hours.

The same effect followed the maternal administration of pethidine independently of apnoea at birth.

The reduced temperature appears to be a natural consequence of anoxia in the baby.

We thank Mr. Leslie Williams, Mr. Douglas MacLeod, and Dr. Reginald Lightwood for permission to examine infants in their care, and Sister K. A. Taylor and her nursing staff for their faithful co-operation.

Mepacrine was first observed to have a beneficial effect on the course of rheumatoid arthritis by Page (1951), when treating discoid lupus erythematosus. Two of these patients had associated rheumatoid arthritis, which cleared up under mepacrine treatment. Haydu (1953) two years later published his result of treatment by chloroquine of 28 patients suffering from rheumatoid arthritis. In the dosage of 0.5 g. of chloroquine thrice weekly for six months he found considerable improvement in 21 of the 28 patients with rheumatoid arthritis without encountering toxic symptoms during the trial. Forestier and Certonciny (1954) published a short-term trial of mepacrine in 11 patients and of chloroquine in 17 patients suffering from rheumatoid arthritis for a period of one to six months. Half of the patients in each group responded favourably. Escarpenter-Oriol *et al.* (1955), quoted by Bagnall (1957), treated eight rheumatoid arthritics with mepacrine and 30 with chloroquine, but none of them received more than five months' treatment. Nevertheless, the authors noted an improvement in 29 of the chloroquine cases.

Following an investigation of the unusually high incidence of amoebic infection in patients with rheumatoid arthritis (95% compared with 30% of normal patients in Oregon), Rinehart employed chloroquine together with di-iodohydroxyquinoline ("diiodoquin") in these patients (Rinehart, 1955; Rinehart *et al.*, 1957). He noted improvement in both conditions and attributed most of the antirheumatic activity to chloroquine. Eight out of 11 children showed major improvement of rheumatoid arthritis, and 8 out of 14 adults experienced similar benefit. He followed this series by a "double blind study" of two groups of rheumatoid arthritics (33 in all) receiving either chloroquine or an inert substance. He regarded the improvement in the chloroquine group as statistically significant, more than half the patients on chloroquine deriving and maintaining improvement after two months.

Freedman (1956) observed 66 patients, divided into equal groups of similar rheumatoid disease, half of whom received chloroquine (200 to 300 mg. a day) and the remainder dummy tablets. Small doses of salicylates were permitted during the trial, which lasted 16 weeks in the first instance. Subjective and objective progress was assessed and there was appreciable benefit during this period. Subsequently, 50 patients remaining under treatment received chloroquine and 43 became really

well. Nausea and vomiting and mild dermatitis were the only toxic effects noted in this group, and necessitated some reduction in dosage. Lacapère *et al.* (1954) treated 80 long-standing cases of rheumatoid arthritis with chloroquine in doses up to 600 mg. daily and reported favourable results in two-thirds of these patients.

A much larger number of patients suffering from rheumatoid arthritis have been treated and observed over the long period of four years by Bagnall (1957). He followed up personally 125 private patients, of whom 121 had more than eight months of continued therapy and 25 received treatment for longer than three years. He stressed that no early response to chloroquine was to be expected and that no benefit may be obtained prior to 6 to 12 weeks after the beginning of treatment. To bridge this period, rest, sedation, salicylates, and when necessary glucocorticoid therapy were used. There was a good result in 70% as judged by work performance, sedimentation rate, and haemoglobin level. Six patients relapsed on premature withdrawal of the drug but benefited when treatment was resumed. Only minor toxic symptoms were encountered. 10% were unable to continue the drug. He concluded that "chloroquine comes closer to the ideal for a long-term safe control of rheumatoid arthritis than any other agent now available." Scherbel *et al.* (1957, 1958)

Literature on Antimalarial Drugs in 1,092 Cases of Rheumatoid Arthritis

Author	No. of Patients	Length of Treatment	Drugs	Results
Page (1951)	2	1-3 months	Mepacrine	Improvement in both cases
Haydu (1953)	28	6 "	Chloroquine	75% considerable improvement
Forestier and Certonciny (1954)	28	1-6 "	11 Mepacrine 17 Chloroquine	50% improved
Lacapère <i>et al.</i> (1954)	80		Chloroquine	60% improvement
Escarpenter-Oriol <i>et al.</i> (1955)	38	Up to 5 months	8 Mepacrine 30 Chloroquine	97% improved in chloroquine group
Rinehart (1955), Rinehart <i>et al.</i> (1957)	25		Chloroquine + diodoquin	65% improvement
Freedman (1956)	50		Chloroquine	86% improvement
Bagnall (1957)	125	30% less than 6 months; 97% from 8 months to over 3 years	"	70% considerable improvement
Scherbel <i>et al.</i> (1958)	716	Up to 3 years	Hydroxychloroquine Chloroquine	58% major improvement (157 patients)

administered chloroquine phosphate or hydroxychloroquine sulphate to 716 patients suffering from rheumatoid arthritis over periods up to three years. They have so far reported their results in 157 patients. A major improvement occurred in 58%. The Table represents a summary of the results of chloroquine treatment of rheumatoid arthritis published up to April, 1958.

Present Series

Our own experience of chloroquine in hypersensitivity states and collagen diseases dates back to July, 1953, when one of us (H. F.) first tried the drug in systemic lupus erythematosus followed by other collagen diseases and hypersensitivity states (1958). In 1954 we began to treat cases of active rheumatoid arthritis with chloroquine, but were quite sceptical about any possible benefit, and it was not until 1955 that we were convinced that chloroquine influenced the course of the disease, and it was from then on that we followed these cases up regularly. Thirty-nine patients (29 female, 10 male) were observed between May, 1955, and August, 1958, the longest for up to four years and the most recent patients for only three months. The

average duration of symptoms prior to the commencement of chloroquine treatment varied between several years in almost half the cases to a few months in three patients. No patient with "burned-out" arthritis was treated. The indications for chloroquine therapy were painful joint swellings and muscle spasm accompanied by a raised E.S.R. and low-grade pyrexia. With few exceptions our patients had had previous treatment elsewhere, including gold injections, steroid hormones, and phenylbutazone, and one patient had had deep x-ray therapy for ankylosing spondylosis. None of these measures gave lasting relief.

We soon found that no benefit from chloroquine could be expected for some three weeks from the start of treatment, and almost all patients therefore received other therapeutic measures soon after admission. These comprised the following. (1) Salicylates in the form of calcium aspirin for symptomatic relief. (2) Complete bed rest for several weeks or until the E.S.R. returned to normal. (3) Artificial fever by means of intravenous T.A.B. vaccine in four doses starting with 25 million and increasing to 100 million organisms at intervals of three to four days. Thirteen patients received the full course. (4) Weekly transfusions of 1 pint (570 ml.) of fresh blood in 11 patients over a period of three to four weeks. (5) Injection of hydrocortisone acetate into single joints to overcome deformities by relief of muscle spasm. (6) Graded physiotherapy after acute stage.

One of us (H. F.) has used this regime of treatment of active rheumatoid arthritis for many years; quite often satisfactory remissions followed, but relapses occurred in most cases sooner or later. Chloroquine was started on admission to the ward or at the end of induced fever treatment. The initial dosage was 600 mg. daily, and was reduced only when gastric irritation made it necessary.

Of the 39 patients, all but five still take a maintenance dose of chloroquine 200 to 400 mg. daily. Two discontinued the drug because of lack of benefit and three could not tolerate prolonged treatment on account of gastric upset.

Results

The results were assessed in four grades: grade 1, full remission; grade 2, major response; grade 3, minor improvement; grade 4, no improvement.

A full remission in rheumatoid arthritis is defined as a state of excellent general health without any joint complaint, normal E.S.R., normal blood count, and being able to lead an active, unrestricted life. Major response (grade 2) comprises a group of patients who had greatly benefited by chloroquine treatment, but who still had minor handicaps—for instance, limited range of movement of a single joint or incapacity to walk beyond 3 miles (5 km.). The few patients who had improved slightly but remained considerably handicapped in their daily lives were placed into grade 3. Grade 4 is self-explanatory.

In 12 patients a full remission was obtained, with weight gain and return of E.S.R. to normal. A major response (grade 2) was observed in 19 patients who take salicylates from time to time but are leading active lives. Minor improvements occurred in four patients and four failed to benefit at all. About 80% of our cases derived a full remission or major benefit by treatment with chloroquine. The failures (grades 3 and 4) include patients with active rheumatoid arthritis of many years' duration as well as patients with quite recent development of joint lesions. On the other hand, some of the best results occurred in long-standing cases (eight years' and five years' history of rheumatoid arthritis in two of our series). Secondary degenerative joint changes with irregularities of joint surface and narrowing of joint spaces remained unaffected, but remineralization of osteoporotic bones took place under treatment. We have not observed relapses in patients after an initial response to chloroquine and whilst taking not less than 400 mg. daily. Bagnall recorded 18 relapses (less than 1.5% of his series). The difference between our results and those of Bagnall may be explained by the different dosage employed. The therapeutic dose given by us was 450 mg.

of chloroquine alkaloid, whereas Bagnall prescribed only 150 mg. base. Our maintenance dose was 300 mg. base daily.

Discussion

If antimalarial drugs, chloroquine in particular, have a beneficial effect on the disease process of rheumatoid arthritis, the question of its mode of action arises. Haydu investigated the effects of chloroquine as an adenosine triphosphatase inhibitor in rheumatoid arthritis. He regarded the high tissue requirements for adenosine triphosphate and the lack of corticoid support—for example, during infection and mental stress—in certain constitutional types as the basis of rheumatoid arthritis. Kurnick (1956) found that chloroquine combined with desoxyribonucleic acid and thereby prevented its depolymerization. This breakdown of the molecule is the preliminary to sequestration of the nuclear material and to phagocytosis, which represent the L.E.-cell phenomena. In other words, the addition of chloroquine *in vitro* to a system otherwise positive for the L.E.-cell phenomena will prevent the reaction taking place.

Experience gained in treating and following up 39 patients suffering from rheumatoid arthritis up to four years does not justify sweeping statements about the effect of a new drug. It was our original intention to publish a five-year review of our observations, but the recent interest aroused in chloroquine as a potentially useful drug in the management of rheumatoid arthritis has induced us to publish this report.

The assessment of any new treatment of rheumatoid arthritis is not easy, as remissions—some of them permanent—may occur at almost any stage of the disease. It is unlikely, however, that anyone experienced in the management of rheumatoid arthritis would attribute a maintained state of remission in over two-thirds of cases under observation to the natural course of the disease. The *Lancet* (1958) dealt with prognosis in rheumatoid arthritis based on observations in the Rheumatic Unit in Edinburgh between 1948 and 1951. 43% of cases admitted in the first year of illness but only 10% of those admitted between the fifth and tenth years were free from any restriction in activity six years later. Hospital treatment comprised bed rest, plaster splints, salicylates, and physiotherapy. These "sound and uncontroversial methods" and ancillary measures (induced pyrexia and transfusions) have in the past failed to bring an arrest of the condition in the majority of cases. The best results have been achieved by long-continued chrysotherapy, using small weekly doses. Gold failed, however, quite frequently even in cases with a short history of illness. Chloroquine does not seem to distinguish between old and recent cases so long as the disease process is active. We have given up corticosteroids for systemic treatment of rheumatoid arthritis altogether and use them only as hydrocortisone acetate for local injections into single joints to achieve mobility and overcome contractures during the first few weeks, until chloroquine takes effect.

It is too early yet to know how patients with rheumatoid arthritis treated with chloroquine will fare after five to ten years. Long-term maintenance treatment with chloroquine has been planned for the patients under review until the day when the enigma of rheumatoid arthritis has been solved and a more specific and radical cure has been discovered.

In the meantime, we believe that further trials of chloroquine in the treatment of rheumatoid arthritis are justifiable in view of the results achieved so far and the lack of dangerous side-effects of the drug.

Summary

The literature on the use of chloroquine in the management of rheumatoid arthritis is reviewed.

Results in treatment and following up 39 patients from three months to four years are described.

Complete remission of the disease process was obtained in 30% of cases, a major improvement occurred in 50%, and insignificant or no benefit was noted in about 20% of the patients.

The drug proved harmless and was well tolerated in larger doses than used by other authors. Relapses whilst on chloroquine were not observed in our series.

We recommend a regime of treatment consisting in bed rest, induced pyrexia, blood transfusions, and salicylates during the first three weeks of treatment, and tablets of chloroquine sulphate, 200 mg. t.d.s., throughout the treatment or immediately after induced fever—this dose of chloroquine to be continued until a remission has been obtained, when the dose may be decreased to 400 mg. daily (equals 300 mg. base). The maintenance therapy may be required for 12 months or longer.

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UNCONTROLLABLE POST-OPERATIVE HAEMORRHAGE AFTER INCOMPATIBLE BLOOD TRANSFUSION

BY

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It has often been reported that a defect of coagulation may occur in obstetrical conditions and in pulmonary and prostatic surgery. For example, it has been noted in accidental haemorrhage, amniotic fluid embolism, intrauterine foetal death, and missed abortion (De Lee, 1901; Dieckmann, 1936; Moloney *et al.*, 1949; Schneider, 1951; Reid *et al.*, 1953; Barry *et al.*, 1955), following pulmonary lobectomy (Soulier *et al.*, 1952), and in metastatic carcinoma of the prostate (Tagnon *et al.*, 1952; Swan *et al.*, 1957). One of the features of these cases has been hypofibrinogenemia.

That abnormal bleeding may occur as a transfusion reaction is not so well known, although it has been recorded by American authors on a number of occasions since it was mentioned by Drinker and Brittingham (1919). Muirhead (1951) found nine cases, while Friesen *et al.* (1952) investigated 11. Other examples are given by Wiener (1954) and Stefanini and Dameshek (1955). Krevans *et al.* (1957) studied two instances, and in a survey of the literature found 11 additional reports. No report of a case has been traced in British literature, although Mollison (1956) refers to the condition.

It is the object of this paper to give a clinical account of such a case which had a fatal termination.

Case Report

The patient was a single woman aged 25 suffering from a chronic gastric ulcer. In the past she had undergone appendicectomy and tonsillectomy, and no excessive bleeding had been noted. Menstrual blood loss had been normal. There was no history suggestive of any allergic upset.

Operation.—A Billroth I partial gastrectomy was carried out, and it was uneventful. The anaesthetic consisted of

thiopentone sodium, tubocurarine chloride, gallamine triethiodide, and nitrous oxide, and a pint (540 ml.) of carefully matched homologous group O rhesus-negative blood was given. The operation was completed at 12 noon.

A second bottle of blood was started at 12.30 p.m. When examined 15 minutes later the patient was rather pale, with a slight cyanotic tinge, and there was a little staining from a stab drainage wound. There was little change during the next two hours. At 2.45 p.m., when about two-thirds of the second bottle of blood (360 ml.) had been given, it was discovered that it was in fact group A rhesus-positive blood which had inadvertently been transfused. Immediately, carefully matched blood of the correct group was substituted and 1 pint (540 ml.) of 50% dextrose given in an attempt to minimize renal complications.

At 4 p.m. it was noted that venous blood sent for further cross-matching would not clot, and by then there was considerable fresh bleeding from the stab wound. Only a small amount of altered blood had been aspirated from the gastric tube during the afternoon, but at 6 p.m. there was 15 oz. (450 ml.) of fresh blood and the main wound had started to ooze. The patient became weaker despite continued transfusion, and another laparotomy was carried out at 7.45 p.m.

Second Operation.—About 4 pints (2 litres) of blood was found in the peritoneal cavity with a few clots. There was a general ooze from many areas involved in the previous operation. On opening the stomach more blood escaped, but again this arose from numerous areas, many not at the suture lines. Despite all attempts at haemostasis the ooze continued. The supply of matched blood for transfusion was temporarily exhausted during the operation, and 2 pints (1 litre) of 6% dextran in saline ("dextraven" and "intra-dex") was given. As nothing further of benefit could be done, the stomach opening was repaired and the abdomen closed with two drainage tubes.

It was now obvious that the patient had developed an abnormal haemorrhagic tendency.

Treatment.—4 ml. of "adrenoxyl" (1.5 mg. of adrenochrome monosemicarbazone dihydrate) and 100 mg. of vitamin K analogue ("synkavit") were given intramuscularly. 10 ml. of 10% calcium gluconate was given intravenously and a rapid transfusion of matched group O rhesus-negative blood continued. After consultation with the director of the regional transfusion centre at 10 p.m. the patient was given 4 pints (2 litres) of fresh dried plasma alternating with blood, and 2 g. of concentrated fibrinogen fraction. At this stage there appeared to be a slight temporary decrease in the rate of blood loss. Fresh frozen plasma was requested for her, but her condition deteriorated and she died at 1.45 a.m. on the day following operation, before it could be given.

She had received a total of 17 pints (9 litres) of blood, 3 pints (1.5 litres) of processed plasma, and 2 pints (1 litre) of dextran, as well as the 4 pints (2 litres) of fresh dried plasma and fibrinogen mentioned above. In all, this represents the administration of approximately 20 g. of fibrinogen, of which half had been given after the haemorrhagic defect had been recognized. In spite of this, up to the time of death, bleeding continued from the drainage tubes in the abdomen and from the gastric tube.

Relevant Post-mortem Findings

There was a large amount of blood and clot in the peritoneal cavity. The stomach was filled with a well-formed clot equivalent to about a pint (0.5 litre) of blood. No open vessels were identified, but there appeared to have been diffuse haemorrhage from the gastric mucosa, in which there were numerous slit-like defects several millimetres in length apparently communicating with submucosal haematoma. The liver and spleen were normal. Histological examination of kidney showed amorphous eosinophilic material, and desquamated epithelial cells in a few convoluted tubules. The lungs appeared oedematous, but there

were no histological changes, and selective staining showed no significant intravascular deposits of fibrin.

Blood Examination.—A specimen of venous blood taken at 3.30 p.m. on the day of operation failed to clot in 24 hours, even after the addition of thrombin in excess, indicating afibrinogenemia. Marked haemoglobinemia was noted soon after withdrawal, proving rapid destruction of the incompatible blood. A similar specimen taken two days before operation clotted normally.

Investigations at the regional transfusion centre confirmed that the patient was group O, rhesus negative, and that she had received group A blood, which had been rapidly destroyed. The pre-transfusion serum of the patient contained an anti-A haemolysin, and it was considered that this was responsible for the rapid haemolysis of the incompatible cells.

Discussion

The patient undoubtedly developed a haemorrhagic defect associated with afibrinogenemia. The development of hypofibrinogenemia has been described by Stefanini and Dameshek (1955). Among the conditions mentioned as leading to the syndrome are haemorrhagic shock and haemolytic transfusion reactions. The patient's condition was good immediately after operation, which had not been associated with significant loss of blood. Therefore, even if haemorrhagic shock can produce such a syndrome, it seems unlikely that it was initially responsible for the onset of the fibrinogen deficiency in this case. The trigger mechanism was almost certainly the transfusion of blood of the wrong group.

Acquired hypofibrinogenemia might theoretically result from (a) defective formation of fibrinogen; (b) intravascular clotting following the entrance of thromboplastic material into the circulation, with consumption of fibrinogen; or (c) depletion of fibrinogen by fibrinolytic or proteolytic enzymes in the blood. In this case it is unlikely that there was any defect in the formation of fibrinogen, as there was no evidence of impaired liver function. It is possible that intravascular clotting was the cause of the haemorrhagic state, because Quick *et al.* (1954) have demonstrated the thromboplastin-like activity of lysed red blood cells. However, there was no evidence histologically of abnormal fibrin deposition in tissues; nevertheless a fibrin deposit could have been destroyed by fibrinolytic enzymes, the presence of which has been reported in some cases of this syndrome.

The response to treatment was disappointing although there was post-mortem evidence of clotting. Stefanini and Dameshek (1955) suggested that the average amount of fibrinogen required in treatment was 2–4 g., but mentioned that 8–20 g. might be necessary. Barry *et al.* (1955) recommended 2–6 g. of the fibrinogen fraction in the treatment of hypofibrinogenemia of pregnancy, but if this was not available found triple- or quadruple-strength raw plasma equally effective (1 pint (0.5 litre) of the latter strength yielding 4.4 g. of fibrinogen). In this case approximately 10 g. of fibrinogen was given after the haemorrhagic defect had been recognized, but it is possible that this amount might have produced a greater effect if more of the fibrinogen had been in a concentrated form and had been administered over a shorter period. However, the failure of the patient to respond suggests that there may well have been additional factors involved.

Other coagulation elements may have been absent or diminished—for example, prothrombin, Factor V, and platelets (Greenwalt and Triantaphyllopoulos, 1954). Krevans *et al.* (1957) studied two patients after 500 ml. of incompatible blood and in both found hypofibrinogenemia, hypoprothrombinemia, and thrombocytopenia, with reduction of Factor V activity in one. (Incidentally, they could find no evidence of increased fibrinolytic activity, and favoured intravascular coagulation as a probable cause of these changes.) In treatment they advised fresh whole blood supplemented by fibrinogen. It may be that the fresh frozen plasma, containing some of these factors, would have been of benefit.

Two pints (1 litre) of dextran 6% in saline was given when matched blood and plasma were temporarily unavailable. In retrospect it is clear that this was inadvisable, as a number of reports have incriminated dextran as a cause of a haemorrhagic tendency (Carbone *et al.*, 1954; Scott, 1955; McKenzie and Langlands, 1956). The mechanism of the process is not clear, and suggestions made include interaction of dextran with fibrinogen, haemodilution, production of thrombocytopenia, and prolongation of the bleeding time. The patient, of course, had developed abnormal bleeding before the dextran was given, but it is possible that the dextran aggravated the haemorrhagic tendency.

Friesen *et al.* (1952) described similar cases in which post-operative bleeding occurred as a result of a haemolytic transfusion reaction, when over 250 ml. of incompatible blood had been given. They felt that fibrinolysis was an important factor, but considered that a "heparinoid disturbance" was present. Toluidine-blue dye, given intravenously to two patients in a dosage of 15 mg. per kg. of body weight, apparently corrected the bleeding tendency. Such treatment might be worthy of a trial in any refractory case.

Treatment with corticotrophin (200 units intramuscularly) or cortisone (400 mg. intravenously) has been recommended, in addition to fibrinogen, by Stefanini and Dameshek (1955).

If the possibility of a bleeding state after incompatible transfusion had been known, the second laparotomy would probably not have been carried out, and appropriate treatment might have been started earlier.

Summary and Conclusions

A case is described in which there was fatal post-operative bleeding, associated with afibrinogenemia, following a haemolytic transfusion reaction.

Treatment is discussed, and the following points may be of value in controlling such a condition: (1) early recognition of the fact that a haemorrhagic state has developed; (2) administration of large amounts of the fibrinogen fraction—for example, 2–6 g., repeated if necessary—or the use of quadruple-strength concentrated raw dried plasma if fibrinogen is not available; (3) fresh frozen plasma, or fresh blood, if there is a poor response to adequate fibrinogen; (4) avoidance of dextran; (5) corticotrophin, cortisone, or toluidine-blue dye intravenously, if not responding.

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THE ISOLATION OF TRYPANOSOMA RHODESIENSE FROM A BUSHBUCK

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It has long been believed that an animal reservoir of Rhodesian sleeping sickness exists, but only one serious attempt has been made to isolate polymorphic trypanosomes from game animals and to test their pathogenicity in man. This was done recently by Ashcroft (1958), who killed 74 animals of various species in two endemic areas in Tanganyika and inoculated blood from them into rats. One polymorphic strain was isolated from a Coke's hartebeest (*Alcelaphus cokei*) near Babati in the Mbulu District and inoculated into man with negative results; this strain was presumably *Trypanosoma brucei*. It must be stressed that the only sure way of differentiating *T. rhodesiense* from *T. brucei* is by the inoculation of man. *T. rhodesiense* infects man while *T. brucei* does not: both trypanosomes are morphologically identical.

The present experiment was carried out on Utonga Ridge, a small peninsula projecting into Lake Victoria about 40 miles west of Kisumu in the Nyanza Province of Kenya. This area was chosen because not only were a few natives suffering from Rhodesian sleeping sickness found near by but because *T. rhodesiense* had been isolated from *Glossina pallidipes*, which is now the predominant tsetse fly on the ridge. Between April and August, 1958, 24 animals, which included 13 duikers, 10 bushbucks, and one serval cat were shot and their blood inoculated into rats. The serval cat was negative, but a strain of polymorphic trypanosomes and *T. congolense* were isolated from the duiker, and two polymorphic strains and two strains of *T. congolense* from the bushbuck. The polymorphic strains were inoculated into human volunteers and one of those from the bushbuck (*Tragelaphus scriptus* Fall.) was pathogenic to man (see below). This strain, which is highly pathogenic to rats and produced numerous posternuclear forms, is presumably *T. rhodesiense*. This is the first time that *T. rhodesiense* has been isolated from animals and establishes finally that Rhodesian sleeping sickness is a zoonosis.

The bushbuck strain was inoculated into the forearm of Mr. C. A. W. Guggisberg, mammalogist on our staff. The inoculum was heavily infected and consisted of 25 ml. of blood from a subinoculated rat with numerous trypanosomes in its blood (over 100 per oil-immersion field). On the seventh day there was a hardish lump at the site of the inoculation and trypanosomes were seen in material aspirated from the swelling. On the eighth day scanty trypanosomes appeared in the blood and the temperature rose to 103° F. (39.4° C.). On the ninth day the arm was very swollen, with a hard inflamed area about 3 in. (7.5 cm.) in diameter on which was a blister about the size of a half-crown. Fluid from the blister contained about three trypanosomes per oil-immersion field. At 11 p.m. the temperature rose to 106.9° F. (41.6° C.) and the patient felt very ill. At 11.45 a.m. he was given his first injection of antypol. Response to treatment was dramatic and recovery uneventful. Rats inoculated on the ninth day with exudate from the blister and blood taken from an earlobe became infected.

The technique employed is considered of great importance. It is essential to inoculate enough blood (30 ml. at

least) from the animal killed into enough rats (six at least), otherwise light infections can easily be missed. In our opinion Ashcroft inoculated too little blood into too few rats; this may be the reason why he isolated so few strains from such a comparatively large sample of animals. Experiments of this kind must be designed with a broad sweep on a large scale and may have to be continued for a considerable time.

Although the isolation of *T. rhodesiense* from a bush-buck is important, it would be interesting to repeat the experiment in areas where *G. morsitans* and *G. swynnertoni* are vectors of sleeping sickness to discover whether the same or other species of animals are acting as reservoirs. This note gives only a brief account of our work; detailed results will be published elsewhere.

We are much indebted to Messrs. Harvey, Harmer, and Highton for their enthusiastic work in the laboratory and the field.

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SECOND BACTERIOLOGICAL STUDY FROM A MATERNITY HOSPITAL

BY

FRANK MARSH, M.D., D.T.M.&H.

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The measures used in a maternity hospital to check the growth and build-up of pathogenic micro-organisms in lying-in wards and nurseries have already been described (Marsh and Rodway, 1954). That paper covered a period of some 38 months, and the methods used were described in some detail. The present paper extends the study for a further four years—to nearly eight years in all.

Floors were treated with "marinol D." After the discharge of a patient, disinfection of a ward was effected by spraying chlorhexidine 1:5,000 from a "microsol" disperser. Blankets were washed in "lissapol N" (1:200) and disinfected with "fixanol C" (1:200). For a while "cirrasol O D" was used, but fixanol C was preferred. Blankets of the mothers were treated every two to three weeks; blankets of the babies every 10 days. Mattress sterilization was by Sparkhall, each time a new occupant used the bed. The rubber or sorbo mattresses of the infants were treated by wiping with a dilute solution of "dettol," "roccal," or chlorhexidine. The pillows were at first disinfected with formalin, but later this treatment was abandoned and plastic covers were used for the pillows. Since May, 1955, hand cream has been supplied for the nursing staff and also for the mothers, after they had washed their hands. Chlorhexidine and roccal were incorporated in the hand cream, 50% of each; the two compounds seemed to be equally effective.

Results

Records were kept of 211 blood-agar plates exposed in the wards during periods of activity. No colonies of *Staphylococcus aureus* were observed. Numerous colonies of *Staphylococcus albus* were identified. On two occasions a few colonies of *Streptococcus haemolyticus* (Lancefield group A) were found on a plate. A total of 477 swabs (nasal 243, eyes 165, and umbilical 69) from infants were examined. *Staph. aureus* was isolated from 58.8% of nasal, 48.4% of eye, and 55% of umbilical swabs taken between the eighth and the tenth days of life. (Penicillin-resistant staphylococci were found in 75 to 90% of the earlier (pre-1954) series, and in 65 to 80% of the present series (1955-7).

Infection among 4,919 infants (1955-7) was 2.5% (respiratory infections 0.2%, minor skin lesions 1.3%, eye infections 0.18%).

A total of 309 swabs from mothers were examined (110 nasal, 124 throat, and 75 nipple). *Staph. aureus* was isolated from 23.6% of nasal, 6.5% of throat, and 47.9% of nipple swabs. (*Staph. aureus* was insensitive to penicillin in 75% positive swabs in 1955, and in 65% positive swabs in 1957.) From January, 1950, to December, 1953, among 4,830 patients (including 64 admitted after delivery) there were 5.3% puerperal pyrexia cases. In 1953 three cases of breast abscess occurred; there were none in 1955-7. (A few post-natal women—a week or two after discharge—developed a breast abscess.) A total of 310 swabs from nursing staff were examined (150 nasal, 111 throat, and 49 hand). *Staph. aureus* was found in 34% of nasal, 4.5% of throat swabs, and in one hand swab. Of these strains 90% were resistant to penicillin.

During the second four-year period, 22 midwives and nurses and 202 pupil midwives were employed. Infections occurred in 75 individuals (33.6%). Four-fifths were minor respiratory cases, mainly tonsillitis and influenza. Other cases included minor skin lesions, boils, and furuncle of the ear (3.5%), eye infections (styes) 1.8%, gastro-enteritis 0.27%, and one case of glandular fever. *Staph. aureus* was not isolated from exposed plates—that is, from air-borne settles—but the micrococcus was isolated from the nasal, eye, and umbilical swabs. Of 255 neonatal deaths, respiratory infection was found in 2.3%.

The methods evolved for the prevention of cross-infection show some success; but *Staph. aureus* implanted in the noses of infants did not seem to be unfavourably affected.

It is thought that *Staph. aureus* confined to the noses of infants may not be harmful unless some means of dissemination occurs.

I thank Miss Helen Rodway, consultant obstetrician, Thorpe Coombe Maternity Hospital, London, for collecting the data and for enlightened supervision of the fight against cross-infection; and Dr. H. Caplin, director of pathology, Forest Hospitals Group, for undertaking many of the swab examinations.

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Medical Memorandum

Acute Haemolytic Anaemia in a Case of Infantile Gastro-enteritis Treated with Oxytetracycline

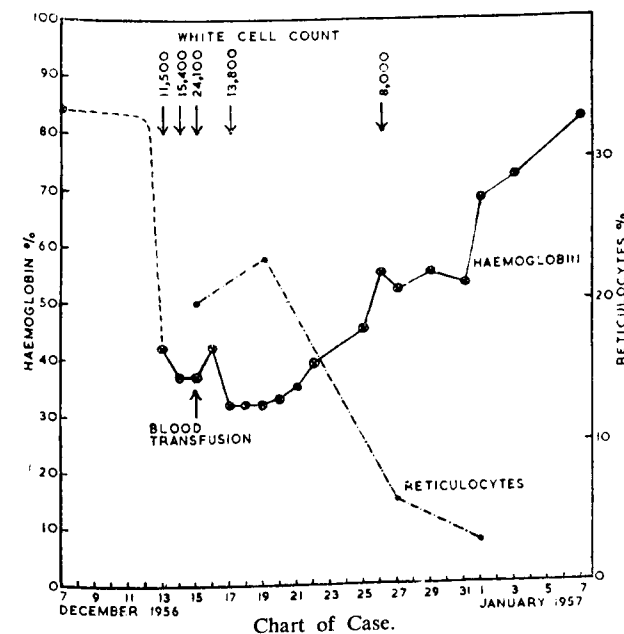
Anaemia of mild or moderate degree following infantile gastro-enteritis is not uncommon, and is usually thought to be due to a toxic depression of blood formation, often in association with a nutritional deficiency. It is not known whether haemolysis plays any significant part. By infantile gastro-enteritis we mean a specific disease due to a number of serologically distinct types of *Escherichia coli*: an acute severe haemolytic anaemia following this condition has not been seen before in this unit. The following case is reported because other workers may have had similar experience and may be able to shed further light on its aetiology.

CASE REPORT

A male infant aged 6 months was admitted to hospital on December 5, 1956, with a five-day history of diarrhoea with some vomiting. His temperature was 98° F. (36.7° C.), pulse 134, and respirations 32. He was an ill child, with moderate dehydration and sore buttocks, but otherwise clinical examination was negative. He had not had any previous illness and there was nothing relevant in the family history. Glucose saline (2.5% glucose in 0.3% sodium chloride) was given by mouth, and after two specimens of

faeces had been obtained oxytetracycline, 50 mg. six-hourly, was begun. After 24 hours his condition had much improved and there was no dehydration. Subsequent progress was uneventful, and oxytetracycline was discontinued on December 11 after a five-day course. At that time he appeared very well, the stools were normal, and the feeds had been increased to full-cream National dried milk.

On December 5 and 6 a pure culture of a smooth type of *E. coli* was isolated from the faeces. It was, however, an anaerogenic strain and was not typable with our sera (O26, O55, O86, O111, O114, O119, O125, O126, O127, and



O128 sera are used routinely). On December 12 only rough *E. coli* were isolated. The haemoglobin on December 7 was 12.6 g./100 ml. (85% Haldane); the Chart shows the further levels.

On December 12 the child was noted to be rather pale; his temperature was 99° F. (37.2° C.). Next day the pallor was marked and there was a subconjunctival haemorrhage in the right eye. The sclerotics showed a suspicion of icterus. He became progressively more ill and on the 15th there was marked air hunger. A small transfusion of about 200 ml. of compatible group A Rh-negative blood was given. The haemoglobin rose slightly on the 16th, but fell again next day. From December 22 there was a steady rise in the haemoglobin value. From December 12 to 22 the bone marrow was very active, but was only able to maintain the haemoglobin at a constant level. The circulating red cells showed an astonishing degree of anisocytosis. Many macrocytic cells were present together with about 5% normoblasts and a maximum reticulocytosis of 23%. The white-cell count increased, reaching a peak of 24,100/c.mm. with many myelocytes and metamyelocytes.

On December 14 the serum bilirubin was 1.3 mg./100 ml. and the liver-function tests were normal. Next day the direct Coombs test was negative on two specimens of blood. On the 19th the test for occult blood in the faeces was negative. The faecal stercobilinogen content was 130 mg./100 g. of moist stool; this figure was thought to be too low for a patient suffering from haemolytic anaemia until it was realized that in an infant's stool most of the pigment was likely to be in the form of bilirubin. There was insufficient material for a quantitative assay of bilirubin in the stool, but qualitative tests showed a very large quantity to be present. On December 21 the faecal stercobilinogen content was less than 20 mg./100 g. of moist stool; bilirubin amounted to 400 mg./100 g. of moist stool. A week later

the bilirubin content was 250 mg./100 g., and the stercobilinogen content 10 mg./100 g. of moist stool. Assays of the bilirubin and stercobilinogen contents of the stools from two infants of the same age who had just recovered from infantile gastro-enteritis showed 50 mg. and 110 mg. of bilirubin and 15 mg. of stercobilinogen per 100 g. of moist stool. The levels found in the patient were obviously greatly in excess of these, indicating that the anaemia was haemolytic in origin.

Red-cell fragility on two occasions was normal. During the period of acute anaemia there was no recurrence of diarrhoea. The stools were of an orange colour, and this was clearly due to the large amount of unaltered bilirubin present. The reduction of bilirubin to stercobilinogen may be imperfect in infants, and the removal of the normal flora by the action of oxytetracycline undoubtedly slowed down the process. Repeated stool examinations did not show any pathogenic organisms. Apart from the small blood transfusion mentioned, no other treatment was given except for several injections of vitamin B₁₂ on the basis that a great deal of blood regeneration was necessary to compete with the haemolysis that was occurring. Between December 11 and 17 there was pyrexia of 99 to 101° F. (37.2 to 38.3° C.), but from the 17th onwards he remained afebrile.

From December 22, when the haemoglobin rose steadily, there were no setbacks, apart from a cross-infection with *E. coli* type O127 which led to a mild gastro-enteritis on January 3, 1957. The blood count was unaffected, but on this occasion the patient was treated with neomycin. By January 7 the haemoglobin had risen to 12.3 g./100 ml. (83% Haldane) and the red cells appeared normal. Follow-up on February 12 showed exactly the same figures.

COMMENT

From the history and clinical examination the case appeared to be one of infantile gastro-enteritis. A smooth *E. coli* was isolated from the stool which was not a recognized pathogenic type, but which might nevertheless have been a pathogenic strain. This has occurred not infrequently, and some strains have been identified by Dr. Joan Taylor, at Colindale, as identical with those causing gastro-enteritis from other areas.

A severe haemolytic anaemia developed about 10 days after the onset of the illness. Haemolysis continued, and in spite of a very active marrow no rise in haemoglobin was recorded for about 10 days. The red-cell fragility was normal and no circulating antibody was demonstrated by the Coombs test. The nature of the haemolysis remains unknown. At the time of onset of the haemolytic anaemia the child appeared to have recovered from gastro-enteritis and there was nothing to suggest a source for the circulating toxin.

The acute haemolysis occurred after a course of oxytetracycline. Thrombocytopenic purpura following this antibiotic has been described by Welch *et al.* (1954) and Beckett *et al.* (1955). The former mention the occurrence of other blood dyscrasias, but make no direct reference to haemolytic anaemia. A search of the literature has not revealed a previous case; nevertheless, oxytetracycline remains a possible cause.

Cross-infection later with another known pathogenic type of *E. coli* (O127) led to a mild gastro-enteritis on January 3, but the blood count was unaffected. This infection was treated successfully with neomycin. Subsequent follow-up has not shown any abnormality in the blood picture.

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Reviews

SOCIAL WELFARE IN SCOTLAND

Scottish Social Welfare, 1864-1914. By Thomas Ferguson. (Pp. 609+xi; illustrated. 42s.) Edinburgh and London: E. and S. Livingstone Ltd. 1958.

This account, by Professor Ferguson, of the Scottish social welfare services is comprehensive and well documented. It is full of facts and figures supported by apt quotations. The 50 years covered show the evolution from primitive conditions to the beginnings of the Welfare State. Though the book is long, it is a pity that it stops at 1914, and it is to be hoped that a further volume, to bring it up to date, is contemplated.

The early chapters describe in considerable detail the housing, earnings, diet, and general environment of the people, ranging from the slum-dwellers of the great cities to the lonely crofters and cottars of the Highlands and Islands living, along with their animals, in "black houses." Then there are over 120 pages on the relief of destitution, and all the controversies about rates of relief and whether any relief should be given to the able-bodied. This is followed by chapters with a greater medical flavour on the infectious diseases, cholera, smallpox, typhus fever, tuberculosis, and certain zoonoses; on the care of the sick, domiciliary and institutional; and on the welfare of mothers and young people.

The half-century saw the beginning of the famous Highlands and Islands Medical Service, and the establishment in 1894 of the Local Government Board, which incorporated the functions of the Board of Supervision and retained for long the latter body's Poor Law outlook with its fixed principle of discouraging idleness and imposture. It saw in 1865 the highest death rate and in 1868 the high-water mark of pauperism. The living conditions described are so degrading as to be almost unbelievable. Quotations show that Professor Matthew Hay, of Aberdeen, wrote that typhus fever was spread by body vermin. This was in 1904, and several years before the role of the louse in this disease was generally accepted.

Scotland is well known for its housing problems, but it is not so well known that at the census of 1871 32.5% of the houses had only one room and that 5% of those living in them consisted of families of ten or more. The reader is brought up against the decline in the purchasing power of money when told that in 1906 the pay for unskilled labourers was 5½d. an hour, and that house rents in the country districts were about £1 to £3 a year.

In a serious book such as this it is a relief to come across a lighter touch, as is the account of the formal opening by Royalty in 1903 of the Colinton Fever Hospital in Edinburgh. The guests arrived early. By inadvertence the doors of the refreshment rooms were opened too soon, and by the time the ceremony was due to start "the tables had been literally swept of all vestige of food."

The book deals not only with purely medical matters, but also with those, now comprised in the term "social medicine," which lead to, or are at least associated with, ill-health. It can be highly recommended, and there is a full bibliography for those who wish to gain even further information.

ALLEN DALEY.

A GREAT MEDICAL EPOCH

The Medical World of the Eighteenth Century. By Lester S. King, M.D. (Pp. 346+xvii; illustrated. 43s. 6d.) Chicago: University of Chicago Press. London: Cambridge University Press. 1958.

The author of this interesting monograph, looking forward as well as backward from the viewpoint of the eighteenth century, finds that a study of this epoch will enable us to understand better "our mature present-day medical structure." He begins his survey by a rather lengthy account of

the feud between physicians and apothecaries which exercised so potent an influence upon medical progress, and he seasons his remarks by quoting from Sir Samuel Garth's poem, "The Dispensary." The second chapter deals with "Quack and Empiric," from the common-sense John Wesley and his popular work, *Primitive Physick*, to Sir William Read, the royal oculist in the time of Queen Anne, and from Berkeley's tar-water to Joshua Ward's drop and pill.

As might be expected, considerable space is devoted to Hermann Boerhaave, by far the greatest physician of the eighteenth century, who strove to blend old and new facts and theories into a well-organized system. His theories were "by no means models of lucidity." So the author tells us, but it is disappointing to find that his own attempts to explain Boerhaave's "gluten," "acrimony," and the like leave the reader more mystified than ever. It is a relief to pass from Boerhaave to the more readable description of the eighteenth-century view of fevers.

"Similia Similibus" is the title of a long and illuminating account of Hahnemann and his homoeopathy. The word suggests infinitesimal dosage, but the prescribing of one drug at a time, and the belief that a drug which produced certain symptoms in health would cure disease marked by the same symptoms, were ideas of equal importance in this system, which arose as a reaction against the barbarous therapy of the day. It was during the eighteenth century that the nomenclature of disease was closely studied, under the stimulus of Linnaeus, whose classifications of plants, or taxonomy, was extended to diseases and called nosology. Emphasis is laid upon the pioneer work of François Boissier de Sauvages, the title-page of whose book is reproduced, entitled *Nosologia Methodica* and dated 1768. About this period William Cullen turned his brilliant talent towards nosology, but it was not yet possible to separate symptoms from diseases, and it is not surprising that Benjamin Rush affirmed that "diseases anastomose" and cannot be classified.

Other leading phenomena of the eighteenth century were the development of medical ethics and of the modern outlook in pathology. John Gregory's lectures "On the Duties and Qualifications of a Physician" were followed by Thomas Percival's important work which coined the term "medical ethics" and was the forerunner of all modern ethical codes. In pathology Morgagni's *De Sedibus et Causis Morborum* in 1761 inaugurated a new era, although the forgotten work of Lieutaud also deserves attention. The concluding chapter, which might well have been longer, describes the rise and fall of inoculation against smallpox and the ever changing attitude in medical practice.

This interesting account of a great epoch deserves to be studied and pondered. Sir Robert Sibbald is not Sibbald (pp. 26 and 27), nor was he appointed professor "early in the century," but in 1685. Again, "empire" on page 34 should be "empirics." These, however, are trivial errors. The bibliographic notes on each chapter are of value, and show that the author has been careful to draw his information from the original sources. It is perhaps a pity that so little mention is made of recent books and articles on the same topic. There are an excellent foreword by Professor Ilza Veith and an adequate index.

DOUGLAS GUTHRIE.

REHABILITATION IN THE U.S.A.

The Handicapped and Their Rehabilitation. Edited by Harry A. Pattison, M.D., F.A.C.P. Introduction by Major-General Melvin J. Maas, U.S.M.C.R. ret. (Pp. 944+xxxii; illustrated. £5 12s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

This book is a mixture of sermon, encyclopaedia, training manual, and synopsis of medical practice. Forty-four authors contribute, and all save one are from the United States of America. Section I—the sermon—contains full extracts from the writings of leading American authorities on rehabilitation such as Kessler and Rusk. Section II deals with specific handicaps, diseases, and age groups. The American public is more informed medically than most, but

it is difficult to believe that they, and for that matter the trained medical auxiliaries, could follow and understand the significance of the technicalities referred to in Chapter 5. Medical practitioners will, on the other hand, find the chapter most rewarding. Another chapter (Chapter 10), entitled "What is Being Done for the Aged," will be very useful for reference to anyone unfamiliar with the work in this field. The majority of the chapters in this section contain full and sound advice and indicate the scope and the basic principles of rehabilitation, stressing always the needs of the individual. Occasional references to the problems of medical diagnosis as already indicated seem to imply that the book is written for the medical graduate. This confusion as to whom the book is designed for is possibly resolved on page 401, where it is stated: "The responsibility for assisting the physician in charge by co-ordinating the activities of the rehabilitation team and for developing on the staff a rehabilitation consciousness are phases of the work of a new profession in the medical field, whether we call the position Rehabilitation Counsellor, Rehabilitation Co-ordinator or Executive Assistant." Section III is a résumé of the role, and occasionally of the training programme, of the different members of the team, and Section IV deals with American practice. The latter affords an excellent survey of the development of rehabilitation services in the U.S.A., both Federal and State and also in industry. This section will be of value to all interested in rehabilitation problems and procedures. Apart from these aspects, the book is essentially designed for the members of the rehabilitation team in the United States of America and thus has a very limited appeal to readers in Western Europe.

R. E. TUNBRIDGE.

STUDY OF BODILY FUNCTION

Taschenbuch Klinischer Funktionsprüfungen. Edited by Arthur Gitter and Ludwig Heilmeyer. Fifth edition. (Pp. 484+xx; illustrated. DM. 18.) Jena: Gustav Fischer Verlag. 1958.

This handbook on clinical procedures by Dr. A. Gitter and Professor L. Heilmeyer deals with the study of function in various organs and systems. The fact that it has reached its fifth edition within four years is some indication of its popularity and usefulness to the German clinician, although the British reader will be conscious of some confusion between detail and repetition. The aim of this book is to describe those practical procedures which determine minor or major abnormalities of function where these are of diagnostic value.

Experimental methods in clinical medicine at the bedside are becoming increasingly important. Recent advances, particularly during the past decade, in all branches of general medicine demand the closest liaison between laboratory procedures and the basic principles of sound clinical methods—to wit, good history-taking and clinical examination of every system (with particular attention to the system currently involved). An adequate knowledge of basic principles in radiology, applied physiology, and pathology has for some years been included in the armamentarium of the practising clinician. To-day clinical laboratory procedures include applied physiological, biochemical, and haematological disciplines which must all be integrated with clinical medicine and brought to the bedside. Only in this way can the physician assess the value and limitations of such investigations.

In the sphere of thoracic medicine, the applied physiology of respiration with special reference to the mechanics of ventilation, disturbances of gas exchange in blood and alveoli, tests of pulmonary function, and methods of study by spirometry and bronchospirrometry, and the like; in the cardiovascular system, angiocardiology, cardiac catheterization, and methods of investigation of the arteries by oscillometry and arteriography; and skin and muscle investigations of blood supply, are among many other features outlined. Tests of renal and liver function and those concerned with endocrine and metabolic disorders are all reviewed; in fact, no system is neglected, and some are

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dealt with in even greater detail than the average reader would consider necessary. There is a very full bibliography, but one could wish that this bibliography had a more international flavour. The book is well produced in a most convenient form, and is, for myself, among the few books I have seen from the presses of East Germany.

PHILIP ELLMAN.

RECTOSCOPIC APPEARANCES

Principles of Rectoscopy. By Karel Herfort and Zdenek Maratka. (Pp. 254; illustrated. 42s.) London: Constable and Co., Ltd. 1958.

The objective of this book, originally written in Czech but with triple translation into Russian, German, and English contained in the one volume, is to describe the technique of proctoscopy and sigmoidoscopy and to record pictorially certain lesions of the anus, rectum, and colon. The author describes his preferred knee-elbow position for sigmoidoscopy and concerns himself with certain of the difficulties and hazards of the examination, but this section has nothing to add to the routine description of the procedure contained in any monograph devoted to proctology. The volume is copiously illustrated, but without reference to the captions I have found it difficult to recognize some of the lesions portrayed in the colour photographs. Two illustrations show the formation of a perineal colostomy and an artificial anus. But the suggestion that a surgical stoma is well sited when placed in these positions will not find general approval amongst English and American surgeons. The multiple artists' drawings of the sigmoidoscopic appearances in the normal and in the diseased bowel are beautifully prepared, but, as in all such illustrations of endoscopic appearances, they tend to be impressionistic rather than realistic. The beginner in sigmoidoscopic examinations may well find initial difficulty in correlating what he visualizes during instrumentation with appearances represented in these colour drawings, but with additional experience they should provide him with considerable help.

Combined with an adequate practical training in the specialty of proctology and the interpretation of sigmoidoscopic appearances the book can play a part. But coloured illustrations, however beautifully prepared, can never replace the experience gained by the detailed and direct observation of the changes accompanying disease processes affecting the rectum and colon.

STANLEY AYLETT.

A bibliography of the publications of W.H.O. from its inception to the end of 1957 is now available (*Publications of the World Health Organization 1947-1957*; 128 pp., H.M. Stationery Office, 17s. 6d.). It lists all articles published in the *Bulletin of the World Health Organization*, all numbers of the *Monograph Series*, the *Technical Reports Series*, and the *Official Records*, and selected material from the *Chronicle*, the *International Digest of Health Legislation*, the *Epidemiological and Vital Statistics Report*, and the supplements to the *Weekly Epidemiological Record*. Certain occasional publications of W.H.O. are also included. The items are serially numbered and grouped alphabetically under subject headings; author and country indexes are provided. The bibliography is also available in French.

In the sixth edition of his *Forensic Medicine* (London, A. and C. Black, 1957; 30s.) Professor Douglas Kerr has made a general revision of the text and has rewritten the section on the treatment of barbiturate poisoning. Mention is made of the B.M.A. report on the *Recognition of Intoxication*, 1954, but the original memorandum published by the Association in 1927 has been retained in the book as being more suitable for teaching purposes, although a table based on data in the later report has been included to show blood alcohol percentages in relation to amounts of beer or spirits consumed.

The Metabolism of Sulphur Compounds, by Professor Leslie Young and Dr. G. A. Maw (pp. 180; Methuen and Co., Ltd., 16s.), deals with various organic and inorganic compounds of sulphur in higher animals and in micro-organisms. Cysteine, cystine, homocysteine, methionine, and other compounds of especial interest are discussed in detail. Each chapter is followed by an extensive bibliography.

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ENVIRONMENT AND BLOOD PRESSURE

Environmental factors in the production of chronic disease have recently been given increasing attention. The Pneumoconiosis Research Unit in South Wales has been in the forefront in this work, and its interest has not been restricted to respiratory diseases. Recently workers there have been studying levels of arterial blood pressure in the general population, and W. E. Miall and P. D. Oldham¹ have described a study of samples of the population of the Rhondda Fach, a mining valley, and of the Vale of Glamorgan, an agricultural area. The samples, chosen at random, were assumed to be representative of the general population in these two districts and were used as the index cases (propositi) for inheritance studies in which measurements were also made for all the first-degree relatives living within 25 miles of the centre of each area. These relatives comprise parents, siblings, and children. The measurements were made under standard circumstances by one observer.

The results from the samples have been used for fitting curves relating arterial pressure with age, and these show that there is no material difference in the relationship in the two populations despite their strikingly different environments. In further analyses of environmental factors the data from both districts have accordingly been pooled. Comparisons of the arterial pressure of individuals is not possible without standardizing for age and sex. A system of scoring devised by M. Hamilton and his associates² has been followed to allow for these variables so that direct comparisons may be made. In this way a number of environmental factors were shown to have a considerable influence on arterial blood pressure. Occupation, either directly or indirectly through economic factors, appeared to affect pressure. People in light work with less expenditure of energy, higher incomes, and higher standards of living had higher pressures. Heavy manual workers with higher expenditure of

energy, lower incomes, and lower living standards had lower pressures. There was a steady trend between these two extremes, the intermediate groups having intermediate pressures. These differences were not due to differences of arm girth or weight. Furthermore, the effects of occupation were most obvious in bachelors and in men over 50 years old. The authors point out that these are the two groups of people who most truly reflect occupational differences in income and energy expenditure.

These observations do not entirely agree with those reported in some other studies. In a survey in Birmingham³ higher pressures were found in Social Class V than in Social Class I, but no real trend with the physical demands of occupation was noted. In Bergen⁴ a study has shown that persons occupied in heavy labour have the highest systolic pressure, while those with independent and responsible positions have the lowest blood pressure. The reasons for these discrepancies are not clear, but it may be noted that in the South Wales survey the blood pressure was taken in the individual's own home after a rest of five to ten minutes. The Birmingham records were made without any previous period of rest. In Bergen each person attended at a centre at a time most convenient to himself. It is therefore not perhaps surprising that the labourer coming straight from his place of work presented a higher systolic blood pressure than the sedentary worker.

An investigation of the effect of family size on blood pressure produced some interesting, and at first sight surprising, results. Pregnancy may provoke the appearance of hypertension in some subjects who develop toxæmia, and in some the rise of blood pressure may persist.⁵ Accordingly, it might be expected that multiparous women might have higher pressures than nulliparous women. However, on the contrary, an inverse correlation was found with family size—the larger the family the lower the pressure. A similar trend was reported in the women of the Bergen survey.⁴ Even more surprising was the finding in the South Wales survey that family size influenced blood pressure in a similar way in the male. The trend for systolic pressure in men aged 15–50 years is almost as marked as in young females, though it is absent in diastolic pressure measurements. Single men had higher systolic pressures than the married, and the fathers of small families higher than those of large families. The influence of family size eventually becomes less obvious in the elderly.

Speculation on the explanation of these environmental effects is tempting but unlikely to be fruitful without further investigation. The fact that the pressures in both males and females are related to family

size suggests that the relationship is probably not a direct physiological effect of pregnancy or lactation. Though women with high pressures may be advised to limit the number of children, this advice is rarely given to hypertensive fathers. The factor which associates high fertility with low blood pressure cannot yet be clearly defined, and several possible explanations come to mind. Clearly, a large family brings financial problems and certainly increases energy expenditure, and in this way may diminish some of the distinctions between the social classes. The findings of this application of epidemiological techniques to the study of hypertension will undoubtedly stimulate much further inquiry.

COMPENSATION FOR INJURY

Workmen's compensation attracts the eye of the public, and undoubtedly press reports of accidents and compensation are widely read by employer and employee. It has often been questioned whether changes in the law have been beneficial to the claimant and have facilitated the task of the doctors concerned with his case. The duties of the certifying surgeon and the medical referee were stated in the Workmen's Compensation Act of 1906, when the previous Acts of 1897 and 1900 were repealed. As time went on further changes were made, and a departmental committee on workmen's compensation issued a report¹ in 1920 (the Holman Gregory report) which influenced the trend of further legislation and practice. In 1946 the National Insurance (Industrial Injuries) Act provided regulations governing the constitution of medical boards and medical appeal tribunals. The appointment of medical assessors in connexion with local appeals tribunals was recognized. One of the consequences of all this is that a group of doctors now deal with these cases and not one or two holding a special and permanent position.

These legal changes may have made the work of the claimant's solicitor easier, but they have merely altered rather than simplified the medical procedure. Sometimes all the claimant's family doctor can do is to provide certification and sedatives—perhaps knowing that the provision of both is necessary but may be harmful—while the medical aspects of the claim pass into the hands of a practitioner or group of practitioners whose main occupation is to prepare

reports on medico-legal matters. They obtain specialist opinion from consultants, particularly neurologists, psychiatrists, and orthopaedic surgeons. There is little evidence that the frequent medical examinations are of benefit to the litigant, and many observers consider that they are detrimental to him and misleading to the lawyers. In fact it can be argued that the present system of long-drawn-out negotiation sometimes tends to demoralize patients, helping to induce a traumatic neurosis, and robbing their doctors of all opportunity to prevent the onset of this clinical condition, so well known to the courts.

Emotional reaction after injury has been recognized for many years, and circumstances have provided labels for types, such as railway spine and shell shock. Sir Francis Walshe,² discussing the subject recently, has observed that some non-medical factor operates to determine the development of traumatic neurosis. The aetiology of the condition has been considered particularly by Farquhar Buzzard,³ J. Collie,⁴ and L. Brahdy and S. Kahn,⁵ as well as Walshe, to name only a few. Their observations show emotional symptoms are more likely to arise after an injury resulting from war or earthquake, or from accidents on the railway or in industry, and particularly in the course of gainful employment, than from injury received on the rugby football ground, hunting field, racecourse, or in childhood. Indeed, traumatic neurosis is rarely found in childhood, though parents suing on behalf of a child may present symptoms of a neurosis. The patient's pretraumatic personality is not necessarily other than normal, but accidents of a particular type or to certain areas of the body are more apt to produce manifestations of traumatic neurosis. If the injury is emotional rather than physical—such as a fright—then headache, fear, vertigo, tremor, and insomnia may develop, though these may also develop after physical injury. Such symptoms are well known after injury to transverse processes of vertebrae, coccyx, head, and neck. In these circumstances it can be difficult to determine if the claimant is a sick man seeking adequate compensation, or a malingerer. Walshe concludes that "trauma by itself does not give rise to neurosis, but when a claim for compensation can be made in respect of an accident or injury, this factor allows, if it does not actively induce, the neurosis. In its absence neurosis does not ensue upon injury." And it is commonly observed that settlement of a patient's claim to his satisfaction usually leads to an improvement or cure, temporary or permanent, of the traumatic neurosis. The remarkable benefit that follows settlement has attracted attention in the courts of many countries. Lump sums have always been popular with the work-

¹ Miall, W. E., and Oldham, P. D., *Clin. Sci.*, 1958, 17, 409.
² Hamilton, M., Pickering, G. W., Roberts, J. A. F., and Sowry, G. S. C., *Ibid.*, 1954, 13, 37.
³ Brown, R. G., McKeown, T., and Whitfield, A. G. W., *Canad. J. Biochem.*, 1957, 35, 897.
⁴ Hummerfelt, S., and Wodervang, Fr., *Acta med. scand.*, 1957, 159, 489.
⁵ Chesley, L. C., Annitto, J. E., and Jarvis, D. G., *Amer. J. Obstet. Gynec.*, 1947, 53, 851.

¹ Departmental Committee on Workmen's Compensation, 1920, H.M.S.O., London.
² Walshe, F., *Med. Press*, 1958, 239, 493.
³ Buzzard, E. F., *Lancet*, 1923, 2, 1285.
⁴ Collie, J., *Fraud in Medico-legal Practice*, 1932, London.
⁵ Brahdy, L., and Kahn, S., *Trauma and Disease*, 1937, Philadelphia.
⁶ Stewart Report, 1936, quoted by Wilson, A., and Levy, H., *Workmen's Compensation*, 1941, London.

man. Now that treatment is provided by the State this is of less importance, but it is worth noting that they are prohibited in many foreign countries, and evidence⁶ from the Ministry of Pensions was that they had not proved successful in cases of war neuroses.

To help the judge decide whether a litigant's condition is legally directly or indirectly the result of injury, the doctor has a duty to state what he finds, and, if asked, he will give his opinion on whether the symptoms result from the injury. Hence it is not for him to decide if there is malingering or fraud, but the doctor can be of great assistance to the court if he can say the man is genuine and he considers him to be as disabled as he claims⁷ to be. Walshe draws important conclusions on the enormous loss to industry of the complications, particularly neurosis, after injury, and the distress to the injured person. He points out that the process of negotiation is often not only interminable but of such a nature as to aggravate the emotional condition of the litigant. Are doctors sometimes at fault in writing pessimistic reports? Are lawyers sometimes blind to the advantages for the claimant of an early settlement? In the end the injured person's recovery is likely to mean more to him than any financial award.

LIVE POLIOMYELITIS VACCINE

An Expert Committee¹ of the World Health Organization, reporting earlier this year, had this to say about living attenuated poliomyelitis vaccines: "Tests on hundreds of thousands of people will be necessary to establish whether the theoretical expectations of safety can be confirmed in actual practice." "Tests" of this magnitude are already in progress in different parts of the world, and a preliminary report on one of them, involving 244,596 persons vaccinated in the Belgian Congo and Ruanda-Urundi, has already been published.² Three articles in this issue focus attention on "the theoretical expectations of safety" of the living attenuated poliomyelitis vaccines so far available. Professor C. H. Stuart-Harris and his colleagues in Sheffield (p. 1188), using Sabin's attenuated type III polio virus, designated 12a₁b (KP₁), in a rigidly controlled trial on 14 boys first immunized with two injections of the formolized vaccine, found that virus isolated from all five of the boys in whose intestines it multiplied regained its power to paralyse monkeys inoculated intracerebrally. Virus isolated from one case on the

fourteenth day after ingestion of the vaccine "showed a degree of neurotropism similar to that of field strains of type III virus from paralytic cases." It is unlikely that any of the strains isolated from boys in this trial was a "wild" strain accidentally picked up, because "no case of type III poliomyelitis was in fact encountered in Sheffield during the entire period of the trial, and the last case of type III virus isolation had been in December, 1956." In another article (p. 1187) Dr. D. S. Dane and Professor G. W. A. Dick and their colleagues in Belfast record neutralizing antibody levels in 60 children vaccinated orally a year previously with living attenuated type II TN virus. Their earlier report³ had shown that this virus regained its cytopathic power and some power to paralyse monkeys in its passage through the human intestine, a result which led to universal agreement² that, on grounds of safety, the TN strain is unsuitable as a vaccine. The Belfast workers now show that the level of neutralizing antibody in the same children a year after vaccination is "of the same order as in children a year after vaccination with two injections of formolized vaccine." This result is disappointing, since one of the expected advantages of living vaccines, chiefly because of the experience with yellow-fever vaccination, was that they would give a more durable immunity. However, as the authors observe, neutralizing antibody titres may not measure immunity, especially as they take no account of possible local immunity in the intestine.

The third paper on live virus vaccines in this issue (p. 1184) is a balanced review of the present position by Professor Dick and Dr. Dane. Thousands of people have been vaccinated with live attenuated virus, and experience shows that there is little likelihood that the vaccinated subject will himself suffer any ill effect: none so far are known to have done so. The possible danger is to contacts, who may become infected from the vaccinated. That contact infection with the live vaccine strains occurs has been repeatedly shown. If such strains remain attenuated, contact infection, by disseminating them among the population, might supplant wild virulent strains and raise the general immunity; but if on passage the vaccine strains regain appreciable virulence, then they might lead to paralytic cases of poliomyelitis among those to whom they spread.

Although their discussion does not take account of the Sheffield experience, Dick and Dane emphasize the importance of defining the limits of safety of living attenuated vaccines as the immediate aim of further trials. Much remains to be done before any firm assumption on the safety of widespread use of live virus vaccine is justified. Under the more or

less controlled and special circumstances of laboratory study, the level of neurotropic virulence can be varied in either direction, or held approximately steady. It is not known whether attenuation is a process of mutant selection, as the plaque-picking technique assumes, or whether it is a phenotypic change induced by environment, of the kind seen with encephalomyocarditis, another R.N.A. virus.⁴ Nothing is known of the nature of the annual change in poliomyelitis which, in temperate countries, brings on the polio season in summer and autumn. It is possible that in nature strains of virus change their virulence in either direction as freely as they do in the laboratory. Dick and Dane record an interesting and highly pertinent observation on the high virulence to monkeys of virus isolated from paralytic cases compared with the much lower monkey virulence of virus presumably of the same strains isolated from contacts of these cases.

Many different pieces of circumstantial evidence seem to indicate that the power of the polio virus to paralyse is a most unstable characteristic, that fluctuations in this power occur in nature for reasons which are entirely unknown, and therefore are unpredictable. The "theoretical expectations of safety" can, in the opinion of some authorities, hardly be said to be firm enough to justify any trials on human beings other than those made on small numbers of volunteers in circumstances such that the spread of the virus can be closely watched and effectively controlled. Such trials are wholly practicable, and are needed to shed further light on this difficult and complex problem. At this stage "trials on hundreds of thousands of people" may or may not be carried through without ill effect. It is difficult to see how they can tell us much about the protective power of the vaccines; and to attempt to apply the results observed in tropical countries with an initially high incidence of poliomyelitis virus to temperate or other countries where the disease behaves differently might, for all we yet know, prove disastrous. The whole history of poliomyelitis vaccination has a tendency to run at a pace decided by politics and the press: in this respect it is very different from the history of diphtheria immunization, which did not become general until the scientific basis of it had been fully worked out. The best chance of achieving a sound assessment of live poliomyelitis vaccines lies in a continuation of careful small-scale studies like those discussed in the three articles in this issue and the many which have been made in the United States by the American workers who have pioneered in this field.

WILD GAME AND SLEEPING SICKNESS

In the Croonian lectures of 1915 Sir David Bruce¹ described the isolation of polymorphic trypanosomes from 14 wild animals out of 180 examined in Nyasaland. He was of the opinion that the organism was identical with the one responsible for Rhodesian sleeping sickness, and that wild game animals must constitute a dangerous reservoir of the infection. Further isolations were made by British and German workers, but all these observations, including Bruce's, were based on the assumption that a single species of trypanosome was concerned; we now know, on the contrary, that two species exist, identical in appearance, one of which is infective to man and animals (*Trypanosoma rhodesiense*) while the other is infective to animals alone (*T. brucei*). The only way of distinguishing the two species is by inoculating them into man, in whom *T. rhodesiense* alone will take. This essential test was not applied by the early workers, and their isolations may have been of either species. The same doubt shadows the experiments of H. L. Duke² in Uganda, where he reported the presence of *T. gambiense* in the sitatunga (swamp bushbuck). Nevertheless, epidemiological evidence was accumulating that game was indeed a reservoir of the human parasite: repeated examples occurred of hunters going into game country totally uninhabited by man and returning not only with the trophies of the chase but with Rhodesian sleeping sickness. Shortly before his death, C. H. N. Jackson³ summarized his experience in Shinyanga and came to the conclusion that wild animals must form a reservoir of the disease in nature, basing this both on the history of cases and on the isolation of true *T. rhodesiense* from tsetse flies caught in the bush.⁴ The susceptibility of antelopes to *T. rhodesiense* was proved beyond question by J. F. Corson, H. Fairbairn, and K. C. Willett, working at the Tinde laboratory of the East African and Trypanosomiasis Research and Reclamation Organization, and the strain was maintained in these animals by blood or fly passage continuously for ten years, at the end of which time it proved to be still infective to man.⁵

Many people were satisfied with this circumstantial evidence, but final proof was still lacking, and two attempts have recently been made to fill the lacuna. M. T. Ashcroft⁶ in Tanganyika inoculated the blood of 47 wild animals into rats and recovered a polymorphic trypanosome from a single hartebeeste; this proved to be non-infective to man. In this issue of the *Journal* (p. 1203) R. B. Heisch, J. P. McMahon, and P. E. C. Manson-Bahr report the actual presence of *T. rhodesiense* in wild game. Using thirty times the quantity of blood that Ashcroft employed and with the resources of the experienced Division of Insect-borne Diseases of the Kenya Medical Department at their disposal, they obtained from a bushbuck a polymorphic trypanosome which was later inoculated into (and infected) a member

¹ W.H.O. Technical Report No. 145, 1958.
² Courtois, G., Flack, A., Jervis, G. A., and Koprowski, H., *Brit. med. J.*, 1958, 2, 187.
³ Dane, D. S., Dick, G. W. A., Connolly, J. H., Fischer, O. D., and McKeown, Florence, *ibid.*, 1957, 1, 59.
⁴ Sanders, F. K., Huppert, J., and Hoskins, J. M., *Symposia Soc. exp. Biol.*, 1958, No. XII, p. 123.

¹ Bruce, D., *Lancet*, 1915, 2, 1.
² Duke, H. L., *Sleeping Sickness Bull.*, 1912, 4, 171.
³ Jackson, C. H. N., *Trans. roy. Soc. trop. Med. Hyg.*, 1955, 49, 582.
⁴ MacKichan, I. W., *ibid.*, 1944, 38, 49.
⁵ Willett, K. C., and Fairbairn, H., *Ann. trop. Med. Parasit.*, 1955, 49, 278.
⁶ Ashcroft, M. T., *Trans. roy. Soc. trop. Med. Hyg.*, 1958, 52, 276.
⁷ Potts, W. H., *Times Science Review*, 1958, no. 28, 13.

of their staff who had remained behind in Nairobi, far from any endemic zone of the disease. The main story of sleeping sickness in Africa is thus brought to a conclusion, though many details still await clarification. It is a paradox that this successful experiment was performed in a region where *T. rhodesiense* was absent until 1940, when it overflowed into Kenya, in the human form, from the epidemic raging in Uganda; wild animals must have become infected later, and once more we have an example of a zoonosis *hors de ligne*.

Confirmation that wild animals are a reservoir of sleeping sickness should not provide to-day ammunition for the bloodthirsty exponents of game destruction for the control of the disease. The facilities offered by the synthetic insecticides, the subtle introduction of sterile male tsetse flies,⁷ or prophylaxis with the new drugs, render this crude approach as unnecessary as the removal of a population. The beautiful African fauna should remain undisturbed.

CARDIOLOGY IN THE N.H.S.

A year or so before the N.H.S. came into being in 1948 a committee on cardiology of the Royal College of Physicians of London reported on the training of cardiologists and on the practice of cardiology in hospitals and in the Health Service that was to come. This month the College has issued a report of another committee on cardiology appointed in 1957 "to review and consider the implementation of the report of the Committee on Cardiology of April, 1947." Of the eighteen members of the later committee nine served on the earlier one. That there is some dissatisfaction about the place of cardiology in the N.H.S. might be assumed from the present report. Many well-trained young cardiologists, it states, are not in a position to use their skill, and this is already deterring the best young men from seeking appointments in cardiac departments. This leads to the suggestion that "the Ministry of Health could with advantage give the same official recognition to cardiology as it does to neurology and certain other specialties." Because a large proportion of the work of physicians in the N.H.S. is concerned with circulatory disablement in some form, the committee regards the investigation and treatment of cardiovascular disorders a necessary part of the work of general physicians, who should, however, always be able to call upon a fully equipped specialist department to help in difficult and complicated cases.

The report gives the committee's recommendations on the training of cardiologists and on the establishment and staffing of cardiac departments. Five years is suggested as the minimum period of training after the conclusion of the trainee's junior hospital appointments: two years of this period should be spent as a registrar or junior teacher in a department of general medicine, two years should be spent in a cardiac department, and one year in research. There should be a department of cardiology at one of the main teaching hospitals of each

medical school, and outside the teaching hospitals a cardiologist should be appointed to every major hospital centre and to every hospital where surgery of the heart is performed. As to the smaller hospital centres, the report urges that a first-class opinion should be available for every patient with a heart disorder needing expert advice: "this means that in every area where access to a major hospital centre is not easy, one or more cardiologists should be appointed among the physicians working in this area." The report is not without glimpses of the obvious: for instance, it outlines the ways in which the department of cardiology should establish liaison with departments of cardiac surgery, child health, and obstetrics, and in its recommendations on accommodation it states that "there should also be adequate room for patients waiting." But, in general, the report gives the Ministry clear guidance on how to provide the best possible cardiological service within the N.H.S.

SPEEDING THE TAN

A tanned skin has come to be regarded as a sign of vigorous health and, lately, as a social asset, for it commonly betokens a visit abroad to those parts of Southern Europe where the sun is less sparing with his favours than in Britain. The cosmetic manufacturers have therefore provided numerous preparations designed to permit tanning while reducing the risk of sunburn, and others which attempt with suitable pigments to simulate a natural tan. Now a drug which increases and accelerates tanning may soon be introduced¹ in the United States.

The drug, methoxypsoralen, has an interesting history. Extracts of the plant *Ammi majus*, containing this substance, were employed in Egypt as an ancient folk remedy for vitiligo. Reports of the first scientific investigation of the photosensitizing properties of extracts of *Ammi majus* appeared in 1947² and the active ingredients were isolated and identified. The first clinical trials were soon carried out, and encouraging results were claimed in the treatment of vitiligo. The psoralens have since been prescribed in dermatological clinics in many countries. There is no doubt that these substances applied topically or taken by mouth before the skin is exposed to ultra-violet light will induce formation of pigment in some areas of vitiligo. However, the response in the individual case is unpredictable; treatment has to be prolonged and is extremely time-consuming; and even if re-pigmentation is achieved it may not be permanent. It has been estimated that only one in seven patients treated obtains satisfactory re-pigmentation. A. Jarrett and G. Szabo³ showed that a pigmentary response is obtainable only in those areas in which some melanocytes remain, and this may explain the many failures. The incidence of unpleasantly severe inflammatory reactions to the topical application of the

¹ *J. Amer. med. Ass.*, 1958, 167, 2081.

² Fahmy, I. R., and Abu-Shady, H., *Quart. J. Pharm.*, 1947, 20, 281.

³ Jarrett, A., and Szabo, G., *Brill. J. Derm.*, 1956, 68, 313.

⁴ Sulzberger, M. B., and Lerner, A. B., *J. Amer. med. Ass.*, 1958, 167, 2077.

psoralens is so high that this treatment has been generally abandoned. Oral administration produces less spectacular side-effects, but nausea, diarrhoea, headache, and depression are not uncommon. Though no better treatment for vitiligo is available, most dermatologists would now agree that the psoralens should be reserved for selected cases treated under close supervision and that these drugs are mainly of value in research.

While the psoralens will induce a much more consistent pigmentary response in normal skin than in vitiligo, it is neither completely constant nor predictable, and the risk of side-effects is equally great. M. B. Sulzberger and A. B. Lerner⁴ point out that we do not know whether prolonged or repeated ingestion of psoralens exposes the subject to other hazards. We do not know, for example, what effect, if any, these drugs may have on the development of chronic solar degenerative changes, including carcinoma. After critical review of the available evidence it is impossible at present to justify the use of the psoralens merely to acquire an impressive South of France tan in an average English summer.

DETECTION OF OVULATION

Since the human ovum does not survive after ovulation for more than a few hours—less than twelve, it is generally believed—conception is unlikely to occur unless coitus takes place within a short time of it. Couples seeking advice on infertility are always told to have sexual relations during the fertile phase of the menstrual cycle, but to define that phase, except in rather general terms, has proved none too easy. The most commonly used adjunct has been the basal temperature record, which characteristically shows a mid-cycle rise and post-ovular plateau caused by the progesterone secreted by the corpus luteum. The temperature rise, "thermal shift," to use the current transatlantic expression, is usually described as being immediately preceded by a temperature drop—the "ovulatory dip"—but this is exceptional and probably fortuitous, though often said to indicate the precise day of ovulation. The inconsistency, if not irrelevance, of the ovulatory dip, and the fact that the thermal shift occurs *after* ovulation (as has been shown most elegantly by the hormone-excretion studies of J. B. Brown and colleagues¹), make the basal temperature record no more useful for detecting the day of ovulation—except in retrospect—than would measurement of the daily output of urinary pregnandiol, which also reflects progesterone secretion. Detection of the urinary oestrogen peak at ovulation would be more precise but is obviously not a practical proposition. Nor, scarcely, is the daily collection and examination of vaginal smears, though by this means it may be possible to pin-point the day of ovulation. The rat-ovary hyperaemia test of Farris,² which, in the hands of

its author, has facilitated precise prediction of the day of ovulation, is also far too cumbersome for general practical use; moreover, some other workers have not had the same success with it.

In view of the shortcomings of these methods of detecting ovulation, much interest attaches to the observation of C. H. Birnberg, R. Kurzrok, and A. Laufer³ that by inserting into the vagina daily a strip bearing glucose oxidase, which detects the presence of glucose ("tes-tape," the British counterpart of which is "clinstix"), the day of ovulation can be detected by a sharp rise in the concentration of glucose in the cervical secretions. J. B. Doyle⁴ has modified this procedure so that the woman can carry it out herself and so select the day of ovulation without any medical intervention. That this change in glucose concentration really indicates the occurrence of ovulation would seem to be attested by Doyle's finding freshly ruptured follicles in two women subjected to laparotomy (for entirely independent reasons) on the day of maximum "tes-tape" colour, and by the prompt occurrence of conception in 23 out of 27 women subjected to A.I.D. by Birnberg and colleagues on days chosen in the same way. For control of fertility by the "rhythm" method, detection of ovulation by this technique would seem to offer an important advance in safety and precision to the patient who chooses to use it.

TRAVELLING SCHOLARSHIP FOR GENERAL PRACTITIONERS

In the Association Notices this week (*Supplement*, p. 212) particulars are given of a scholarship for which competition among general practitioners is likely to be keen. The trustees of the Claire Wand Fund are offering a travelling scholarship of a maximum value of £600 to a general practitioner prepared to spend 6–8 weeks in the U.S.A. and Canada and to attend the Second World Conference on Medical Education in Chicago early next September.¹ The Claire Wand Fund was established in memory of the wife of Dr. S. Wand, the present Chairman of Council, and the capital sum from which the Fund's income is derived was contributed mainly by general practitioners in recognition of the outstanding services rendered to the medical profession by Dr. Wand and Dr. D. P. Stevenson during the negotiations leading to the Dankwerts award. The income of the fund is applied "for the purpose of further education of medical practitioners who are predominantly engaged in general practice," and the award of the travelling scholarship now announced is to enable a general practitioner to study what is done for the further education of general practitioners in Canada and the U.S.A. In submitting their applications general practitioners should describe what studies they propose to undertake in North America: applications should be submitted to the secretary of the Fund at B.M.A. House not later than January 31, 1959.

¹ See *British Medical Journal*, *Supplement*, 1958, 1, 194.

¹ Brown, J. B., Klopfer, A. I., and Loraine, J. A., *Proc. roy. Soc. Med.*, 1958, 51, 556.

² Farris, E. J., *Human Ovulation and Fertility*, London, 1956.

³ Birnberg, C. H., Kurzrok, R., and Laufer, A., *J. Amer. med. Ass.*, 1958, 166, 1174.

⁴ Doyle, J. B., *ibid.*, 1958, 167, 1464.

certify as mentally defective children in need of special education. In considering the question of mental defect in young children, therefore, we are concerned only with low-grade cases—that is, with idiocy and imbecility. The school medical officer may, however, also be concerned with the question of educational retardation and the need for special education.

I understand that the position in the area with which I am here concerned is that special schools are not available for the educationally subnormal (E.S.N.) until they reach the age of 7 years. An adjacent local authority, on the other hand, has taken the step of providing a nursery school for the E.S.N. Let me say at once that there is a question of expediency here. From a practical point of view, and faced with pressure of social circumstances, it may be easier to help a supposedly backward child in areas where special facilities are provided from an early age. So far as principle is concerned, however, a decision regarding special schooling at the age of 7 years seems much more desirable. By that age it will have been found by experience what the child's capabilities in the way of learning really are, and some form of assessment of his probable future progress will be possible. It seems very undesirable that a child should be classed at the age of 2 or 3 years as E.S.N. or even occasionally as feeble-minded, since an analysis of the total situation in such cases will more often reveal a disturbed background than a disturbed child (Hilliard and Kirman, 1957). Adverse social factors play a major part in causing such cases to be considered retarded (Craib and Woodward, 1958; Kirman, 1958). It is particularly important to remember that once such a decision has been made the label tends to stick to the child throughout his subsequent career regardless of all provision for reassessment.

Anatomical Basis for Mental Defect

Tests are of value only if they predict subsequent attainment, and the predictive value of tests of ability under the age of 5 is limited (Vernon, 1955). If, therefore, we are attempting to assess in the case of a particular young child whether or not he is mentally defective on the basis of unusual behaviour it seems desirable to confine our attention to gross defect. It has long been considered that in most cases of gross mental defect there is a corresponding gross abnormality of the brain. Berry (1938) noted the marked reduction in weight and size. Recent work (Crome, 1954) on a big series of unselected cases has confirmed that obvious lesions are usually present. Figs. 1 to 5 illustrate some of the abnormalities observed. This being so, it will be found that in a considerable number of cases a detailed history and a careful physical examination will provide evidence of abnormality to supplement the story of abnormal behaviour. This applies equally to cases due primarily to genetic factors (primary amentia) and to those ascribed to environmental influences (secondary amentia). In a proportion of cases, however, the cerebral abnormality is discovered only after death, and during life there were no neurological symptoms and no history of illness or untoward event which might have produced the abnormality. In these cases the only symptoms of the cerebral defect are those which are summed up as "mental defect."

First Symptoms Noted By Parents

The data shown in the accompanying Table are derived from the social histories of 233 patients admitted to hospital, usually under the age of 5 years, as mental defectives. In each case the leading symptom complained of by the parents is taken. In some instances there was no specific complaint, merely a general statement that the child was

slow in developing, but in the majority more specific information was available. The symptoms leading to the first recognition of the mental defect have been shown at the time at which they came to the notice of the parent. In



FIG. 1.—Hydrancephaly. Very little functioning brain cortex. Complaint of constant screaming and taking no notice at 3 months.

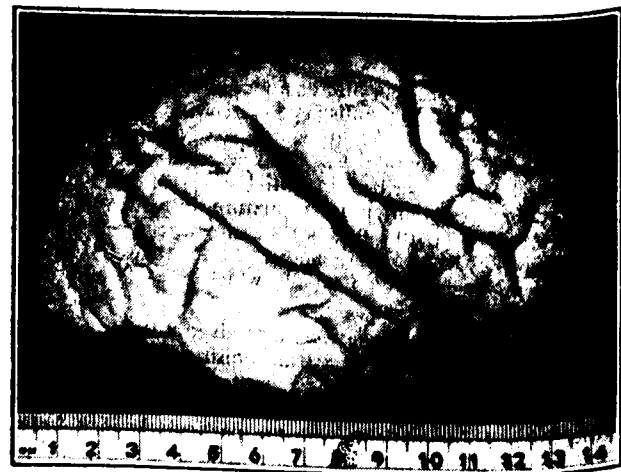


FIG. 2.—Pachygyria with very poor development of sulci. Convulsions at 3 months followed by regression.



FIG. 3.—Frontal lobes not separated. Did not suck well. Difficult to feed from birth.

many cases this was when the parents first felt sure about the defect: they had often had a vague suspicion previously that all was not well. This was particularly so, for example, in the case of twins where the normal child was available for comparison. In many histories additional details have been supplied, but it was thought that a clearer picture would emerge if only the first symptoms which arrested the attention of the parent were recorded.

Table Showing Time of Appearance of First Symptoms of Mental Defect in 233 Children

Symptom	Age in Months							Total
	Birth	Under 3	3-5	6-11	12-23	24-35	36-48	
Physical features	25	18	8	5	4	1	—	61
Eye defect	4	5	9	5	4	2	—	29
Feeding difficulties	3	1	—	—	—	—	—	4
Quiet	—	2	—	—	1	—	—	3
Cerebral palsy	—	1	5	—	—	—	—	6
Slow	—	1	14	16	9	3	—	43
Not taking notice	—	1	6	1	—	—	—	8
Not sitting	—	—	14	15	5	—	—	34
Screaming	—	1	4	1	2	—	—	8
Peculiar movements	—	—	4	—	—	—	—	4
Not crawling	—	—	2	—	—	—	—	2
Not walking	—	—	—	1	10	5	—	16
Restless	—	—	—	1	3	1	—	5
Not using hands	—	—	—	1	—	—	—	1
Head banging	—	—	—	—	1	—	—	1
Not speaking	—	—	—	—	1	4	—	5
Not playing with toys	—	—	—	—	—	1	—	1
Destructive	—	—	—	—	—	—	1	1
Not clean	—	—	—	—	—	—	1	1

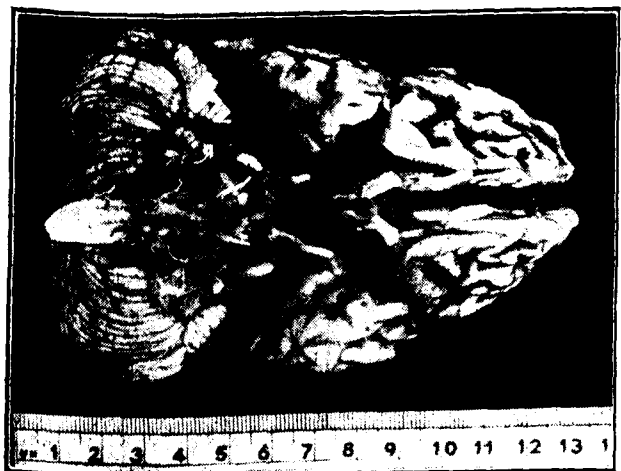


FIG. 4.—Atrophy of brain. At 6 months child did not seem to see or hear.

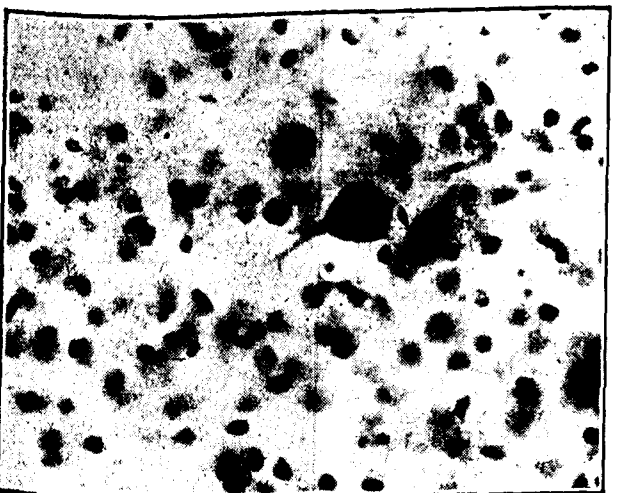


FIG. 5.—Same case as 4, showing lipoidosis. A case of cerebro-macular degeneration.

The biggest single group of cases was recognized by the parents or by their medical advisors on the basis of physical abnormalities, and this was also the group most readily recognized at birth, as might be expected, since the range of behaviour of the newborn baby is so limited. The commonest of the physical abnormalities recognized in this way was mongolism, but the group also includes such conditions as microcephaly and hydrocephalus. Another big group of cases was noticed early on account of "eye defect." Some of these children were blind, but more often they seemed blind to the parents at this early stage. Their eyes did not follow a light or they failed to fix objects with their eyes, or, slightly later, failed to turn their heads towards objects displayed. The groups which first came to attention because of feeding difficulties, quietness, or cerebral palsy were smaller, and the next big group is that merely classed as generally slow. This is obviously a residual collection due either to failure of the parent to particularize or simply to realization of the fact that this was indeed the most accurate description of the position, that the child was slow in all his accomplishments.

In the "not taking notice" group the emphasis is on the lack of emotional response, whilst the big "not sitting" group begin to worry the parents because of failure to reach this important and well-recognized "milestone" at the appropriate time. A smaller group of parents had suspended judgment until the child failed to walk at the normal time, and only five had delayed still further until the child had reached the appropriate time for beginning to talk. Five patients were noticeable because of restlessness and single cases because of other symptoms.

In glancing through the list of symptoms perhaps the most striking thing is that most of them are negative—that is, simply a statement that a child failed to do a certain thing at a certain time. Only 18 cases drew attention to themselves because they did something which was unusual. Perhaps a more correct statement would be that they persisted in doing something after the time for this form of activity had gone by; this applies, for example, to the fine repetitive movements of the fingers which are normal in a young baby but which are later described in imbeciles and idiots as "digital mannerisms." These patients with positive symptoms included the "screaming" group, those with "peculiar movements," restlessness, head banging, and destructiveness. The majority, then, exhibit simply a quantitative defect or retardation of behaviour development which may be given a quantitative expression on the basis of any of the recognized scales of norms.

Psychosis or Mental Defect?

Difficulties may arise in the interpretation of the abnormal behaviour noted in both the majority and the minority groups. For example, it is well known that on occasion a child who fails to sit, stand, or talk at the usual time may yet prove to be above average in intelligence. It is, however, the minority group whose leading abnormality consists of qualitatively abnormal behaviour who are most difficult to understand. On the one hand the symptoms may simply be evidence of retardation. This may be true of restlessness. Normal children are restless, but they are usually capable of being trained to some extent, so that the expression of the restless tendency can sometimes be limited by parental influence. This implies, however, capacity to respond to "atmosphere," to adult approval or disapproval, and to other factors in the social environment. Very backward children are slow in acquiring this capacity, and the abnormality is not so much that they are restless as that they are inappropriately and persistently restless in an unmodifiable manner.

On the other hand such symptoms as restlessness or "peculiar movements" are also characteristic of children with psychotic and neurotic illnesses. It is often a matter of extreme difficulty to distinguish between simple mental defect and psychosis in a young child. To some extent the distinction is one of definition. In any considerable group

of mentally defective children there is a small minority who might more aptly be described as psychotic. They function socially at idiot level and fail to co-operate in standard tests to such an extent as to secure a very low rating. On the other hand, careful observation may lead to an impression that the child has considerable capacities which are unused or are utilized in a negative manner. For example, a child who attracts attention by head banging may display other forms of negativistic behaviour. This behaviour may be nicely timed in such a manner as to indicate considerable discernment of social situations. The appearance of a stranger or any other slight derangement of the usual order of events may be followed by refusal of food or by a display of head banging. Obsessional tendencies in such patients may likewise indicate extreme nicety of perception.

The position is still further complicated by the fact that it is not rare for a backward child to develop superimposed psychotic features. Similarly, withdrawal and "autism" may be seen in children who are known to suffer from epilepsy or to have good evidence of structural abnormality of the brain.

It should also be pointed out that in psychotic children simple failure to carry out normal activities may also be a conspicuous part of the picture. The commonest form of infantile psychosis is of the schizophrenic type with poverty of social contact, and an important feature is often muteness, though such children may speak in complete sentences on exceptional occasions.

It follows that there are three possible interpretations of such abnormal features as head banging, restlessness, destructiveness, peculiar movements, and screaming. In the first place, any one of these symptoms taken alone may be merely a passing phase in the life of a child and may have no serious significance. It may represent a natural reaction to some set of unfavourable circumstances such as a sudden alteration in the amount of parental attention available. Secondly, these symptoms may be the manifestation of a profound abnormality of personality in a childhood psychosis. In the present connexion I am using the term psychosis to cover a serious prolonged mental illness in which there is no evidence of gross organic brain damage and in which there is an impression of retention of a potentially normal mental capacity: fortunately such conditions are relatively rare in young children. Finally, these symptoms are by no means uncommon as part of the picture of simple mental defect.

At this point I would like to emphasize something which may be thought obvious—this is, that backward children, like ordinary children, react to their environment, though at a more infantile level. If that environment is conducive to the development of emotional disturbances then they may well develop and complicate the picture of straightforward defect. An investigation by Dr. M. Woodward (in press) showed that there was a correlation, significant at beyond the 0.001 level, between disturbed behaviour after admission to a mental deficiency hospital and a mentally adverse home background prior to admission, using objective criteria.

In order to illustrate the vexed question of infantile psychosis and mental defect a film was recently prepared by Dr. E. J. Anthony, of the Institute of Psychiatry, including some studies of typical mannerisms and movements. Two photographs illustrating this subject are reproduced here (Figs. 6 and 7) showing the mannerisms commonly seen in idiocy. Mannerisms of this type are described in such conditions as phenylketonuria, but they are in no way specific to this condition and may be seen in idiocy due to any cause. It is also very difficult to differentiate such mannerisms from those which may be seen in psychotic children. The distinction must be made on the basis of the general picture rather than of the individual symptom. In idiocy the child has not advanced beyond the level of repetitive manipulation, whilst in psychosis he may regress to that level. A clear history of previous normality is sometimes valuable in

making the distinction, but there are reservations to this. In a minority of cases severe defect, perhaps amounting to idiocy, develops after some cerebral catastrophe—for example, post-inoculation encephalopathy or status epilepticus from whatever cause.

Limited Significance of Individual Features

It is extremely hazardous to make any definite forecast on the basis of a single defect or abnormality in the behaviour of a child.

The question of mannerisms may be used to illustrate this point. Persistent head rolling is such a mannerism, and may be seen quite frequently in both idiot and psychotic children. It is also, however, by no means uncommon in normal children. It may, at one stage in the development of an otherwise quite normal child, seem to be an essential preliminary to sleep, when it appears to serve a self-hypnotic role. In normal children these circular activities of very limited scope tend to be broken as the child develops more complicated behaviour patterns and responds to a greater variety of stimuli. In idiots this does not happen, or happens only very slowly and as a result of intensive training. As with normal young children, idiots will tend to resort to repetitive self-hypnotic behaviour when there is little else to attract their attention or when they are bored. It is clear, then, that the presence of such a mannerism cannot in itself be the basis for a diagnosis of defect or of serious maladjustment.

Similar considerations apply to delay in any one accomplishment, though the reasons for this may be somewhat different from those which apply in the case of mannerisms. Urinary incontinence illustrates the problem very well. All young babies are incontinent of urine, as are most idiots, but it is well known that urinary incontinence, especially nocturnal, may persist into adult



FIG. 6.—This boy aged 10 years was thought to be normal up to the age of 3½ years but deteriorated rapidly. He now functions at imbecile level. He shows a variety of mannerisms.



FIG. 7.—An idiot aged 8 years suffering from phenylketonuria.

life in a great variety of conditions apart from mental deficiency. A proportion of these cases are obviously neurotic in that they have other obvious features of neurosis, such as excessive anxiety, night terrors, shyness, timidity: others have some physical abnormality such as paraplegia to account for the weakness. In many children, however, this lack of sphincter control seems to be a solitary abnormality, and one is tempted to think in terms of delayed maturation of the apparatus responsible for the establishment of control. To base any far-reaching conclusions on the existence simply of urinary incontinence at, say, the age of 5 years is improper.

A word may also be said about the need for similar caution in interpreting normal behaviour in very young children. The older views about cerebral localization have come in for a good deal of criticism lately, and, while there is still a lack of general agreement on the subject, there is a tendency to a more dynamic concept of cerebral function which visualizes the central nervous system acting as a whole. None the less, it seems reasonable to suppose that activities such as breathing, coughing, and sucking, which are early developed, are more directly dependent on the integrity of the lower centres, while functions such as the use of logarithmic tables demand a certain amount of normal cortical tissue. The acquirement of skills such as sitting up independently and walking occupies an intermediate position. Most commonly, in severe mental defect the whole range of capabilities is affected in a fairly even manner. Even such elementary functions as coughing and swallowing may be seriously impaired, and breathing may be difficult to establish in a child with a severe brain abnormality. However, from time to time a case is encountered in which early development seems fairly normal in regard to the more vegetative functions and to early motor development. This may apply to children with a severe degree of tuberous sclerosis who may yet sit and walk at a normal time but prove eventually to be of idiot level. The most obvious explanation of this phenomenon would appear to be the fact that in severe mental defect there is a tendency for the higher centres to be more severely damaged than the lower. Similar considerations would apply to the case recently demonstrated by Professor Illingworth in which an infant with gross microcephaly passed the first "milestones" at the correct time.

A parallel with the phenomenon mentioned above may be found in cases of athetosis due to rhesus incompatibility. These children may seem fairly well after recovery from the acute illness (Crome *et al.*, 1955), and athetosis manifests itself only when the child reaches the stage of development at which co-ordinated purposeful movements are attempted.

Advantages and Disadvantages of Early Attention

I have avoided using the term "diagnosis" in this connexion, since mental defect is not a disease entity but rather a legal and social convention. As more light is thrown on the cause of deviation from the normal it becomes increasingly valuable to direct attention to young children who exhibit unusual or retarded behaviour. There is a small group of conditions which are amenable to direct treatment, such as cretinism, phenylketonuria, hypoglycaemia, galactosaemia. Some cases of petit mal associated with backwardness may also derive benefit from treatment. There is a whole group of children who are backward in certain respects whose prospects may be improved by careful study and advice. The most obvious of these is the group of deaf or partially deaf, but many other physical disabilities produce a similar effect. The deaf child is often regarded as mentally defective and frequently finds his way into a mental deficiency hospital, where he may develop a superimposed psychosis. It is essential that such a child should have expert advice and attention from an early age, and in his case the presenting symptom may be failure of speech development, inattention, and naughtiness, contrasting with a good level of attainment in some directions.

On the negative side, too much attention to delayed development at an early stage may distress the parent, may lead the doctor into unwise predictions, and may have a deleterious effect on the child's subsequent career. It is usually quite unjustifiable to ascertain a child under the age of 5 years as ineducable, and it is most undesirable that legal formalities such as certification as mentally defective should be undertaken at this stage. It is to be hoped that when new legislation is devised the present provision for the certification of young children as mentally defective will be replaced by a different arrangement for the care of such children, leaving it to the initiative of the parent to place them in hospital if this seems necessary. This should make it easier for the doctor to study the development and the needs of the individual child without the necessity to arrive at an early decision for purely statutory reasons.

Summary

It is seldom possible to predict accurately mental abnormality in a young child on the basis of specific behaviour disorders. Simple retardation of development is commoner than disturbed behaviour. In regard to mental deficiency it is possible to recognize only severe mental defect at an early stage. Often it is an adverse social background, not mental defect as such, which is the problem. Decisions regarding mental defect are often best postponed. The predictive value of tests under the age of 5 years is very low. A detailed history and physical examination are essential to assessment. Only 8% of 233 imbeciles and idiots drew their parents' attention by disturbed behaviour. The others were simply retarded. Disturbed behaviour of identical pattern may be found in idiots, in psychotic children, and, transiently, in normal children. The distinction must be based on the general picture, not on individual symptoms. Defectives are responsive to the environment and may develop a psychotic overlay in unfavourable circumstances. Even in severe defect early accomplishments are sometimes normal for the age. Early assessment and attention are important, especially where there are conditions which can be treated or complications such as deafness, but expediency should not be allowed to precipitate a rash decision which will prejudice the future of the child.

Permission has been received for reproduction of Fig. 1 from L. Crome and P. E. Sylvester's paper on hydrancephaly (*Arch. Dis. Childh.*, 1958, p. 235); of Figs. 2 and 3, from L. T. Hilliard and B. H. Kirman's *Mental Deficiency* (Churchill, London, 1957); and of Fig. 4 from I. Crome's article, "A Case of Lipoidosis Following Rh Factor Incompatibility" (*J. clin. Path.*, 1956, vol. 9, p. 326).

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The *International List of Advanced Programmes in Nursing Education*, published by the International Council of Nurses in 1954, has been brought up to date with the issue of a *Supplement*. This publication gives detailed information of programmes for "post-basic education of graduate nurses" in every country where such facilities exist. The *List and Supplement* can be obtained from the Council at 1, Dean Trench Street, London, S.W.1, price, post free, 21s. (*Supplement* only, 5s.).

SOCIAL WORK IN GENERAL PRACTICE

BY

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Considerable interest to-day is focused on the treatment and management of stress and strain and emotional disturbance in general practice. Opinions vary regarding the extent and importance of this problem, but few would deny that the family doctor, whether he likes it or not, is faced with a variety of social and emotional problems on which patients seek his advice and help. This raises the question of how far, in his capacity as medical adviser, he is concerned with them, and, if he feels rightly concerned, the question of what sort of help he can be expected to give. Here again opinions differ, ranging from the few doctors who consider these problems still outside their scope to those who consider the general practitioner should "do it all." The abundance of articles and correspondence on the subject, however, suggests that many family doctors feel a need for some sort of help in dealing with this aspect of their work, and some have written interesting accounts of the particular form of help they have chosen or have been able to find (Balint, 1957; Saville, 1957; Davis, 1957; Chalke and Fisher, 1957; Backett *et al.*, 1957).

At Darbshire House, Manchester University Health Centre, it was decided in June, 1955, for good or ill, to attach a trained social worker to the group of four family doctors practising from the centre and serving approximately 12,000 patients in a closely populated city area. I would like to say a little about this experiment.

First Steps

Experiment it certainly was, as the doctors had not worked directly with a social worker before and I had not worked in general practice. At the outset none of us had any clear idea of the sort of work which might be necessary or possible. The doctors knew that I had been a hospital almoner and had had some experience of child guidance, and it was agreed that in the first place they should refer to me any problems presenting social or emotional factors with which they thought or hoped I might be able to help.

During the first few months, which were largely spent in getting to know each other and learning to appreciate each other's points of view, two difficulties confronting the busy practitioner became steadily clearer; one was connected with the rapid advance in scientific medicine over the past 20 to 30 years, and the other with the growth of the social services over the same period of time.

The first difficulty is best illustrated by an account by one of the doctors of the tremendous change which the introduction of antibiotics had made in the management of pneumonia within his lifetime. Twenty years ago there was little the doctor could do but wait and hope until the crisis passed and then watch over a long, slow convalescence. Now the illness is usually arrested by a few injections, which take a minute or two to give and which can sometimes be delegated to the nurse. The relief from a heavy burden of responsibility in the doctor can readily be appreciated, but his personal contact with the patient and family is immeasurably curtailed and treatment tends to become a service rendered by the doctor rather than an experience lived through with the family. One suspects that the doctor may feel less helpless, but not the family. The mother who said, "We liked the old doctor; he used to talk to us

about Johnny; the new one just sticks needles into him," was, I think, voicing her feeling that she no longer had any significant part to play in the treatment of her child. This does not, of course, mean that the new and the old approach cannot be combined, but perhaps they tend, at present, to remain distinct and are often kept so by the pressure of present-day practice and perhaps for other less obvious reasons.

The second difficulty concerns the rapid growth in the social services and revolution in social legislation over the same period of time. This often makes the doctor feel that management of his cases in a truly personal way has been taken out of his hands. With the best will in the world he could not be expected to be fully conversant with this side of the picture as well as keeping abreast of development in the medical sphere.

Thus doctors and patients alike tend to complain of a dwindling sense of responsibility and consideration towards each other in an age when pain and suffering are no longer accepted passively as the inevitable lot of man, and there is a general feeling that for any misfortune whatever there must be a remedy somewhere in somebody's hands.

Our experience at Darbshire House has, I think, shown that in both these spheres a social worker can give useful assistance to the doctor.

Using the Social Services Effectively

Part of the social worker's basic equipment is a sound knowledge of the social services, both statutory and voluntary. In addition it is her duty to know clearly how these services actually operate in the district in which she works, so that she can interpret and explain them to the doctor and patient, both of whom tend to find them confusing. She can then assist the doctor to choose the agency most likely to help his patient, and can also help him to prepare and assist the patient to make good use of the facilities offered.

Take the simple example of advising a patient to attend a Ministry of Labour rehabilitation unit. It is important that the doctor distinguishes this service from Government training schemes, otherwise there is a danger of raising false expectations in the patient; it is useful to be able to answer some of the patient's questions about the allowances he will receive and to understand that he will not be guaranteed a job on completing the course, although the Ministry of Labour will do everything in its power to place him. It is helpful to understand the sort of experiences he may expect during the first few weeks at the unit: for the timid or truculent, for example, the aptitude tests can be a source of anxiety or irritation which may bring the patient back to complain at the surgery.

A patient who undertakes such a course free from avoidable misconceptions regarding its purposes is likely to make better use of the opportunity and to feel more confidence in the doctor who suggested it, and the social worker can often detect the hidden misconceptions which prevent patients from using the appropriate social service. For instance, a widow was found to be afraid to apply for National assistance because her husband had at one time drawn assistance under false pretences and she feared she would be penalized for his sins. A girl would not take out an affiliation order, believing that the court would send her to Borstal for having an illegitimate child while she was still under 21.

Doctors can attend lectures, read pamphlets, and pay visits of observation, but these time-consuming activities are, we think, no substitute for the opportunity to learn from repeated application and practice in collaboration with a social worker directly attached to the group.

Understanding Family Relationships

The social worker can often supplement the doctor's knowledge and understanding of family problems with her special skills in interviewing and understanding of personal

relationships. In an area such as ours it is not possible for the doctor to know all his patients and families intimately. Families move into and out of the district, split up, and come together again with surprising frequency. The doctor may be called suddenly to attend a family about which he knows nothing but where he senses underlying problems. Sometimes only one member of a family is registered with him, which makes it difficult to get a clear picture of the family as a whole; or the patient may be living alone, often as a result of intolerable conflicts with his family. In such cases an unhurried interview in which the patient does most of the talking and the social worker most of the listening, or a home visit to meet other members of the family, can illuminate the situation and enable the doctor to adopt the most helpful attitude towards the patient and family.

Young Mrs. X had been registered with the doctor for a few months, during which she had appeared repeatedly at the surgery seeking help with trivial ailments in herself and her baby daughter. The doctor was disturbed by her seemingly unreasonable demands on his time and patience, and asked me to see her.

She told a story of a grossly deprived and insecure childhood, and finished by saying, "The doctor is really a nice fatherly soul, isn't he?" This suggestion that she was seeking from the doctor a relationship which she had never had from her parents helped us to come to terms with our own attitude towards her.

Although her basic need for a good parent could never be fully satisfied by the doctor or anyone else, it was helpful that the doctor could understand this need and could tolerate and accept her demands without anxiety. It would have been no good to lecture her on being overanxious, but by accepting her anxiety as real and understandable he could give her a measure of reassurance and security which she should be able to communicate to her child, and, in a slight degree, prevent this child suffering as severely as she had done herself.

This sort of help may also be needed by families who have been registered with the doctor for some years and whose contact with him has been slight because they are seldom ill and send for him only in a crisis or because the management of the ill member of the family is in the hands of a hospital or other organization. This was the case with Mrs. Y, who had a spastic child, Jane, aged 2, and a normal healthy boy, John, aged 7 months. Mrs. Y had attended hospital regularly with Jane ever since she was a baby, and she also went to the child welfare centre with John, and she rarely sent for the family doctor. However, he was called in when John had bronchitis, and noticed that Mrs. Y spoke about Jane in such a way that he asked me to call and assess the situation, mentioning that the undesirable housing conditions made the problem of looking after Jane very difficult.

During my visit I gradually realized that Mrs. Y really had little idea of what to expect from Jane and did not seem to have grasped the implications of her condition. She held Jane up to show me her scissor gait, then put her on the floor, saying, "Look, she won't sit up." She put Jane in a chair with John, an extremely robust and vigorous child, and got annoyed with her for flopping over on to him. Mrs. Y was a young immature woman, but not by nature callous or unkind.

I discussed this with the doctor and suggested it would be helpful for someone to explain the child's condition to the mother and, if possible, to the father also, since Mrs. Y did not strike me as being capable of passing on to her husband, without distortion, whatever the doctor might tell her, and since any mother with a severely handicapped child needs the utmost support from her husband and this is more likely to be fostered by including him in consultations. Mrs. Y must certainly have received considerable information and advice already, but she had clearly been unable to accept and comprehend the nature of Jane's disability while she was still a baby, until John, at 7 months,

had started to outstrip the 2-year-old Jane. It was then the family doctor to whom she voiced her anxiety.

The housing problem did undoubtedly add to her difficulties, but, in spite of application to the housing department, there was no hope of an early solution. However, after a long discussion with the doctor, Mr. and Mrs. Y thanked him for his help, and we learned a little later that they were saving a deposit for a new house.

Long-term Casework with Families

The foregoing examples mainly illustrate help I was able to give to the doctor; the next example is a little different in that the help was given more directly and continuously to the family.

Mrs. Z had been unfortunate with her children. After carrying her first baby eight months she was delivered of a macerated foetus; her second child, Paul, was a mongol; her third child, Douglas, developed epileptic fits at 2½. When I first met them Paul was 5 years old and attending an occupation centre daily; Douglas was 4, and Mrs. Z was complaining of his excessive temper tantrums and destructiveness.

During a visit to the home I saw both parents, who spent much time demonstrating to me, in the presence of Douglas, what a terrible child he was, with the natural result that he behaved accordingly. The mother was sure he was going to be delinquent; the father certain he was "mad" and would never allow his teachers to teach him anything if they succeeded in getting him to school at all. The father said, half provocatively, that friends had advised him to take the child to a psychiatrist, and the mother said that, although she had great faith in the doctor, they had never had "specialist" advice—she seemed to favour a medical or neurological consultation. In fact, the child's attacks were well controlled with phenytoin sodium and phenobarbitone, and he had only an occasional fit.

I suggested that, if the family doctor agreed, we could refer them to the psychiatric department of the children's hospital, where there was a close liaison with the neurological department. They were obviously in two minds about this, but agreed I should consult the doctor. From their manner it seemed to me that these two highly anxious, ill-informed, and guilty parents were unlikely to make good use of this offer without further help and encouragement. The mother poured scorn on those who had already attempted to help her with Paul, and the parents clearly felt threatened by the idea that anyone could do better with their children than they. On the other hand, I felt that behind all this display of aggressive anxiety was considerable positive feeling.

A report was sent to the hospital, and, pending an appointment, I visited the mother fortnightly, seeing her for about an hour. At first she was aggressively casual, but on the third visit this attitude collapsed as she told me how difficult it was to be the mother of the only two children in the street who were "queer"—how she felt people criticized her for being too severe or too lenient with them, making her feel she ought not to have had them at all or should have put them in a home. Gradually she was able to discuss her wish to reject her children and her guilt about it, as well as her wish to cherish them, and how both she and her husband wondered why this had happened to them and who was to blame. She had rather resentfully given up work when Douglas started having fits and had taken to minding three normal children under 3 years of age from 8 a.m. to 5 p.m. five days a week in a house which was barely big enough to hold her own family. She denied emphatically that Douglas could feel jealous of these children, although he was often aggressive towards them; nor could she admit any rivalry between Douglas and Paul, as "she treated them both alike although Paul was worth ten of Douglas." Gradually, however, she began to watch Douglas's behaviour towards the other children and to admit its meaning; and she also began to realize that it was impossible

to treat a mongol child and an intelligent epileptic one exactly alike and to see that it must be difficult for Douglas to have an older brother who will remain a baby while he has to grow up.

Mrs. Z attended the psychiatric department in due course and obtained some satisfaction from learning that Douglas was of normal intelligence and some measure of reassurance about handling his tantrums and understanding of his type of epilepsy. She would not agree to attend more regularly than at three-monthly intervals, and, after consultation with the psychiatrist and his social worker, I continued to visit the home, extending the intervals between interviews as the situation improved.

The family was helped to tackle its housing problem, and there is a definite hope of removal within 18 months. This seems to have spurred the father on to get a better job, but the mother has begun to talk about loneliness on a new estate. Facing a new set of neighbours may well arouse some of her old fears, so we will try to keep in touch with her for a while round the removal time.

It is not possible to give an account of all that has been discussed or has happened during the 12-months association with this family, but certain changes have occurred: medication for Douglas has been reduced and he has not had a fit for nine months; and he started school recently without undue disturbance.

The precise reasons for these changes are open to dispute, although this is not the only case in which a gradual reduction in the need for medication has followed a combined attempt by the doctor and social worker to understand the emotional stresses in a family in which the patient has been diagnosed as having epilepsy. The situation is by no means stable even now, but the mother often speaks of Douglas as "really a very good boy" and the relationship between them seems calmer and warmer. We have yet to see if the improvement will last, as my visits become less frequent and we cannot definitely claim to have prevented more serious and chronic trouble later, although, judging from the accounts we often hear about the distressing early experiences of adult epileptics with disturbed personalities whose families do not appear to have had similar help, we hope that some lasting benefit has been given in this case.

The tensions in this family had been building up for a long time—at least from the shock of Mrs. Z's first disastrous pregnancy. The problem centred in feelings of failure and inadequacy in having produced three damaged children—an extremely difficult situation for any couple to face, much less Mr. and Mrs. Z, who had themselves both suffered considerable emotional deprivation in their own childhood. Many workers had attempted to help them piecemeal with these problems, but what the family most seemed to need was a steady relationship with one person who could accept and tolerate the situation at its most explosive and encourage them to talk freely without fear of criticism or coercion; someone, moreover, who could act as a focusing point, helping them to integrate the separate experiences with the doctor, psychiatrist, health visitor, and teacher, and with relatives and neighbours.

This sort of relationship, I suggest, could not have been supplied by the doctor even though the problem in this case was directly associated with medical care, but it was most appropriately handled by someone working in close co-operation with the doctor.

Conclusions

In conclusion I would like to summarize some advantages which appear to belong particularly to a setting in which a social worker is attached directly and exclusively to a group of family doctors.

1. Accessibility

Help is available on the spot whenever the doctor is puzzled or disturbed by a particular problem, and consequently he tends to seek it more readily than if this were

to involve considerable time and effort in seeking it elsewhere. This is particularly so where the problem does not fall easily into a case for referral to any of the well-known social agencies, but where the dominant need is for an assessment of the situation on which to base a plan of help.

2. Participation in Group Discussion

Informal group discussion over morning coffee will often centre in a particular patient or family; more often it will concern the wider aspects of social care such as housing or employment policy, care of handicapped children or old people, or such perennial points of dispute as "malingering," use and abuse of the Health Service, the "unreasonable" patient, the "problem" family. The social worker can often bring a fresh perspective to bear on these subjects or provide information in the light of which judgments can be confirmed or modified.

3. Interpretation of the Aims and Limitations of Social Work

During the early months of my appointment the attitude of the doctors to me (as a social worker and not as a person) swung from scepticism about the value of social work in general to completely unrealistic demands on my resources. My own feelings were naturally coloured by the anxiety of working in a new setting, but it seemed to me that I was expected as "a nice motherly soul" to perform miracles which the psychiatrist had failed to produce; as a "strong right arm" to the doctor to wrest from the authorities houses for all the ill-housed, jobs for all the unemployed; as an "expert" to clean up and re-educate problem families of long standing; in short, to relieve the doctor of all those painful situations in which he felt unable to be effective in his own right. Those who complain most loudly that social workers spoon-feed their clients and sap their sources of self-help and initiative sometimes demand just this from workers with whom they come in contact.

It was only gradually that we saw that the doctor and social worker must pool their resources and think about their work together in terms of the achievement of reasonable expectations and limited aims. We had to distinguish between what the doctor and social worker might want and what the patient wanted; to examine the values and principles which guided our work and to ask whether disappointing results arose from inadequacies within ourselves, the families, or the social system, or from factors about which we still have little knowledge. To cure sometimes, to relieve often, and to comfort always could then be accepted as applicable to social work as it is to medicine. The more realistic conception of social work aims and methods achieved through daily discussion and experiment can then be transferred to the relationship between the doctor and other social workers outside the group whom the doctor may wish to contact on his own initiative.

4. Exploration of the Role of the Social Worker as Colleague of the Doctor

Patients who consult the doctor on social or emotional problems or who present symptoms which appear to be connected with such difficulties may, I think, be said to have chosen the doctor as a source of help rather than anyone else. They are therefore likely to have strong feelings about any attempt on the doctor's part to suggest they look elsewhere for aid even though they may clearly be asking for the sort of assistance the doctor does not feel qualified to give. If the doctor's own conception of social work is not clear he will hesitate to redirect his patients but remain uneasy at being unable to help them. To have acquired an informed attitude towards social work as described in the last section is therefore helpful, but the strength of the patients' feeling towards the doctor has also to be reckoned with. Too hasty a referral to the social worker may be interpreted as a rejection, and we have learned from experience that it is only when the patient feels assured that the doctor has taken his trouble seriously that he can

tolerate the idea of discussing it with someone else, whom the doctor can then introduce as a colleague, supplementing and not supplanting the aid he offers. In other words, the social worker becomes a sort of extension of the doctor, and patients are then able to accept her as an integral part of the service.

The patient's loyalty almost inevitably remains with the doctor. I well remember the slight shock I experienced when a patient whose problem had been satisfactorily resolved said to me, "the old 'Doc' worked jolly hard on that problem"—my own contribution had been apparently incidental. Our close association has made both the doctors and me very much more aware of the feeling content of the doctor-patient relationship and consequently able to use it more effectively.

5. Discovering Unmet Need in General Practice

It has been shown from the examples quoted in this article that some of the patients and families were already in touch with other workers. Mrs. Y, for example, was known to the staff at the welfare clinic, to the specialist, the physiotherapist, and possibly the almoner at the hospital; Mrs. Z was being visited at intervals of three to six months by the health visitor responsible for the care of children under 5 and by another who supervised the baby-minding; she was also known to the school health and education department in respect of the mongol child. The needs of the family as a whole, however, had either not been recognized by the other workers, each of whom gave particular help with particular problems, or, if they were recognized, it had not been possible, for one reason or another, for them to give the overall help needed. Particularly in the case of Mrs. Z there was a need for one person to undertake the job of standing alongside the family, co-ordinating their experiences in seeking help with their problem; and this sort of need appears to us to occur more often than suspected in general practice. This was also recognized during a survey of a general practice carried out by the Social Medicine Research Unit of the Medical Research Council in 1953 (Backett *et al.*, 1954). "This is not just a question of better co-ordination of the services . . . the need is for a person, someone with professional training and skill, who can help people by means of a casework relationship to use their own and the community's resources in tackling their problem" (Shaw, 1954).

6. Opportunities for Preventive Work

The family doctor is often in a unique position for observing the earliest signs of social and emotional breakdown. Particularly in the case of mothers and babies, he witnesses early signs of anxiety and stress which, left unrelieved, may have serious repercussions in their emotional development and future happiness. Each time the doctor and social worker collaborate in analysing and assessing family needs and tensions the importance of relieving early signs of stress becomes more apparent. Until recently, at any rate, social workers have been made more aware of this in their training than medical students in theirs, but I think it is clear from the examples quoted here that unless both the doctor and the social worker appreciate the importance of this aspect of family care on equal terms little can be achieved.

Hence, for the time being at least, there is much to be said in favour of providing the general practitioner with an opportunity of working with a social worker in closer relationship than has hitherto been the custom.

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RHEUMATIC DISEASE AND INDUSTRY

[FROM A SPECIAL CORRESPONDENT]

A joint meeting of the Empire Rheumatism Council and the Association of Industrial Medical Officers was held at the Royal Society of Medicine on October 30 as part of the latter society's 84th meeting. The Chairman, Dr. W. S. C. COPEMAN, opening the discussion, drew attention to the importance of the rheumatic diseases in industry. This group of diseases was second only to respiratory illness as a cause of absence from work.

Field Surveys

Professor J. H. KELLGREN, director of the Rheumatism Research Centre of Manchester University, said that the study of rheumatic diseases had in the past been greatly hampered by the lack of diagnostic definitions—from the eighteenth-century belief that most musculo-skeletal pains were gouty to the nineteenth-century concept of rheumatic fever as an all-embracing rheumatic process. Two recent developments had been of the greatest importance here—radiology and serology. Radiology had enabled rheumatoid arthritis to be distinguished from what he preferred to call osteoarthritis; and, later, other polyarthritides such as spondylitis, Reiter's disease, and psoriatic arthropathy had come to be defined. Serological work had shown that rheumatoid arthritis is associated with a macro-globulin which appeared to be specific, and that this might be associated with visceral, vascular, and cutaneous manifestations of the disease. Biochemical techniques might well add further knowledge. These developments had enabled field workers to gather accurate information about the prevalence and incidence of various forms of chronic rheumatic disease. Professor Kellgren then described the procedure used in some of these surveys, emphasizing the difficulties of relying on only clinical diagnostic criteria. Many of these difficulties did not arise in radiological and serological studies. Radiological surveys had the advantage that standardization could be achieved, observer-error studies could be carried out, and the films could be kept as a permanent record. Serological studies had also produced results of great value. He cited the familial aggregation of the rheumatoid serum factor as an example, and suggested that this might be analogous to the hyperuricaemia of gout. From the epidemiological standpoint there were two main groups—those with the generalized changes of osteoarthritis and disk generation, the most important numerically, and, secondly, those with inflammatory polyarthritis. For both of these groups we now had the techniques and equipment to study them in industry. Interesting variations in prevalence had already been noted—for example, as between rural and urban populations in South Wales.

Dr. J. S. LAWRENCE, director of the Empire Rheumatism Council's mobile field unit, said that industry was concerned not only with direct environmental factors but also with absenteeism due to rheumatic diseases generally. With an ageing population the latter would become increasingly important. He quoted National Health Insurance statistics for 1953-4, which showed an annual loss of 28 million man-days from rheumatic disease alone. After reviewing the role of the rheumatic diseases in various industries, he described a survey designed to investigate the prevalence of rheumatism in miners. This showed a clear association between the severity of x-ray changes in the lumbar spine and the complaint rate of back-hip-sciatic pain. A further survey had then been conducted to study possible occupational factors, and this had shown an association with back strain, other postural factors, and exposure to damp conditions. He believed that the heavy toll of rheumatic disease in miners was largely preventable, mainly by increased mechanization, which need not, as it was inclined to do at present, involve the use of still heavier equipment. Turning to rheumatoid arthritis, he said there were evidently considerable regional differences. This disease affected 3.3%

of adults in Leigh, Lancashire, but only 2% in Pittsburgh, U.S.A. These differences became even more marked after correction for the different age-structures of the population. Dr. Lawrence had also studied the value of routine physiotherapeutic measures in the treatment of rheumatic disease, and produced data to show that recovery could be hastened quite appreciably and rendered more complete by appropriate physiotherapy, active and sometimes passive movements and heat being of value, but massage appearing to have no detectable effect on recovery rates.

Variants of Rheumatoid Arthritis

Professor E. G. L. BYWATERS, director of the Medical Research Council's special unit for juvenile rheumatism, then discussed unusual variants of rheumatoid arthritis. The definition of the usual in a disease of unknown aetiology was difficult enough, and, although dogmatic criteria could be and indeed had been agreed upon, many cases fell into the "probable" and "possible" categories. The variant might be hard to distinguish, especially at the onset, even in those cases which eventually developed all the classical features of the disease.

He then went on to describe some of the more unusual presentations of rheumatoid arthritis, including those that began with involvement of a particular joint such as in the big toe, which were often labelled as "gout"; those with fever, pericarditis, and a migratory polyarthritis, mislabelled "rheumatic fever"; cases which remained limited to one particular joint for a long period of time, usually treated as tuberculous unless the clinician was aware that rheumatoid arthritis not infrequently presents in a single joint. The disease might be confined to bursae and tendon sheaths, in the foot producing "metatarsalgia," or oedema without obvious joint involvement; palindromic rheumatism, with recurrent attacks of pain and swelling in numerous joints over many years, each lasting about 24 hours and then returning completely to normal. These were illustrated by a series of cases, as was the so-called "anarthritic" rheumatoid arthritis. Finally he mentioned cases presenting with iritis, pericarditis, or as a pyrexia of unknown origin. They should be on guard against regarding this disease—or any disease—as a real entity; by providing a specific name we implied that a disease had as much real existence as an elephant or a giraffe. Rheumatoid arthritis should be thought of as a reaction pattern to perhaps a number of different factors. Study of the variants might eventually give some clue to the nature of these factors.

QUEEN MOTHER AT KING'S

Paying her first visit to King's College Hospital since becoming Chancellor of London University, QUEEN ELIZABETH THE QUEEN MOTHER opened a new extension to the Medical School on November 4. One of the pleasures of being Chancellor, she said, was that it brought her frequently into touch with institutions with which she was already familiar. The University's medical ramifications were a constant source of interest, and she had noticed particularly that association with the University, especially in the case of the medical schools, did not mean dull uniformity: each school had its own individuality based on the history and traditions of which it was rightly proud. It might be, however, that with the passage of time some traditions became less important. For example, the liberal attitude which King's had adopted towards the admission of women medical students was no longer distinctive, since all the other medical schools in London had followed suit.

No one could predict what the future held, but it was wise of the School to put its house in order and to see that its facilities for teaching and research kept pace with the ever-increasing demands that were likely to be made upon them. It was from this point of view that the new extension was so timely. "I wish," she added, "there was in sight an equally satisfactory solution to that great problem which

faces both the Hospital and the School: the need for more beds."

In his address of welcome to Her Majesty, the chairman of the Medical School, Mr. R. A. HORNBY, said the reason why it had been necessary to add to the buildings of a medical school which had no present intention of increasing its students was that, with the advance of medical science, it was essential to provide accommodation and equipment to keep pace with it.

Dr. VERNON F. HALL, dean of the School, said the total costs of the extension had been some £205,000, of which well over half had been generously contributed by the University Grants Committee. The remainder had been found from the School's own funds, including a bequest by Dr. Harold Wiltshire, a former member of the staff. The extension housed the new medical and surgical units and a considerable addition to the department of chemical pathology; there was a large practical pathology classroom and a clinical lecture theatre designed for showing cases to small groups of students. The other facilities included a clinicopathological demonstration room in which all aspects of selected diseases could be displayed for varying periods, accommodation for the Clubs and Societies Union, a mixed common room for students, and a council room. Unfortunately, it had not been possible to establish a chair in medicine as there were not sufficient beds to satisfy the needs of a professorial unit, but part-time directorships had been established in medicine and surgery. The medical unit was under the direction of Dr. Clifford Hoyle, and the new surgical unit under Mr. Harold Edwards. The extension to the department of chemical pathology provided a suite of nine research laboratories which would be a valuable addition to Professor C. H. Gray's overflowing department.

Her Majesty then inspected the new building and unveiled a plaque commemorating her visit.

HEBERDEN SOCIETY

At a meeting of the Society at Stoke Mandeville Hospital on October 11 Dr. M. SARTY GOOD reviewed his series of 20 patients with temporal arteritis. Headache had been a prominent feature in every case; tender and thickened temporal arteries in 19; constitutional illness, anorexia, and fever in 16; pain and stiffness of the jaws in 9; painful neck in 9; and pains in the muscles and limbs in 10. Twelve had developed eye involvement, of whom three not treated with cortisone had become suddenly blind. The average duration of disease after biopsy in the patients not receiving steroids and in eight patients receiving steroids was 5.4 and 2.5 months respectively. His experience and that of others suggested that early biopsy for diagnosis, followed by cortisone treatment, could shorten the disease and prevent blindness.

Dr. A. R. HORLER and Dr. MALCOLM THOMPSON (Newcastle) had found instances of pleural effusion complicating rheumatoid arthritis in 8 out of 52 men and one out of 128 women, as against only one in 180 control patients without this disease. In 5 men the pleural effusion was an inaugural event in the development of the arthritis. Dr. C. J. BARFORD (London) reported the case of a woman with rheumatoid arthritis who developed fever and pericarditis and a positive L.E.-cell test after five years of prednisolone therapy. She also had unusual nodules at the lung bases, which proved to be tuberculous at necropsy.

New Steroids

Dr. H. F. WEST (Sheffield) opened a discussion on the new steroids triamcinolone and dexamethasone. Twenty-eight patients with rheumatoid arthritis on prednisolone were allocated at random either to continue with this steroid or to change to triamcinolone, on a roughly "tablet-for-tablet" basis. Those who changed had fared slightly but not significantly better, but the average dose (9 mg.) of triam-

(Continued at foot of next page)

To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in current use.

Dolviran (Farbenfabriken Bayer A.G.; distributors, Levmedic Ltd.).—Each tablet contains acetylsalicylic acid 0.2 g., phenacetin 0.2 g., codeine phosphate 0.01 g., caffeine 0.05 g., phenobarbitone 0.025 g. The valuable analgesic effects of combinations of aspirin, phenacetin, and codeine are well known. Caffeine is a stimulant of the central nervous system and phenobarbitone is a depressant of the central nervous system. It would seem to be illogical to prescribe them together. The quantity of caffeine in this preparation, however, would have a negligible effect, as it is about a third of what would be contained in a small cup of tea. This preparation is about three times as expensive as compound codeine tablets B.P.

N.H.S. basic price: 10 tabs., 2s. 2d.

Robaxin (A. H. Robins Co. Ltd.).—This is 2-hydroxy-3-o-methoxyphenoxypropyl carbamate (methocarbamol), and is one of the derivatives of mephenesin which have been tested in an attempt to find a more effective drug for the relief of skeletal muscle spasm. It has a more prolonged action than mephenesin and has been reported to be effective in treating acute muscle spasm associated with injuries and in treating orthopaedic conditions, but is of only limited use in treating spasticity and rigidity caused by lesions of the central nervous system. It often causes slight drowsiness and dizziness, but serious toxic effects have not been reported. It is supplied in tablets of 0.5 g., and the dose suggested by the makers is 4-9 g. daily, depending on the severity of the spasm.

N.H.S. basic price: 50 tabs., 21s. 8d.

(Continued from previous page)

cinolone was probably on the high side and was apt to produce excessive side-effects. In another group of patients steroid hypertension was not altered by change to triamcinolone. The new drug had been useful to some patients who were excessively wakeful on prednisolone, but its tendency to reduce appetite and cause loss of weight and weakness was a disadvantage. Other speakers reported that triamcinolone caused excessive loss of muscle tissue in some patients, giving the clinical appearance of a myopathy. Experience of dexamethasone was limited, but it seemed an effective drug. Caution was needed, since it had been reported that dexamethasone could suppress the adrenal cortex in sub-therapeutic doses, a finding so far not confirmed.

Dr. J. F. BUCHAN (London) had treated 38 ambulatory patients suffering from rheumatoid arthritis with chloroquine sulphate. In a double-blind trial, objective assessment of disease activity and joint involvement at three and six months showed chloroquine sulphate to be clearly, but weakly, effective in this disease. Stainable bone-marrow iron had been studied by Drs. A. G. S. HILL and C. L. GREENBURY (Stoke Mandeville). It proved to be absent or scanty in 56%, and excessive in 22%, of 120 patients with rheumatoid arthritis, but there was no correlation with circulating haemoglobin. Remissions of disease induced by steroids were accompanied by rise of haemoglobin and disappearance of excess concentration of marrow iron. Dr. J. J. R. DUTHIE (Edinburgh) had confirmed that large doses of intravenous iron (up to 5 g.) induced remission in a controlled trial in rheumatoid arthritis. As part of the remission there was an improvement in the accompanying anaemia. Dr. W. R. M. ALEXANDER (Edinburgh) described experiments in purifying the rheumatoid agglutinating factor.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Iproniazid Jaundice

SIR,—The three articles concerning the toxic effects of iproniazid ("marsilid") (*Journal*, November 1, pp. 1067, 1068, and 1070) are valuable. In view of the reports that iproniazid administration is sometimes associated with jaundice, this case report of a patient who received iproniazid 100 mg. daily for five months and died from hepatic coma may be of interest.

Miss C. Y., aged 70, attended the department of cardiology, Edinburgh Royal Infirmary, as an out-patient on March 11, 1957, because of effort angina of nine months' duration. Although there was no clinical history of myocardial infarction, an electrocardiogram showed old transmural posterior and anteroseptal myocardial infarcts. Glyceryl trinitrate and restriction of her activities were advised. She was next seen one year later on March 13, 1958, at a routine follow-up clinic, when it was noted that her angina was less incapacitating and that she was able to walk half a mile (0.8 km.) without stopping. In April her family doctor prescribed iproniazid 50 mg. twice daily, with subsequent reduction of the incidence of angina and of her requirement of glyceryl trinitrate from 8 to 1 or 2 tablets of 1/130 gr. (0.5 mg.) daily.

On August 8, 1958, her sister noticed that her conversation was muddled and that she was slightly confused. She complained of vague ill-health, and two days later visited her family doctor, who noticed that she was slightly jaundiced and discontinued iproniazid. Her confusion continued, and during the night of August 14 she was found wandering in the garden of her house, shouting and disorientated. On the evening of the following day she was admitted as a certified patient to a mental hospital. Jaundice was present and there was tenderness in the right hypochondrium. Her confusion fluctuated until the third day after admission, when she became semicomatose and deeply jaundiced.

She was then admitted to the Edinburgh Royal Infirmary under the charge of Dr. Rae Gilchrist on August 18. Jaundice was marked. There was no history of any contact with infective hepatitis or of any venepuncture as a possible source of homologous serum jaundice. There was guarding in the right hypochondrium, but no detectable hepatic enlargement. There was no splenic enlargement or ascites. Temp. 97° F. (36.1° C.), pulse 76 mm./hr. B.P. 110/60, Hb 97%, W.B.C. 5,300, E.S.R. 6 mm./hr. The urine contained bile and urobilinogen. Serum bilirubin 6.3 mg.%, alkaline phosphatase 19 K.-A. units, zinc and thymol turbidity 8 units each. Serum sodium 128 mEq/l., serum potassium 3.54 mEq/l., serum chlorides 105 mEq/l. Prothrombin activity 36%. Blood urea nitrogen 19 mg.%. Total proteins 5.8 g.%. Electrophoresis of serum proteins showed that 45% was albumin, 8% alpha₂-globulin, 7% alpha₁-globulin, 10% globulin, and 30% gamma-globulin. The patient became progressively more disorientated and required paraldehyde for sedation. Incontinence developed after three days. Serial liver function tests showed little significant change. She was treated with intravenous 5% glucose saline or 50% glucose with added potassium chloride. Her serum potassium and sodium were controlled at a steady level until the eleventh day, when her serum potassium dropped to 2.76 mEq/l., from 3.34 mEq/l. Despite the administration of more potassium chloride, her serum level remained low and was 2.76 mEq/l. when she died in coma on September 5.

At necropsy, the liver was flabby and slightly smaller than normal (1,070 g.). Its capsule was normal and on section the parenchyma was soft, diffused, and brownish yellow. The intra-hepatic bile ducts showed no macroscopic abnormality. The gall-bladder contained concentrated bile and was normal. The common bile duct was patent and healthy. Histological examination revealed subacute and extensive necrosis of the liver: the lobular pattern was partly destroyed and large numbers of polymorphs and round cells were present in the bile ducts and periportal tissue. The heart showed left ventricular hypertrophy and the myocardium had marked focal fibrosis with widespread patchy necrosis. Although the coronary ostia was patent, the whole coronary arterial tree was markedly involved with atheroma.

Middleton, Lancashire.¹ One day an article might be written where some mothers' refusal to breast-feed is attributed to a belief that artificial feeding is just as beneficial with fewer side-effects. My wife's experience, having her first baby earlier this year at University College Hospital, London, was a very pleasant one. At the antenatal clinic and in hospital she stated her views in favour of artificial feeding. After some discussion her views were respected and no breast-feeding occurred at all. In some hospitals this would be unheard of, but I feel they would do well to follow suit.—I am, etc.,

LEO GOLDSTONE,
Statistician, Essex County Council,
Chelmsford.

REFERENCE

¹ Burns, C., *Med. Offr.*, 1957, 98, 205.

Thoracic Outlet Compression Syndrome

SIR,—The case histories of two patients under my care whose cervical ribs and upper dorsal ganglia had been removed for symptoms of arterial occlusion in the fingers make me less optimistic that these procedures will prevent the progress of the disease than Professor G. C. Rob and Mr. A. Standeven appear to indicate in their article on the complications of the thoracic outlet syndrome (*Journal*, September 20, p. 709). A further patient whom I have recently treated for blockage of the first part of the subclavian artery, and hope to describe in detail, presented with symptoms which previously would have been ascribed to compression of the artery at the thoracic outlet. The Seldinger technique of aortography permits demonstration of the branches of the aortic arch with minimal upset and danger to the patient. I suggest that until the patency of the appropriate vessels at their origin has been proven by aortography peripheral external pressure of any kind ought not to be considered as a cause of abnormal vascular symptoms and signs in one upper limb.

Case 1.—Female: At the age of 32, 1946, for three months attacks of numbness and whiteness in left ring and middle finger when cold. Rounded pulsatile swelling above left clavicle. Left radial pulse abolished when shoulders braced back and arms raised above head. Thick tendinous scalenus anticus divided and cervical or anomalous first rib removed, and two months later upper dorsal ganglionectomy was performed by Sir James Learmonth because frequent vasospastic attacks persisted in the hand. Relief was temporary but the condition not disabling until 1957, when a sudden attack of pain in the whole arm, forearm, and hand, together with coldness and weakness, occurred. No major pulse was now palpable distal to the bifurcation of the brachial artery. The aneurysm which Sir James had found at the first operation starting behind the lateral border of the scalenus anticus was excised.

Case 2.—Female: At the age of 21, 1957, pain and colour changes in the left hand were produced by cold. A left cervical rib was removed in Galway, but the symptoms persisted and were relieved by upper dorsal sympathectomy performed by Professor P. A. Fitzgerald a year later. Sympathectomy for similar symptoms appearing in the right hand and feet in 1952 was similarly successful (H. S. S.). In 1956 the patient suffered pain in the left forearm and hand of sufficient severity to prevent her working. The hand was pale and the radial pulse absent. An aortogram by the Seldinger method showed blockage of the second part of the subclavian artery with some filling of the axillary artery. Treatment by thromboendarterectomy or insertion of a bypass graft is contemplated.

Case 3.—Female: At the age of 46, 1956, small patches of superficial venous thrombus occurred and resolved on the left upper limb. Pain and colour changes in the fingers of the left hand when cold for eighteen months. Persistent pain and early gangrene of finger-tips for six months. Thrill and bruit over left subclavian artery, radial pulse present. Blood pressure—right arm 180/95 mm. Hg; left arm 140/75 mm. Hg. Aortogram showed incomplete blockage of the first part of the left subclavian artery. Thromboendarterectomy of the first part of the subclavian artery, the occluding plaque being removed by direct arteriotomy after exposure of the area by resecting the left fourth rib. All pain was relieved, normal blood pressure was restored, and the gangrene is resolving.

—I am, etc.,

Leeds, 1.

H. S. SHUCKSMITH.

Antibiotics in Acute Tonsillitis and Otitis Media

SIR.—I was extremely interested in Dr. John Fry's contribution (*Journal*, October 11, p. 883) on the use of antibiotics in acute tonsillitis and acute otitis media. It is of the greatest interest to see the "opinions" which many of us have formed from "impressions" checked in this way by a general practitioner in a scientific manner.

I should be very glad if Dr. Fry could check another impression which I have formed, quite without scientific corroboration—namely, that recurrences of acute tonsillitis and acute otitis media occur more frequently in those patients who are given penicillin at the first onset of the illness than in those who receive no antibiotics. I have delayed or withheld penicillin in the treatment of many cases of acute tonsillitis, particularly in children, in recent years (unless other reasons for giving it were present), believing that the untreated patient can build up an immunity.—I am, etc.,

Birmingham, 14.

M. BARROW.

Halothane Concentration

SIR.—Please allow us to comment on some points raised by Drs. P. J. C. Burton and F. R. Gusterson (*Journal*, September 27, p. 799).

(1) It is stated that the Coxeter-Mushin Mark I unit is unsuitable for use with closed-circuit halothane because of "relatively large areas of dead space." This statement simply does not make sense. There can be no dead space in a circle system save that between the system and the patient's alveoli. A moment's reflection will show that the charge of gases in the system is moved onward with each respiration of the patient, and that in the Coxeter-Mushin unit each inspiration supplies the patient with a gas mixture which has passed twice through the carbon-dioxide absorber and once (in part) through the halothane vaporizer, irrespective of the contained volume of the system. We have had Coxeter-Mushin units (both Mark I and Mark II) in daily use with halothane for nearly a year and can detect no difference in the clinical results obtained.

(2) The writers state, "Work is in progress which will demonstrate clearly . . . that, in a true circle system with halothane, the carbon dioxide build-up with low minute volumes is very slight and of no clinical significance." Surely this forecast of results before the completion and publication of research can only cast doubts upon the impartiality with which the work is being carried out, thus bringing to naught the laudable desire of Drs. Burton and Gusterson to further the use of closed-circuit halothane.

(3) Drs. Burton and Gusterson are "perturbed . . . that an anaesthetist might be content these days to use an unknown concentration of halothane." We on the other hand are perturbed to find anaesthetists of their experience so obsessed with mathematical symbols. Surely it must be clear by now that the only reliable indication of vapour strength of any inhalation anaesthetic in clinical use is the condition of the patient. In closed circuit anaesthesia far too many variable factors affect the concentration of the anaesthetic vapour to allow of any accurate calibration by percentage, and, as for fabricating a vaporizer to deliver a "safe" concentration of halothane, we believe that no vaporizer has any clinical application unless it can deliver a vapour strong enough to produce third plane anaesthesia in the most resistant patient. Administration of such a concentration to a feeble emaciated individual would quickly produce respiratory arrest. For which type of patient is the projected "safe" vaporizer to be calibrated?

(4) Drs. Burton and Gusterson refer to our recently published articles¹ as authority for the statement that halothane is certain to ruin the ether vaporizer of the B.O.C. circle unit. They seem to have misunderstood our statements. If they will reread the articles in question we hope it will become quite clear to them: (a) That only the Boyle II machine in its present form is temporarily "ruined" by halothane. The lesion produced is "gumming" of the vaporizer drum caused by combination of the lubricant with metallic salts formed by the action of halothane on the alloy of which the machine is made. The resultant thick paste prevents movements of the control drum. (b) That the Coxeter-Mushin machines can be easily and rapidly fitted with plastic washers and gaskets which make them absolutely halothane resistant. We have had about a year's trouble-free service from four such units in this hospital group.

(5) The great danger of sudden increases in vapour concentration is described when B.O.C. circle units are used with halothane.

We can only say that in a series of some 2,000 cases using the circle absorber units of the Coxeter-Mushin (Marks I and II) and the Boyle II machines we have encountered no such danger in any case. In our experience each setting of the vaporizer control produces a fixed stable level of anaesthesia in a given patient. This level can be maintained hour after hour once the appropriate setting has been found to suit both patient and surgeon.

It is hard to see how any anaesthetist who has a Coxeter-Mushin unit at his disposal could honestly justify the purchase of a new apparatus for use with closed-circuit halothane when for a few shillings his present machine can be satisfactorily and safely modified for this purpose.—We are, etc.,

Ards Hospital,
Newtownards, Co. Down.

M. A. WOODS.
T. A. BROWN.

REFERENCE

¹ Brown, T. A., and Woods, M. A., *Brit. J. Anaesth.*, 1958, 30, 333 and 338.

Sweet Tooth and Decay

SIR.—I was very interested to read in the *Journal* of September 6 (p. 638) Mr. F. T. Ranson's impression that sugar-cane chewing is beneficial to teeth. My practice is sugar-cane chewing is beneficial to teeth. My practice is in the largest sugar-cane-growing area of this island. It has never been my misfortune to see such a lot of decay in the incisors, and I had been wondering whether the chewing of sugar-cane, in which the incisors would be used much more than in eating other types of softer sweet foods, could have anything to do with it. I have been thinking of doing a small survey and comparing it with a survey in another part of the island where cane is not readily available, but have not got round to it. I would be very interested to know if such a survey has been done elsewhere and with what results.—I am, etc.,

St. Vincent, B.W.I.

V. M. USBORNE.

"Flat on Your Back"

SIR.—I have discovered an interesting reaction made by patients during routine examination. On making the request, "Please lie on your back," the patient almost invariably rolls over into the prone position, making it completely impossible to examine the abdomen. In a fairly unselected series, I have found this response in about 80% of patients. It does not seem to depend on the apparent intelligence of the subject. I have noticed that the correct position can invariably be obtained by asking, "Please lie flat on your back."

Can anyone explain the psychology of this different response?—I am, etc.,

Birmingham, 29.

K. G. BLAND.

Children in Hospital

SIR.—James Robertson (*Journal*, August 2, p. 275), of the Tavistock Clinic, has done a great service by bringing to the notice of the profession the great harm which can result from the admission of the under-4-year-old to hospital. His booklet and film² are full of stimulating ideas which would be well worth study by all connected with the admission of children to hospital.

I feel that much can be done to make the stay in hospital of the older child a less unpleasant experience. Such simple matters as the time of admission, and the mother being encouraged to give the child its first bath, can make a tremendous difference to the child. I would like to see children allowed to have their own night clothes. These points are brought out in a film I made some years ago. When making that film I found that a child's greatest objection to a stay in hospital was "needle pricks." This led me to work out a premedication avoiding injections. I use "elixir of oblivion" (methylpentynol) in which hyoscine is dissolved. Since my original work I have increased the dose of methylpentynol and now use 1 drachm (3.5 ml.) of the elixir for each stone (6.4 kg.) in weight. The dose of hyo-

scine varies from gr. 1/150 (0.43 mg.) for children up to 3 years, to gr. 1/100 (0.65 mg.) for children over 4 years old.

These children are induced with a sleep-dose of thiopentone, of which they have no recollection. Another important modification in this technique is the addition of gr. 1/200 to gr. 1/100 (0.33 mg. to 0.65 mg.) of atropine to the thiopentone, as some of the children are not quite "dry" with the hyoscine alone. It is also important to remember that methylpentynol has no analgesic properties, so that some analgesic should be given as soon as the child recovers its vital reflexes. I have used nepenthe for this purpose, but am at present investigating the value of D.F.118 (dihydrocodeine).—I am, etc.,

Worthing.

F. R. GUSTERSON.

REFERENCES

¹ *Young Children in Hospital*, 1958, Tavistock Publications Ltd., London.
² "Going to Hospital with Mother." Film, 16 mm. Tavistock Institute of Human Relations.
³ "Premedication and Nursing Care of Children." Film, 16 mm. Central Film Library.

Costs of Notification

SIR.—Last year (*Journal*, May 25, 1957, p. 1241) we wrote to you to draw attention to the remarkable expenditure of money in the notification of infectious diseases. In particular, we mentioned measles as a prime example of a disease whose notification we think to be of no value whatever. We were surprised at how little response our letter evoked. In the past five years 2,162,826 cases of measles have been notified. The cost in notification fees alone for this amounts to over £270,000. Can you, or anyone, tell us to what purpose—other than the provision of pocket money to G.P.s? And what good has come of the notification of acute pneumonia, scarlet fever, or whooping-cough, cases of which total 871,097 at a cost of nearly £110,000?

Enthusiastic G.P.s have in the past five years notified 3½m. cases of infectious disease. It is impossible to assess the cost of the collection, collation, and correction of these figures in terms of paper, postage, and pay-packets, but it can be stated categorically that the notification fees in England and Wales have totalled £406,437. How much longer must this pathetic situation continue?

We do not claim that notification of all infectious disease is useless, and it might be argued that value would arise from the notification of rubella, rheumatic fever, and acute otitis media. We are saddened, however, to think that the £1m. or so that has been uselessly scattered in the past 10 years might have been usefully diverted, for instance, to research in poliomyelitis.—We are, etc.,

E. O. GIBSON.

R. M. EMRYS-ROBERTS.

Walton-on-Thames.

Why Suffer from Rheumatism?

SIR.—Muscular pain is caused through increases of muscle tension. The physical secondary effects of such increased tension—i.e., mechanical defects and degenerative processes—are the conditions at which the Empire Rheumatism Council has directed its research (*Journal*, October 25, p. 1034). The primary cause of this increased tension in those conditions labelled rheumatism is psychological, and the site affected governed by the mental mechanism of symbolism.

There are complicated relationships between psychic activity and muscular innervations. As long ago as 1892 Freud postulated the conversion of psychic into motor excitement in hysteria. The psychic experiences were unpleasant to discuss, were not apparently remembered, and there was no idea of a causal connexion between exciting cause and the pathological phenomena. The individual suffering from obsessional neurosis is really substituting thought for action. In mild cyclothymics one sees conditions of inhibited and exaggerated phantasy run parallel with variations of liveliness of movement. There appears then to be some reciprocity of muscular innervation with thinking and attention, and an ability for conversion of psychic to motor or motor to psychic energies. To the unconscious mind symbols indicate not resemblance but identity. The child finds the whole world

Obituary

ARTHUR MILLER, F.R.C.S.Ed., D.L.O.

Mr. Arthur Miller, honorary surgeon in charge of the ear, nose, and throat department at both the French and Italian hospitals in London, died in London on October 11. He was 70 years of age.

Arthur Alfonse Miller was born on February 28, 1888, and qualified by taking the London Conjoint diploma in 1916. After qualification he held the appointments of house-surgeon and house-physician at Queen Mary's Hospital for the East End. He then served in France for the remainder of the first world war at various English and French military hospitals. In 1921 he was awarded the Cross of Chevalier of the Legion of Honour for his services to the French sick and wounded. After the war he settled in London as an ear, nose, and throat surgeon. He took the D.L.O. of the English Royal Colleges in 1928, and was elected F.R.C.S.Ed. five years later. He was appointed clinical assistant in his specialty at the Prince of Wales's General Hospital, Tottenham, in 1924, and soon afterwards took up a similar post at the French Hospital. Later he was appointed assistant surgeon to the French Hospital, and in 1934 became full surgeon. For a time in the mid-thirties he was chief clinical assistant at the Central London Ear, Nose, and Throat Hospital, and subsequently became laryngologist to the Italian Hospital. For some years he was also assistant aurist under the London County Council and the Ealing Borough Council, and he had been on the staffs of the British Dental Hospital and the Edgware General Hospital. A member of the Società Italiana di Laringologia, Otologia, e Rinologia, he was a corresponding member of the Société d'Oto-Rhino-Laryngologie of Paris. He leaves a widow.

G. E. P. writes: Arthur Miller worked at the Italian and French hospitals in London for more than 25 years, and in so doing became a household word to these quite considerable colonies of "strangers within our gates." He was known for those two qualities which matter most in medicine—professional skill and the confidence he inspired in his patients. To his colleagues on the staffs of these hospitals I think that he will always be remembered for the brusqueness with which he inadequately concealed the innate kindness of his mind. His loyalty was immutable. In the special work of dealing yearly with patients from no fewer than 20 countries he had those cosmopolitan qualities of mind which it will be hard indeed to replace. His private life was one of simple and total devotion to his wife, and those who were privileged to share happy moments with them in their home life will be with her in heart and sympathy at this time.

H. H. BROOME, C.I.E., M.B., Ch.B., F.R.C.S.

Lieutenant-Colonel H. H. Broome, a former principal of King Edward Medical College, Lahore, died at Salisbury on October 31. He was 83 years of age.

Harold Holkar Broome was born on March 6, 1875. From Owens College, Manchester, he went on to Edinburgh University as a medical student, and graduated M.B., Ch.B. in 1898. Distinguishing himself greatly as a student, he won several prizes and scholarships and a medal in practical anatomy. Returning to Owens College, he was junior demonstrator in anatomy, and after a term as house-surgeon at the North Lonsdale Hospital, Barrow-in-Furness, he returned to the college to become senior demonstrator in anatomy. He took the London Conjoint diploma in 1901, and was admitted F.R.C.S. in 1913. In 1903 he was awarded the Martin Memorial gold medal and entered the Indian Medical Service as a lieutenant. Five years later he was appointed professor of anatomy at the King Edward Medical College, Lahore. During the first world war he served on the North-West Frontier of India and in Meso-

Surely it is incumbent upon the medical profession not to delude itself or allow its prestige to be used in foisting on the public a promise of protection incapable of fulfilment. Civil Defence workers should understand that the very casualties they strive to help may well be dangerously radioactive and thus render these same defence workers themselves casualties. A dustbin lid seems scant shield against a hydrogen bomb. In this nuclear age the old adage "Prevention is better than cure" is our only hope of survival.—We are, etc.,

PAUL Z. HAMMET.
JOANN Z. HAMMET.

Darlaston, Staffs.

Driving Licences

SIR.—Judicious economy is to be welcomed, and the extension of the period of validity of a driving licence from one year to three years will no doubt save both time and labour. Incidentally it will also probably result in some quite unmerited profit to the Exchequer from those who cease to drive owing to death, departure, or disablement.

At times the possession of a long-term driving licence may be a mixed blessing. Thus, a young man who develops occasional attacks of epilepsy, having just acquired a licence permitting him to drive a motor vehicle for the next three years, is under undue temptation to make use of such a licence if he is free from attacks for some months. He may neglect medical advice, but he cannot be accused of having made a false statement for the purpose of obtaining a licence that is valid for three years to come.—I am, etc.,

London, W.1.

E. C. O. JEWESBURY.

After-dinner Speeches

SIR.—Sufferers from the incidence of this complaint (*Journal*, October 11, p. 904) may be interested, even if not particularly heartened, to learn that it does not occur amongst the Chinese. Speeches in that country, whether at official, mercantile, or private functions, are made before the meal, when all are seated at table. The knowledge that those present are far more anxious to eat than to listen, coupled with the shuffling of servants and the clink of dishes and bottles in the background, induces in the host or chairman a desirable brevity, apart from the fact that to keep guests from their food in an unreasonable manner is in itself an act of discourtesy. As a result of this sensible custom dinners tend to be enjoyed by all and not merely by some, while the speeches themselves provide material for leisurely table discussion.—I am, etc.,

London, N.W.3.

H. G. LOWDER,
Commissioner,
Chinese Customs Service (1908-1940).

POINTS FROM LETTERS

Pyrexia Agitans

Dr. H. DE GLANVILLE (Winneba, Ghana) writes: I have just belatedly noticed Dr. A. P. Millar's letter in the *Journal* of June 7 (p. 1355) on this subject, and I recall the instability of my own temperature when recovering in a tropical hospital five years ago from an embolic infective arthritis. My temperature chart refused to settle though I felt well, and showed an unexpected 6 o'clock rise each evening. To avoid this I tried not leaving my bed all afternoon, and not bathing before it was taken, but still the rise occurred. Next day I checked my temperature hourly with the same thermometer, but, although it was subnormal at 5 p.m., it was up again at 6 p.m. The following day I checked it every 10 minutes from 5.30 p.m., and to my considerable surprise it rose suddenly between 5.50 and 6 p.m., and was back to normal or subnormal by 6.20 p.m. I forget the exact figure to which it rose, but it was doubtless something between 99° and 100° F. (37.2-37.8° C.). I persuaded my medical attendant to ignore the chart, and shortly after left hospital and convalesced uneventfully. Since then, however, I have felt certain that in some patients the temperature remains unstable for a prolonged period into convalescence after a febrile illness, and I have been encouraged thereby metaphorically to throw the thermometer out of the window on more than one occasion when it has told a tale at variance with clinical sense.

potamia and German East Africa. Returning to India after the war, he was professor of surgery at King Edward Medical College from 1922 to 1930, and for most of that time was its principal. While holding these posts he was appointed C.I.E. in the New Year Honours List of 1929. A Fellow of Punjab University, he had been dean of its faculty of medicine. He retired from the I.M.S. in 1930. A member of the British Medical Association for over fifty years, he was president of the Punjab Branch in 1929-30. During the second world war he came out of retirement to act as medical superintendent and surgeon at the Alverstoke Emergency Hospital at Gosport, Hampshire. In 1902 he married Miss Clara Alice Finney, by whom he had two sons.

ALEXANDER MELLICK, M.D., F.R.F.P.S., D.O.M.S.

Dr. Alexander Mellick died suddenly at his home in Glasgow on October 19 at the age of 55. Though he had been under medical care for some time he had attended the meeting of the Orthoptic Society in London the previous day.

Alexander Mellick was born in Glasgow on July 23, 1903, and attended Alan Glen's School and Glasgow University, where he graduated in science in 1924, and medicine in 1926, proceeding to the M.D. five years later. He started his professional life as a general practitioner in the East End of Glasgow, with an attachment as physician to the outpatient department of the Glasgow Royal Infirmary. In 1933 he seized an opportunity to join the staff of the Glasgow Eye Infirmary as a clinical assistant. Becoming surgeon in charge of wards in 1949, he was admitted a Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow in that same year. A man of quiet and retiring disposition, he was widely read in both medicine and ophthalmology. This medical bent was shown in his ophthalmological practice, and found scope in his appointment as consulting ophthalmic surgeon to the Southern General Hospital, Glasgow, and to the infectious diseases hospitals. He had done original work in orthoptics, and in the last few years he was surgeon in charge of the Orthoptic School at the Glasgow Eye Infirmary. He also became a member of the Orthoptic Board. Dr. Mellick was very musical, and a brilliant pianist. His death is a loss to ophthalmology, and in particular to orthoptics in Glasgow. He leaves a widow.

J. G. MacKENNA, M.B., Ch.B., D.P.H.

Dr. J. G. MacKenna, honorary consulting physician to the Royal Alexandra Infirmary, Paisley, died at his home at Paisley on October 16. He was 80 years of age.

John George MacKenna was born at Dumfries on March 20, 1878, the son of the Rev. Robert MacKenna. He was educated at Dumfries Academy and at the Royal High School, Edinburgh. He then entered Edinburgh University as a medical student, graduating M.B., Ch.B. in 1900. After graduation he held the appointment of assistant surgeon at the Southern Dispensary, Liverpool, for six months, returning to Edinburgh to take the D.P.H. of the Scottish Royal Colleges in 1901. In the same year he was appointed assistant medical officer of health and assistant bacteriologist at the Paisley Infectious Diseases Hospital. In 1907 he settled in private practice in the town, and, later, was appointed assistant surgeon to the Royal Victoria Eye Infirmary. For over thirty years he served the Royal Alexandra Infirmary, first as assistant visiting physician and then as full physician, and when he retired in 1944 he was appointed honorary consulting physician. Dr. MacKenna had many interests outside his profession. A staunch Liberal, he became president of the Paisley Liberal Association. On one occasion, when he took the chair at a political meeting at which both Mr. Herbert Asquith and Mr. David Lloyd George were among

the speakers to a packed audience, he conducted the proceedings so successfully that Mr. Asquith afterwards described him as the finest chairman he had ever sat under.

J. S. D. writes from Paisley: As a contemporary of the late Dr. John MacKenna I cannot help feeling that his death has cast a gloom over this town and the medical profession, of which he was a worthy and highly respected member for many years. Starting at the beginning of the century, he built up a large practice, and to his patients he was guide, philosopher, and friend in their illnesses and worries. Interested in literature, he read much and was an excellent public and after-dinner speaker. His chief sport was cricket, which he played in his early days, and in which he took a great interest till the end. Of a quiet, courteous nature, and endowed with a cultured mind and sound judgment, he attracted many friends, who enjoyed his company and conversation. Reared in the manse, he had strong religious convictions, which he consistently practised throughout his life. Retiring from practice several years ago owing to ill-health, which fortunately did not completely incapacitate him, he continued to take an alert interest in all around him till the end, which came, as he had wanted it, very quickly. To his widow, son, and daughter we extend our sincere sympathy.

KATHERINE J. S. CLARK, M.D., D.P.H.

Dr. Katherine J. S. Clark, for many years a school medical officer in Edinburgh, died at her home there on October 6. She was 92 years of age.

Katherine Jane Stark Clark, the fourth of the nine children of the Rev. John Clark, a minister of the United Presbyterian Church at Hardgate, Kirkcudbrightshire, was born on July 15, 1886. The whole family of nine went to Edinburgh for their education, and Katherine Clark attended the Merchant Company's School which is known as the Mary Erskine School. After leaving there she trained as a nurse at Dundee Royal Infirmary, and then spent some years doing private nursing. At this time she took an active part in the campaign for women's suffrage and in the efforts to gain advanced university education for women. When the University of Edinburgh decided to admit women to the professional examinations she made up her mind to enter the extra-mural school of medicine for women. She graduated M.B., Ch.B. in 1903, and then served as a house-physician at Leith Hospital and as resident medical officer at Craigleith (now the Western General Hospital). In 1906 she obtained the D.P.H. of the Scottish Royal Colleges. In the following year she proceeded to the M.D., taking rheumatism in children—in which she was very interested—as the subject for her thesis. For some time she was a school medical officer in Yorkshire, but in 1910 she returned to Edinburgh to take up a similar appointment under the School Board, and continued to work in the schools until her retirement in 1931. During the first world war she joined the R.A.M.C., and, when the Queen Mary's Army Auxiliary Corps was organized, was appointed medical controller in the Scottish Command, attaining the rank of colonel. At that time some doubt was expressed whether she was a member of the R.A.M.C. or of the Women's Army, but it was decided that she was in the R.A.M.C. After retirement she continued to lead a full and active life. A pioneer in her own work, she maintained her interest in the immense progress made in the care of children under local authorities. She was associated with many professional and social service organizations and gave outstanding service to the community. She found relaxation in the management of her home, in gardening, and in travel, and was happy with her books and her friends almost to the end. She died after a short illness, leaving many friends of a younger generation to remember her with pride and affection.—J. K. R.

C. W. JENNER, L.M.S.S.A.

Dr. C. W. Jenner, who had been living in retirement at Manningford Bohune, Wiltshire, died on October 22 at the General Infirmary, Salisbury. He was 74 and had formerly been in practice in Haslemere, Surrey.

Cyril William Jenner was born at Durrington, Wiltshire, on September 16, 1884. His forebears were well known in Wiltshire for over 200 years, and he was a great grand-nephew of the celebrated Edward Jenner, the pioneer of vaccination. After going to school in Cirencester and Salisbury he became a medical student at the London Hospital and qualified in 1913. Soon afterwards he went into practice in Haslemere, where he remained, an esteemed family doctor, for 44 years. On his retirement he had served the Haslemere Hospital for 43 years, being for many years chairman of the medical staff committee and a member of the house committee. He was keenly interested in all aspects of the hospital life, and, with the able assistance of his wife, was largely responsible for the acquisition and equipping of St. George's ward as a maternity unit. He also served on the medical advisory committee of the Guildford group of hospitals, and his quiet confidence and wise counsel were appreciated by all.

During the 1914-18 war he served as a captain in the R.A.M.C. in Gallipoli, Egypt, and Palestine, being attached to the 2nd South Midland Mounted Brigade Field Ambulance. A lover of Gilbert and Sullivan, he was a member of the cast in many productions at Haslemere during the period between the wars. For many years he rarely missed a meeting of the Guildford Division of the British Medical Association, being chairman of the Division in 1949 and one of the representatives at the Annual Meeting of the Association in Dublin in 1952. He did not consider that there was sufficient reason to alter course and give evidence before the Royal Commission, but once a firm decision had been reached he was prepared to co-operate. Only last year he resigned from the Surrey Local Medical Committee: he had been a member of it and of its predecessor, the Surrey Insurance Committee, for 35 years, a magnificent record of voluntary service.

The very large congregation at the memorial service on a recent Saturday afternoon in Haslemere Church was the fitting tribute of friends, patients, colleagues, and nurses to his long years of untiring and devoted service.—C. P. W.

IVOR CHANCE, M.B., B.S.

Dr. Ivor Chance, who had only recently established himself in general practice at Reading, died at Middlesex Hospital on October 27, four days before his 35th birthday.

Ivor Chance was born on October 31, 1923, the son of the late Major Maurice Chance, of Dorking. Receiving his medical training at the Middlesex Hospital, he graduated M.B., B.S. in 1948, and then held the appointments of house-surgeon in the ophthalmic department at Middlesex Hospital and house-physician in the cardiology department at Ashford Hospital, Middlesex. From 1955 until earlier this year he worked at a mission hospital in Uganda. He leaves a widow and two sons and two daughters.

W. R. B. writes: In 1955 Ivor Chance decided to give up his plans for obtaining a practice in England in order to work for three years in a mission hospital in Uganda. While at Mengo Hospital, Kampala, he threw himself with characteristic energy into all the varied activities of medical missionary work. Paediatrics was his great interest, and he spent much time devising plans for the new children's ward, in which the mothers are given their own dormitory and courtyard. To deal with the problem of kwashiorkor he enlisted the help of Church World Service of America, and

in co-operation with the Y.W.C.A. arranged for many tons of dried milk powder to be distributed to the under-5-year-olds in central Uganda. He did a great deal to help the Sanyu Home for motherless babies in Kampala, working hard to improve the facilities and the diets for these children. At the time of his death he was enlisting fresh support in England for the home, and had plans for an extension of cottage homes and foster-parents for the many orphan children in Uganda. In 1958 he returned to England for family reasons, and had just begun in practice in Reading when overtaken by his final illness. Although he was in Uganda for only three years, he made a lasting impression not only by his professional keenness but by his warm-hearted friendliness and generosity, his transparent sincerity, and his true Christian witness. He is remembered with gratitude and affection by many hundreds of his friends of all races, who think of him as a real friend and brother as well as a beloved doctor.

D. C. DRUITT, M.R.C.S., L.R.C.P.

Dr. D. C. Drutt, who was in general practice at Petworth, Sussex, for some 40 years, died there on October 12. He was 73 years of age.

Daniel Cuthbert Drutt was born at Christchurch, Hampshire, on August 12, 1885. His father was a solicitor, but his grandfather and great-grandfather were doctors. His grandfather, Dr. Robert Drutt, who died in 1883, was the author of the well-known *Surgeon's Vade Mecum*, which passed through eleven editions, and of a small work entitled *Cheap Wines, Their Use in Diet and Medicine*; he also had the distinction of being one of the last to receive the Lambeth M.D., which was granted to him in 1878. From Felsted School Daniel Drutt went on to Guy's Hospital for his medical training, and qualified M.R.C.S., L.R.C.P. in 1909 and then entered general practice at Saffron Walden, Essex. He served in the R.A.M.C. in the first world war from 1916 onwards, and was appointed to the Order of Leopold. In 1919, soon after his return to civilian life, he settled in general practice at Petworth, where he became also honorary surgeon to the cottage hospital.

A colleague writes: Dan Drutt came into general practice at Petworth in 1919, and in the subsequent forty years accepted the challenges of country practice and adapted himself to the tremendous changes which occurred during that time. He was a good doctor, a first-class diagnostician, and always maintained that he knew a little about everything and not too much about anything. In 1952 he retired from full-time practice because of illness, but continued to take an active interest in many of his patients. He was a family doctor, a lovable and kind man.

D. B. McGRIGOR, O.B.E., M.B., Ch.B., D.M.R.E.

D. C. B. writes: May I add a small personal note about Brigadier D. B. McGrigor, whose obituary you recently published (November 1, p. 1108)? I worked with him in Millbank in the 'twenties, and I had the privilege of his friendship ever since. He was a fine man, tall and handsome—he never lost his erect carriage even in the later years of his life—warm and generous. I never saw him during the last war, but afterwards it was a pleasure, and illuminating, to listen while he told of men and events during the war, for, whilst he was kindly in his judgments, he had a keen eye for frailties. "Elegant" was a favourite word of his, and he used it to describe a man who might, but need not, be eminent in his profession, but who was a man of whom men could approve. In this sense he was indeed an "elegant" man, and he will be missed by a very wide circle of friends all over the world.

Medical Notes in Parliament

HOUSE OF LORDS

Alcohol and Road Accidents

On November 4 Lord AMMON asked if the Government could now announce the publication date of the report from the Medical Research Council on the relation of drink and road accidents. Lord HAILSHAM, Lord President of the Council, replied that a paper giving the results of the experimental work conducted under the auspices of the Medical Research Council on the effect of alcohol upon the skill of drivers of motor vehicles had already been published in the *British Medical Journal* on October 25, 1958.* A more detailed presentation of the methods used, and the data upon which the conclusions were based, would be published by the M.R.C. in due course.

Report in "British Medical Journal"

Lord AMMON asked for the reason for the continual delay in publishing the report. "Is it usual to publish a report to this House in a journal before Parliament receives it?"

Lord HAILSHAM.—My Lords, with regard to the first part of the question, the reason for the delay in the publication of the full report is that those concerned have not yet completed the draft. The answer to the second part of the question is that it was thought desirable to give the findings to the public as soon as possible. When the full report came he understood that it would add nothing of importance, so far as the general public were concerned. It would, however, be of interest to other research workers in that it would give full experimental details. Lord AMMON asked if the Lord President did not know that an extract from the report was published in the *British Medical Journal* and an indication that they had the full report, and, in fact, had had it for some time? Lord HAILSHAM said the *British Medical Journal* did not have the full report because it was not ready. What was published on October 25 was a paper giving the results of the experimental work.

Lord MATHERS asked the Lord President whether he was aware that on several occasions publication of the report had been promised by the Government? What purpose was intended to be served by withholding the report from publication?

Lord HAILSHAM said the Government was not withholding publication of the report. They would publish it as soon as they had it. What was holding up its publication was the fact that the author or principal draftsman of it, as a university professor of psychology, was an independent worker who had undertaken this work with the aid of a grant from the Medical Research Council. He had been asked to produce the report as soon as possible, but there must be some limit to the amount of pressure put on a person in that position. There was no question of the Government's not making up its mind. It was a scientific report, and it was not ready yet.

QUESTIONS IN THE COMMONS

Atomic Radiation Effects

The PRIME MINISTER was questioned on November 4 about the United Nations Scientific Committee's Report on the dangers of radiation. He said he had given careful study to the report, and also to the statement on the report by the Medical Research Council presented to Parliament last August. In their consideration of all questions relating to the effects of radiation the Government would take the conclusions of the report into account. Mr. J. RANKIN (Glasgow, Govan, Lab.) asked him if he was now prepared

*See Drew, G. C., Colquhoun, W. P., and Long, H. A., *Brit. med. J.*, 1958, 2, 993.

to say that it was the Government's view that nuclear tests should be stopped for ever. Mr. MACMILLAN replied that the report made clear that the radiation dose to be expected from the fall-out of tests was minute compared with other causes, both natural and man-made. Some of these natural causes were due to the geological formation and radioactivity of rocks, and so forth, which were matters for further study. The man-made causes included luminous watches, clocks, television receivers, and shoe-fitting fluoroscopes. Regarding the latter, action had been taken by the Home Secretary. A committee under the chairmanship of Lord Adrian was inquiring into diagnostic radiology, and that was perhaps one of the most important aspects of it. There was also the question of occupational exposure among some industrial, medical, and atomic-energy research workers. There careful and minute medical procedure was carried out, but if it was necessary to tighten up that procedure they would examine that too.

Mr. PHILIP NOEL-BAKER (Derby, South, Lab.) called attention to the statement the previous week of the chairman of the U.S. Atomic Energy Commission that the U.S. made 32 test explosions last year, not 16 as had been previously declared. Did that mean that the studies made by the United Nations Committee and the M.R.C. were based on incomplete information about the amount of radiation released by tests? Mr. MACMILLAN said, "No." But apart from the radiation side there were other aspects. From natural and other man-made causes there were far greater dangers than from tests. "Of course, I hope we shall reach agreement on abolishing the tests, but I think the matter should be held in proportion."

Radio "Scatter" Stations

Mr. CHARLES ORR-EWING, Under-Secretary of State for Air, answered several questions on November 5 about the high-power tropospheric forward-scatter stations to be constructed in this country for N.A.T.O., and the possible effects of radiation from them on people living in the locality. He stated that the plans were still being examined. The stations were for radio communication, and not radar warning. Local authorities would be consulted whenever this was required. The stations would be so designed and located that no radiation hazards would arise to the general public, nor would any houses have to be evacuated. He was asked what was the scientific basis for this statement, and replied that the conclusion had been reached after mature consideration and consultation with the Medical Research Council, which was satisfied that radiation at the relevant wavelength had a thermal effect only, and that there was no biological effect.

Subliminal Advertising

Mr. NESS EDWARDS (Caerphilly, Lab.) asked the Postmaster-General to what extent he had been consulted under Section 4(5) of the Television Act, 1954, about the use of subliminal advertising by the Television for South Wales and the West of England contractors, and how far this form of advertising conformed to his approved rules. Mr. ERNEST MARPLES said that subliminal advertising would be contrary to the first paragraph to the Second Schedule of the Television Act. There had been no reason, therefore, for consultation or direction under Section 4(5) in this respect. The Authority had been assured by Television for South Wales and the West of England that the "keep watching" sign was transmitted at speeds at which it could be plainly seen, and that in any case the use of the message had ceased on October 21. The Authority also informed him that subliminal transmissions in any form were prohibited in its programmes, with the possible exception of some scientific programmes in which subliminal techniques would be openly examined.

On November 6 Mr. J. STONEHOUSE (Widnesbury, Lab.) asked the President of the Board of Trade whether he was aware of the dangers of the use of subliminal techniques

for advertising and other purposes; and if he would take steps to ban their use. Sir DAVID ECCLES said he understood that these techniques could be used in cinemas and on the television. Their use in cinemas would be subject to the local licensing authority.

Mr. STONEHOUSE: Is the right hon. gentleman aware of the very welcome lead given by the Institute of Practitioners in Advertising, which has declared these sinister techniques professionally unacceptable? Would he follow that lead and ban these techniques from all kinds of communication? Further to that, could he say what was being done about the importation of American horror films which use these techniques? Sir DAVID ECCLES said it was really not the Board of Trade's responsibility to ban these techniques from all forms of communication. He thought his responsibility rested probably on the part of the supplementary question which referred to the import of films. If they contained these practices and they were found to be bad, the Government would certainly see what could be done about it.

Law on Attempted Suicide

Mr. KENNETH ROBINSON (St. Pancras North, Lab.) asked the Home Secretary what progress he had made in his consideration of the law relating to attempted suicide. Mr. R. A. BUTLER told him that before a change in the law was proposed it was necessary to ensure that persons who attempted suicide, and needed care but could not be given it, or would not accept it, unless they were brought before the courts, could be looked after by other means. He was still studying this difficult problem, and could not at this stage give an undertaking about when legislation could be introduced.

Scottish Lunacy Law

Dr. J. DICKSON MABON (Greenock, Lab.) asked the Secretary of State for Scotland on November 4 if his consultations with the professional and other organizations concerning the Russell Report on Scottish Lunacy were concluded; and what action he intended to take. Mr. J. S. MACLAY replied that, at his request, the Scottish Health Services Council were considering the application to Scotland of the recommendations of the Royal Commission on Mental Health in England and Wales in the light of the Scottish White Paper issued in 1955. He had received their first report. He had also other memoranda from interested bodies under consideration. He expected to receive a second and final report from the council early next year.

Cyprus Doctors' Suggestion

Mr. D. WADE (Huddersfield, L.) asked the Secretary of State for the Colonies what answer had been given to the proposal by the Human Rights Committee of the Cyprus Medical Association that one of its members should be present at the post-mortem examination of persons who died while in the hands of the security forces in Cyprus. Mr. J. PROFUMO, Under-Secretary, stated that the Governor was considering the representations made to him on October 23. Mr. WADE, while recognizing the extreme provocation with which the troops were faced, asked if it would not be wise to take any opportunity to provide evidence to the people of Cyprus and the world that no unnecessary violence was used by the security forces, in spite of that provocation. Mr. PROFUMO said the Governor would have all these matters in mind when he considered the representations.

Polio Vaccine

Mr. FENNER BROCKWAY (Eton and Slough, Lab.) asked why supplies of the anti-poliomyelitis vaccine produced by the Glaxo Laboratories at Stoke Poges were not distributed after April; and for what period this hold-up continued. Mr. WALKER-SMITH said he understood that production difficul-

ties intervened. He could not yet say when the distribution of vaccine from this manufacturer would be resumed.

Royal Commission on Doctors' Pay

Mrs. LENA JEGGER (Holborn and St. Pancras, South, Lab.) asked the Minister of Health on November 10 when he expected to receive the report of the Royal Commission on doctors' pay. Mr. D. WALKER-SMITH.—The Commission are still taking evidence and collecting necessary information. They expect to be able to submit their report about next summer.

Composition of Flour

Mr. M. LIPTON (Brixton, Lab.) asked the Minister of Agriculture, Fisheries, and Food when the Food Standards Committee would complete their report on the composition of flour and bread, which had been under consideration since May, 1956. Mr. J. B. GODBER, Parliamentary Secretary, said that an interim report dealing with milk bread would be available early in the new year. The Minister understood, however, that investigation of the technical problems involved was taking longer than the committee had expected and that it would be some little time before the drafting of their main report could be put in hand.

Chronic Disease.—At the end of 1957 nearly 10,700 names were on waiting-lists for 57,600 chronic sick and geriatric beds in Health Service hospitals in England and Wales (Minister of Health, November 10).

Medico-Legal

THE CHEMISTS' FEDERATION JUDGMENT

[FROM OUR LEGAL CORRESPONDENT]

Judgment was given on November 3 by the Restrictive Practices Court in the Chemists' Federation case (*Journal*, October 18, p. 985, and October 25, p. 1049). The reserved judgment giving the Court's reasons for its general conclusions expressed on October 13 was delivered by Mr. Justice Devlin (*The Times*, November 4).

He started by explaining the principle adopted by the Federation that proprietary medicines should only be sold to the public by or through registered pharmacists. The restriction which the Court had to consider sought to control all medicines in the same way as the sale of medicines containing poisons or other dangerous substances was controlled by the Pharmacy and Poisons Act, 1933. The machinery through which control was exercised was the C.F. List, which originated in the desire of retail chemists to protect themselves from what they regarded as unfair competition. Manufacturing members of the Federation agreed that all their products falling within the definition "medical preparations" might be put on the List and distributed only to wholesalers who were members of the Federation. These undertook to supply them to retail chemists only. Sale was not restricted to retail chemists who were members of the Federation, nor were the retailers required to sell C.F. List goods only, although they were expected to promote the sale of C.F. goods as against non-C.F. goods.

Court's Task

By Section 20 (1) of the Restrictive Trade Practices Act, 1956, the Court was required to consider whether this restrictive machinery was contrary to the public interest. They were not to answer this question as a matter of policy, but by the test formulated by Parliament in Section 21 of the Act, which provided that a restriction was contrary to

public policy unless it fell within one of the seven categories set out in the section and was not unreasonable having regard to the balance between the relevant circumstances and any detriment to the public resulting from the restriction. The Court's task was that of any ordinary court of law, to construe the words of the Act and to see if upon the facts proved the case fell within them.

Protection of Only a Small Minority

The Federation's case was that their restriction fell within category (a) or (b) of Section 21. The case under category (a) was that the restriction was reasonably necessary to protect the public against injury in connexion with the consumption and use of medicines. The only significant difference between the sale of medicines by an unqualified person and by a chemist was that, if the chemist was told by the customer of the condition to be relieved, he had the training and ability to select the appropriate remedy. The C.F. restriction did not, however, require C.F. List products to be sold only by the chemist himself and not by his unqualified assistants. The restriction would protect only a small minority who, while in doubt about the right medicine to buy, had not the sense to ask for advice from a qualified person but yet gave some manifestation which would cause the chemist to make some inquiry about their condition. On the evidence the risk of injury through buying from unqualified persons could not be rated so high as to say that it balanced the detriment to the public from not being able to buy commodities it wanted from any retailer who was willing to sell them.

The Federation's case under category (b) was that the removal of the restriction would deny to the public specific benefits. These were: the opportunity which it afforded chemists to give advice; the work of the Federation's standards committee, which examined the formulae of medicines on the List for suitability and examined claims relating to their performance to see whether they were justified; and that it was only the protection from competition afforded by the restriction which kept country chemists in business and so available for the National Health Service.

The Court was not satisfied by the evidence on any of these heads that the restriction was justifiable under Section 21.

No Immediate Injunction

The Registrar had applied under Section 20 (3) for an injunction. The Court did not think that Parliament had intended any approach other than the normal rule that an injunction, breach of which carried committal as a penalty, would be granted only if there was reasonable apprehension that an offence was about to be committed or repeated. Until the judgment the Federation had not known whether its restriction would be declared illegal under the new Act or not. The Federation would be given a reasonable time to put its affairs in order, and should not have to do so under the shadow of an injunction. If the Registrar was dissatisfied with what was done he could apply to the Court specifying the particular activities he desired to be restrained.

The order of the Court would therefore consist simply of a declaration in the terms specified in the judgment.

DEAF-AND-DUMB DRIVER FINED

[FROM OUR LEGAL CORRESPONDENT]

On September 29 a deaf-and-dumb driver, Arthur James Callaway, aged 49, was fined £5 at Worthing for careless driving (*Daily Telegraph*, September 30).

When the chairman of the justices expressed surprise that Callaway, who communicated with the court through a deaf-and-dumb-club interpreter, should have been able to pass his driving test, particularly as he could not write and even had difficulty in interpreting deaf-and-dumb sign language, he was told that this was not an isolated case. Callaway, who according to his father was deaf and dumb

from birth, had ridden a bicycle for more than 30 years, and after six weeks' teaching by his father had passed his driving test at the first attempt in 1956. Since then he had driven 6,000-7,000 miles with no trouble. He had learnt deaf-and-dumb language at the age of 17 but had since forgotten it.

No statistics are kept on the number of deaf-and-dumb drivers, because this disability is not one of those specified in the driving licence application forms. On test the examiner's instructions are conveyed either in writing or through an interpreter.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on October 16 the degree of B.M. was conferred on F. S. Plumpton, G. O. M. Jones, and (in absence) on Gillian M. Shaw.

UNIVERSITY OF CAMBRIDGE

In Congregation on August 2 the following degrees were conferred:

M.D.—*Vishnu Sarma.
M.B., B.Chir.—*I. F. M. Buchanan, R. C. L. Feneley, *J. G. Lancaster.
M.B.—*I. D. Hunter-Craig, N. W. Oakley, J. C. Twomey, *W. G. Shakespeare, A. F. Fleming, J. Hedley-Whyte, A. C. Smith, *A. J. Earl, G. C. Sutton, N. E. S. Holden, *E. P. Brooks, I. Chippendale, R. H. Johnson, H. B. Valman, *A. Reynolds, D. A. Birkett, F. T. Brough, G. M. Davies, *P. J. Ball, D. M. Whiteford, *Shirley A. Bolt, *Heather M. Rumsey, *Nerys Davies, *Margaret R. Skelton, Mrs. Audrey E. Fairley.

*By proxy.

UNIVERSITY OF ABERDEEN

At a graduation ceremony held on November 5, the degree of M.D. was conferred on H. G. Richmond (with honours) and on R. S. Crow (with commendation).

UNIVERSITY OF DURHAM

In Congregation on September 27 the following degree and diplomas were conferred:

PH.D. IN MEDICINE.—Israel Kleinberg (*in absentia*).
DIPLOMA IN PSYCHOLOGICAL MEDICINE.—J. R. B. Ball, N. E. Crumpton, S. L. Davies, A. King, P. Roughhead.

UNIVERSITY OF LONDON

The following have been appointed or nominated for appointment or reappointment as representatives of the University on the governing bodies indicated in parentheses: Dr. R. A. Shooter (Mitchell City of London Educational Foundation) and Dr. Sybil Yeates (Waverley, Burrage, Church Manorway and King's Warren London County secondary schools).

The following have been recognized as teachers of the University in the subjects indicated in parentheses: *St. Mary's Hospital Medical School*, Dr. Michael Feiwel (Dermatology). *London Hospital Medical College*, Dr. G. P. Fox (Anaesthetics), Dr. R. S. Murray (Radiology) and Dr. Richard Creese (Physiology). *Institute of Ophthalmology*, Mr. C. A. G. Cook (Ophthalmology). *Institute of Child Health*, Dr. R. W. Cope (Anaesthetics). *Institute of Orthopaedics*, Dr. P. G. Walker (Biochemistry).

The Sir William Dunn Scholarship for 1958 has been awarded to David Edward Jewitt (King's College).

On August 6 the degree of M.D. was awarded to G. G. Meynell and A. Paton.

The following candidates at the London School of Hygiene and Tropical Medicine have been approved at the examination indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN PUBLIC HEALTH.—L. Baldacci, J. L. Bosc, J. M. Davies, R. O. M. Jones.

UNIVERSITY OF BIRMINGHAM

The following appointments have been made: Drs. A. Glass and A. W. Rogers, Lecturers in Anatomy; Drs. H. A. Ellis and D. J. Parish, Lecturers in Pathology; Dr. J. D. Cumming, Lecturer in Physiology; Dr. S. H. Taylor, Lecturer in Medicine; Mr. G. T. Watts and Mr. F. Ashton, Lecturers in Surgery; Dr. E. M. Little, Lecturer in Obstetrics and Gynaecology; Dr. June K. Lloyd, Research Fellow in Paediatrics and Child Health.

UNIVERSITY OF LIVERPOOL

In Congregation on September 26 the degrees of M.B., Ch.B. were conferred on Malvina Harris.

UNIVERSITY OF LEEDS

The following have been approved at the examination of the degree of Ph.D. in the subjects indicated in parentheses: R. Fielden and R. D. Robson (Pharmacology), G. N. Graham (Medicine), and R. Wilson (Experimental Pathology and Cancer Research).

UNIVERSITY OF SHEFFIELD

Dr. Helen Beladi has been appointed full-time research assistant in virus diseases, and Dr. P. Chowdhuri full-time research assistant in the department of obstetrics and gynaecology.

The following resignations have been received: Dr. L. Robertson, honorary demonstrator in bacteriology; and Dr. K. D. Neame, lecturer in physiology.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the College, held on October 30, licences to practise were conferred upon the following 136 candidates who had passed the final examination in medicine, surgery, and midwifery of the Conjoint Board and who had complied with the by-laws of the College:

J. W. Abrams, O. O. Akinkugbe, J. G. Allardice, A. C. Ames, E. C. Ashby, Mary E. Ashworth, R. M. Ayadi, Judith M. Babb, J. R. Ball, N. S. Bamji, F. Bannerman-Lloyd, Anne P. Barrett, Patricia A. Blackwell, Ingrid J. Booth, Helen D. Bower, N. A. Boyd, P. P. Bricknell, M. F. H. Bush, J. S. Cameron, M. I. D. Cawley, M. Charlesworth, R. K. Clarke, L. J. Clein, R. J. Clement, Diana E. Clough, G. F. Cohen, L. Cook, S. Craske, A. N. Cruickshank, J. O. Dalrymple, D. J. C. Davies, E. T. L. Davies, J. B. Davis, W. R. Dean, Alison J. Dow, J. T. K. Duncan, A. Dunnill, N. J. L. D'Vaz, Margaret L. E. Eastcott, D. R. Edbrooke, Davnet A. V. Fenton, Frances E. Freeman, A. J. V. H. French, A. J. Gardner, Elzbieta E. Gielniwska, A. V. Gillespie, G. T. Gooding, Judith M. Hall, J. W. Harcup, G. Hass, R. T. Hawley, B. Hayes, V. N. Highman, O. Holmes, J. M. Howell, Doreen M. Hudson, Margaret J. Hunter Rowe, T. A. Russell, P. B. Jacobs, R. W. James, Rosemary A. Johnson, O. P. Jones, Mary O. Joseph, P. M. Katrak, C. W. Keen, A. Kenyon, Angela R. Kosky, M. J. S. Langman, M. I. Leckie, J. P. Lee-Potter, L. A. Lees, Valerie Little, L. S. S. Lung, K. H. McCraith, G. W. McKenna, B. W. Maitland, R. Marks, Sylvie Marston, Margaret Masterton, Ann R. Matthews, T. S. Matthews, N. S. S. Meimary, Yvonne M. Metcalf, D. J. O. Mills, P. V. Mills, D. F. Munro, Jane A. Napper, J. L. Nimmo, R. F. Norris, J. B. Nuttall, J. O. Onyeachonam, A. A. Osindero, Mary W. Parry, P. G. Parry, P. O. D. Pharoah, J. W. Porter, L. A. C. Pugh, H. B. Raeburn, T. Ramsamy, Marjory M. R. Reid, N. A. Retz, A. B. Richards, G. A. Richardson, R. M. Riddell-Smith, Gwyneth M. Riley, R. R. Roberts, Hildegard M. I. Seeman, Olive P. Sharp, Muriel A. Shiel, R. M. Simons, Cynthia G. Smith, I. S. Smith, S. Sprague, Shirley H. Stanness, J. F. Steele-Perkins, Hazel G. Stephens, M. P. Sternberg, D. J. Steward, J. D. M. Stewart, D. W. B. Summers, J. L. K. Tamakloe, Veronica Thatcher, M. J. A. Thompson, R. A. Thompson, M. K. Tidman, J. M. Todd, E. W. B. Varley, S. O. Wamuo, K. H. Warden, J. B. Warren, T. P. Welch, M. P. Wilderspin, M. C. T. Wilkes, G. E. Winbolt, Yvonne Young.

Diplomas in Ophthalmology were granted, jointly with the Royal College of Surgeons of England, to R. J. M. Boucherat and to the other successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England held on October 9.

Diplomas in Child Health were granted, jointly with the Royal College of Surgeons of England, to Margaret S. Brothwood and R. B. Razvi and to the other successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England held on October 9.

Diplomas in Industrial Health were granted, jointly with the Royal College of Surgeons of England, to M. C. Gupta and P. V. Krishnamurti.

Diplomas in Tropical Medicine and Hygiene and in Physical Medicine were granted, jointly with the Royal College of Surgeons of England, to the successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England held on October 9.

Other diplomas were granted, jointly with the Royal College of Surgeons of England, as follows:

DIPLOMA IN PUBLIC HEALTH.—D. S. Jani.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—G. Woolfson.

DIPLOMA IN ANAESTHETICS.—D. M. Davies.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on October 9, with Sir James Paterson Ross, President, in the chair, the Mitchiner Medal was presented to Lieutenant-Colonel R. H. Robinson by the Director-General of the Army Medical Services (Lieutenant-General Sir Alexander Drummond).

The Handcock Prize was presented to Mrs. E. M. Cooke, of the Royal Free School of Medicine.

Mr. F. R. Jackaman (Queen Elizabeth's School, Barnet, and Cambridge University) was admitted as Macloghlin Scholar.

The John Hunter Medal and Triennial Prize were awarded to Dr. L. W. Proger, Pathology Curator, for his devoted services to the Hunterian Museum.

The award of a Mackenzie Mackinnon Research Fellowship to Mr. K. E. D. Shuttleworth was announced.

Arrangements were approved for the celebration next year of the centenary of the institution of the licence in dental surgery.

A diploma of Fellowship was granted to B. P. Scrivener, and a diploma of Membership to A. B. Richards.

Diplomas of Fellowship in the Faculty of Anaesthetists were granted to the following successful candidates:

Jean M. Horton, S. W. Kemp, B. R. J. Simpson, J. D. K. Burton, T. M. McAneny, A. McL. Keil, Patricia Painter, R. L. Hargrove, T. M. Ness, S. Thirumalai, J. L. Hadley, Ellen R. S. Armitage, A. J. Booth, Sheila R. Clarke, B. J. Muir, J. R. Munro, B. Solomon, F. R. Bhupalan, P. S. Keddie, R. M. Nicholl, T. J. Stanton, G. Tay, H. R. P. Coutanceau, G. W. Duckworth, G. L. F. Lau, F. M. Mehta, I. A. Sloan, J. V. Farman.

The following diplomas were granted, jointly with the Royal College of Physicians of London:

DIPLOMA IN OPHTHALMOLOGY.—A. K. Banerjee, J. C. Chang, K. K. Chau, S. R. Chowdhuri, B. P. Cooper, R. J. Croke, Elizabeth L. R. Douglas, L. K. Dutta, J. M. Elby, Asuncion N. Fernandez, R. S. Garkal, J. H. L. George, P. K. Ghosh, Elizabeth F. Hamilton, A. C. A. Hempel, D. E. Hone, M. I. Khan, S. Khoshnevis, A. Krishna Murthy, P. Lancer, M. G. Lyall, A. J. Lyne, A. Lytton, K. J. Modi, V. S. Pande, M. V. Parikh, J. A. Pearce, H. J. Penkala, Pe Than Maung, D. N. Randeria, J. M. Rodd, P. G. Rowsell, I. S. Roy, M. I. Sharma, S. A. Sheikh, G. E. M. Smith, G. C. Sood, D. J. Thornton, N. H. Welsh, G. S. Willett, M. S. Wilson.

DIPLOMA IN CHILD HEALTH.—V. K. Agarwal, V. C. Agarwal, Hilary Allin, Elizabeth M. F. Andrews, K. D. Austin, J. F. Baden-Daintree, S. Barua, N. Bhaktlingam, Josephine Bradford, Helen R. L. Brown, K. W. Browne, Anne J. Buge, Mary S. Campbell, J. C. Chakrabarti, C. P. Chin, D. R. Chopra, R. K. Chopra, J. Connolly, M. J. Conway, Izette R. Coulton, P. N. Cretney, Edith Danos, B. S. David, G. N. Dubey, V. Dubowitz, F. M. Elderkin, J. H. Fairley, Hazel M. Fearn, W. R. Forbes, R. A. Gould, Margaret S. Hall, Jean G. Harrison, I. A. Hashimi, Anne Heath, C. P. Hindley, Barbara L. Hooker, M. J. Howell, D. Hull, Rosemary P. W. Johnston, J. Keane, Katie Keane, P. N. Krishnamurthy, Julie S. S. Lim, H. M. Lipman, Gwendolen Mallal, A. V. Mar, Valerie J. Marrian, Miller, A. Mithal, D. M. Morgan, Khurshed Moulvi, Janice H. Mount, O'Neill, M. S. Pardiwalla, K. M. Patel, P. N. Krishnamurthy, Julie S. S. Lim, Ann Priestman, Gillian Prosser-Ashby, K. A. Rahimulla, Shirley G. Ratcliffe, L. Sash, R. Schofield, S. Shabbir, Jean Shackleton, A. J. H. Shepherd, K. Soni, Anne L. Stewart, Susan Stonestreet, M. K. Strelling, Margaret J. D. Surges, Hui Lim Helen Tay, A. F. Taylor, Dileas M. Tingle, H. L. Utian, N. A. Vellani, Geraldine M. Walshke, K. Warburton, R. W. Watton, Mary Wilkie, R. Winstone, Lina Yut Lin Yung.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—S. Abedin, A. A. Ahmed, K. Bery, F. S. Boi-Doku, M. C. Brain, K. R. Bremner, D. G. Carlson, Hin-Wing Chan, D. P. Daly, M. E. Fearnley, R. D. Foord, D. A. Gandhi, D. J. Hansman, T. Htin, H. A. Jesuthasan, B. Jha, H. A. J. Kassam, H. J. Khambatta, M. A. Khan, M. D. Khan, K. K. Koraiah, M. C. Latham, P. B. Lees, M. H. Mahmoud, K. K. Mallik, M. A. Mannan, F. X. Martin, M. C. Mathews, R. A. Miller, D. Misra, M. T. Moore, H. Nadiy, Rosemary A. Page, G. M. J. Pais, Valerie J. Prior, S. H. Qureshi, W. H. Rees, S. P. Shah, J. Sharan, R. P. Singh, R. Singh, D. R. Stein, B. V. Suryanarayana, N. A. Syed, I. Taha, Tha Khin, T. Thavornstiri, E. Trinick, K. E. Usher, N. A. Vellani, C. Vesuna, A. E. Wanigesooria, Anie Wiersinga, M. H. Zafar.

DIPLOMA IN PHYSICAL MEDICINE.—E. N. Coomes, R. Danbury, Helene V. Goodman, G. Holden, K. H. Nixon, S. K. Sarkar, V. L. Steinberg, W. G. Wenley, V. B. Whittaker.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

At the annual meeting of Fellows, held on October 18, the following officers were appointed for 1958-9: *President*, Dr. P. T. O'Farrell; *Vice-President*, Dr. M. Crowe; *Representative of College on General Medical Council*, Dr. Edward T. Freeman; *Registrar*, Dr. Charles Dickson; *Treasurer*, Dr. Geoffrey Bewley.

ROYAL AUSTRALASIAN COLLEGE OF PHYSICIANS

At a meeting of the Council of the College held in Melbourne on October 9 the following candidates, who were successful at an examination by the Australian Board of Censors, were admitted to Membership of the College: Dr. W. Berns, Dr. F. J. T. Croll, Dr. J. C. Farrell, Dr. H. G. Gallagher, Dr. B. R. Huxtable, Dr. K. P. W. Moore, and Dr. T. Selby, of New South Wales; Dr. N. McK. Bennett, Dr. R. A. Chenoweth, Dr. A. E. Doyle, Dr. A. D. Grounds, Dr. F. L. Johnson, Dr. D. S. Nurse, Dr. R. G. Shaw, Dr. L. E. G. Sloan, Dr. B. M. Spence, Dr. J. B. Webb, and Dr. C. W. E. Wilson, of Victoria; Dr. B. J. Knapp and Dr. J. P. Masel, of Queensland; Dr. I. J. Forbes and Dr. J. G. Wilson, of South Australia; Dr. J. A. Bonnin, of South Australia, and Dr. K. V. Smith, of New South Wales, were admitted under the special provisions of Article 37.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending October 25 (No. 43) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	4	3	6	0	2	3	0	4	0	
Dysentery	525	61	157	5	2	197	20	89	1	4
Encephalitis, acute	6	0		0		2	0		1	
Enteric fever:										
Typhoid	3	0	0	0	2	4	0	0	2	
Paratyphoid	10	0	6(B)	0	8(B)	1	0	0	0	
Food-poisoning	228	33	15	7		108	16	84	0	
Infective enteritis or diarrhoea under 2 years				12	53				4	38
Measles*	4,232	243	28	53	205	1,414	23	24	27	19
Meningococcal infection	29	3	14	0	1	35	7	12	1	2
Ophthalmia neonatorum	26	4	10	0		35	4	5	0	
Pneumonia†	263	21	164	13		1,897	138	622	47	67
Poliomyelitis, acute:										
Paralytic	62	6	26	3	5	56	3	0	3	4
Non-paralytic	13	0				10	0			
Puerperal fever‡	212	38	15	1		287	34	5	1	
Scarlet fever	803	56	106	27	51	399	40	64	13	32
Tuberculosis:										
Respiratory	481	58	81	19		515	56	113	20	
Non-respiratory	53	4	8	3		74	8	11	2	
Whooping-cough	594	36	69	67	34	349	22	22	0*	11

DEATHS	1958					1957				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	0	0		0		0	0		0	
Encephalitis, acute	0	0		0		0	0		0	
Enteric fever	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years	6	0	2	1	0	0	0	0	0	0
Influenza	13	3	1	0	0	51	31	16	13	
Measles	0	0	0	0	0	0	0	0	0	0
Meningococcal infection	0	0				3	1			
Pneumonia	422	28	18	15	3	76	24	31	8	
Poliomyelitis, acute	4	1		0	0	1		0	0	
Scarlet fever	0	0	0	0	0	0	0	0	0	0
Tuberculosis:										
Respiratory	72	5	6	0	5	9	12	1	8	
Non-respiratory		0	1	0	1	0	3	0	0	
Whooping-cough	0	0	0	0	0	0	0	0	0	0
Deaths 0-1 year	321	23	26	6	10	32	22	3	5	
Deaths (excluding stillbirths)	9,056	751	532	104	134	955	647	138	190	
LIVE BIRTHS	13,874	1141	1035	222	344	1243	992	197	317	
STILLBIRTHS	307	27	17			25	18			

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

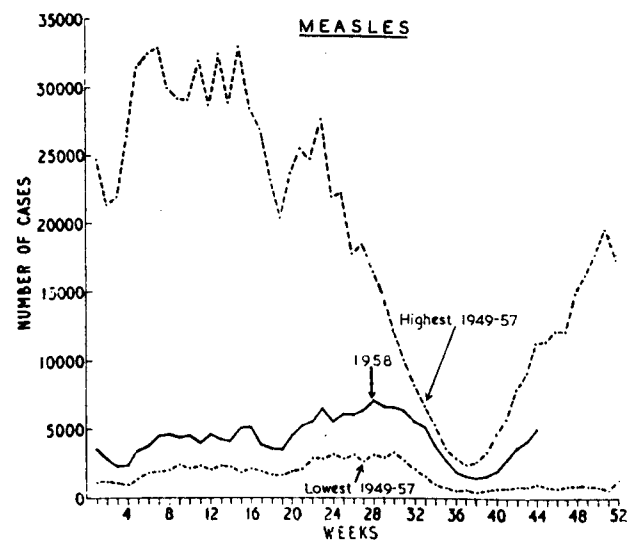
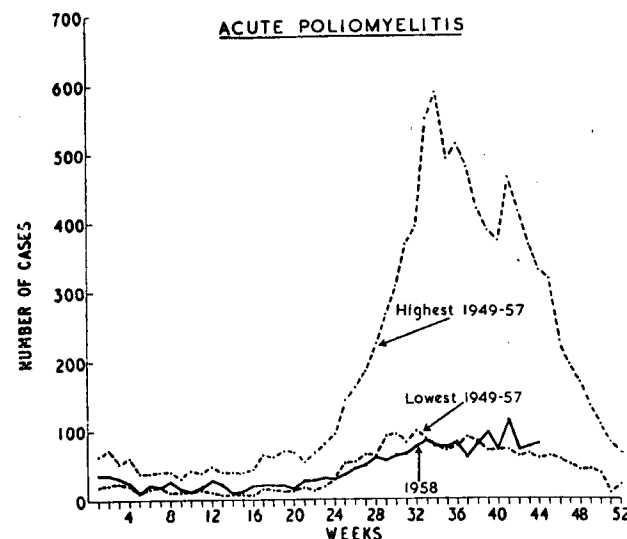
Vital Statistics

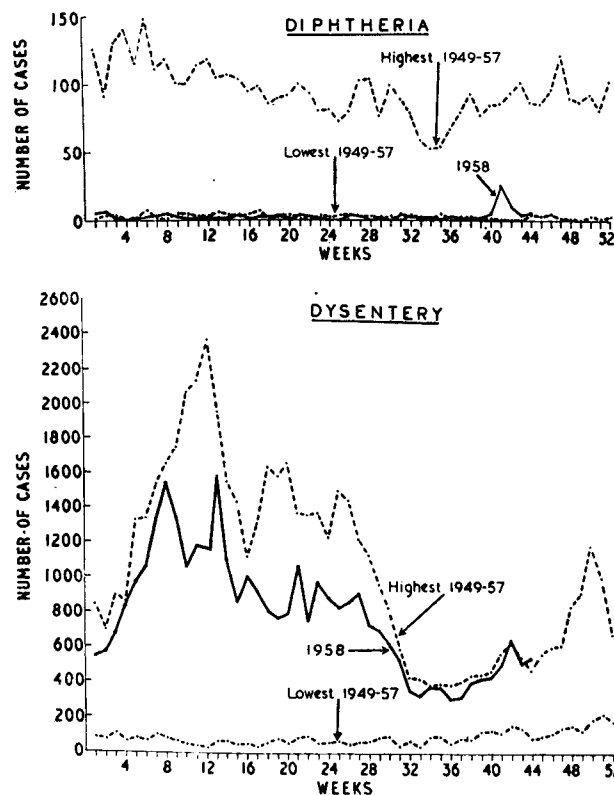
Typhoid: Oysters Suspected

Seven cases of typhoid fever suspected of being caused by infected oysters have been reported recently. They are in the London area, except for one at Sidcup, Kent, and one at Sudbury, Suffolk. The last patient ate the oysters in Colchester, Essex, the others in London. In three cases the oysters are known to have come from the West Mersea beds, and in four cases the West Mersea strain of the bacillus has been identified.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus -----, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Week Ending November 1

The largest fluctuations in the notifications of infectious diseases in England and Wales during the week ending November 1 were increases of 782 for measles, from 4,232 to 5,014, 86 for scarlet fever, from 803 to 889, 53 for acute pneumonia, from 263 to 316, 43 for whooping-cough, from 594 to 637, and 26 for dysentery, from 525 to 551.

The largest rises in the incidence of measles were 155 in Yorkshire West Riding, from 461 to 616 (Halifax C.B. 167), 106 in Yorkshire East Riding, from 195 to 301 (Kingston-upon-Hull C.B. 263), 88 in Lincolnshire, from 165 to 253 (Scunthorpe M.B. 83), 87 in Surrey, from 60 to 147, 82 in Middlesex, from 200 to 282, and 79 in Sussex, from 82 to 161; the largest falls were 68 in Caernarvonshire, from 134 to 66, 56 in Devonshire, from 169 to 113, and 49 in Hampshire, from 101 to 52. Only small changes in trend were reported in the local areas for scarlet fever and whooping-cough. 6 cases of diphtheria were notified, being 2 more than in the preceding week; 3 of these cases were notified in London.

The notifications of acute poliomyelitis numbered 79 and were 8 fewer for paralytic and 12 more for non-paralytic cases than in the preceding week. The largest returns were Lancashire 19 (Manchester C.B. 9), Yorkshire West Riding 12 (Nidderdale R.D. 6), Durham 5 (Sunderland C.B. 2), Hampshire 5 (Southampton C.B. 2), London 5.

The chief centres of infection for dysentery were Yorkshire West Riding 100 (Leeds C.B. 44), Lancashire 53 (Liverpool C.B. 20), Glamorganshire 52 (Cardiff R.D. 22, Barry M.B. 12), London 46 (Islington 10, Wandsworth 10), Northumberland 32 (Newbiggin-by-the-Sea U.D. 19), Warwickshire 25 (Coventry C.B. 16); Essex 24 (Walthamstow M.B. 14), Hampshire 23 (Southampton C.B. 18), and Durham 22.

The New Zealand Department of Health (P.O. Box 5013, Wellington) has published a *Directory of Homes and Clubs for Old People*. This is based on a survey carried out in February last, and it is hoped to publish supplements from time to time.

Medical News

Epsom College Scholarships.—The council of Epsom College will, about the end of May, 1959, elect to one or more Henry Robinson scholarships, tenable from September, of a maximum value of £250 a year. These scholarships are open only to sons of registered medical men or women, aged between 12 and 14 on January 1, 1959. They are awarded on the results of a competitive examination, and there is no means test. About 5 or 6 open scholarships will be given on the results of the same examination, maximum value £150 a year; for these, boys of medical parentage compete on level terms with sons of the laity. Full details can be obtained from the Headmaster, Epsom College, Epsom.

Royal College of Obstetricians and Gynaecologists.—A large gathering of obstetricians and gynaecologists, their guests, and their ladies attended the College's annual dinner at the Dorchester Hotel on November 7. The president, Professor ANDREW CLAYE, was in the chair, and after the dinner and speeches there was dancing. Sir MALCOLM TRISTRAM EVE, Q.C., First Crown Estate Commissioner, welcomed the College as new tenant of the Crown in Regent's Park. It was the desire of the Crown Commissioners to save all the Nash terraces if possible, he said; each building facing the park would revert to residential use, and each terrace would be largely rebuilt, but retaining, or returning to, Nash's original elevation. The College was privileged in being allowed to build its new house in what is a "residential area," and Sir Malcolm expressed the hope that some other colleges might join them there. Professor CLAYE, responding, said the building was progressing steadily and should be finished by the end of 1959. While they could now see enough money forthcoming to build and equip it, funds for its maintenance were still urgently needed. It would become the focal point of almost all their work. The College, he continued, was engaged, with the help of its councils in the Dominions, in revising the M.R.C.O.G. Extramurally, it was taking part with other bodies in the review of the N.H.S. and in other matters of professional concern. Dr. T. F. Fox, for the guests, replied to Mr. JOHN PEEL's gracious toast: the evening, he said, had been positively Caesarean.

Doctors' Hobbies.—The second Doctors' Hobbies Exhibition, organized by Benger Laboratories Ltd., was opened on November 10 by Sir CLAVERING FISON, chairman of the Fison Group, in the Great Hall of B.M.A. House. More than 500 doctors showed samples of the things they do in their leisure time, to make an impressive collection of over 700 exhibits. First prize was won by Dr. A. W. FAWCETT, of Sheffield, whose 4 ft. model of the torpedo-boat destroyer *Tigress*, in which he served, had taken him 14 years to complete. The second prize went to Dr. A. H. WORTMAN, of London, for a collection of stamps issued by Imperial Russia in 1858. Dr. S. COMPTON, of Guildford, took the third prize for tapestries of exceptional quality. The exhibits were grouped in 23 classes, of which easily the most popular were those for photography (transparencies, portraiture, and general) and painting (oil and watercolour). Next in popularity were "authorship," embroidery, woodwork, and sculpture and wood-carving. But such a list gives little idea of the great variety of the profession's leisure interests: they include, for instance, tame chinchillas, popular songs, stage properties, Esperanto, the collection of abbreviations from newspapers and journals, poetry, an electronic organ, sock-darning, a telephone-tapping device, ships in bottles, models of all kinds, ceramics, violins, and match-box labels. The standard was far higher than last year, and once again the photographs were outstanding. The paintings were more numerous and included some fine work, notably the prize-winning industrial landscapes by Dr. A. B. FOLLOWS and Dr. PH. TUTTNAUER's imaginative "Boats at Rest." The exhibition was open for five days.

Transatlantic Clinical Conference.—The British panel for the transatlantic clinical conference on December 5 between the B.M.A. Annual Clinical Meeting in Southampton and the A.M.A. Meeting in Minneapolis, U.S.A., will be Dr. W. D. BRINTON (chairman), Professor JOHN MCMICHAEL, F.R.S., and Mr. HOLMES SELLORS. The Clinical Meeting, which lasts from December 4 to 7, will also include four panel discussions and three general sessions on practical clinical subjects. Advance registration forms for the meeting are obtainable from the Executive Officer, B.M.A. House, Tavistock Square, London, W.C.1. These should be completed and returned without delay.

London Medical Exhibition.—Sir ROY CAMERON, F.R.S., gave the address at the opening of the 42nd London Medical Exhibition, held at the Royal Horticultural Hall, Westminster, from November 10 to 14. The exhibition is staged each year by the British and Colonial Druggist Ltd. Pride of place at the exhibition, said Sir Roy, went to treatment. Doctors would find new measures for the more effective use of healing drugs, not only by prolonging their local and general action and removing unpleasant side-effects but by promoting their absorption, simplifying their administration, and, above all, by doing away with even the remote possibility of danger. No less important was reduction in cost, something that must appeal to everyone in these days of financial stringency. It was fitting, too, that new discoveries in the recognition of disease should be placed as early as possible before the profession, and the London Medical Exhibition had certainly accepted its responsibilities in that direction. Simpler apparatus for blood-pressure determination, reliable stains for microscopical diagnosis, and less complicated methods for examination of the urine, blood, and body excretions would appeal to those who spent their lives in the quiet alleys of medical endeavour. As one whose life had been given up to teaching and investigation, he commended this display of the development and application of medical research.

Royal College of Physicians of Edinburgh.—At a quarterly meeting of the College held on November 4, 1958, with the president, Dr. A. RAE GILCHRIST, in the chair, the following were elected Fellows of the College:

F. P. Reid, Maung E. K. N. Gour, R. Schneider, T. Schneider, I. Singh, N. Ali, I. Schrire, H. A. Reid, J. M. Staveley, G. B. Tait, M. Watt, S. G. Nelson, G. M. Carstairs, J. N. Swanson, D. H. Clark, M. A. Keith, A. C. Bhabha, N. C. Begg, R. Grenville-Mathers, A. M. Kassim, S. R. K. Padmavati, J. D. Matthews, P. C. Mitchell, J. F. McHarg, S. E. Large, W. S. Watson, J. Harper, W. Macleod, M. Macleod, H. B. Craigie, S. P. V. Sherlock.

The following were elected Members of the College:

D. F. Cappell, D. M. Fraser, W. M. Millar, K. M. Robertson, K. S. Grover, F. R. D. Minett, P. K. Roy, M. O'Mahony, R. D. Spooner, S. N. Mukherjee, E. T. Hughes, D. J. Hodges, J. C. Ghosh, J. G. Sowerbutts, S. Janaki, W. A. Penman, A. M. Womack, N. S. Dhillon, E. C. Knox, P. V. Vora, S. G. F. Mads, M. D. Kay, L. L. Sinha, S. S. Syalee, E. S. Emslie, D. Montgomery, T. D. Grant, G. P. McGovern, C. E. Rotem, T. K. Chaudhuri, T. C. Dennison, P. S. Terespolsky, P. C. Sharma, D. J. Robinson, S. V. Bakshi, A. J. Watson, S. S. Jhaveri, G. W. Ashcroft, J. S. Beck, W. K. C. Morgan, E. J. Raffle, J. R. Tighe, P. Ganeriwala, J. A. Fuller, H. R. Klein, O. P. Gupta, I. W. Delamore, A. Mitra, J. Dominian, E. Chesler.

Royal Faculty of Physicians and Surgeons, Glasgow.—Besides the election of Mr. A. H. Jacobs as president (*Journal*, November 8, p. 1171), the following were elected office-bearers at the annual general meeting of the Royal Faculty of Physicians and Surgeons of Glasgow on November 3: Visitor, Dr. J. H. Wright; hon. secretary, Dr. Gavin B. Shaw; hon. treasurer, Mr. R. B. Wright; hon. librarian, Dr. A. L. Goodall; representative on the G.M.C., Dr. Andrew Allison; councillors, Dr. G. J. Aitken, Dr. W. Ferguson Anderson, Dr. W. Malcolm Gibson, Dr. D. McKay Hart, Dr. A. Cameron Macdonald, Dr. T. J. Thomson, and Professor G. M. Wyburn. Dr. C. G. A. Thomas was presented with a cheque for his winning essay

in a competition sponsored by the council of the Faculty for the trustees of the Glasgow Lock Hospital Fund.

Poisons List.—The Home Office announces that Statutory Instruments are being prepared to give effect to recommendations from the Poisons Board. It is proposed to make the following changes in the Poisons List and Rules:

1.—Anileridine, dextromoramide, etoxeridine, levomoramide, methylhydromorphone, morpheridine, myrophine, oxymorphone, racemoramide, trimeperidine, and the esters of 1-methyl-4-phenyl-piperidine-4-carboxylic acid, and the salts of these substances, will be added to Part I of the Poisons List and the First Schedule to the Poisons Rules. The existing entries relating to pethidine and the isopropyl ester of 1-methyl-4-phenylpiperidine-4-carboxylic acid and their salts will be deleted.

2.—Derivatives of 3-(10-phenothiazinyl) propane substituted in the 1-position, and the salts of these substances, will be added to Part I of the Poisons List and to the First and Fourth Schedules to the Poisons Rules. The existing entries relating to chlorpromazine and promazine and their salts will be deleted.

3.—Endrin will be added to Part II of the Poisons List and to the First, Fifth (in respect of "preparations for use in agriculture or horticulture"), Seventh, Eighth, and Ninth Schedules to the Poisons Rules.

4.—2-Methoxycarbonyl-1-methylvinyl dimethyl phosphate ("phosdrin") will be added to the list of phosphorus compounds in Part II of the Poisons List, in Rule 14(2)(b)(vi) of the Poisons Rules and in the First, Third, Fifth, Seventh, Eighth, and Ninth Schedules. It will also be added to the Sixteenth Schedule.

5.—Organic compounds of mercury in aerosols will be included in the First Schedule to the Poisons Rules regardless of their percentage content of mercury, and also in paragraph 6 of the Seventh Schedule.

6.—The entry in the second column of the Fifth Schedule to the Poisons Rules relating to calcium arsenates will be amended to read "preparations for use in agriculture or horticulture."

7.—The requirement in Rule 12(2)(e) and (f) of the Poisons Rules that a prescription for a poison included in the Fourth Schedule shall show the total amount to be supplied or the total amount intended to be administered or injected will be amended to exclude preparations included in the *British National Formulary*.

Central Midwives Board Headquarters.—The MINISTER OF HEALTH, accompanied by Mrs. WALKER-SMITH, officially opened the new offices of the Central Midwives Board during a reception held in the new building, at 39, Harrington Gardens, London, S.W.7, on November 6. The Board has taken a 64-year lease of the house, which provides enough accommodation for its increasing work. Last year there were 4,039 successful candidates for the first part of the midwives certificate examination, and the names of 2,800 women were enrolled on the register as having been successful in the second part. The chairman of the Board, Dr. ARNOLD WALKER, and Mrs. WALKER received the guests at the reception.

Birmingham University.—The title of reader in comparative neurology has been conferred on Dr. J. T. EAYRS, senior lecturer in neuro-anatomy and at present Henry Head research fellow of the Royal Society in the department of anatomy. Dr. H. A. SALMON has been appointed a temporary lecturer in physiology, and Dr. B. J. KEY a research fellow in the department of experimental psychiatry.

N.E. Metropolitan Board.—Sir JAMES PATERSON ROSS, P.R.C.S., was the principal guest at the eighth annual dinner of the North-east Metropolitan Regional Hospital Board on October 22. Over 300 attended, under the chairmanship of the Board's chairman, Sir GRAHAM ROWLANDSON.

St. John Ambulance Brigade.—Mr. G. W. WOODHILL, Cadet Officer for London District since 1955, has been appointed secretary of the Brigade in succession to the late Mr. GEORGE QUILTER.

Professor W. C. W. Nixon has been elected a foreign member of the Turkish Society of Obstetrics and Gynaecology.

COMING EVENTS

University College, London.—Dr. D. A. DENTON, director of the Ion Exchange Research Unit, Melbourne, will lecture on "The Control of Secretion of the Transplanted Adrenal Gland" on November 19 at 5.30 p.m. in the physiology theatre.

Institute of Neurology.—Professor J. N. CUMINGS will deliver his inaugural lecture as professor of chemical pathology at the Institute of Neurology, Queen Square, on November 24 at 5.30 p.m. His subject will be "Neurochemistry and Neurochemists."

Kettle Memorial Lecture.—Dame JANET VAUGHAN will lecture on November 27 at 5 p.m. at St. Bartholomew's Hospital Medical College on "The Relation of Radiation Dosage to Radiation, with Reference to Bone-seeking Isotopes."

Richard Bright Centenary.—On December 1 Guy's Hospital Medical School is celebrating the centenary of Bright's death with a combined round on Bright's disease (2.15 p.m.) and a memorial lecture (5 p.m.) by Professor M. L. ROSENHEIM on "The Syndromes of Bright's Disease." Further details are obtainable from the Medical School.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, November 17

GUY'S HOSPITAL.—At Anatomy Lecture Theatre, 5.15 p.m., lecture demonstration in endocrinology by Dr. P. M. F. Bishop: Acromegaly. **HUNTERIAN SOCIETY.**—At Apothecaries' Hall, 8.30 p.m., discussion: This Society Accepts the Need for Human Artificial Insemination. Speakers, Rt. Rev. the Lord Bishop of Croydon, Mr. W. A. Fearnley-Whittingstall, Q.C., and Mr. V. B. Green-Armytage.

Tuesday, November 18

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. W. Hayes: Bacterial Genetics and Gene Structure. **HEATHERWOOD ORTHOPAEDIC HOSPITAL.**—8.30 p.m. Mr. J. Charnley: Lubrication of Joints, with Special Reference to Arthroplasty. **INSTITUTE OF DERMATOLOGY.**—5.30 p.m., Dr. G. C. Wells: Mechanisms of Epidermal Sensitization. **KEIGHLEY AND DISTRICT MEDICAL SOCIETY.**—At Skipton General Hospital, 8.30 p.m., Dr. P. C. Reynell: Some Recent Advances in the Treatment of Liver Disease.

MANCHESTER MEDICAL SOCIETY.—At Large Anatomy Theatre, Manchester University, 4 for 4.30 p.m., University Lecture on the History of Medicine by Dr. W. S. C. Copeman: Doctors and Disease in Tudor Times. **MANCHESTER UNIVERSITY: DEPARTMENT OF OCCUPATIONAL HEALTH AND NORTH-WEST ENGLAND FACULTY, COLLEGE OF GENERAL PRACTITIONERS.**—At Theatre 1, Clinical Sciences Building, York Place, 8.30 p.m., Professor R. E. Lane: Effect of Work on Some Selected Medical Conditions. **RESEARCH OFFENCE SOCIETY.**—At Lecture Theatre, Zoological Society of London, Regent's Park, N.W.1, 5.30 p.m., 27th Stephen Paget Memorial Lecture by Mr. Richard Fort, M.P.: The Irrational in Public Life. **ROYAL COLLEGE OF PHYSICIANS OF LONDON.**—5 p.m., Charles West Lecture by Dr. E. M. Creak: Child Health and Child Psychiatry—Neighbours or Colleagues?

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. J. S. Tompkinson: History and Present-day Practice of Contraception. **UNIVERSITY COLLEGE LONDON.**—At Anatomy Theatre, Gower Street, W.C.1, 1.15 p.m., Mr. D. A. Sholl: Randomness of the Brain. **UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.**—At Physiology Theatre, Gower Street, W.C.1, 5.30 p.m., Professor J. F. Danielli, P.R.S.: Generalized Cell Theory and Its Relevance to Certain Problems of Drug Action. **WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.**—5.30 p.m., Mr. K. I. Nissen: Carpa Tunnel Syndrome.

Wednesday, November 19

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Virus Diseases. **INSTITUTE OF DISEASES OF THE CHEST.**—5 p.m., Mr. V. C. Thompson: Carcinoma of the Lung: Early Diagnosis. **INSTITUTE OF UROLOGY.**—4.30 for 5 p.m., Mr. Harland Rees: Differential Diagnosis of Frequency of Micturition. **MIDLAND MEDICAL SOCIETY.**—At Dudley Road Hospital, 8.15 p.m., clinical meeting. **NATIONAL COLLEGE OF RUBBER TECHNOLOGY,** Northern Polytechnic, Holloway Road, N.1, 4.30 p.m., Mr. O. F. Mackinnon: Plastics in Dentistry. **NORTH-WESTERN THORACIC SOCIETY.**—At Aintree Hospital, Liverpool, 5 p.m., Dr. D. L. Caldwell, Selection of Patients for Admission to a Chronic Bronchitic Unit; Dr. G. Yates, Chronic Bronchitis in General Practice; Dr. M. Davies, Bronchitis and Atmospheric Pollution. **POSTGRADUATE MEDICAL SCHOOL OF LONDON.**—2 p.m., Guest Lecture by Dr. S. M. Cohen: Turnover of Plasma Proteins. **ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.**—3.30 p.m., Mr. J. Sharp Grant, Some Comments on the Development of Occupational Medicine. (Illustrated.) **SCIENTIFIC FILM ASSOCIATION.**—At 4th Floor Temporary Lecture Theatre, Royal College of Surgeons of England, 6.30 p.m., subject: Presenting Medicine to the Public on Television. Principal speaker, Mrs. Mary Adams. Discussion to be opened by Mr. A. Dickson Wright.

UNIVERSITY COLLEGE LONDON.—At Department of Pharmacology, 5.30 p.m., Dr. D. A. Denton (Melbourne University): The Control of Secretion of the Transplanted Adrenal Gland. **WEST LONDON MEDICO-CHIRURGICAL SOCIETY.**—At Nurses' Hall, West London Hospital, W.1, 8.30 p.m., Mr. J. Johnston Abraham: The West London 50 Years Ago.

Thursday, November 20

BRISTOL UNIVERSITY.—At Reception Room of University, 8.15 p.m., Carey Coombs Memorial Lecture by Dr. Bernard Schlesinger: Course and Treatment of Rheumatoid Diseases in Childhood. **BRITISH INSTITUTE OF RADIOLOGY.**—8 p.m., subject: Use of the Rad as a Dose Unit in Radiotherapy. To be opened by Dr. F. Ellis, Dr. C. W. Wilson, and Mr. D. E. A. Jones. **BRITISH POSTGRADUATE MEDICAL FEDERATION.**—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. J. H. Humphrey: What are Gamma-globulins? **HONEYMAN GILLESPIE LECTURES.**—At Anatomy Theatre, University New Buildings, Teviot Place, Edinburgh, 5 p.m., Professor J. Walker: Foetal Dissociation Curve for Oxygen. **HYPONOTHERAPY GROUP.**—At Royal Society of Medicine, 8 p.m., Dr. Peter Scott: Crime and Adolescence. **INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.**—At Chelsea Hospital for Women, 4.30 p.m., Guest Lecture by Mr. D. M. Stern: Abnormal Uterine Haemorrhage. **LIVERPOOL MEDICAL INSTITUTION.**—8 p.m., Hugh Owen Thomas Memorial Lecture by Mr. H. Jackson Burrows: Prosthetic Replacement of Bone. **MANCHESTER MEDICAL SOCIETY: SECTION OF ANAESTHETICS.**—At Staff House, Manchester University, 7.45 for 8 p.m., Presidential Address by Dr. A. J. Gray: On Veins and Needles. **NEW HEALTH SOCIETY.**—At Board Room, Y.W.C.A. Central Club, Great Russell Street, London, W.C.1, 3 p.m., Mr. T. T. Stamm: Foot Troubles. **ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.**—At Liverpool School of Tropical Medicine, 7.30 p.m., laboratory meeting. **ST. ANDREWS UNIVERSITY.**—At Physiology Department Lecture Theatre, 5 p.m., Dr. Agnes R. Macgregor: Changing Problems of Paediatric Pathology. **ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.**—5 p.m., Dr. Maurice Partridge: postgraduate demonstration in psychiatry. **UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.**—At Physiology Theatre, Gower Street, W.C.1, 5 p.m., Dr. E. M. Shooter: Configuration of Proteins in Solution.

Friday, November 21

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 5 p.m., 4th Crookshank Lecture by Lord Cohen of Birkenhead: Contribution of X-rays to the Basic Medical Sciences. **INSTITUTE OF DERMATOLOGY.**—5.30 p.m., Dr. D. I. Williams: clinical demonstration. **INSTITUTE OF DISEASES OF THE CHEST.**—5 p.m., Mr. J. R. Belcher and Dr. E. H. Hudson: clinical demonstration. **INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.**—(1) 3.30 p.m., clinical discussion for general practitioners by Mr. Maxwell Ellis: Malignant Diseases of the Pharynx. (2) 5.30 p.m., demonstration of films by Dr. T. V. L. Crichtlow. **INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.**—At Queen Charlotte's Hospital 2 p.m., Guest Lecture by Mr. D. McKay Hart: Virus Diseases *Complicating Pregnancy. **LEICESTER CHRISTIAN MEDICAL ASSOCIATION.**—At Leicester Royal Infirmary, 8.45 p.m., Dr. Robina A. Taylor (Ghana): Racial Problems in Medical Practice. **MIDLAND CENTRE FOR NEUROSURGERY, HOLLY LANE, SMETHWICK.**—8 p.m., Sir Russell Brain: Endocrine Exophthalmos. **POSTGRADUATE MEDICAL SCHOOL OF LONDON.**—10 a.m., Guest Lecture by Mr. T. Holmes Sellers: Diagnosis and Treatment of Atrial Septal Defects.

Saturday, November 22

SCOTTISH OTOLARYNGOLOGICAL SOCIETY.—At Royal Infirmary, Dundee, 2 p.m., 77th meeting.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Naylor.—On October 28, 1958, at Ann Arbor, Michigan, U.S.A., to Paz Buenaventura (formerly Dominado) and Bernard Naylor, a son—Patrick John. **Winter.**—On October 18, 1958, to Dr. Margery Joan, wife of Dr. David Winter, 292, Hagley Road, Birmingham, a daughter—Sarah Elizabeth.

DEATHS

Cohen.—On October 23, 1958, at 35, Bath Hill Court, Bournemouth, Jack Cohen, L.R.C.P.&S.I., of Southport. **Coulson.**—On October 21, 1958, at a nursing-home, James Edmund Coulson, M.R.C.S., L.R.C.P., aged 92. **Galloway.**—On October 20, 1958, at Castle Street, Banff, John Charles Galloway, M.D., D.P.H., aged 82. **Hay.**—On October 19, 1958, at Stoneham, The Mall, Brading, Isle of Wight, Arthur Edgar Hay, M.R.C.S., L.R.C.P., aged 80. **Hughes.**—On October 19, 1958, at 20, Broomfield Lane, Hale, Cheshire, Thomas Martin Hughes, M.R.C.S., L.R.C.P., L.D.S.R.C.S., aged 80. **James.**—On October 15, 1958, at Gateacre Grange, Liverpool, Dorothy Mary James, M.D., D.P.H., aged 54. **Jenner.**—On October 22, 1958, Cyril William Jenner, L.M.S.S.A., of Mortimers, Manningsford Bohune, Wilts, late of Cherrimans, Shottermill, Haslemere, Surrey. **Knight.**—On October 19, 1958, at 162, Willesden Lane, London, N.W.1, Stephen John Knight, M.R.C.S., L.R.C.P. **Macdonald.**—On October 21, 1958, at Harpenden Memorial Hospital, Herts, William George Macdonald, M.B., Ch.B. (1908). **Thomas.**—On October 20, 1958, Arthur Henry Thomas, M.B.E., M.B., Ch.B., aged 84. **Todd.**—On October 20, 1958, Arthur Theodore Todd, O.B.E., M.B., Ch.B., of Upton Cheyne, Bilton, near Bristol. **Wilson.**—On October 21, 1958, John Stephen Herbert Wilson, M.R.C.S., L.R.C.P., of Old Forge House, Hatfield Broad Oak, Bishop's Stortford, Herts.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Haemorrhage from Anticoagulants

Q.—What is the treatment for haemorrhage in patients who are on phenindione or similar anticoagulants?

A.—Patients on prolonged anticoagulant treatment at home should carry two capsules of vitamin K₁ and take these with a drink of fruit juice immediately any bleeding is noticed. They should also carry an ampoule of vitamin K₁ for a doctor to inject if necessary. In addition, the patient must be instructed to stop taking the anticoagulant completely until he has a medical check-up and a blood test. The treatment is the accepted one and is preferable to blood transfusion, which may give rise to the production of undesirable circulating antibodies. Blood transfusion should be used only to replace blood loss when haemorrhage has been very severe. The sudden withdrawal of anticoagulant treatment and the rapid return of prothrombin levels to normal may, in certain cases, precipitate coronary thrombosis, but the dangers of this are negligible when measured against those of haemorrhage. Haemorrhage occurs only when the prothrombin levels are below 12% of normal, while anticoagulant action is still partly efficacious at 40% level. There is, therefore, usually time to assess the patient's condition before the danger level for thrombosis has been reached, and anticoagulant therapy may rapidly be restarted if bleeding has stopped.

Treatment of Anthrax, Botulism, and Snake-bite

Q.—Where may emergency supplies of therapeutic and prophylactic agents for anthrax, botulism, and snake-bite be obtained in England and Wales?

A.—A memorandum (H.M.(58)66) issued by the Ministry of Health in August lists the following centres as holding supplies of these agents. A 24-hour service is maintained at each centre.

Region 1: Newcastle.—The Pathological Laboratory, Cumberland Infirmary, Carlisle (anthrax antiserum and snake-bite antivenom only) (Carlisle 22332); The Dispensary, Newcastle General Hospital (Newcastle 38811).

Region 2: Leeds.—Castle Hill Hospital, Cottingham, Hull (Cottingham 47371); Seacroft Hospital, York Road, Leeds (Leeds 648164).

Region 3: Sheffield.—Nottingham City Hospital, Hucknall Road, Nottingham (Nottingham 63361).

Region 4: East Anglia.—Regional Transfusion Centre, Brooklands Avenue, Cambridge, Monday-Friday, 8.30 a.m.-5.30 p.m. and Saturday, 8.30 a.m.-12.30 p.m. (Cambridge 56912); all other times Cambridge 56913.

Region 5: North-west Metropolitan.—Edgware General Hospital (Edgware 2381).

Region 6: North-east Metropolitan.—North Middlesex Hospital, N.18: Day—Chief Pathologist, Night—Resident Pathologist (Edmonton 3071).

Region 7: South-east Metropolitan.—South London Transfusion Centre, South-east Sub-depot, David Salomon House, Southborough, near Tonbridge: day service (Southborough 1480); night service (Maidstone 4463 and 4660).

Region 8: South-west Metropolitan.—South London Transfusion Centre, Stanley Road, Sutton, Surrey (Vigilant 8221); Royal Portsmouth Hospital, Commercial Road, Portsmouth (snake-bite antivenom only) (Portsmouth 22281); *The Dispensary, Royal South Hants and Southampton Hospital (botulinus antitoxin and snake-bite antivenom only) (Southampton 26211); Royal Victoria Hospital, Shelley Road, Bournemouth (snake-bite antivenom only) (Boscombe 35201).

* This hospital carries snake-bite antivenom not only against native snakes but against tropical snakes which may be imported with cargoes arriving at the docks.

Region 9: Oxford.—Northampton General Hospital (Northampton 4680); Royal Berkshire Hospital, Reading (Reading 81721).

Region 10: South-western.—Ham Green Hospital, Bristol (Pill 2165); Pathological Department, Royal Devon and Exeter Hospital, Exeter (Exeter 73519; Exeter 72261 when laboratory closed); Scott Isolation Hospital, Plymouth (Plymouth 64311 and 61437); Pathological Department, Royal Cornwall Infirmary, Truro (Truro 3029).

Region 11: Wales.—Cardiff Isolation Hospital, Cardiff (Cardiff 21466); West Wales General Hospital, Glangwili, Carmarthen (botulinus antitoxin and snake-bite antivenom only) (Carmarthen 6733); Aberystwyth General Hospital (botulinus antitoxin and snake-bite antivenom only) (Aberystwyth 374); Caernarvon and Anglesey General Hospital, Bangor (botulinus antitoxin and snake-bite antivenom only) (Bangor 3321-5); Maelor General Hospital, Wrexham (Wrexham 3512).

Region 12: Birmingham.—The Dispensary, Selly Oak Hospital, Birmingham (Selly Oak 1361).

Region 13: Manchester.—The Dispensary, Manchester Royal Infirmary (Ardwick 3300).

Region 14: Liverpool.—Fazakerley Hospital, Longmoor Lane, Liverpool, 9 (Aintree 2342).

Anthrax antiserum for use prophylactically

Antiserum required for persons exposed to infection may also be obtained in 10-ml. containers during the day-time from the following centres:

Region 1: Newcastle.—Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle, 4 (Newcastle 38811).

Region 2: Public Health Laboratory, 16/18, Edmund Street, Bradford, 5 (Bradford 24314); Public Health Laboratory, 184, High Street, Kingston-upon-Hull (Hull Central 35371).

Region 5: North-west Metropolitan.—Central Public Health Laboratory, Colindale Avenue, London, N.W.9 (Colindale 7041).

Region 9: Oxford.—Public Health Laboratory, General Hospital, Northampton (Northampton 347).

Region 10: South-western.—Public Health Laboratory, Musgrove Park Hospital, Taunton (Taunton 5753).

Region 11: Wales.—Public Health Laboratory, Institute of Preventive Medicine, The Parade, Cardiff (Cardiff 29110 and 23967).

Region 12: Birmingham.—Public Health Laboratory, Royal Infirmary, Worcester (Worcester 5238/9).

Region 14: Liverpool, Public Health.—Laboratory, 126, Mount Pleasant, Liverpool (Royal 3636).

Pregnancy and Hodgkin's Disease

Q.—What is the effect of pregnancy on Hodgkin's disease and on leukaemia?

A.—There is no evidence that pregnancy has any adverse or beneficial effect upon the course of either Hodgkin's disease or leukaemia. 306 pregnancies occurring in 229 patients with Hodgkin's disease have been reported in the literature. Myles¹ analysed all the reported cases and showed that the relapse rate was no greater than that expected over a nine-month period in non-pregnant patients. Southam *et al.*² concluded from their own series that pregnancy probably does not alter the course of Hodgkin's disease. However, disease first manifest during a pregnancy tends to be more acute.

Sheehy³ reviewed the course of chronic granulocytic leukaemia in 94 patients in whom an associated pregnancy had been reported. He found no significant difference in survival from a similar group without pregnancies. Yahia, Hyman, and Phillips⁴ analysed 73 cases of acute leukaemia associated with pregnancy. Abortion or premature labour were common, but the course of the disease was not apparently affected. Very few cases of pregnancy occurring during the course of chronic lymphocytic leukaemia have been reported, probably because the age of onset of this type of leukaemia is most commonly post-menopausal and because the disease is in any case less common in women.

REFERENCES

- 1 Myles, T. J. M., *J. Obstet. Gynaec. Brit. Emp.*, 1955, 62, 884.
- 2 Southam, C. M., Diamond, H. D., and Craver, L. F., *Cancer*, 1956, 9, 1141.
- 3 Sheehy, T. W., *Amer. J. Obstet. Gynec.*, 1958, 75, 788.
- 4 Yahia, C., Hyman, G. A., and Phillips, L. I., *Obstet. gynec. Surv.*, 1958, 13, 1.

NOTES AND COMMENTS

Mortality from Whooping-cough.—Dr. PAUL DE BELLEFEUILLE (Ottawa, Ontario, Canada) writes: Many paediatricians will differ with the answer on mortality from whooping-cough ("Any Questions?" August 30, p. 574) on the matter of treatment. In the convulsant child "lumbar puncture is certainly useless." Perhaps, but I have seen protracted convulsing cease immediately upon relieving pressure thus. In the answer antibiotics are advised only in the treatment of secondary infection; in fact, whooping-cough itself, especially when seen fairly early, responds well to streptomycin, the tetracyclines, and chloramphenicol (the latter is perhaps preferred), and such therapy should not be withheld from the infant whooper. But even more important is serum therapy, using either human hyperimmune serum or rabbit hyperimmune serum, whereby death in infancy and troublesome bronchial disability in the future may be avoided. The last statement in the answer, on the uselessness of vaccine therapy once an attack has developed, should be modified by adding that an injection of vaccine to a child who has previously been vaccinated will have an early "booster" effect and help the child in fighting the infection.

OUR EXPERT replies: In a carefully controlled trial, conducted by the Medical Research Council,¹ chloramphenicol and chlortetracycline were both shown to have a slight beneficial effect in whooping-cough provided they were given in the first eight days of the disease—i.e., often before the whoop had developed. After this stage they were shown to have no effect and they should therefore not be given as a routine to children suffering from whooping-cough. They are perhaps best used in contacts of obvious cases when the disease can be suspected in the pre-whooping stage. The pathology underlying the severe type of convulsions is complex and the cerebrospinal fluid pressure is not always raised. Convulsions which clear up following a lumbar puncture can scarcely be due to the severe brain damage, which often causes coma lasting for weeks, if not death: probably every patient has a lumbar puncture carried out by a house officer, but the writer bases his opinion of its uselessness on over 20 years' experience of such cases. It would be difficult to prove that hyperimmune serum prevents death or future pulmonary disability without a control trial on a vast scale, for, after all, death is a comparative rarity in whooping-cough and future pulmonary disability very difficult to assess. Results from small published trials seemed to indicate that it might have some effect given early in young infants, but its effect was probably less conclusive than the effect of antibiotics already mentioned. With regard to the use of a booster dose of vaccine to children already immunized, surely the natural infection with live *H. pertussis* provided by an attack of the disease would be at least as potent a booster as an injection of dead vaccine. A large number of doubtful remedies for whooping-cough have been tried over the years with varying degrees of enthusiasm. I tried in my answer to give realistic suggestions for the prevention and treatment of the causes of mortality from the disease.

REFERENCE

¹ Medical Research Council, *Lancet*, 1953, 1, 1109.

Extra Skin Crease.—Dr. R. D. LAURENSEN (Kingston, Ontario, Canada) writes: Congenital dislocation of the hip is once more being discussed (*Journal*, June 14, p. 1432; July 5, p. 58; September 20, pp. 743 and 753). Interest is centred on the early diagnosis of this condition because delay in diagnosis so frequently leaves a tragic aftermath. It so happens that I have just completed a review of the literature on this subject in order to establish a background for further investigations into its aetiology. As a result of my findings, I consider the reply by your expert to the comment of Mr. H. H. Nixon ("Notes and Comments," September 20, p. 753) to be worth more than just a corner of a page. Your expert states: "Abnormal skin creases and limited abduction are in themselves not infallible but are certainly most suspicious." Exactly so. They are the very signs which may encourage a doctor to seek the guidance of an experienced orthopaedic surgeon. From my recent studies I am certain that to cast away any sign which may lead to an early diagnosis of congenital dislocation of the hip would be sheer folly.

Mr. H. H. NIXON (London, W.1) writes: I would like to take up a few points arising from your expert's reply to my letter ("Notes and Comments," September 20, p. 753). I agree wholeheartedly that everything possible should be done to diagnose congenital dislocation of the hip as early as possible. I still maintain that asymmetry of skin creases is an unsuitable test and that limitation of abduction is more suitable. The two cases your expert mentions from Caffey's paper¹ did indeed have normal

abduction at first and yet subluxated later. He did not mention that they also had asymmetric skin creases so that neither test would have discovered them. I am not surprised at this, because his radiographs show that the subluxation was not present either. When it developed so did its physical signs. Early tests can be expected only to diagnose congenital dislocations. Post-natal dislocation will still need to be sought later. The relative frequency of these types is not yet known. Nor is there any reliable criterion of "dysplasia" or the inherited potential dislocation. Regarding the 44.2% of babies with limitation of abduction in Caffey's figures, it should be noted that most of them were slight limitations and that only 8.2% had limitation to 60% and only 3.8% had unequal limitation. In my experience the limitation in cases of congenital dislocation has been marked. It has been my practice to have x-rays of all such cases. In milder degrees of limitation the mother has been shown abduction exercises and the child seen again in three months. If the condition is simply what Denis Browne calls an asymmetric pelvis then abduction will have become freer. If it were a dislocation then persistence of the limitation would lead to an x-ray which would reveal it without undue loss of time. In fact, none of these milder asymmetries has yet proved to have a dislocation. Dr. E. Loewenstein-Kuester's letter (*Journal*, September 20, p. 743) reminds us how important this condition is. My anxiety is that enthusiasm may lead to a spate of unnecessary (and not necessarily harmless) pelvic radiography, and even unnecessary treatment of alleged "preluxations."

REFERENCE

¹ Caffey, J., Ames, R., Silverman, W. A., Ryder, C. T., and Hough, G. *Pediatrics*, 1956, 17, 632.

OUR EXPERT replies: The further comments of Mr. Nixon and of Dr. Laurenson are of interest. It is appreciated that there are difficulties, but, like Dr. Laurenson, I feel that the occasional abnormal skin crease is an indication for examination, and if necessary radiology, to avoid the tragedy of late diagnosis of congenital dislocation of the hip.

Corrections.—Dr. M. J. TARSH writes: My attention has been drawn to certain historical inaccuracies in my summary of the background of the Hebrew University Medical School (*Journal*, September 6, p. 605). The British Mandate in fact ended on May 14, 1948, and not in 1947. Mr. Ben Gurion declared the existence of the State of Israel on the next day. The "year of intermittent fighting" that I mentioned took place immediately from this date and is usually referred to as "The War of Liberation." The combined Arab attack to which I referred started also on May 15, 1948. Mount Scopus was and still is an area of great strategic importance.

There was a mistake in Figure 1 in the article entitled "The Physiological Activity of D-Thyroxine" by Dr. Raymond Greene and Miss Helen E. A. Farran (November 1, p. 1057): under "Dosage," in the bottom right-hand corner of the figure, the squares denoting L-thyroxine and D-thyroxine should be transposed.

In the article "Rationale of Antihistaminic Therapy in Thermal Injury," by Drs. D. L. Wilhelm and Miss Brenda Mason (*Journal*, November 8, p. 1141), line 31 of the first column on page 1142 should read "... was graded $\pm$, $\pm$, $\pm$, $\pm$, $\pm$, $\pm$," and the last line of the first column on page 1142 should read "... as little as 10 μ g./kg. to $\pm$ (Fig. 1)."

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 29 1958

PNEUMONIA COMPLICATING ASIAN INFLUENZA

BY

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The epidemic of influenza which later became known as "Asian flu" apparently originated in China in February, 1957, and its causative organism, a new variant of influenza virus A, was first identified in cases which occurred in Hong Kong in April, 1957 (Meyer, Hilleman, Miesse, Crawford and Bankhead, 1957). The epidemic spread rapidly across Asia and Europe, and appeared sporadically in Britain during the summer months. The first wave of infection occurred in Yorkshire; it spread almost immediately to the North and more slowly to the South, the North having the more severe experience (Martin, 1958). Local outbreaks developed in many places in the latter half of August, but October was the peak month, and the infection had virtually disappeared by the end of November.

Asian influenza attacked an estimated twelve million people in Britain, and was directly or indirectly responsible for about 16,000 deaths, two-thirds of the fatalities being in persons over the age of 55 (W.H.O. Weekly Epidemiological Record, 1958). The mortality rate was not exceptional, possibly owing in part to the outbreak having passed its peak before the usual minor respiratory infections and winter ailments had become widespread. The incidence of pulmonary complications, principally pneumonia, was also low, figures for general practices being 3.5% of 750 (Fry and Hume, 1957) and 5% of 542 (Edmundson and Hodgkin, 1957), and amongst R.A.F. recruits 5% of 391 (Gilroy, 1957); it increased steadily as the epidemic progressed (Cantor, 1957; Gilroy, 1957). No accurate figures are available to indicate the frequency of pneumonia amongst emergency hospital admissions for Asian flu, but it is unlikely to have been much in excess of one-half, at least so far as London hospitals were concerned: this was also the experience of Walker, Douglas, Leckie, Pines, and Grant (1958) in Edinburgh.

Early in the epidemic it became evident that no single hospital was likely to have sufficient clinical material for a comprehensive study of the various pulmonary complications. Also, with much interest attaching to the significance of superinfection by *Staphylococcus aureus*, a special investigation of staphylococcal pneumonia would necessitate the inclusion of a large number of hospitals.

Material

Two surveys were devised—one to examine the general pattern of all influenzal pneumonias admitted to a group

of hospitals, and the other to assess the clinical significance of secondary invasion by *Staph. aureus* by collecting instances of staphylococcal pneumonia from a wide range of hospitals. The following comprised the material.

1. The clinical, radiological, and pathological records of all cases of pneumonia occurring in the ten London undergraduate teaching hospitals during the autumn of 1957. Firm clinical evidence of influenza was required in each case, together with radiological or pathological proof of pneumonia, except in a very few in which the clinical evidence appeared to be unquestionable. Many doubtful cases were discarded, including some with probable pneumonia which were not x-rayed at the height of the disease. A total of 165 cases satisfied these criteria, of which 20 (12%) were regarded as instances of staphylococcal pneumonia. The design of the survey was such that viral identification could not be insisted upon.

2. The clinical, radiological, and pathological records of cases of staphylococcal pneumonia admitted to hospitals in the London area, mainly in the North-east Metropolitan Region (93), the Royal Navy (8) the Army (13), and the Royal Air Force (21), making 135 cases altogether, during the autumn of 1957. The criteria of influenza were the same as for the teaching hospitals.

Comparison between Staphylococcal and non-Staphylococcal Pneumonia

In order to compare staphylococcal and non-staphylococcal pneumonia, the 20 staphylococcal cases have been extracted from the teaching hospital series and added to those from non-teaching hospitals, so that the comparison is between 145 non-staphylococcal pneumonias from teaching hospitals and 155 staphylococcal pneumonias from all sources.

The serious consequences of secondary infection by *Staph. aureus*, particularly in children and young adults, are amply confirmed by this investigation. Table 1 shows the mortality rates by age and sex in the two groups. The high proportion aged 15-34 in the staphylococcal group is partly accounted for by the inclusion of Service patients. The most striking feature is that for staphylococcal pneumonia age had no effect upon mortality, whilst for non-staphylococcal pneumonia almost all the deaths were in the oldest age group.

TABLE I.—Mortality in Relation to Age and Sex

	Total	Age (Years)				Sex	
		0-14	15-34	35-54	55-	Male	Female
Staphylococcal pneumonia	No. . . 155 Deaths 44 % . . 28	10 3 30	74 19 26	28 8 29	43 14 33	98 25 26	57 19 33
Non-staphylococcal pneumonia	No. . . 145 Deaths 18 % . . 12	10 — —	38 1 3	35 1 3	62 16 26	86 11 13	59 7 12

An attempt was made to grade the severity of the infection in each case into mild, moderate, or severe. Although complete accuracy was not possible, mainly because of difficulties in definition, consideration of the various clinical aspects and their responses to treatment resulted in the allocation of individual cases to one or other of the three categories with reasonable confidence. Table II shows the distribution. In the staphylococcal

TABLE II.—Severity of Infection in Staphylococcal and Non-staphylococcal Pneumonia Complicating Asian Influenza

	Mild	Moderate	Severe
Staphylococcal pneumonia	19	65	71
Non-staphylococcal pneumonia	42	69	34

group, 71 (46%) of the patients were severely ill, compared with 34 (23%) of those with non-staphylococcal pneumonia, many of whom were elderly and had associated chronic bronchitis or cardiac disease.

In a review of the various clinical features the staphylococcal series consistently showed the severer reaction. The median duration of symptoms before admission was five days for the patient with staphylococcal pneumonia and four days for the others; 18% of each group had symptoms for less than two days, and their mortality was higher than those with longer histories. The median duration of stay in hospital of the survivors in the staphylococcal group was 26 days, compared with 16 days for the others. Only 12 of the staphylococcal patients were in hospital for less than a fortnight, compared with 50 of the others. Part of this difference is accounted for by the long stay of the Service patients; of the 42 with staphylococcal pneumonia, 25 were in hospital for four weeks or more, but, even excluding these, the median for the remainder was 24 days.

Examination of temperature charts showed that deaths occurred in patients with maximum recorded temperatures ranging from 99° F. (37.2° C.) to over 105° F. (40.6° C.), and that a high temperature by itself did not carry a poor prognosis. However, the median duration of fever in the survivors was twice as long in the staphylococcal group (eight compared with four days), as was the duration of a temperature above 100° F. (37.8° C.) (four compared with two days); 32% of the staphylococcal and 4% of the non-staphylococcal patients had a temperature of 100° F. (37.8° C.) or over for more than a week. In assessing the total length of fever, some account must be taken of the four to five days' duration of symptoms before admission, which, so far as could be determined from the notes, was usually a febrile period. Hence the total duration of fever in the survivors was probably of the order of two weeks for the staphylococcal cases and eight days for the others.

There was a sharp difference in the radiological features in the two groups (Table III). In the staphylococcal pneumonias 37% of all patients had three or

more zones involved, compared with 19% for the others. In each group mortality increased sharply with the number of zones affected. Although no radiographs were taken of almost half the patients who died, necropsy proof of extensive pulmonary involvement was almost invariable when this examination was performed. The excess of lung abscesses in the staphylococcal series is to be expected.

TABLE III.—Radiology at Height of Disease

	Total	No. of Zones Involved				Abscess	No Radiograph Taken
		1	2	3	4 or More		
Staphylococcal pneumonia	No. . . 155 Deaths 44 %.. 28	27 2 7	44 4 9	27 4 15	30 11 37	21 — —	27 23 85
Non-staphylococcal pneumonia	No. . . 145 Deaths 18 %.. 12	65 — —	38 4 11	16 3 19	12 6 50	2 — —	14 5 36

These findings amply confirm the virulent nature of staphylococcal pneumonia complicating Asian influenza. Compared with non-staphylococcal pneumonia, it caused a severer and longer illness, with a higher and more prolonged fever, radiological evidence of more extensive pulmonary involvement, and, most important of all, a high mortality in children and young adults.

Pathological Aspects

Bacteriology

Table IV shows the principal pathogenic bacteria which were isolated from sputum. In the staphylococcal series, *Str. pneumoniae* and *H. influenzae* were found on a few

TABLE IV.—Principal Pathogenic Bacteria in Sputum

	Cases	Organisms*						Not Tested
		<i>Staph. aureus</i>	<i>Str. pneumoniae</i>	<i>Strep. pyogenes</i>	<i>H. influenzae</i>	<i>Kleb. friedländeri</i>	Non-pathogens	
Staphylococcal pneumonia	155	151	7	—	6	—	—	4
Non-staphylococcal pneumonia	145	—	24	2	23	2	74	30

* More than one organism was cultured from several cases in both series. Of the four cases in the first series in which the sputum was not tested the diagnosis was made in one from a blood culture and in three at necropsy.

occasions. Whether *H. influenzae* should be regarded as a pathogen in this context is not clear; certainly it is capable of producing pneumonia, but the evidence that it does so very often is uncertain. In the non-staphylococcal group, almost exactly one-half yielded no pathogens, and a further 21% either had no sputum or did not have it examined; of the remainder *Str. pneumoniae* and *H. influenzae* occurred with equal frequency (16 and 17% respectively), and *Str. pyogenes* and *Kleb. friedländeri* were found on two occasions each.

Antibacterial Therapy

Table V shows the frequency with which the various antibacterial drugs were used. In the non-staphylococcal series, penicillin was administered to no less than 74% of the patients and one or other of the tetracycline group to 32%. Most of the patients had an illness of only mild or moderate severity, and a single drug sufficed to effect a cure in most of these. Indeed, 60% of patients had only one antibacterial drug. The other remedies, such as streptomycin and chloramphenicol, were usually reserved for severe infections and were given either in conjunction with the first choice or after it had failed.

In the staphylococcal series, the pattern of chemotherapy was rather different. Although penicillin (76%) and the

TABLE V.—Number of Patients Treated with Various Drugs

	No. of Patients Treated	
	Non-staphylococcal	Staphylococcal
Sulphonamides	16	12
Penicillin	108	118
Tetracycline	47	76
Chloramphenicol	13	25
Streptomycin	20	37
Erythromycin	2	39
Novobiocin	—	3

tetracycline group (49%) were the most popular, erythromycin, streptomycin, and chloramphenicol were used much more frequently than in the non-staphylococcal series. Only 28% were given a single drug. The great majority had at least two of the remedies listed in Table V, and two had as many as five. These were usually given either in an effort to overcome fulminating influenza or in order to conform with the results of tests for drug sensitivity. The sensitivities of the various staphylococci are given in Table VI, according to whether they were isolated (a) within four

TABLE VI.—Sensitivities of Staphylococci Isolated from Patients with Staphylococcal Pneumonia Following Influenza

	(a) Isolated Within 4 Days of Admission			(b) Isolated More Than 4 Days After Admission			(c) Influenza Contracted in Hospital			% Resistant (b+c)
	No.	Resistant	%	No.	Resistant	%	No.	Resistant	%	
Sulphonamides	34	15	44	5	4	80	1	0	0	67
Penicillin	113	55	49	18	16	89	9	9	93	93
Streptomycin	89	11	12	17	9	53	7	6	62	62
Tetracycline	94	21	22	18	12	67	9	8	74	74
Chloramphenicol	96	6	6	16	1	6	7	1	9	9
Erythromycin	60	4	7	17	1	6	8	0	4	4

days of admission and were presumably acquired outside hospital, (b) more than four days after admission and could well have been acquired within hospital, and (c) from patients already in hospital when they contracted influenza. As might be expected, the latter groups show a considerably higher resistance rate to the more commonly used antibiotics, penicillin, streptomycin, and tetracycline, the figures being 93%, 62%, and 74% respectively, compared with 49%, 12%, and 22% of strains isolated within four days of admission. The low rate of resistance to chloramphenicol and erythromycin probably reflects the relatively restricted use of these drugs in the past. An attempt was made to correlate the *in vitro* sensitivities with therapeutic responses, but, chiefly because of the many occasions on which two or more drugs were prescribed either together or in succession, no valid conclusions could be drawn.

White Blood Cell Count

In almost all hospitals a white blood cell count was done as a routine, usually with a differential count in addition. In 26 patients the count was repeated after an interval, but the great majority had only a single observation. Table VII shows that the test was carried out in all but 40 of the

TABLE VII.—White Blood Cell Counts Within Five Days of Admission to Hospital Related to Deaths and Survivors from Severe Infections

	W.B.C.	Cases	Deaths (a)	Survivors from Severe Infections (b)	% of Deaths and Survivors from Severe Infections (a+b)
Staphylococcal pneumonia	<6,000 . . . 6,000— . . . 14,000— . . . Not known . . .	18 63 34 40	3 17 6 18	5 10 9 5	44 43 44 57
Non-staphylococcal pneumonia	<6,000 . . . 6,000— . . . 14,000— . . . Not known . . .	34 71 23 17	5 5 1 7	3 9 5 2	24 20 26 53

155 staphylococcal patients and all but 17 of the 145 non-staphylococcal patients. In both groups counts were omitted in several patients who died shortly after admission. The findings strongly suggest that no relationship exists between a white cell count taken within five days of admission and either the severity of the illness or the mortality. Despite the theoretical argument that it might help to differentiate a predominantly viral infection from one with secondary invasion by a pyogenic organism, this examination, at least so far as pneumonia complicating influenza is concerned, seems to provide little information of value, and the rarity of serial counts confirms this view.

Clinical Aspects

Although the majority of patients overcame their infections without causing undue alarm, many had features which are associated with a grave prognosis, such as mental changes, prostration, pallor, cyanosis, and excessive dyspnoea. In a number of instances the influenza was superimposed upon other diseases—for example, chronic bronchitis and cardiovascular disorders. In order to enlarge the experience of these more formidable aspects, a further 79 cases of non-staphylococcal pneumonia have been added to the staphylococcal and non-staphylococcal groups compared above, making 379 cases altogether. The further 79 cases were from non-teaching hospitals; some were thought originally to be instances of staphylococcal pneumonia, the others were from hospitals which supplied non-staphylococcal in addition to staphylococcal material. They were to some extent a selected group with severe infections, and so could not be included in the foregoing comparison between staphylococcal and non-staphylococcal pneumonias.

Previous History

Chronic Bronchitis and Emphysema.—A previous history of chronic bronchitis was noted in 84 patients, and of these 25 (30%) died. The great majority were over the age of 55, and this mortality is similar to the overall rate within this age range. Almost certainly more would have died if the epidemic had reached its height in the winter months, but some credit must be given to their medical attendants, principally general practitioners, for instituting early and effective treatment in this vulnerable group. The pattern of infection did not differ appreciably from that in non-bronchitics, but any tendency to asthma or bronchospasm exaggerated the degree of dyspnoea.

Ischaemic heart disease was present in 11 patients, of whom six died, and hypertensive heart disease in six, with two deaths. Cardiac failure contributed to a fatal outcome in several of these.

Several authors have been impressed by the seriousness of Asian influenza in patients with *chronic rheumatic carditis*, particularly mitral stenosis. Reid (1957) saw nine such patients with two deaths, and Govan and Macdonald (1957) had experience of nine patients who were also pregnant, of whom four died. Hers, Goslings, Masurel, and Mulder (1957) found 10 rheumatic hearts in 252 necropsies, and Giles and Shuttleworth (1957) seven in 46 necropsies; Roberts (1957), examining 12 cases of fatal fulminating influenza, noted mitral stenosis in three. In our series, eight patients had chronic rheumatic carditis (six mitral stenosis, two aortic incompetence), of whom four died. These figures are well in excess of the expected mortality, and associated rheumatic heart disease must be regarded as a serious disadvantage.

Pregnancy.—In its later stages, pregnancy certainly constitutes a hazard when influenzal pneumonia is superimposed. Of seven pregnant women in this series, two died, one having mitral stenosis in addition. The others were all very ill, and four delivered their babies at the height of the infection.

Diabetes.—Of nine diabetics, six died, four of whom were admitted in a state of coma with grossly disordered carbohydrate metabolism.

Nervous Features

Mental changes are among the most alarming features of influenzal pneumonia. They vary from confusion to delirium and coma, and were present in some degree in 15% of this series. They can be accounted for by three entirely different mechanisms—namely, by anoxia and carbon dioxide retention resulting from pre-existing chronic pulmonary disease or extensive involvement of the lungs and air passages; by "general toxæmia," in which case the adrenals may play a part; or by direct invasion of the brain by viruses or bacteria. The invasive nature of influenzal pneumonia is such that gaseous exchange in the lungs may easily become inadequate, particularly in patients with pre-existing chronic pulmonary diseases, and the resulting acute anoxia will readily contribute to mental impairment. "General Toxæmia" is discussed later in relation to fulminating influenza. Evidence of direct microbial invasion of the brain is fragmentary.

Although the existence of true influenzal encephalitis remains somewhat nebulous, the clinical features in several of the cases reported in the present outbreak have been typical of a viral encephalitis; but the organism has not been found in the brain, and the changes in the cerebrospinal fluid have been scanty or absent (Dubowitz, 1958; Smith, 1958; Dunbar, Jamieson, Langlands, and Smith, 1958). McGill and Goodbody (1958) report an instance with extensive haemorrhages in the white matter, conforming to the acute haemorrhagic leuco-encephalitis described by Crawford (1954), but Giles and Shuttleworth (1957) were unable to find any microscopical evidence of encephalitis in two patients admitted to hospital in coma and whose brains showed intense congestion and oedema. Perhaps further evidence of the possible neurotropic properties of the Asian strain will be forthcoming. The following are instances of neurological involvement in this series.

L. S., male aged 44. On admission, two days' history of cough, sputum, pleurisy, stiffness of neck, and mental confusion. Temperature 104° F. (40° C.); purulent sputum containing *H. influenzae*; radiological consolidation in three zones. Diagnosed as "meningism," the cerebrospinal fluid containing 27 cells per c.mm., 90% lymphocytes, 10% polymorphs. Treatment with penicillin and "sulphatriad" resulted in a complete clinical recovery in six days; discharged from hospital after 16 days.

A. M., male aged 17. Admitted to hospital on day of onset, with general aches, cough, and mental confusion. Temperature 103° F. (39.4° C.), scanty mucopurulent sputum containing no pathogens, radiological consolidation right base. Treated with penicillin, but fever persisted with increasing delirium leading to coma and generalized convulsions. Died on the tenth day. Post-mortem examination showed deeply congested superficial cerebral veins with slightly blood-stained fluid in both ventricles; no microscopical evidence of haemorrhage or encephalitis.

T. B., male aged 22. On admission, six days' history of increasing illness with moderate fever and delirium. Radiological consolidation of right middle and lower zones; *Staph. aureus* isolated from thin right purulent effusion on day of admission. Treated with penicillin, streptomycin, and erythromycin in full doses. Became rapidly comatose, the cerebrospinal fluid being purulent and containing 2,160 cells per c.mm., mainly polymorphs. Died on tenth day of illness. Necropsy showed extensive pneumonia of both lungs with multiple small staphylococcal abscesses. The brain contained several septic infarcts in addition to meningitis.

D. C., male aged 22. On admission, three days' history of increasing headache, dyspnoea, and mental confusion. Temperature 104° F. (40° C.); purulent sputum contained *Staph. aureus* sensitive to all drugs; patchy radiological consolidation in all zones of both lungs. Stiffness of the neck led to a diagnosis of meningism, and the cerebrospinal fluid contained 12 cells per c.mm., of which 11 were lymphocytes. Treated with penicillin, tetracycline, and chloramphenicol, he made a complete recovery in a month.

The third of these patients evidently died from septic emboli which derived from the lungs. The others had fairly firm clinical evidence of encephalitis, but pathological proof was lacking.

Amongst the minor neurological disorders, one young adult, who had a sharp attack of influenza, developed weakness and tingling of one leg which was attributed to a toxic neuritis; it resolved completely in three weeks. Another had a transient weakness of one arm.

Post-influenzal depression was noted on a number of occasions.

Fulminating Influenza

A diagnosis of fulminating influenza is often made in patients whose clinical features are alarming and in whom the degree of toxæmia is extreme. Despite the lack of a clear definition, the term is a useful one. In the 1918-19 epidemic the graver forms were referred to as "pneumonic influenza," the course of the illness being regarded as "fulminating" (French, 1920). Clearly, emphasis upon the pulmonary component to the exclusion of the state of the air passages and the degree of toxæmia is undesirable, and the somewhat non-committal term fulminating influenza is now generally used to describe the severest forms of this infection (Scadding, 1937; Stuart-Harris, 1953).

In this series 132 patients were judged to have been gravely ill, of whom 76 (58%) died. How many of these should be regarded as instances of fulminating influenza is a matter of opinion, but, so far as could be judged from the records, they all fell within the category. They had the features ordinarily associated with this diagnosis in the following proportions: prostration (55%), cyanosis (80%), pallor (12%), mental disturbance (48%), excessive dyspnoea (62%), and blood-stained sputum (36%). The figures are comparable to those from previous epidemics, and the reason for the large total is that the cases were derived from a considerable number of sources and contained a high proportion (71, or 54%) of instances of staphylococcal pneumonia.

Perhaps the outstanding qualities of fulminating influenza are the short duration of the acute illness and the severe degree of toxæmia, so that effective treatment to combat collapse must necessarily be given quickly. In addition to oxygen therapy, antibacterial drugs, and the maintenance of a clear airway, which are considered elsewhere, the possibility of steroid therapy arises, the value of which in the present epidemic has produced conflicting opinions. Plaza de los Reyes and Cruz-Coke (1957) and Rotem (1957) claim to have obtained good results; Walker *et al.* (1958) are not particularly impressed; and Gunn (1957), after observing four fatal cases treated in this way, thinks that they should not be given and suggests that they may interfere with immunity mechanisms. Librach (1957), summarizing the evidence for and against steroid therapy in acute infections, advocates caution. Before passing final judgment, three aspects need to be considered.

(a) *Evidence of Adrenal Damage.*—Macroscopic evidence of damage was rarely encountered in the present epidemic. Amongst the necropsies in this series, the state of the adrenals was recorded on 24 occasions. None showed gross changes, but the following were observed: acute congestion (2), loss of cortical lipoid (2), enlargement and tenseness (1), and a few focal haemorrhages (1). Warrack (1957) cites an instance of fulminating influenza in which the adrenals showed only a minimal amount of functional tissue, with heavy intercellular haemorrhage. Adrenal haemorrhage was noted on only eight occasions in a survey of 219 necropsies undertaken by the Public Health Laboratory Service (1958). Hence evidence of structural damage is not impressive.

(b) *Effect of Toxæmia upon the Adrenals.*—Adrenal impairment, which need not necessarily be accompanied by evidence of macroscopic or microscopic damage, may prevent the output of large quantities of hydrocortisone and thus lead to a relative failure. The acute toxæmia of fulminating influenza rarely lasts for more than a few days, so that the administration of hydrocortisone would be no more than a form of substitution therapy. Its frequent use in similar crises, such as post-operative states, suggests that it does not interfere with the processes

of inflammation and healing provided that it is used for a short time only.

(c) *Nature of Fulminating Influenza.*—The essential components are inflammation and obstruction of the airway to the lungs, pulmonary oedema, haemorrhage and pneumonia, and toxæmia. Steroid drugs can hardly be expected to relieve tracheobronchial obstruction, and their ability to restrict the spread of infection in the lungs is doubtful. Where they are most likely to succeed is in the suppression of circulatory collapse resulting from toxæmia, and this is the purpose for which they are given.

Biochemical proof of inadequate adrenal response to fulminating influenza is not so far forthcoming, and when we are faced with a desperately ill patient the results of such tests as are available cannot be awaited. Surely the best policy is to give hydrocortisone for a few days in the reasonable hope that it will be effective and the almost certain knowledge that it will do no harm.

In this series some 27 patients had steroid therapy in adequate dosage, usually 100 mg. of hydrocortisone intravenously, followed by 50 mg. 6- or 12-hourly; of these, 17 died. The relative importance of obstructed airway, loss of effective alveolar surface, and toxæmia in each case cannot be accurately assessed from the notes. Also, eight of the deaths occurred within 24 hours of admission to hospital. However, the impression is that the survivors were those with a reasonably free airway and comparatively little radiological evidence of consolidation who responded promptly to a combination of hydrocortisone and antibiotics.

The following case illustrates the difficulties of clinical assessment.

L. S., female aged 16. Influenza started with a cough, sore throat, and left pleuritic pain. She remained at home, feeling reasonably well with a mild fever, until the fifth day, when she was admitted to hospital with a few hours' history of increasing illness and delirium. On examination she was prostrate, pale, and semicomatose. She had a tachycardia and a temperature of 104° F. (40° C.). Her breathing was unembarrassed, she had no sputum, and there were signs of bronchitis in her lungs; a radiograph of her chest showed patchy consolidation at the left base. Within an hour of admission she had 50 mg. of hydrocortisone and 250 mg. of erythromycin intravenously, and 20 ml. of anti-staphylococcal gamma-globulin. After four hours she was much improved, and at the end of 24 hours she seemed to have fully recovered. Erythromycin was continued, by mouth, for a further two days, and she was discharged from hospital perfectly well after 16 days.

Obstructed Air-passages

In the early stages of influenza the brunt of the infection often falls upon the epithelium of the trachea and bronchi. The inflammatory reaction may be severe enough to cause obstruction to airflow, with consequent stridor and indrawing of the soft tissues of the neck during inspiration; if unrelieved, it can by itself lead to a fatal outcome. On reaching the lungs the infection characteristically passes through the phase of oedema and haemorrhage before frank consolidation develops. Hence, from the therapeutic standpoint, the need to relieve respiratory obstruction occasionally overshadows all other measures, and this particularly applies in fulminating influenza.

Tracheobronchial intubation serves the dual purpose of enlargement of the airway by the removal of debris, usually at the expense of damage to the acutely inflamed respiratory epithelium, and the aspiration of inflammatory products and oedema which derive from the lungs; these latter may not amount to more than an ounce or two at a single aspiration, but their removal often gives considerable symptomatic relief. Therefore, adequate clinical and, if possible, radiological assessment must be made before intubation in order to determine so far as is possible the extent both of the obstruction to airflow and of the pulmonary oedema.

Bronchoscopy, perhaps because it is the commoner procedure, can often be performed more quickly and easily than tracheotomy. It has the advantage that the larger bronchi can be aspirated under direct vision, but it is dis-

tressing and exhausting, and the inevitable epithelial damage is such that the instrument should not be passed more than once. Indeed, bronchoscopy should probably be reserved for acute emergencies only.

Tracheotomy, the treatment of choice in tracheobronchial intubation, is a minor procedure in the hands of experts, and enables the nursing staff to carry out repeated suction by catheterization.

Despite the theoretical objections of some authors (Sheldon, 1957), intubation was regarded as a life-saving procedure in the present epidemic by the majority (Anderson and Niblock, 1957; Rawlins, 1957; Walker *et al.*, 1958). Almost certainly it should have been performed earlier and more frequently. In this series bronchoscopy was carried out three times (no deaths) and tracheotomy six times (three deaths). Several other patients had clinical evidence of a stridor, which usually resolved with antibiotic therapy; but a very large number had extensive pulmonary oedema, and upon them aspiration was not attempted.

L. P., female aged 9. Admitted with two days' history of increasing dyspnoea, sore throat, and vomiting. On examination temperature 104° F. (40° C.), extreme dyspnoea, cyanosis, stridor, and sucking in of soft tissues of the neck during inspiration. Lung fields radiologically clear; purulent sputum contained scanty *Staph. aureus*. Dramatic recovery in four days with antibiotics, tracheotomy, and repeated tracheobronchial aspiration.

D. P., female aged 8. Admitted with two days' history of general aches, rigor, and increasing dyspnoea. On examination temperature 104° F. (40° C.), she was collapsed, cyanosed, and breathless with stridor. Extensive confluent radiological opacities in all zones of the right lung. Purulent sputum contained *Staph. aureus*. Failed to respond to tetracycline and erythromycin, becoming increasingly breathless, and died on the sixth day of her illness. No bronchoscopy or tracheotomy. Necropsy showed that the whole of the trachea and main bronchi were filled with thick tenacious yellowish-brown mucopus. The lungs showed extensive haemorrhagic oedema and bronchopneumonia with multiple small abscesses.

Lung Abscess

Radiology cannot reflect the true incidence of abscess formation in the acute stages, because the ring shadows are often obliterated by surrounding pneumonia and oedema. This was frequently seen when comparing radiographs with necropsy specimens, and applied particularly to the smaller abscesses which occur so commonly in acute staphylococcal pneumonia. However, radiological cavitation was observed on 25 occasions—staphylococcal 21 (14%), others 4 (2%). There were no deaths in this group, principally because they could not be diagnosed in the acute stage.

In the staphylococcal series, several of the large lung abscesses were diagnosed two weeks or more after the onset of influenza in patients who felt that they had more or less recovered from their infections but who were troubled by excessive purulent sputum. Most of the abscesses responded rapidly to antibiotic therapy. During the short period of observation available, 13 resolved completely, 5 became hairline cysts of which 2 persisted, 2 continued as thin-walled cavity systems, and 1 remained a rather thick-walled cavity after two months. The four lung abscesses in patients from whom *Staph. aureus* was not isolated resolved with treatment; staphylococci might well have been found in these if they had been looked for earlier and more thoroughly.

Pleural Effusion

Pleural effusions occurred in 24 patients: staphylococcal 18 (12%), and others 6 (3%). For the most part they were small and serous, and resolved without treatment or following simple aspiration. There were four empyemata, three of which were successfully treated by aspiration and the instillation of penicillin. The fourth was a classical example of an acute staphylococcal lung abscess which ruptured into the pleural cavity and produced a pyopneumothorax. Aspiration was followed by pleural decortication and a full recovery.

Cardiovascular Complications

Acute myocarditis may have been the precipitating cause of death in a few cases of fulminating influenza, probably resulting more from the general toxæmia than from any specific effect of the virus upon the myocardium. Giles and Shuttleworth (1957), in a series of 46 post-mortem examinations, frequently encountered cardiac enlargement for which there seemed to be no adequate explanation, and myocardial oedema was in their opinion the most constant microscopical finding. The following are instances of myocardial involvement.

P. M., female aged 19. Admitted to hospital with one day's history of general aches, lassitude, cough, and pleuritic pain. During the next six days her condition gave rise to no anxiety, her temperature did not exceed 100° F. (37.8° C.), and a radiograph of her chest after four days showed no abnormality. Her scanty sputum was not examined. On the seventh day of her illness she rapidly became worse, with delirium leading to coma, and died on the eighth day, despite large doses of penicillin, chloramphenicol, intravenous steroids, and staphylococcal antitoxin. Post-mortem examination revealed extensive pneumonia and haemorrhagic oedema of both lungs, a culture growing *Staph. albus* only. The pericardial sac contained a few ounces of clear yellow fluid, and there were a few subpericardial petechiae. The heart was dilated, weighed 251 g., and the myocardium was pale, soft, and claylike in consistency. Subendocardial haemorrhages were seen throughout the left ventricle.

P. McL., female aged 23. Admitted to hospital with seven days' history of lassitude, general aches, and pleurisy. On examination she was semicomatose, cyanosed, breathless, and had a temperature of 102° F. (38.9° C.). She was treated with intramuscular chloramphenicol and intravenous hydrocortisone, but died 30 hours later. Necropsy showed extensive bronchopneumonia and haemorrhagic oedema of the lungs with one acute abscess, measuring an inch (2.5 cm.) across. The pericardium contained 400 ml. of green purulent fluid with rough fibrin deposits. The heart was dilated, weighed 300 g., and the myocardium was creamy white, very soft, and of claylike consistency; there were a few small abscesses in the wall of the left ventricle. Coagulase-positive staphylococci and haemolytic streptococci group A were cultured from the trachea, the lungs, and the lung abscess; the streptococci were also grown from the blood and the pericardial fluid.

Embolic Phenomena.—Instances of embolic spread to sites outside the thorax were seen only in the staphylococcal series, and then only on four occasions (3%). An example of multiple cerebral infarcts has already been cited. Another patient developed several emboli of his fingers and toes, and acute arthritis of the knee. *Staph. aureus* was cultured from his blood, and he recovered completely in three weeks with appropriate antibiotics. A third patient developed a septic infarct of his foot which required incision and from which *Staph. aureus* was isolated.

J. C., male aged 23. Admitted to hospital with a history of influenza two weeks previously, from which he never fully recovered. Three days before admission he developed acute arthritis of the ankle. A radiograph of his chest showed confluent consolidation of the greater part of the left lower lobe, and his purulent sputum contained *Staph. aureus*. He responded well to antibiotics, and was discharged from hospital after three weeks with his foot in plaster.

Discussion

Every few years epidemic influenza presents its challenge to medical resources. Reports of outbreaks of Asian influenza during its passage from the Far East suggested that the pulmonary complications were few and the mortality rates low (Guthrie, Forsyth, and Montgomery, 1957; Lim, Smith, Hale, and Glass, 1957; Rowland, 1958). In Britain several problems associated with the pneumonic forms were anticipated, such as the possible number of deaths in the various age groups, particularly in the elderly with pre-existing cardiac and pulmonary diseases, the frequency of the fulminating variety, the nature of the complications, the pattern of secondary bacterial invasion, and the efficiency of the newer remedies such as tetracyclines, chloramphenicol, erythromycin, and the corticosteroids.

The mortality among the 165 patients in London undergraduate teaching hospitals was 10%, the majority of deaths

occurring at or after the age of 55; this compares with 11% of 262 pneumonic patients analysed by the Combined Study Group, Dundee (1958), and 17% of 69 similar patients seen by Walker *et al.* (1958) in Edinburgh. Death rates from pneumonic influenza before antibiotics were discovered were 27.5–40% in the pandemic of 1918–19 (Brem, Bolling and Casper, 1918; Opie, Freeman, Blake, Small, and Rivers, 1919; Chickering and Park, 1919; French, 1920), with no improvement in later epidemics (Collins, 1931; Scadding, 1937). Direct comparisons between Asian influenza and pre-antibiotic epidemics are naturally hazardous, owing to differences in virulence of the viruses concerned and of associated bacteria, and the variable times of onset and duration; but if they are limited to cases with pneumonia, these difficulties are to some extent overcome. Certainly, the consistently lower death rates in recent years cannot easily be explained other than by attributing them to improved methods of treatment.

Instances of fulminating influenza occur in all major epidemics and constitute a considerable clinical problem. Owing to the lack of a satisfactory definition, their frequency in this or other epidemics cannot be determined. In the present context they seemed to occur unevenly in and near London, some large hospitals admitting none and others as many as five or six. Of the 132 patients whose influenza was regarded as fulminating, 58% died; 30% of the deaths occurred within 24 hours and 80% within a week of admission. At the height of the outbreak many hospitals were crowded with patients. The medical and nursing staffs, often depleted by the infection, had to care for many influenza patients, one or two of whom might be suffering from this acute medical emergency, against which some of the newer remedies had not been adequately tested. As the epidemic progressed, the pattern of infection became clear and the treatment more definitive. Several hospitals formulated emergency plans for the very ill which were carried out on admission, and consisted in the main of oxygen therapy, intravenous erythromycin and hydrocortisone, and, if available, staphylococcal antitoxin. These measures almost certainly saved lives in the present series, but a study of the records suggested that insufficient use was probably made of early intratracheal intubation.

Secondary invasion by *Staph. aureus*, as had been anticipated, undoubtedly added materially to the severity of the outbreak. It was encountered in 12% of the 165 patients in London undergraduate teaching hospitals, and was very common in pathological series from other sources. Roberts (1957) found *Staph. aureus*, usually in pure culture, in 8 out of 9 cases of fulminating influenzal pneumonia. Hers *et al.* (1957) in 61% of 103 fatal cases of influenza, Giles and Shuttleworth (1957) in 33% of 46 influenza deaths, and the Public Health Laboratory Service (1958) in 62% of 477 fatalities.

Experience in this epidemic has left the question of the choice of antibiotics for routine use to some extent unsolved. The majority of patients overcame their pneumonia uneventfully, and penicillin and tetracycline appeared to be equally effective. The problem lay with the 10–15% who developed staphylococcal pneumonia. Patients treated at home in the first instance, as were one-third in this series, may reasonably be given penicillin or tetracycline in the knowledge that it is suitable for non-staphylococcal infections, and will rapidly resolve about one-half of the staphylococcal infections. Once patients have been admitted to hospital, close co-operation with the laboratory is necessary, so that staphylococci may be identified in direct smears of sputum within two hours and their sensitivities reported from primary cultures in 24 hours. This system was in use in many hospitals taking part in this investigation, and accounts partly for the frequent changes in antibiotic therapy within 48 hours of admission in the staphylococcal series.

The complications were remarkably few. Pleural effusions, with one exception, responded to simple measures, and antibiotics were almost uniformly successful in resolving

NEUROLOGICAL AND HEPATIC
DISORDERS ASSOCIATED
WITH INFLUENZA

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From time to time in the history of mankind influenza has taken its toll in terms of human life and suffering. The present pandemic, which appears to have started in North China in the early spring of 1957, spread to Hong Kong, and was first reported from Singapore in May. Cases started to appear in Madras in the same month, after the arrival in the port of s.s. *Rajula* from Singapore. Very soon after, other Indian ports also reported the occurrence of cases. The epidemic thence spread fanwise throughout the country, and by the end of the month most of the towns of South India were affected. The vast majority of these cases conformed to the usual clinical picture associated with influenza and described in previous epidemics (Abrahams *et al.*, 1919; Stuart-Harris, 1945). Early in this epidemic we realized that some of the cases showed unusual clinical features referable to the central nervous system and the liver. These cases were therefore studied in detail, and the observations form the subject of this paper.

Present Investigation

Out of 9,459 cases of influenza admitted to the various military hospitals in South India, a total of 30 showed the features mentioned. All the cases occurred during the peak period of the epidemic in the stations. Sixteen occurred in one station in 17 days. The usual incidence of encephalitis in this station is one or two cases a year. Five cases occurred in another station in 27 days, whereas the usual incidence of encephalitis there is about one a year.

Clinical Features.—These are shown in Table I. They do not pertain to the initial signs and symptoms of influenza but to those of the subsequent illness, during which neurological and hepatic manifestations developed. In a typical case after an attack of influenza the patient was afebrile and progressing well, when suddenly there was an onset of severe persistent vomiting followed very soon by delirium, boisterousness, and coma. Some of these cases had convulsions. In a few, localizing neurological signs were noted. A third of these cases had raised serum bilirubin. Complete recovery occurred in 13, and 17 proved fatal.

Age-and-Sex Incidence.—Age varied from about 14 to 26 years, except one case of a child aged 2 years and 9 months and another of an adult aged 36. All the patients were males. No inference can, however, be drawn from this age-and-sex incidence, since the number of cases affected was small, and the community at risk was of a similar age-and-sex group.

Onset.—As already indicated, after a typical attack of influenza there was an afebrile period varying from one to

Summary

The clinical and pathological records and radiographs of 165 patients with pneumonia complicating influenza admitted to the 10 London undergraduate teaching hospitals in the autumn of 1957 are reviewed. Of these, 20 (12%) were instances of staphylococcal pneumonia.

The non-staphylococcal cases are compared with the staphylococcal cases, together with a further 135 instances of staphylococcal pneumonia complicating influenza during the same period which were derived from hospitals in and near London, mainly in the North-east Metropolitan Region and from the three armed Services.

The severer course and higher mortality in the staphylococcal series are discussed.

The clinical assessment and emergency treatment of fulminating influenza are described, with special reference to bacteriology, choice of antibiotics, steroid therapy, and tracheobronchial intubation.

In order to enlarge experience of the severer forms of influenzal pneumonia and the less common forms of treatment, the records of 79 cases were added to the above series, making a total of 379 cases.

We record our sincere thanks to the many physicians and pathologists who made the collection of so large a series possible, particularly the medical committees of the 10 London undergraduate teaching hospitals, the Senior Administrative Medical Officer, and the medical committees of the hospitals in the North-east Metropolitan Region, and the Medical Directors General and medical officers of the Royal Navy, Army, and Royal Air Force. We are also indebted to individual physicians and pathologists at the following hospitals—Bedford General, Brompton, Buchanan, Lister, Mount Pleasant, North Herts, Royal East Sussex, Royal Northern, Schrodel's, St. Andrew's, Bow, St. Helier, and St. Olave's.

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seven days in 20 cases. In seven there was no such interval, while in the remaining three the history of respiratory infection was atypical. Vomiting, which was invariably the first symptom, was present in 29 cases and absent in only one. It started suddenly in 27 and insidiously in two (Cases 6 and 24).

Fever.—This was not a constant feature in all the cases. It was high in eight, and the rest had either a low pyrexia or were afebrile. Headache, which was present in 12, was not a prominent symptom except in one. Some degree of toxæmia was recorded in 13 cases.

Central Nervous System.—Of all the 30 cases showing neurological involvement, 19 went into coma with or without convulsion after passing through a phase of confusion, delirium, and boisterousness. Four of the patients who developed coma ultimately recovered. Seven were only drowsy, and four others were conscious throughout. The degree of cerebral aberration did not affect the ultimate outcome. Fifteen cases showed localizing neurological signs in the form of involvement of the pyramidal tract or conjugate deviation. One patient (Case 24) developed extensive paralysis of muscles of the trunk and limbs but not of the head and neck. He was conscious throughout and died of respiratory failure.

Other Systems.—Icterus was apparent in only one patient, although serum bilirubin was raised in 10—eight died and two recovered.

Laboratory Findings

The laboratory findings are given in Table II. Total and differential leucocyte counts were carried out in all cases and were within normal limits. Urine examination showed the

presence of bile in only one case. Albumin was found in 13 and sugar in four. The presence of sugar in urine, however, was not regarded as very significant, as all these cases were on intravenous concentrated glucose therapy. The serum bilirubin level was raised above 1 mg./100 ml. in 10 cases, the highest level being 4 mg. C.S.F. examination was carried out in 25, but did not show any significant abnormality. Blood-sugar estimation was carried out in 20 cases; the results were within normal limits. Blood urea was estimated in 25. It was raised above 40 mg./100 ml. in four fatal and three non-fatal cases.

Serological findings are given in Table III. In addition to Case 1, as shown in this table, influenza virus A was also isolated from lungs removed at post-mortem examination in Cases 3, 5, 17, and 28. Influenza virus A has also been isolated from the brain of Case 24. The exact relationship of this virus to virus A/Asia/57 is being studied in the Pathology Department of the Armed Forces Medical College, Poona. The serological study for influenza was inconclusive.

The H.I. and complement-fixation tests against arthropod-borne encephalitis viruses were carried out in four cases. The tests were put up against Chikungunya and AR 339 strain of Sindbis of group A viruses and Japanese B. Murray Valley, Egypt 101 strain of West Nile, and Trinidad 1751 strain of Dengue of the group B arthropod-borne viruses. This study did not incriminate any of these viruses as the causal agent.

Treatment

In the absence of any specific therapy various lines of treatment were tried, either singly or in combination.

TABLE I.—Clinical Features

Case No.	Vomiting	Fever	Headache	Toxæmia	Respiratory Involvement	Clinical Jaundice	Neurological Features	Outcome
1	++	High (106° F.: 41.1° C.)	+	+	0	0	Convulsions, coma, plantar extensor	D. 3rd day
2	++	High (104° F.: 40° C.)	0	++	0	+	Delirious, comatose, plantar extensor	" 6th "
3	+++	Low	+	+	+	0	Drowsy, with plantar extensor, later delirious, boisterous, and comatose	" 3rd "
4	+++	"	0	0	+	0	Drowsy, with plantar extensor Lt., later delirious, boisterous, and comatose	" 3rd "
5	+++	0	0	0	+	0	Boisterous, maniacal, with plantar extensor, later comatose	" 3rd "
6	+++	Low	+	0	0	0	Boisterous, maniacal, with plantar extensor and Rt. cremasteric absent, later comatose	" 5th "
7	+++	"	+	0	0	0	Drowsy, with plantar extensor, abdominals and Rt. cremasteric absent, later comatose	" 4th "
8	++	"	+	++	+	0	Delirious, boisterous, with plantar extensor Rt., later comatose, nystagmus during recovery	R. 12th day
9	++	"	0	0	0	0	Delirious, boisterous with plantar extensor Rt., later comatose	" 10th "
10	++	"	+	+	0	0	Delirious, restless, plantar extensor, Lt. cremasteric absent, later comatose	" 9th "
11	+	High	+	0	+	0	Drowsy, with vertigo	" 6th "
12	+	Low	+	0	+	0	Conscious throughout, plantar extensor Rt. till 8th day	" 5th "
13	+++	0	0	0	0	0	Conscious throughout, plantar extensor Lt. for 2 days	" 8th "
14	+	Low	+++	+	0	0	Drowsy till 5th day, giddy till 8th day	" 4th "
15	+++	0	0	0	+	0	Convulsions, with conjugate deviation, later comatose, with plantar extensor and alternating spasticity and flaccidity of Rt. and later Lt. side	D. 6th "
16	+	0	+	0	0	0	Confused and restless, but conscious, with plantar extensor	" 6th "
17	+++	Moderate (102° F.: 38.9° C.)	0	++	0	0	Confused and restless	" 6th "
18	++	"	0	+	0	0	Comatose, plantar extensor	" 9th "
19	+++	High	+	+	+	0	Comatose	D. 3rd "
20	++	Low	+	++	0	0	Conjugate deviation with jactitation	" 1st "
21	+	High	0	0	0	0	Sudden weakness of respiratory muscles and rest of the body except head and neck. Died of respiratory failure	" 2nd "
22	0	(106° F.: 41.1° C.)	0	0	0	0	Boisterous, later comatose	" 2nd "
23	+	Moderate (101° F.: 38.3° C.)	0	0	0	0	Giddy, delirious, boisterous plantar extensor Rt., later comatose	" 6th "
24	++	0	0	0	0	0	Boisterous, maniacal, with conjugate deviation, coma, and convulsions	" 3rd "
25	+++	Low	0	0	0	0	Delirious and boisterous, later coma, and convulsions	" 5th "
26	++	High	0	++	+	0	Confused, restless, later comatose	" 2nd "
27	+	Moderate (101° F.: 38.3° C.)	0	+	0	0	Delirious and boisterous, later comatose	" 3rd "
28	+++	High	0	0	0	0		
29	++	0	0	0	0	0		
30	++	Low	0	0	0	0		

0=Nil. +=Slight. ++=Moderate. +++=Severe.

+++=Gross. D.=Died. R.=Recovered.

Eighteen cases were treated with heavy doses of intravenous vitamins and concentrated glucose. Tetracycline or chlor-tetracycline in full doses, either parenterally or orally, was administered to 22 cases. Hydrocortisone parenterally, 100 mg. eight-hourly, was used in four cases. Penicillin alone was administered to five cases. It may be reiterated that some of the patients received a combination of vitamins, tetracycline, and hydrocortisone, whereas others received one or two of these products only. No conclusion could be drawn about the effectiveness of any of the treatment given in the present series of cases.

Post-mortem Appearances and Histopathology

All the 17 patients who died were subjected to post-mortem examination, which was performed 2½ to 25 hours after death. Special attention was paid to the lungs, brain, and liver, since all these cases had a history of influenza, and had cerebral symptoms with neurological signs and clinical or biochemical evidence of jaundice.

TABLE II.—Laboratory Findings

Case No.	Urine		Serum Bilirubin		C.S.F.	
	Bile	Misc.	Day of Illness	mg./100 ml.	Protein mg./100 ml.	Cells/c.mm.
1	0	Alb. + Gr. casts	2	1.25	20	2
2	0	Alb. +	4	3	20	0
3	0	0	3	0.6	30	2
4	0	0	2	0.6	30	3
5	0	0	2	4	30	2
6	0	0	{ 3	1.75	30	3
7	0	Alb. +	{ 5	3.5	30	3
8	0	Sgr. +	{ 3	1	30	3
9	0	0	{ 8	1.75	40	3
10	0	0	{ 12	0.4	35	2
11	0	0	{ 2	2	30	4
12	0	0	{ 4	1.5	30	2
13	0	0	{ 10	0.4	30	2
14	0	0	{ 3	0.4	30	4
15	0	0	{ 2	0.8	30	2
16	0	0	{ 5	0.4	30	2
17	0	0	{ 2	0.2	30	4
18	0	Alb. + Sgr. +	—	—	30	3
19	0	Alb. trace	3	0.3	25	—
20	0	0	3	0.2	—	—
21	0	Alb. +	3	0.2	20	0
22	0	Alb. trace	—	—	—	—
23	0	Alb. +	1	2	50	8
24	0	0	—	—	25	3
25	0	—	2	0.2	—	—
26	0	Alb. + + Gr. casts	—	—	70	4
27	0	Alb. trace	5	0.8	30	4
28	0	Sgr. +	3	0.2	—	—
29	0	0	5	3	—	—
30	+	Alb. + PC. + R.B.C. +	{ 2	4	30	2
			{ 3	1.5	40	—

Alb. = Albumin. Gr. = Granular. Sgr. = Sugar. PC. = Pus cell. — = Not done. 0 = Absent.

TABLE III.—Serology

Case No.	Influenza H.I. Titre						Isolation of Virus
	F.M.I.		B6		New Virus		
	1st Sample	2nd Sample	1st Sample	2nd Sample	1st Sample	2nd Sample	
1	256	—	—	—	Neg.	—	+
6	—	256	—	128	—	0	—
8	—	256	—	2,048	—	32	—
9	128	128	32	64	8	16	—
11	128	256	32	32	0	0	—
18	128	128	—	—	0	16	—
19	0	0	128	128	0	0	—
20	256	2,048	—	—	0	0	—
21	256	256	—	—	0	8	—

F.M.I. strain = Virus A. B6 strain = Virus B. New virus = A/Asia/57. — = Not done. 0 = Nil.

Lungs.—Naked-eye appearances varied from an intense congestion to patchy haemorrhagic pneumonia. Histologically the general picture was a complete denudation of the ciliated epithelium of the mucous membrane of the bronchial tree. Haemorrhagic consolidation was also present in many of these cases. Case 24, from whose brain influenza virus A was isolated, showed the characteristic bronchial mucosal change without any pulmonary involvement.

Brain.—Naked-eye appearances varied from moderate to severe congestion with petechial haemorrhages in the white matter in all cases, and histology confirmed the presence of diapedesis of cells into the Virchow-Robin space in some. In a few cases neuroglial proliferation was also present. Case 24 showed evidence of neurone degeneration, including satellitosis and neuronophagia.

Liver.—On naked-eye examination no specific change was noticed. Appearances varied from a normal to a mild congestion or a patchy yellowish discoloration. Histologically there was evidence of fatty change not confined to any zone. In 12 out of 17 fatal cases there was evidence of portal or periportal round-cell infiltration. In the majority of cases there was no necrosis of liver cells.

Discussion

In association with various epidemics and pandemics of influenza, respiratory and abdominal complications have been described. Of these the former have been responsible for most of the fatalities. To our knowledge the neurological and hepatic features manifested by our patients have so far not been recorded in the literature, including reports of the recent pandemic (Lim *et al.*, 1957; Holland, 1957; Smith *et al.*, 1957). Non-specific non-localizing cerebral symptoms have been described by many (Cole, 1918; Benjafield, 1919; Abrahams *et al.*, 1919). Edmundson and Hodgkin (1957) have also mentioned facial neuralgia and peripheral neuritis as complications or as possible concomitant diseases with influenza.

All the cases which showed the unusual neurological or hepatic manifestations occurred during the height of the influenza epidemic in the various localities. Every one of them had a preceding influenza-like illness. In the fatal cases incontrovertible evidence of respiratory infection with influenza virus was present. These facts would indicate that the unusual features are in some way related to the influenza infection. Hyperbilirubinaemia was not invariably present, and where serum bilirubin levels were abnormal they were not very high. Cholaemia could not therefore account for the neurological manifestations. Besides, the type of neurological signs seen have not, in our experience, been associated with liver-cell failure. Apart from coma, convulsions, etc., localizing features like pyramidal signs were present in both comatose and non-comatose patients. These facts would indicate that we are here dealing with an encephalitic syndrome.

The clinical manifestations of these patients do not resemble those of the sporadic or epidemic cases of encephalitis reported from Jamshedpore (Chari and Swamy, 1955) or from Lucknow (Kaul, 1955), nor do they conform to the features of arthropod-borne encephalitis (Webb and Pereira, 1956). Serology also excludes the latter group. Such aetiological factors as measles, mumps, and vaccination were not responsible for the abnormal neurological signs.

Although the post-mortem examination (and virus culture) and histopathology have confirmed the presence of respiratory infection with influenza virus, the morbid appearances both of the liver and of the nervous system are variable and indefinite. They have been recorded here for the sake of completion, but it must be mentioned that no definite inference can be drawn from them. Influenza virus A has been isolated from the brain in one patient (Case 24), who also had marked histopathological changes in the C.N.S. Influenza virus has not, to our knowledge, been

isolated from the brain so far, and its significance cannot therefore be assessed without further study. This is being carried out in the Pathology Department of the Armed Forces Medical College, India. It is difficult to state whether the neurological and hepatic syndromes were caused by a new mutant of influenza virus, by the activation during the influenza epidemic of an associated neuro-viscerotropic virus, or by a hybridization of viruses of the type produced by Burnet (1957) in his experimental genetic studies on viruses.

Summary

A short account of the origin and spread of the pandemic of influenza of 1957 is given. In India cases started appearing in Madras in May, 1957, and very soon after it spread to the rest of South India.

Out of a total of 9,459 cases of influenza admitted to military hospitals in South India, 30 developed manifestations of neurological and hepatic involvement. Sixteen of these were reported from one station in 17 days and five from another in 27 days.

These manifestations usually developed after an afebrile period following a typical attack of influenza.

They were ushered in by incessant vomiting followed by delirium, boisterousness, and coma. Half the patients showed localizing neurological signs: raised serum bilirubin was present in one-third.

All the 17 fatal cases were subjected to post-mortem examination. Respiratory system showed appearances typical of influenza. Influenza virus was isolated from the lungs in five of them. The liver showed a variable and indefinite picture. The brain showed congestion and diapedesis of cells. In one case neurone degeneration was present and influenza virus A was isolated from the brain substance.

Serological tests did not indicate an infection with arthropod-borne encephalitis viruses.

From the evidence presented it appears probable that the clinical manifestations of neurological and hepatic involvement are closely related to infection with influenza virus and are of a type not so far described in any other form of encephalitis reported from India. The significance of the morbid anatomy and histology and the exact causal relationship of the influenza virus to the syndrome are, however, not clear.

Our thanks are due to the medical officers who helped in the management and follow-up of the cases and to the officers and staff of the Pathology Department of the Armed Forces Medical College, Poona, for their help in the investigation of cases and examination of post-mortem material. We acknowledge the help and co-operation of the Virus Research Centre, Poona, in undertaking serological studies. Our thanks are also due to Dr. I. G. K. Menon, Deputy Director, Pasteur Institute, Coonoor, for his co-operation. We are grateful to various officers commanding military hospitals in Southern Command, D.M.S. Army, and the D.G. A.F.M.S., for permission to publish the report.

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ASIAN INFLUENZA (1957) IN ALLERGIC PATIENTS

BY

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The clinical, epidemiological, and pathological aspects of Asian influenza have already been described (*Brit. med. J.*, 1957; Smith *et al.*, 1957; Sweet and Dourado, *Lancet*, 1957; Roberts, 1957; Zhdanov *et al.*, 1957; Fry, 1958; Martin, 1958).

Altogether I treated 344 cases of influenza in general practice during the epidemic in 1957, the first case being seen on August 25, 1957, and the last on November 3, 1957. The practice is an industrial one with 5,560 patients, and I am one of three partners. It was estimated that there were 216 allergic patients in this practice (Hamilton and Bendkowski, 1954). The number of allergic patients has risen with the increase in the size of the practice, and there are now about 250. I treat most of these, and have had an opportunity of studying the clinical course of Asian influenza among them.

Classification

The 344 influenza patients were divided into three groups: (1) allergic (124 cases); (2) non-allergic, but who came from allergic families (59 cases); and (3) non-allergic (161 cases). The distribution of allergic diseases in patients suffering from influenza is shown in Table I.

TABLE I.—Severity of Symptoms Among the 344 Patients

Allergic Disease	No. of Cases			Total
	Very Severe	Severe	Mild	
<i>Allergic Patients</i>				
Bronchial asthma ..	49	4	2	55
Allergic rhinitis ..	20	8	2	30
Respiratory allergy ..	9	2	2	13
Urticaria and angio- neurotic oedema ..	7	7	6	20
Atopic eczema ..	2	1	—	3
Contact dermatitis ..	1	1	1	3
Total ..	88	23	13	124
<i>Other Patients</i>				
With family history of allergy ..	12	25	22	59
Non-allergic ..	27	45	89	161

Findings

Each patient was examined and assessed according to severity of symptoms. This was judged by temperature, headaches, aches and pains, dizziness, vomiting, cough, dyspnoea, sweating, and prostration. Table I shows the severity of symptoms among the allergic patients and among the others.

TABLE II.—Main Finding on Physical Examination

Clinical Finding	No. of Cases		
	Allergic	With Family History of Allergy	Non-allergic
Laryngitis	15	29	105
Bronchitis	48	28	48
Bronchopneumonia	11	1	5
Lobar pneumonia	3	—	3
Bronchitis with asthma	47	1	—
Total	124	59	161

Every patient was examined with special attention to the respiratory system. Table II shows the main clinical finding. There were three cases of epistaxis among the allergic and one case of fits among the non-allergic patients.

Some patients managed to come to the surgery, but the majority of those suffering from influenza asked to be visited at their homes. Table III shows the distribution of home visits among the three groups.

All the patients suffering from influenza were ordered to bed. The duration of bed rest varied in the three groups of patients (Table IV).

TABLE III.—Home Visits

No. of Visits	No. of Cases		
	Allergic	With Family History of Allergy	Non-allergic
1	15	19	50
2	46	28	59
3	31	3	10
4	15	—	5
More than 4	9	—	8
Surgery attendance only	7	9	28
Admission to hospital	1	—	1 (died)
Total	124	59	161

TABLE IV.—Bed Rest

Duration	No. of Cases		
	Allergic	With Family History of Allergy	Non-allergic
< 1 week	24	20	65
1 week	59	24	50
1 week to 10 days	24	1	8
2 weeks	7	—	3
Over 2 weeks	4	—	2
No bed rest at all	6	14	33
Total	124	59	161

In an epidemic of influenza there is no time to wait for complications that might arise. The general practitioner has to deal with the cases promptly. His knowledge of the patients, their previous ailments, their house conditions, and the nursing facilities, as well as the clinical findings—all have to be considered before prescribing treatment. Table V shows the therapy given.

TABLE V.—Therapy

Drugs	No. of Cases		
	Allergic	With Family History of Allergy	Non-allergic
Antibiotics	101	27	65
Sulphonamides	16	14	30
Antispasmodics	54	—	—
Steroid hormones	11	—	—
Analgesics and cough mixtures	7	18	66

TABLE VI.—Time Away From Work or School (221 Cases)

Duration	No. of Cases		
	Allergic	With Family History of Allergy	Non-allergic
1 week	2	13	50
2 weeks	36	25	36
3 weeks	32	1	15
1 month	4	—	4
Over 1 month	2	—	—
Carrying on working	—	—	1
Total	76	39	106

All the working patients and the schoolchildren were advised to rest at home for at least a week to avoid any after-effects (Table IV).

Some of the patients complained of weakness, tiredness, dizziness, and other ill-defined symptoms. Such after-effects were diagnosed as post-influenza debility. Table VII shows the nature of after-effects in patients suffering from influenza.

TABLE VII.—After-effects

Nature of After-effects	No. of Cases			Total
	Allergic	With Family History of Allergy	Non-allergic	
Chronic cough	39	3	11	53
Bronchial asthma	40	1	—	41
Debility	2	—	13	15
Otitis media	3	—	—	3
Total	84	4	24	112

Discussion

Asian influenza affected both the allergic and the non-allergic patients. The virus had a predilection for the respiratory tract, causing laryngitis, bronchitis, and in some cases pneumonia. Patients suffering from bronchial asthma, nasal allergy, or both together (respiratory allergy) were severely afflicted by influenza. Their symptoms were worse than those of the non-allergic patients. The majority of the non-allergic patients (105 out of 161) had only laryngitis. In the allergic group the majority of patients developed bronchitis or bronchitis with exacerbation of asthma, and there were 14 cases of pneumonia. Eight cases of pneumonia occurred among the non-allergic patients. Patients with a family history of allergy showed a tendency to develop bronchitis more readily than the non-allergic patients; there was one case of pneumonia among them.

The duration of bed rest and of the time away from work or school was longer in the allergic patients than in the non-allergic.

The therapy in allergic patients consisted of great amounts of antibiotics, antispasmodics, and steroid hormones; only seven cases were treated with analgesics alone. One non-allergic patient aged 83 died of bronchopneumonia.

The allergic patients caused a great deal of anxiety to their families and to the practitioner during the influenza epidemic. The after-effects, mainly exacerbation of asthma, persisted for a long time. The explanation for the severe clinical picture of influenza in allergic patients is beyond the scope of this article and beyond our present knowledge. Infectious and allergic diseases however, have one thing in common: the antigen-antibody reaction.

Summary

Observation was kept on 344 cases of Asian influenza occurring in general practice. There were 124 patients with personal history of allergic diseases. Allergic patients were severely afflicted by influenza, developing bronchitis, asthma, and pneumonia more readily than the non-allergic patients. The incidence of after-effects among the allergic patients was higher than in the non-allergic.

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AGE AND ASIAN INFLUENZA, 1957

BY

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The object of this investigation was to study the influence of age and related factors on susceptibility to influenza during the 1957 autumn epidemic. Certain other clinical and epidemiological observations that were made are also included in this report. The inquiry was conducted in a general practice in a post-war housing estate on the south-eastern outskirts of London; the doctor (J. W.) had just over 2,000 patients on his list, but those entering or leaving during the study, and a large group of about 200 gypsies, were excluded, leaving a total of 1,732 on whom the results are based.

Methods

From the middle of August, 1957, to the end of the year an attempt was made to record all acute respiratory illnesses in the 1,732 patients who were present during the whole of this period. The illnesses were divided clinically into those that probably were influenza and those that probably were not. Illnesses recorded were those for which the doctor was consulted and others of which he learned by inquiry. Ascertainment in families of four or more persons was probably fairly complete because these were included in a special study of secondary attack rates. Nearly all such families known to have a case of influenza were followed for at least two weeks and a record was made of acute respiratory illnesses before and after the first case seen; families without a known case were visited in December and inquiry was made. Information on smaller families was less complete; illnesses seen were noted and inquiries made about other members of the family then and at any subsequent opportunity. Although there must inevitably have been illnesses which were not recorded and some mistakes in clinical diagnosis, we believe that, for the epidemic period at least, a reasonable estimate of the incidence of influenza was obtained.

For the study of secondary attack rates, 104 families of four or more, in which a probable case of influenza occurred, were investigated in greater detail. So far as possible these were consecutive and unselected families, but some, where good co-operation was not anticipated, were excluded. The clinical features of all acute respiratory illnesses in these families were recorded in a standard manner. Acute and convalescent paired sera were obtained from 99 patients in 89 of the 104 families. Fifteen families were included but not tested, usually because the first subject seen was too young to bleed and there was no further illness in the family. It is possible that a slight bias towards high secondary attack rates in families tested serologically was thereby introduced.

The blood specimens were taken in vacuum tubes (Bayer) and posted to the laboratory, where serum was separated and completed pairs were examined for evidence of influenza-A infection by the complement-fixation test. Of the 99 pairs a fourfold or greater rise in titre was found in 61 and a twofold rise in a further 12; the 61 serologically confirmed cases were in 59 families.

Findings

Age and Sex Incidence

The epidemic lasted about eight weeks and reached its peak in all age groups in the week ending October 13. Most cases in the few weeks preceding the epidemic were in young adults. Attack rates by age and sex up to the end of November are given in Table I. Almost a third (31%) of

TABLE I.—Clinical Attack Rates by Age and Sex (Up to November 30)

Age in Years	Males		Females		Total	
	At Risk	Percentage Attacked	At Risk	Percentage Attacked	At Risk	Percentage Attacked
0-4	115	36	92	25	207	31
5-14	194	51	172	48	366	49
15-39	323	25	352	28	675	27
40-59	192	21	169	29	361	25
60 and over	55	15	68	10	123	12
All ages	879	31	853	30	1,732	31

the patients in the practice had influenza during this period, and, apart from a rather higher rate among males aged 0-4 years, there was little difference between the sexes. About half the schoolchildren were ill, a third of the pre-school children, a quarter of adults under 60, and about an eighth of the older persons. Between December 1, 1957, and January 5, 1958, there were a further 60 illnesses, including five who had been ill before; no specimens were taken from any of the five, so the cause of their illness is uncertain.

Effect of Schoolchildren

As the highest attack rates were among children aged 5 to 14 years, it seemed possible that families with children

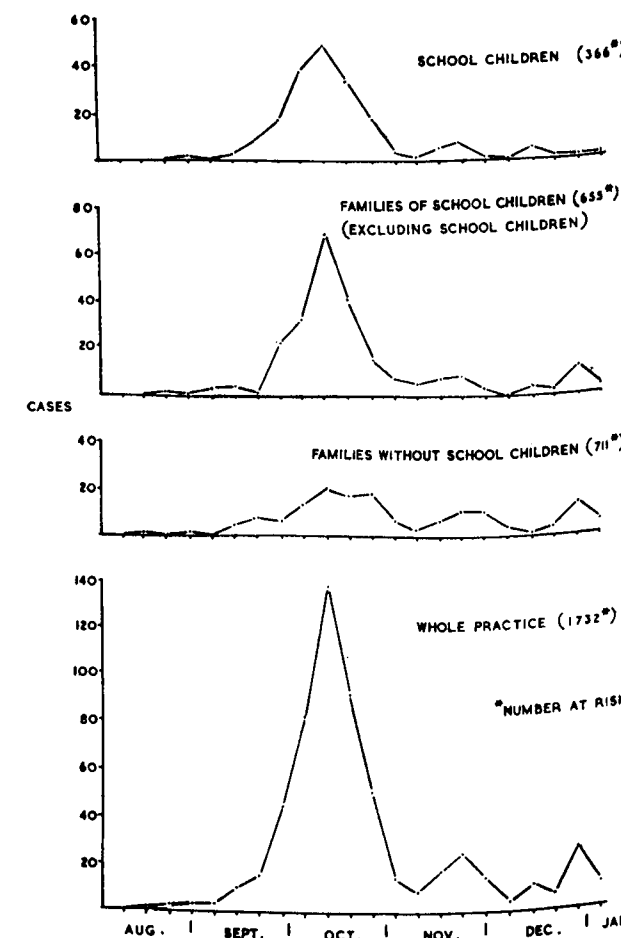


FIG. 1.—Weekly incidence of influenza in a Kent practice.

of this age might have suffered more from influenza than those without. That this was so is shown in Fig. 1, which shows that the epidemic was almost confined to schoolchildren and their families. Of the 529 persons who were recorded as having had influenza, 399 (75%) were children aged 5 to 14 or members of families with a child of this age.

TABLE II.—Influenza Attack Rates in Families With and Without Schoolchildren (Up to November 30)

Age Group	With Schoolchildren		Without Schoolchildren	
	No.	Attacked	No.	Attacked
0-4 years	104	34%	103	29%
5-14	357	34%	318	18%
40-59	181	32%	180	17%
60 and over	13	31%	110	10%
Total	655	33%	711	18%

In families that included a school child the attack rate was about 33% in all other age groups (Table II). In families without a school child, only children under 5 had an attack rate approaching this level; the rates among the adults were much lower.

Secondary Attack Rates

There were 59 families in which at least one case of influenza was confirmed by serological tests and a further 45 families similarly studied in which no confirmation was obtained. Secondary attack rates—that is, attack rates among the remainder of the family after exclusion of the first case—were calculated in an attempt to find out whether there was any relation between age and susceptibility under the conditions of home exposure. A family outbreak (or episode) in this calculation was defined as a group of influenzal illnesses, no two consecutive cases being separated by more than seven days. In 86% of episodes all cases occurred within seven days of onset of the first case. Persons with influenza more than seven days prior to the beginning of an episode were excluded from those at risk.

It may be seen in Table III that the secondary attack rates for all age groups under 40 years were similar, but over this age they fell away. Rates based on 59 episodes in families with a serologically confirmed case did not differ greatly from those based on all 104 families (105 episodes).

TABLE III.—Secondary Attack Rates in 104 Families with 4 or More Persons

Age (Years)	All Episodes		Serologically Positive Episodes	
	No. Exposed	Percentage Attacked	No. Exposed	Percentage Attacked
0-4	60	37	57	37
5-14	59	57	38	63
15-39	63	54	26	61
40-59	41	54	20	55
60 and over	28	44	26	58
All ages	39	48	33	64
	82	37	33	36
	56	19	16	13
	21			
All ages	389	49	229	53

TABLE IV.—Order of Onset of Illness in Relation to Age (105 Family Outbreaks)

Age Group	No. Illnesses	1st	2nd	3rd or More
0-4 years	40	13%	52%	35%
5-14	121	52%	29%	19%
15-39	102	30%	34%	35%
40+	40	37%	15%	48%

The lower rates in persons of 40 and over could be explained either by lower susceptibility or by less exposure to infection. The primary cases in family episodes were most frequently in schoolchildren aged 5-14 years and least frequently in children under 5 (Table IV). The subsequent order of becoming ill also varied with age, those of 40 or

more seldom being infected next but most often being third or later. This suggests that older persons may have been less exposed to infection from the younger ones, who introduced it to the family, than were infants and young adults.

In an attempt to overcome the difficulty of unequal exposure the records of all families in the practice without a child aged 5-14 were searched for episodes in which the first case was in a husband or wife. There were 83 such families, and in 14 (17%) the spouse also developed influenza within seven days. Of 59 spouses aged 20-49 years, 9 (15%) were attacked, compared with 5 (21%) out of 24 aged 50 or more.

Serial Intervals

As influenza is probably most infectious during the first few hours of illness serial intervals between dates of onset in family outbreaks may provide a measure of the incubation period. The distribution of serial intervals in the 104 families specially studied is illustrated in Fig. 2; there is a periodicity of about two days, which agrees well with previous estimates.

Clinical Features

There have been many descriptions of the symptomatology of influenza in this and in previous epidemics, but most of them have been based on the study of adults, and little attention has been given to variations associated with age. In the 59 family episodes in which at least one case was confirmed serologically there were 187 illnesses. An analysis of the clinical features in these illnesses is presented in Table V. The general clinical picture was similar to that

TABLE V.—Clinical Features of Illnesses in Serologically Confirmed Family Outbreaks

Age group: No. of Cases:	0-4 24	5-14 71	15-39 70	40+ 22	Total 187
Onset:	%	%	%	%	%
Gradual	50	48	61	55	54
Sudden	50	52	39	45	46
Symptoms:					
Cough	84	83	93	82	87
Headache	8	65	92	82	70
Sneezing	75	63	67	73	67
Nasal symptoms	62	62	71	59	65
Sore throat	17	56	73	55	57
Sweating	37	46	61	68	48
Shivers	8	41	59	59	46
Aches and pains	12	17	73	59	42
Malaise	33	7	17	18	15
Prostration	17	13	26	9	14
Drowsy	54	11	0	0	11
Delirium	4	21	3	5	10
Nose bleeds	17	8	9	0	9
Faint and giddy	0	4	10	14	7
Hoarseness	8	1	6	9	5
Vomiting	29	23	11	9	18
Abd. pain	0	10	9	0	7
Diarrhoea	8	4	1	0	3
Complications:					
Pneumonia	4	3	1	9	3
Otitis media	4	3	0	0	2
Most frequent initial symptoms	Cough	Headache	Headache	Sore throat	Headache
	Drowsy	Sore throat	Sore throat	Headache	Sore throat
Most troublesome symptoms	Cough	Headache	Headache	Headache	Headache
	Drowsy	Sore throat	Prostration	Cough	Cough
Days fever (median)	3		3	3	3
Days in bed (median)	2	3	3	3	3

usually found in influenza, the most prominent complaints being cough, headache, sneezing, nasal symptoms, sore throat, sweating, shivering, and aches and pains. The onset was described as sudden in about half the cases only—less than is usually stated.

Some of the age differences in symptomatology can probably be attributed to the young being less able to describe their troubles; thus it is not surprising that sore throat, headache, and aches and pains were infrequent in those under 5 years of age, whereas malaise was relatively prominent. Other differences, however, may be more real—for

example, the greater frequency of drowsiness, vomiting, diarrhoea, and nose bleeds in the young, or delirium in children of school age, and of aches and pains and faintness or giddiness in adult life. Six cases of pneumonia (3%) and three of otitis media (2%) were the only important complications, and there were no deaths. Two children developed fever and polyarthritides 4 and 12 days after the onset of illness; but haemolytic streptococci were isolated from one, and the sister of the other had otitis media, so it is uncertain whether these should be regarded as complications of influenza.

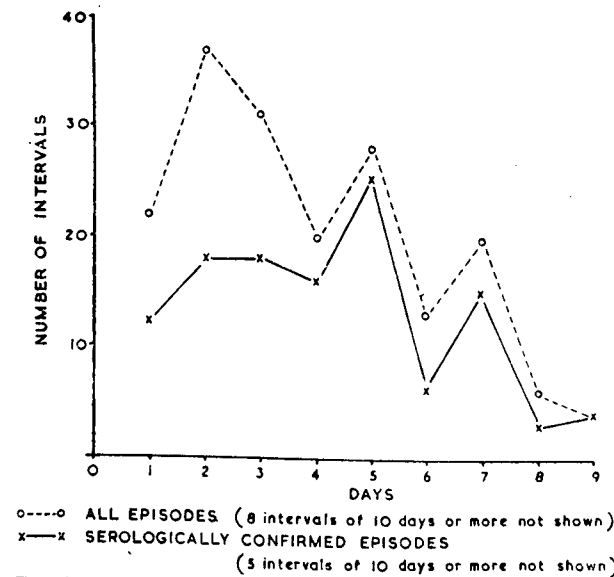


FIG. 2.—Distribution of serial intervals between first and subsequent cases in family episodes.

Discussion

Much of the value of the age-incidence figures shown in Table I depends on the extent to which they are representative of the country as a whole. From August 21 to the end of the year the number of new claims for National Insurance sickness benefit in Britain was about 2½m. more than the average for the same periods in the previous five years—that is, an increase equivalent to about 12½% of the insured population. We are indebted to the Ministry of Pensions and National Insurance for the information that the excess, compared with the previous year, of claims received by their nearest office (Sidcup) also amounted to about 12½% of the estimated population at risk. As no figure exists for the population normally served by a given insurance office this can be only a rough estimate, but it encourages the belief that the incidence figures are fairly representative of the national experience.

About a quarter of the adults of working age in this practice had an influenza-like illness, which is much greater than the National Insurance figure of 12½%. Sickness benefit can be paid only for incapacity lasting more than three days, whereas many illnesses, either because they were mild or at a week-end, caused lesser or no absence from work, which probably accounts for the difference. Sickness statistics for the past three years, kindly supplied by Morphy-Richards, Ltd., who have a large factory in the same area, showed that the proportion of their employees who were absent rose to 23% during the influenza epidemic compared with a level of about 6% in previous years. The absence rate from influenza was therefore probably more than 17%, and so compatible with the practice figures. If the age-specific attack rates in this practice are applied to the population of England and Wales we may estimate that there were about 12m. cases of influenza—a similar figure to that put forward by Fry (1958). Unfortunately, both these estimates are based on practices in the same part of the country.

From the figures for secondary attack rates (Table III) we infer that the high incidence of influenza among school-

children in the general population was not due to any greater susceptibility to infection in this age group, but to other factors. Outbreaks among schoolchildren appeared to play a big part in the spread of Asian influenza in the country generally last autumn, and it is clear that, in this practice at least, the epidemic was almost confined to schoolchildren and their family contacts. The low attack rate among older people may well have been due to the fact that comparatively few have close contact with schoolchildren.

Though the proportion of schoolchildren who escaped infection with Asian virus was probably small, perhaps three-quarters of the adult population were still susceptible to Asian virus after the autumn epidemic. It is possible that infection smouldering on during the winter contributed to the relatively high mortality in the country during December and January (McDonald, 1958). But even when the winter was over most older persons must still have been susceptible to the Asian virus. It remains to be seen, however, whether any further epidemic is possible until the school population become susceptible once more, either as a result of waning immunity or of antigenic variation in the virus.

Summary

During the autumn epidemic 31% of the patients in a practice on the south-eastern outskirts of London had clinical influenza. About half the schoolchildren were ill, a third of pre-school children, a quarter of adults under 50, and an eighth of adults over 60. It seems probable from National Insurance statistics that the prevalence of influenza in this part of Kent was similar to that for the country as a whole; there may therefore have been about 12m. cases of influenza in England and Wales during the autumn epidemic.

Three-quarters of patients in the epidemic were children aged 5 to 14 years or members of families with a child of this age. In such families the proportion attacked was about 33% at all ages. The falling attack rate with age in the practice as a whole was entirely due to the experience of families without children of school age.

Secondary attack rates were calculated for a group of 104 families in which a case of influenza occurred. Serological confirmation of influenza virus A infection was obtained in at least one patient in 59 of the families. Secondary attack rates for all age groups up to the age of 40 years showed little variation, but above that age the rates fell away. The sequence of becoming ill in these family outbreaks suggested that the lower rates in older people were possibly due to less exposure to infection. Attack rates in husbands and wives supported this view.

The clinical features of illnesses in family outbreaks where at least one case was confirmed serologically varied with age: drowsiness, vomiting, diarrhoea, and nose bleeds were more prominent in the young; delirium in children of school age; and headache, aches and pains, and faintness and giddiness in adult life.

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The annual report (1958-59) of the National Marriage Guidance Council (78, Duke Street, London, W.1) states that the past year has been one of steady expansion and new work. "It is unfortunate," continues the report, "that this has not been matched by a corresponding increase in Government grant." 197 candidates attended the sixteen selection conferences for marriage guidance counsellors, of whom 128 (65%) were accepted for this work.

THE PROBLEM OF SUSPECTED RECURRENCES IN CANCER OF THE ALIMENTARY TRACT

BY

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In recent years important advances have been made in the treatment of recurrent and disseminated cancer, resulting both in prolongation of life and in palliation of symptoms.

Radiotherapy remains a well-tried and useful method of treatment for recurrences from a wide range of tumours, and to this has now been added the use of sex hormones and endocrine gland ablations for prostate gland and breast secondaries, radioactive iodine for thyroid metastases, and cytotoxins (Bodley Scott, 1958) for some cases of disseminated bronchial and testicular growths.

Unfortunately the adenocarcinoma of the alimentary tract are relatively insensitive to conventional radiotherapy, are not hormone-dependent, and show no response to any of the available cytotoxic agents. For this reason it is not unnatural to find a pessimistic attitude often taken by the patient's doctor when recrudescence of such a growth is suspected following removal of the primary tumour. Should a recurrence have in fact developed, any further attempt at cure depends on the possibility of excision of the secondary deposit.

The more aggressive surgical attitude which is developing to this problem of secondaries in the alimentary tract is engendered by modern advances in technique. Of particular importance are the use of relaxant drugs, chemotherapy, blood transfusion, and the possibilities of excising major vessels with graft restoration of continuity and of successful right or left hepatic lobectomy; all contribute to the possibility of adequate excision of intra-abdominal, body-wall, pulmonary, or even intracerebral secondary deposits.

In this paper we present a number of encouraging examples of later surgery carried out because of suspected recurrence of growth following resection of a primary tumour of the alimentary tract. Recurrences may be completely removable with hope of ultimate cure of the patient; a second operable primary growth may be encountered; or, most happy of all, the symptoms may be found to be due to a non-malignant condition such as adhesions, stricture, or intra-abdominal abscess. In many cases exploration unfortunately reveals a hopelessly incurable situation, but, even here, relief of symptoms may be achieved by short circuit, colostomy, or palliative resection.

Case 1. Repeated Excision of Abdominal Secondary Deposits Following Hemicolectomy for Carcinoma of Caecum

A civil servant aged 54 had a right hemicolectomy performed in December, 1953, for a carcinoma of the caecum 2 cm. in diameter. Histologically this proved to be a Broders grade II growth, and none of the eight lymph nodes examined contained secondary deposits.

He was readmitted in October, 1955, complaining of attacks of severe abdominal colic. Clinical examination was negative, but occult blood was present in the stools, and a barium follow-through examination showed dilated loops of upper jejunum.

Second Operation.—Laparotomy on October 12 revealed a stenosing tumour obstructing the mid small bowel. There were hard enlarged glands in the adjacent mesentery and nodules of growth on the serosa of both bowel and mesentery. A nodule 5 cm. in diameter was also found in the posterior rectus sheath near the umbilicus. This nodule, the small-bowel tumour, and the affected mesentery were removed together with 19 cm. of small intestine.

Microscopical examination showed this small-bowel tumour to be a secondary deposit from the original growth lying deep to but ulcerating through the mucosa. The lymph nodes, serosal nodules, and mass in the abdominal wall all proved to be secondary deposits.

In October, 1956, routine examination revealed a mass at the umbilicus; there was no clinical evidence of dissemination elsewhere.

Third Operation.—On November 8 the palpable mass was found to be a tumour 4 cm. in diameter adherent to the umbilicus, and this was excised widely. A further deposit 2 cm. in diameter was removed from the omentum. Numerous small nodules of growth were found in the mesentery of the terminal ileum, and a wide resection of mesentery together with about 50 cm. of ileum was performed. Again histological examination confirmed the malignant nature of all the involved tissues. The patient recovered smoothly and remained in excellent health, but in August, 1957, a small lump in the operation scar was detected at follow-up.

Fourth Operation.—On September 6 a wide excision of abdominal wall was carried out removing a 3-cm. deposit within the rectus abdominis. Laparotomy revealed no evidence of intra-abdominal malignant disease.

In April, 1958, his abdominal wall was soundly healed and he was very well, clinically free from disease more than four years from the date of the first operation.

Case 2. Resection of Solitary Secondary Deposit in Lung Two Years After Abdomino-perineal Excision for Carcinoma of Rectum

A solderer aged 49 had an abdomino-perineal excision performed for a carcinoma of the rectum in November, 1955. Histologically this proved to be a Dukes stage C. Broders grade III growth. He attended the follow-up clinic in August, 1956, complaining of a cough with blood-stained sputum; an x-ray film of his chest showed: "Some shadowing of the right lung." He was seen again in February, 1957, when the report on his chest x-ray examination was: "The shadow at the right base is getting bigger. This has the appearance of a neoplasm." In July, 1957, his chest x-ray film showed "further increase in the size of the right basal shadow." During the whole of the year, the patient's general condition remained excellent and there was no sign of any abdominal recurrence.

As the growth in the lung appeared to be very slowly growing he was referred to the thoracic surgical unit. A bronchogram confirmed the presence of a tumour in the right lower lobe of the lung, and in October, 1957, this lobe was resected. The histology showed that the growth was a secondary deposit from the original carcinoma of the rectum. At the time of writing the patient was alive and well.

Case 3. Anterior Resection for Carcinoma of Rectum. Abdomino-perineal Resection for Second Primary Growth in Rectum

A gas-fitter aged 65 had an anterior resection performed for a carcinoma of the rectum in November, 1953. Histologically this proved to be a Dukes stage A, Broders

grade III growth. The patient was seen regularly in the follow-up clinic, and in April, 1955, on rectal examination, a polypoid mass was felt at 3 in. (7.5 cm.). At this time the patient had no symptoms.

The growth was removed with diathermy, and the histology showed it to be adenocarcinoma of the rectum (Broders grade I). It was hoped that, as the tumour was of a low grade of malignancy, local excision would be sufficient. A recurrence, however, was soon evident, and an abdomino-perineal excision of the rectum was performed in August, 1955. Histologically, this new primary proved to be a Dukes stage A, Broders grade I growth. At the time of writing the patient is alive and well with no sign of recurrence.

The completely different histology of the two tumours strongly suggests that the second growth had arisen *de novo*.

Case 4. Resection of Pelvic Colon for Annular Carcinoma. Laparotomy for Suspected Recurrence. Small-bowel Obstruction Found to be Due to Adhesions: No Recurrence of Growth

A housewife aged 46 had a resection of the pelvic colon for an annular carcinoma in October, 1954. Histologically this proved to be a Broders grade II growth, and none of the lymph nodes examined showed secondary deposits. In July, 1956, she was seen in the follow-up clinic, where "some fullness" was noted beneath the scar in the left iliac fossa. At this time she was quite well, but admitted to having occasional attacks of abdominal colic and vomiting.

In January, 1958, she was admitted with a subacute intestinal obstruction. A straight x-ray film of the abdomen showed dilated loops of small bowel with some fluid levels, and a barium enema demonstrated some distortion at the site of the old anastomosis, possibly due to a growth.

At laparotomy a loop of ileum was found to be snared by a band running to the site of the colonic anastomosis. There was no sign of any recurrence of the original growth. The band was divided and the patient made an uninterrupted recovery. She remains alive and well.

Case 5. Chronic Abscess of Abdominal Wall Simulating Secondary Deposit

A man of 71 had an emergency ileo-transverse colostomy followed by a right hemicolectomy performed for an obstructing carcinoma of the ascending colon in June, 1953. He remained well until late in 1957, when he noted a lump in the abdominal scar. When seen at the follow-up clinic in February, 1958, there was a mass 7 cm. in diameter deep in the abdominal wall, which was hard and rather tender. He was afebrile. A confident diagnosis of a secondary deposit was made. At operation, however, this proved to be a chronic thick-walled abscess of the abdominal wall containing a length of nylon suture. Culture of the pus grew *Streptococcus pneumoniae*, and histological examination of the abscess wall showed a non-specific chronic inflammatory change only. He made a smooth recovery from this operation, over four and a half years after his original resection.

Comment

In the five years, 1953-7, 31 patients had laparotomies for suspected recurrent cancer; the operative findings are detailed in Table I. In 11 cases it was possible to remove the recurrence, and the case histories of these patients are summarized in Table II. Palliative procedures were done in four patients (one colostomy and three short circuits). One patient (Case 3) was found to have a new primary growth. In only four instances was it found impossible to do anything at operation.

It is a striking fact that in 11 patients, although a recurrence was suspected on clinical grounds, a benign condition was found at operation. One interesting feature of this last group is that in three patients the late appearance of a chronic abscess simulated a recurrence. Two patients had

TABLE I.—Patients Explored for Suspected Recurrences (1953-7)

Sex and Age	Original Operation	Site of Excised Recurrence	Interval Between Original Operation and Excision of Recurrence	Length of Survival After Last Excision
Excision of recurrences				
Palliative operations (1 colostomy, 3 short circuits)				
Inoperable				
Excision new primary growth				
Non-malignant conditions discovered (3 deep abscesses, 1 anastomotic ulcer, 7 intestinal obstructions due to adhesions)				
F 67	Bilroth I gastrectomy for carcinoma of stomach	1. Scar 2. Scar 3. Both axillae	7 months 17 " 21 "	Alive and well, 4 months after last excision
F 53	Hartman's operation for carcinoma of sigmoid colon	Scar	25 "	Alive and well at present, 17 months after last excision
F 54	Abdomino-perineal resection for carcinoma of rectum	Scar	5 "	Dead, Survived 6 months
F 66	Right hemicolectomy for carcinoma of caecum	1. Umbilicus 2. Scar of above excision	26 " 29 " Also given deep x-ray therapy	Dead, Survived 4 months
F 65	Abdomino-perineal resection for carcinoma of rectum	Perineum	2 months. Also given deep x-ray therapy	Dead, Survived 26 months
M 54 (Case 1)	Right hemicolectomy for carcinoma of caecum	1. Small intestine, mesentery, and abdominal wall 2. Small Intestine, omentum, and abdominal wall	22 months 35 "	Well, 10 months after last excision
F 67	Hartman's operation for carcinoma of recto-sigmoid junction	3. Scar Mass in left iliac fossa involving small bowel	45 " 39 "	Died in post-operative period
F 66	Anterior resection for carcinoma of rectum	Small bowel	22 "	" "
F 60	Resection for carcinoma of pelvic colon	Anastomotic line; abdomino-perineal excision performed	34 "	Dead, Survived 25 months
F 47	Resection for carcinoma of descending colon	Right Sylvian fissure	16 "	Dead, Survived 4 months
M 49 (Case 2)	Abdomino-perineal excision of carcinoma of rectum	Lung	24 "	Well, 6 months after last excision

deep abdominal-wall abscesses 18 months and four years (Case 5 above) after colectomy; both had had pre-operative and post-operative chemotherapy, and both had nylon suture material within the abscess cavity. The third patient developed an intra-abdominal abscess adjacent to the anastomosis of a right hemicolectomy, performed seven years previously, which was followed by a course of penicillin and streptomycin.

Such abscesses probably represent either flare-ups in foci of latent infection or sterilized collections of necrotic material which become secondarily infected. With extensive use of chemotherapy these delayed abscesses, presenting many months or even years after abdominal operations, will probably become more common (we have seen two following gastrectomy) and constitute an important differential diagnosis from secondary deposits in a laparotomy scar.

Discussion

A radical approach to the problem of recurrent abdominal cancer is the "second look operation" introduced by Wangenstein *et al.* (1954). He undertakes re-exploration of the abdomen six to eight months after the initial operation in cases where examination of the resected specimen shows that adjacent lymph-node involvement has occurred. At the second laparotomy any suspicious tissue is excised.

and, if this in turn proves to be involved, further explorations are undertaken at similar time intervals until no recurrences are found. He quotes one patient who had a total of five re-explorations following resection of a carcinoma of the caecum. At the last operation no malignancy was found, and the patient was well more than five years after the original hemicolectomy.

Although this scheme has been adopted by some other surgeons (Wilson, 1956), it is still admittedly in its trial stage. There are two disadvantages; first, it is necessary to explain to the patient the exact nature of his disease and its prognosis, a procedure which is inadvisable in a proportion (we would say a very high proportion) of cases; and second, in this country, the "second look" operation would impose a heavy strain on the available general surgical hospital beds. However, this procedure may well offer the possibility of improving the prognosis in relatively young and intelligent patients with intra-abdominal cancer.

Although the "second look" idea remains to be evaluated, there is no question that much can be gained from periodic careful clinical follow-up examination by the surgeon or general practitioner of all patients who have had resections of tumours of the alimentary tract. In some, evidence of recurrence will be found on clinical examination before symptoms have appeared.

Now that a standard technique has been devised for right hepatic lobectomy (Raven, 1947; Lloyd-Davies and Angell, 1957), as well as the comparatively simple resection of the left lobe for solitary or localized deposits, re-exploration can be undertaken with more confidence and with a greater chance of success than in the days when liver secondaries appeared to be a hopeless problem.

Pulmonary metastases were for long regarded as evidence of inoperable dissemination of malignant disease. Further research has shown that they may occur as a solitary deposit, and, where careful investigation reveals an isolated pulmonary secondary with no effusion and no evidence of spread elsewhere, surgery should be advised. The number of reports of successful removals of secondary pulmonary deposits is steadily increasing. Alexander and Haight (1947), for example, collected 24 cases, 12 of the patients being still alive (eight for more than a year after operation); one patient was well 12 years later. By 1956 Kelly and Langston reviewed 109 patients who had undergone surgery for lung secondaries: 19 (23.2%) had survived for two years or more without recurrence. Nelson *et al.* (1957) reported the resection of two successive pulmonary deposits from a patient who had had a resection of a carcinoma of the left colon, and collected 11 other cases where two lung secondaries had been removed.

Even cerebral secondaries are by no means always irremovable; Störtebecker (1954) reported a study of 158 resections of metastatic brain tumours, although only 13 of these came from primary carcinomata of the alimentary tract. The present series includes a deposit in the Sylvian fissure from a carcinoma of the descending colon.

Although our thesis is that recurrent growths are not necessarily irremovable, their prevention is better than cure. It will be seen that five patients in the present series had secondaries in the abdominal wall removed—one on two occasions and one on three. These deposits probably represent direct implants of malignant cells at the time of the original operation. Naunton Morgan (1958, personal communication) believes that conventional skin towels are inadequate to prevent inoculation of cancer cells at operation, and advocates the use of macintosh-reinforced towels over the raw wound surfaces and wrapped around the growth itself before this is handled extensively.

Recent cytological investigations have demonstrated cancer cells in the venous blood draining tumours of the large bowel in between 30 and 50% of cases examined (Fisher and Turnbull, 1955; Burns and Pfaff, 1956). Moore *et al.* (1957) have even detected tumour cells in the peripheral blood in 25 out of 57 patients with tumours of the alimentary tract.

It seems logical, therefore, that ligation of the vascular pedicle should be carried out before proceeding with manipulation of the tumour whenever possible, in an attempt to limit dissemination of malignant emboli into the blood stream (Cole, 1955).

Goligher *et al.* (1951) analysed the causes of recurrence following anterior resection of the rectum. Some are almost certainly second primaries (see Case 3), others result from inadequate resection, and others still from tumour-cell implantation at the anastomosis; an example of the latter occurred in the present series. Not only should excision be adequate (a 2-in.—5-cm.—clearance as the minimum distally) but the distal bowel should be washed out with 1:500 perchloride of mercury to kill off free cancer cells and prevent their implantation.

Unfortunately many patients will present with evidence of recurrences so hopeless that laparotomy is contraindicated; these will include the cases with ascites, a fixed mass in the pelvis, jaundice, and extensive liver secondaries. Pain in these sufferers can be controlled by analgesics and opiates, supplemented by chlorpromazine. Some selected cases may benefit from cordotomy, splanchnic blocks, and permanent local spinal blocks (Maher, 1955). Ascites and malignant pleural effusions may both be controlled in some measure by instillation of radioactive gold (MacKay, 1957), with relief from distension and dyspnoea. Above all, the "hopeless case" must not feel that he is being abandoned; attention to small details of nursing care will give considerable relief in the terminal stages of malignant disease.

Summary

Recurrence of symptoms after resection of a primary tumour of the alimentary tract may be due to secondary deposits, but these may be operable even if in lung or brain. In other cases the symptoms may be caused by the development of a fresh primary tumour or even by some non-malignant condition.

A more optimistic surgical attitude towards suspected recurrences is advocated and some encouraging examples are presented.

We thank the surgical consultant staff of the Radcliffe Infirmary, Oxford, for permission to study the patients recorded in this series. We are grateful to Mr. D. A. Abernethy and Mr. A. Elliot Smith for their advice and criticism.

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"To-day, we understand the means by which tuberculosis can be prevented, and we have the drugs through which, provided treatment is begun early and continued properly, the illness can be cured. . . . In 1957 there were 4,784 deaths, as against 23,076 ten years ago, though over 30,000 new patients are still discovered every year. Tuberculosis has been removed from among the great killers of men, and demoted to the position of a lesser—though still formidable—enemy. There are still 350,000 patients attending our chest clinics in Britain; and if we add their families (who are at risk) this means at least a million lives directly affected by a preventable disease."—From the *NAPT Annual Report, 1957-1958*.

HEPATIC COMA IN LIVER FAILURE AND GASTRO-INTESTINAL HAEMORRHAGE TREATED WITH NEOMYCIN

BY

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The introduction of protein withdrawal, oral broad-spectrum antibiotics, and enemata as a basis for treating hepatic impending coma and coma (Sherlock *et al.*, 1954) has been supported by encouraging results in larger groups of patients (Sherlock *et al.*, 1956; Summerskill *et al.*, 1957a). However, the relative contribution of each measure to the therapeutic response is uncertain, and protein deprivation, which may have to be long-continued, is particularly undesirable when liver disease is associated with undernutrition. No comparative studies are available to indicate the most effective antibiotic in hepatic coma, but the recent use of neomycin in three patients by Fisher and Faloon (1957) is important, as temporary clinical improvement was compatible with continued protein administration. Dawson *et al.* (1957) treated acute hepatic coma in 12 patients with neomycin, protein deprivation, and other measures. No conclusions were drawn in regard to its specific therapeutic action in either series, as coma was often due to multiple factors and additional methods of treatment were employed simultaneously. In this paper the effect of neomycin is compared with that of other antibiotics under controlled conditions, and the degree to which protein withdrawal and other procedures may be modified as a result of neomycin therapy is also studied.

Material

Six patients (three male and three female) with impending hepatic coma or coma complicating cirrhosis were studied (Table I). Cirrhosis was thought to be the

TABLE I.—Biochemical Findings

Case No.	Sex and Age	Serum Bilirubin (mg./100 ml.)	Serum Albumin (g./100 ml.)	Thymol Turbidity (Units)	Serum Sodium (mEq/l.)
1	F 60	6.0	2.2	16	137
2	F 75	4.0	2.8	10	112
3	F 77	1.5	3.5	5	127
4	M 24	20.0	2.9	2	99
5	M 55	0.8	4.8	1	142
6	M 49	0.9	3.1	1	125
Normal values		<1.0	>4.0	<5	(137-144)

sequel of virus hepatitis in Case 1 and of long-standing cardiac failure in Case 3; in Cases 5 and 6 it was possibly associated with alcoholism; and in Cases 2 and 4 the cause was uncertain. All except Case 6 had stigmata of chronic liver disease, and the relevant biochemical findings are shown in Table I. Case 2 gave a history of poor nutrition, and the serum albumin concentration was below 3 g./100 ml. in Cases 1, 2, and 4.

Coma was attributed to liver failure in Cases 1, 2, and 3, as all had developed ascites and two had become jaundiced shortly before the onset of neuropsychiatric disorder. The presence of a portal collateral circulation facilitating the onset and perpetuation of coma in these patients could not be excluded, but splenomegaly or superficial abdominal collateral veins were not found and there was no radiological evidence of oesophageal

varices in Case 1. Additional factors which may contribute to coma, such as high protein feeding, gross or occult gastro-intestinal bleeding, drugs, or intercurrent infection, were excluded. Ascites in Cases 2 and 3 was accumulating despite treatment, and was associated with serum sodium concentrations below 130 mEq/l., findings suggesting advanced liver damage and a poor prognosis (Hecker and Sherlock, 1956).

In Cases 4, 5, and 6 coma followed major gastro-intestinal haemorrhage. Gastro-oesophageal varices were demonstrated by barium swallow and meal, portal venography, and oesophagoscopy in Cases 4 and 5, while Case 4 also had intractable ascites, hypoalbuminaemia, and was deeply jaundiced (Table I). In Case 6 bleeding originated from a chronic gastric ulcer and there was no evidence of portal hypertension at laparotomy.

Methods

Daily assessment of the neuropsychiatric state was based on the observations of Walshe (1951), Adams and Foley (1953), and Summerskill *et al.* (1956). Because of the characteristic fluctuations in the syndrome, a distinction was made only between "coma" (absence of response to strong stimuli), "impending coma" (personality changes with objective signs, of which a flapping tremor was the most prominent), and the absence of gross psychiatric or neurological disorder.

Diets with calculated protein and sodium contents were supplied by the hospital dietetic department: antibiotics were given by mouth or intragastric drip in equally divided doses three or four times in the 24 hours; and enemas were administered when necessary to ensure daily bowel movements.

The biochemical tests, including the nitrogen balances, and bacteriological investigations reported were routine laboratory procedures.

Results

Case 1 (Fig. 1).—A woman aged 60 was admitted to hospital unconscious, and initial treatment by protein withdrawal, intragastric glucose, and enemata was followed within 48 hours by emergence from stupor, but tremor and confusion continued. Protein was added cautiously, but a daily intake of 30 g. was followed by gross neuropsychiatric disorder. Reduction of the amount to 20 g. failed to bring improvement. The patient's behaviour was incompatible with her retention in a general ward when neomycin (6 g. daily) was started, 12 days after admission to hospital. Within 24 hours normal mental function was restored and tremor and the other neurological abnormalities disappeared. The protein intake was then raised by 10-g. increments every three or four days to a total of 50 g. daily without neuropsychiatric deterioration. Simultaneously the daily dose of neomycin was reduced, and after two weeks it was discontinued. Five days later the patient again became drowsy, confused, and tremulous, but it was possible to raise the protein intake to 70 g. daily. Chlorotetracycline (2 g. daily) did not improve the neuropsychiatric state. Accordingly, neomycin (6-4 g. daily) was substituted for it without alteration in dietary protein. After three days there was a striking improvement in response to neomycin, and after a further six days it was possible to withdraw chemotherapy. There was no further relapse, the jaundice and ascites subsequently disappearing.

Case 2 (Fig. 2).—A woman aged 75 was admitted to hospital for the treatment of ascites, but her condition slowly deteriorated and she developed impending coma and then lost consciousness. She remained in deep coma for five

days despite therapy with protein withdrawal, "sigmamycin" (tetracycline and oleandomycin in proportions of 2:1) (2 g. daily) and enemata. The following day she

regained consciousness, although confusion and tremor continued for a further day. After the neuropsychiatric state had remained normal for 24 hours, 20 g. of protein was added to the diet. The next day confusion, drowsiness, and tremor reappeared, but the amount was increased to 40 g. daily. Neuropsychiatric disorder persisted, and neomycin (6 g. daily) was substituted for sigmamycin. Within 24 hours the patient had returned to normal consciousness, although remaining on 40 g. of protein daily. Neomycin was discontinued after a four-day course, being replaced by sigmamycin (2 g. daily). Two days later there was a return of drowsiness, confusion, and tremor. Chloramphenicol (2 g. daily for four days) was substituted for sigmamycin for the treatment of an infection of the urinary tract, but it had no effect on the neuropsychiatric condition. Neomycin (8 g. daily) was therefore reintroduced, and within three days there was again a striking response, the patient becoming orientated and more alert. Subsequently the dosage was reduced slowly without deterioration in her condition.

Case 3 (Fig. 3).—While in hospital for treatment of congestive cardiac failure, a woman aged 77 became confused, tremulous, and intermittently stuporous. Ammonium chloride (1 g. t.d.s.) had been included in her treatment, but its cessation failed to influence her condition. Chlorotetracycline (2 g. daily) was then given without altering the diet, and the patient regained consciousness, although confusion, apathy, and tremor persisted. Neomycin (6 g. daily for four days) was substituted for chlorotetracycline and further improvement occurred after two days. Tremor was no longer apparent and she was alert enough to sit out of bed and feed herself. Two days after neomycin treatment was stopped some tremor and apathy returned.

Case 4.—A man aged 24 was admitted to hospital with melaena and impending hepatic coma. A portacaval anastomosis, which had subsequently become occluded, had been constructed 16 months previously. Neomycin therapy (6 g. daily) was started

immediately, but balloon compression of the gastro-oesophageal region was not undertaken. Haemorrhage, with the daily passage of loose melaena stools, continued for six days and the haemoglobin concentration was 8.9 g./100 ml. (60%) after 6 pints (3.4 litres) of blood had been given during this time. A protein intake of 40 g. daily was allowed throughout, and, despite progressive liver failure, with increasing jaundice (serum bilirubin 20 mg./100 ml.), the accumulation of tense ascites, and hyponatraemia (serum sodium concentration 99 mEq/l.), there was no neuropsychiatric deterioration. Normal consciousness was re-established 36 hours after admission and subsequently maintained. After the cessation of bleeding, liver function improved quickly.

Case 5.—A man aged 55 with known portal hypertension was admitted to hospital following the passage of melaena stools. Irrational, violent behaviour prevented the immediate introduction of a gastro-oesophageal compression balloon, and neomycin (6 g. daily), together with routine treatment, was started. Bleeding continued for four days and, after 6 pints (3.4 litres) of blood had been given in this time, the haemoglobin concentration was only 10.2 g./100 ml. (64%). Grossly abnormal conduct and a "flapping" tremor persisted for three days and some confusion continued for a further two days. Protein was withdrawn from the diet for two days, but it was then introduced in

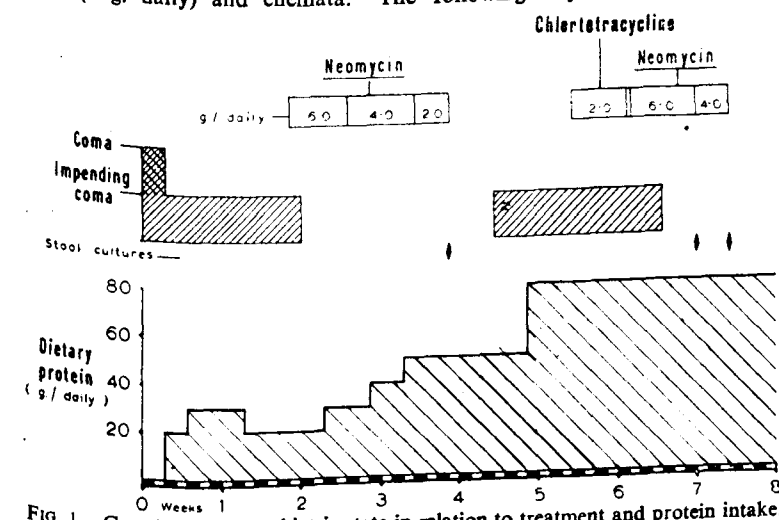


Fig. 1.—Case 1. Neuropsychiatric state in relation to treatment and protein intake.

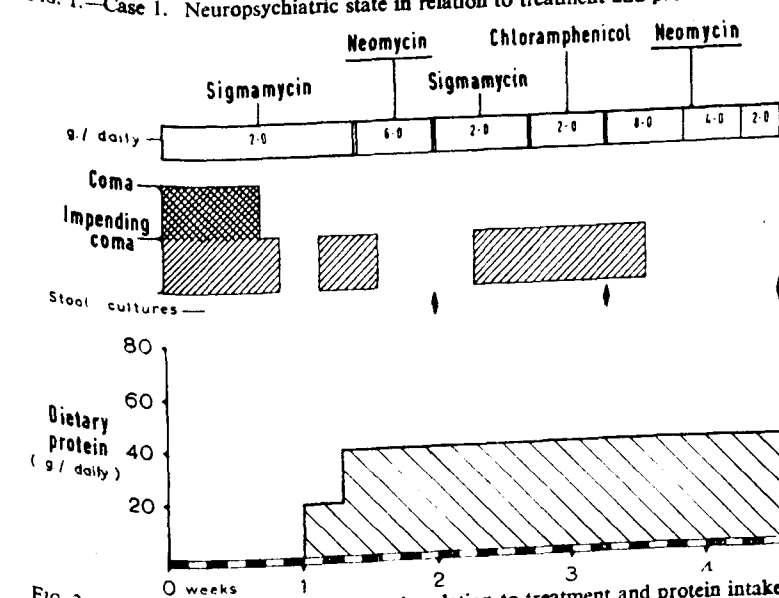


Fig. 2.—Case 2. Neuropsychiatric state in relation to treatment and protein intake.

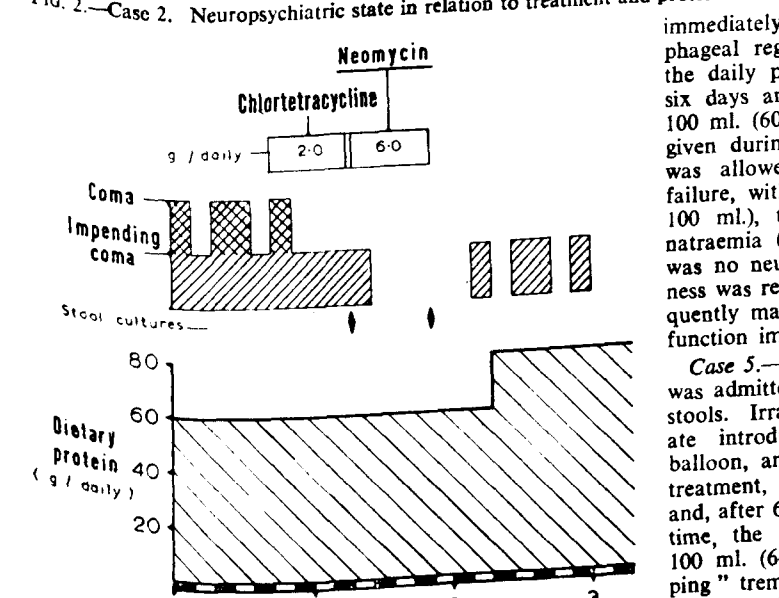


Fig. 3.—Case 3. Neuropsychiatric state in relation to treatment and protein intake.

daily increments of 10 g. without apparently prejudicing improvement in the neuropsychiatric state.

Case 6.—A man aged 49 was admitted to hospital following haematemesis and melaena of three days' duration. The next day he developed impending hepatic coma. Although standard biochemical tests of liver function showed no abnormality (Table I), 50% of injected bromsulphthalein was retained in the blood after 45 minutes, thus supporting the possible presence of liver disease. Neomycin therapy (6 g. daily) was instituted immediately. Profuse bleeding continued, and, despite the rapid transfusion of 7 pints (4 litres) of blood, his condition deteriorated. Although impending hepatic coma had been present for 12 hours, surgical treatment was thought necessary to arrest the haemorrhage. Accordingly Mr. K. Lloyd Williams undertook a laparotomy under general anaesthesia (Dr. L. Khan) with thiopentone, pethidine, gallamine triethiodide, nitrous oxide, and oxygen. The liver was cirrhotic, but no splenomegaly or portal collateral veins were found, and three chronic gastric ulcers were present. A Polya partial gastrectomy was performed. His recovery from the anaesthetic and his post-operative progress were uneventful, and no further neuropsychiatric disorder occurred.

Bacteriological Studies

Stool cultures were examined at various stages of treatment in Cases 1-5. A "sterile" stool was obtained after four to six days' neomycin (6 g. daily) in Cases 2, 4, and 5, although faecal organisms persisted in Case 3 after the same treatment. Stools from Case 1 and 2 which were examined after longer courses of neomycin (6-14 days) grew an apparently normal faecal flora in three instances despite continued clinical improvement. The average daily dose of neomycin was less than 6 g. on these occasions. Faecal organisms were also present after chlortetracycline in Cases 2 and 3 and after both sigmamyacin and chloramphenicol in Case 2.

Additional Observations

Hepatic fetor was present initially in all patients, but it disappeared within 36-48 hours of treatment with protein withdrawal or antibiotics. Despite the subsequent addition of dietary protein and the reappearance of neuropsychiatric signs, fetor was not detected during the intermittent administration of antibiotics. The patients had loose stools with neomycin, but troublesome diarrhoea did not occur and no other toxic effect was observed.

Following a period of equilibration on the appropriate diet and antibiotic, four-day nitrogen balances were carried out on Case 1. During treatment with chlortetracycline (2 g. daily) there was a total nitrogen output of 46.1 g. with a positive balance averaging 2.2 g. daily. When neomycin (6-4 g. daily) was substituted for chlortetracycline, the urinary nitrogen loss was reduced and the positive nitrogen balance improved to 3.5 g. daily (Table II).

TABLE II.—Nitrogen Balance During Treatment with Chlortetracycline and Neomycin in Case 1

Drug	4-day Collections (g./Nitrogen)			
	Dietary Nitrogen	Urine Nitrogen	Stool Nitrogen	Balance
Chlortetracycline	54.9	34.2	11.9	+ 8.8
Neomycin	55.1	29.4	11.6	+14.1

Discussion

Treatment with antibiotics, protein withdrawal, and enemata in hepatic coma is based upon evidence that nitrogenous compounds of intestinal origin are a cause of the neuropsychiatric disorder. The object of therapy is therefore to reduce the amount of nitrogenous material in the intestines and, with antibiotics, to inhibit bacterial enzyme activity by suppression of the gut flora. The regime is of proved therapeutic value when coma results from intolerance of nitrogenous substances, such as gastro-intestinal

bleeding or high-protein feeding, in patients with adequate liver function. In coma due to liver failure there is more widespread clinical and metabolic disturbance and consequently a much poorer prognosis (Sherlock *et al.*, 1956; Summerskill *et al.*, 1957a). Moreover, the issue is rarely sufficiently prolonged or uncomplicated to permit controlled observations in relation to specific therapy.

Cases 1, 2, and 3 are of interest, as comparative studies were possible, although coma resulted from hepatic failure. In two patients relapses occurred after initial treatment when relatively small amounts of protein were added to the diet, and they responded successfully on four occasions to neomycin without alteration of the diet. In the third patient, recovery occurred when neomycin was given, despite the continued administration of protein. Other antibiotics (chlortetracycline, sigmamyacin, or chloramphenicol) proved less effective with the identical protein intake and general management, although chlortetracycline was followed by improvement in one patient. The therapeutic action of neomycin occurred within 24-72 hours and deterioration took place on withdrawing the drug after a similar interval. These results stress the importance of oral antibiotic therapy even when coma is due to hepatic failure and, in the absence of other comparative data, suggest that neomycin is the most effective of currently recommended antibiotics in hepatic coma. This accords with the experience of Dawson *et al.* (1957) with neomycin in the management of chronic or recurrent neuropsychiatric disorder due to protein intolerance in patients with extensive portal-systemic collateral circulations, and with the improvement in E.E.G. appearances following use of the drug in patients with liver disease (Parsons-Smith *et al.*, 1957).

In Cases 4 and 5, with impending coma due to bleeding varices, deterioration to coma was prevented and full restoration of consciousness occurred when neomycin was given, although the haemorrhage was not controlled. Recovery was particularly striking in Case 4, in which deep jaundice and ascites were present, especially as an adequate protein intake was allowed throughout. The improvement in Case 6 was predominately due to surgical arrest of the bleeding, but the use of neomycin before operation probably ensured the smooth post-operative course, as impending coma had been present for at least 12 hours prior to general anaesthesia and constituted an important contraindication to surgery.

The close relationship between protein feeding and hepatic coma (Phillips *et al.*, 1952) is particularly important when coma complicates liver disease associated with malnutrition. Neomycin was superior to other antibiotics tested in permitting an adequate protein intake despite neurological disorder. Moreover, the nitrogen balance was positive during neomycin therapy, whereas the tetracycline antibiotics increase nitrogen catabolism and may cause a negative nitrogen balance (Faloon *et al.*, 1954, 1957).

A nutritious diet is important in the management of many patients with cirrhosis (Patek *et al.*, 1948), and the extent to which neomycin therapy will obviate protein deprivation in the treatment of hepatic coma is not yet clear. Clinical improvement with neomycin appears within 72 hours and temporary elimination of protein from the diet for this period is still prudent if coma is established or anticipated. When consciousness returns, an adequate protein intake (40 g. daily) may be tolerated, and if protein undernutrition is thought to be of aetiological significance in the liver disease larger amounts can be tried. As the presence of blood in the intestines has an effect similar to that of protein in precipitating hepatic coma (Sherlock *et al.*, 1954), balloon compression of the gastro-oesophageal region (Sengstaken and Blakemore, 1950) is of prophylactic use in patients with bleeding varices. However, the tube is often difficult to introduce in the uncooperative pre-comatose patient, hard to tolerate, and apt to cause ulceration of the oesophagus (Sherlock, 1958). The control of neuropsychiatric complications with neomycin during bleeding in Cases 4 and 5 indicates that compression can be reserved for patients in

whom haemorrhage is catastrophic or results in progressive neuropsychiatric deterioration. The smooth recovery of Case 6, despite preoperative impending coma, suggests that neomycin is also effective as a prophylactic measure in patients with liver disease prior to operation.

The relative significance of various organisms in the production of toxic nitrogenous substances in the human intestine, and therefore the specific action of neomycin, remains uncertain. Although the faecal flora is qualitatively and quantitatively normal in cirrhosis and hepatic coma (Phear *et al.*, 1956), some organisms, particularly coliforms and *Sr. faecalis*, extend abnormally far up the intestines (Martini *et al.*, 1957). Neomycin, being poorly absorbed from the intestines, is relatively non-toxic, and doses of 8-12 g. daily were shown by Fisher and Faloon (1957) to "sterilize" the stools within 36 hours to 5 days. With the lower dosage employed in this study, the stools were "sterile" in three patients after four to six days' treatment. Reappearance or persistence of the faecal flora was not necessarily accompanied by clinical deterioration, and this agrees with the more extensive bacteriological studies of Dawson *et al.* (1957). Neomycin presumably exerts some specific effect on bacterial growth and metabolism under these circumstances that explains its clinical superiority to the other antibiotics used.

Toxic agents derived from nitrogenous material in the intestines, and of possible causal significance in hepatic coma, include methyl mercaptan (Challenger and Walshe, 1955) and tertiary amines (Butt and Mason, 1954), but evidence accumulates to incriminate ammonia in particular (Kirk, 1936), although its effect on brain metabolism has been variously interpreted (Bessman and Bessman, 1955; Summerskill *et al.*, 1957b). Ammonia from food, blood, and other nitrogenous material in the intestines can reach the systemic circulation by passing through a diseased liver or by way of portal collateral vessels (White *et al.*, 1955), and this accords with clinical experience, which relates hepatic coma to inadequacy of liver function, the extent of the portal collateral circulation, and the amount of nitrogenous material in the intestines (Sherlock *et al.*, 1954). Oral neomycin reduces portal blood ammonia levels effectively in dogs (Silen *et al.*, 1955), and Fisher and Faloon (1957) showed that both peripheral and portal vein ammonia values were lowered in patients with cirrhosis, even when protein was given. However, during long-term treatment, Dawson *et al.* (1957) found that ammonia concentrations in the blood tended to rise, although this was not necessarily associated with clinical deterioration.

Conclusion

These cases have been reported because, as is rarely possible in acute hepatic coma, objective assessment of the efficacy of a single therapeutic agent has been possible. Wider experience with neomycin in this department has confirmed its usefulness but has also emphasized two disadvantages. The first is its cost, although in these patients it was effective in doses well below the 12 g. daily used by Fisher and Faloon (1957). The second, if paradoxical, sometimes constitutes a practical dilemma and involves irreversible hepatic failure due to terminal chronic liver disease. Neomycin is sometimes so effective in prolonging normal consciousness in such patients that the distressing and unequal struggle appears to be unduly prolonged.

Summary

Neomycin was more effective than chlortetracycline, sigmamyacin, or chloramphenicol in treating three patients with hepatic coma due to liver failure under controlled circumstances. Neomycin therapy permitted an adequate protein intake, which, with the other drugs, caused neuropsychiatric deterioration.

Impending hepatic coma was precipitated by haemorrhage from gastro-oesophageal varices in two other

patients, one of whom also developed liver failure. Restoration of consciousness followed neomycin treatment despite persistent bleeding and continued protein-feeding. Balloon compression of the gastro-oesophageal region was not necessary. In another patient, impending coma resulted from massive bleeding from a gastric ulcer. Despite the neuropsychiatric disorder, general anaesthesia and surgical treatment were followed by an uncomplicated post-operative course with neomycin therapy. The influence of these findings on the management of hepatic coma is discussed.

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The British Council for Rehabilitation has set up a working party under the chairmanship of Dr. ELFED THOMAS, director of education for the City of Leicester, "To investigate the needs of physically and mentally handicapped school-leavers; to study the means of meeting their difficulties, and to make recommendations." The work is expected to take about two years and will be on a nation-wide basis. The composition of the working party includes educationists, representatives of the medical services, the voluntary organizations engaged in social work of an educational and medical nature, the Trades Union Congress, industry, and observers from the Ministries of Education, Health, and Labour and National Service, and local authorities. While it is recognized that the statutory services show an enlightened approach to the problem, states the council, and, as promulgated, appear to make reasonable provision, there still remain gaps. There are, continues the council, far too many handicapped school-leavers who, for one reason or another, miss the opportunities they should have and are left in what could become a hopeless position. The British Council for Rehabilitation (Tavistock House South, Tavistock Square, London, W.C.1) would therefore welcome evidence relevant to the above terms of reference from any source.

SURVEY OF PUPILS IN SCHOOLS FOR PHYSICALLY HANDICAPPED IN LONDON

BY

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AND

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The proper placing of the handicapped school child, particularly the physically handicapped school child, in the school community has been a matter for discussion for many years. In deciding what is best for each child there are so many variables, apart from the physical handicap, to be taken into account—age, intelligence and personality, length of stay in hospital, family care, availability of day and boarding "special" schools, transport, size of classes, and types of buildings of near-by "ordinary" schools. In recent years there has been a demand for the admission to ordinary schools of children who would previously have been regarded as too severely handicapped for anything but a special school. At the same time there are now in the special schools many children who in previous years would have been regarded as too seriously crippled for life outside a hospital or the four walls of their home.

Surveys of the reasons for admission of children attending special schools for the physically handicapped in London have been carried out from time to time, the most recent being in 1949, 1951, and 1954. The results of these surveys were not published, although the London figures for 1951 were included among those for the whole of England and Wales in the survey made at that time by the Chief Medical Officer of the Ministry of Education (1954). So far as earlier surveys are concerned, the results of one carried out in London in 1928 were published in the Annual Report of the London County Council (1928). No records are available of any such surveys which may have been carried out between 1929 and 1948.

Method

Early in 1957 it was decided that another survey should be made, and the schools were asked to submit lists of the particular defects of their pupils. In practically every case the child was under observation by a consultant or specialist at a hospital, so that the school doctor had available enough evidence upon which to give a precise diagnosis. The returns from the schools were coded, and an aggregate for London was made of the coded items. In the interests of clarity, and with a view to comparison with any other current and future surveys, the coding was based on the classifications and nomenclature of the *International Statistical Classification of Diseases, Injuries, and Causes of Death* (W.H.O., 1957). It says much for the precise nature of the information available in the schools that in only a handful of cases was it necessary to ask the school for further information before a code number could be assigned.

Results

The full tabulation given in Table I shows 93 different conditions for the 1,325 children in 17 schools at the time of the survey. The largest group is cerebral palsy, 312, but this does not represent all the children of school age in London with cerebral palsy, as a survey in 1955 (MacGregor *et al.*, 1957) revealed 526 cases between the ages of 5 and 16 years. Children crippled by poliomyelitis (240) formed

TABLE I.—1957 Survey of Pupils in Schools for the Physically Handicapped in London

Code No.	Condition	No. of Cases
010	Tuberculosis of meninges and C.N.S.	1
011	" " peritoneum	24
013-0	" " spine	33
013-1	" " hip	11
013-2	" " knee	5
013-3	" " other bones and joints	240
081	Post-poliomyelitis	2
193	Malignant neoplasm of brain	1
199	" " " leg	5
223	Benign neoplasm of brain	1
225	" " " knee	2
228	Haemangioma	7
237	Tumour of brain	1
241	Asthma	4
253	Cretinism	3
272	Diseases of pituitary gland	4
277	Dwarfism	1
284	Post-rickets	1
286-0	Coeliac disease	1
289-0	Gaucher's disease	2
289-2	Lipodystrophy	1
292-2	Cooley's anaemia	1
292-4	Aplastic anaemia	1
293	Anaemia	21
295	Haemophilia	1
298-0	Hepatosplenomegaly	11
344	Post-inflammatory disease of C.N.S.	312
351	Cerebral spastic infantile paralysis	1
352	Other cerebral paralysis	23
353	Epilepsy	1
355	Huntington's chorea	29
356-0	Progressive muscular atrophy	1
357	Friedreich's ataxia	1
364	Polynuria	4
410	Rheumatic valvulitis—mitral	25
411	" " " aortic	1
411	" " " combined	1
414	Rheumatic endocarditis	1
416	" " " carditis	1
445	Malignant hypertension	1
453-3	Vasomotor disturbance	1
468-2	Lymphadenitis	1
526	Bronchiectasis	1
560	Hernia	1
587-2	Fibrocystic disease of pancreas	8
593	Nephritis	2
601	Hydronephrosis	1
602	Renal calculus	1
722-0	Still's disease	15
724	Arthritis	4
730-1	Osteomyelitis	14
730-3	Periostitis	1
732	Perthes's disease	14
733	Dysplasia epiphysealis	1
735	Prolapse intervertebral disk	1
744-1	Progressive muscular dystrophy	24
745	Curvature of spine	14
748	Clubfoot	22
749	Coxa vara	2
751	Spina bifida	37
752	Hydrocephalus	22
753-1	Congenital malformation of nervous system	6
754-0	Tetralogy of Fallot	31
754-1	Patent ductus arteriosus	10
754-2	Interventricular septal defect	40
754-3	Interatrial septal defect	27
754-5	Other congenital malformations of heart	19
754-6	Coarctation of aorta	1
754-7	Other congenital circulatory malformations	18
756-1	Imperforate anus	3
757	Congenital malformation of genito-urinary system	4
758-0	" " " dislocation of hip	19
758-1	Chondrodystrophy	9
758-2	Congenital malformation of skull	2
758-3	Brittle bones	10
758-6	Other congenital malformations of bones and joints	33
759-1	Epidermolysis bullosa	3
780-3	Jacksonian epilepsy	1
780-4	Athetosis	21
780-5	Ataxia	7
N800/1	Fracture skull	3
N808	" " " pelvis	1
N813	" " " arm	1
N823	" " " leg	1
N836	Dislocation patella	6
N856	Traumatic cerebral paralysis	2
N888	Amputation arm	1
N891	Scarring leg	3
N897	Amputation foot	1
N898	" " " leg	1
N901	Injury both legs	1
N945	Burns both thighs	1
N948	Multiple burns	1

the second largest group, and congenital heart disease (127) was the only other group of more than a hundred cases. In essence Table I shows that, apart from these large categories, the children attending the special schools for the physically handicapped are suffering from a very wide range of conditions, some of which in this survey are represented by only one or two children.

From the point of view of morbidity statistics it is important to note that the figures given in Table I, which relate

only to children in special schools for the physically handicapped, cannot be used to measure the incidence of any particular condition amongst the child population, since there are many handicapped children satisfactorily placed in ordinary schools, and there are others who are not in school at all. On the other hand, from the point of view of education statistics, the figures are of importance as a measure of the need for special educational provision.

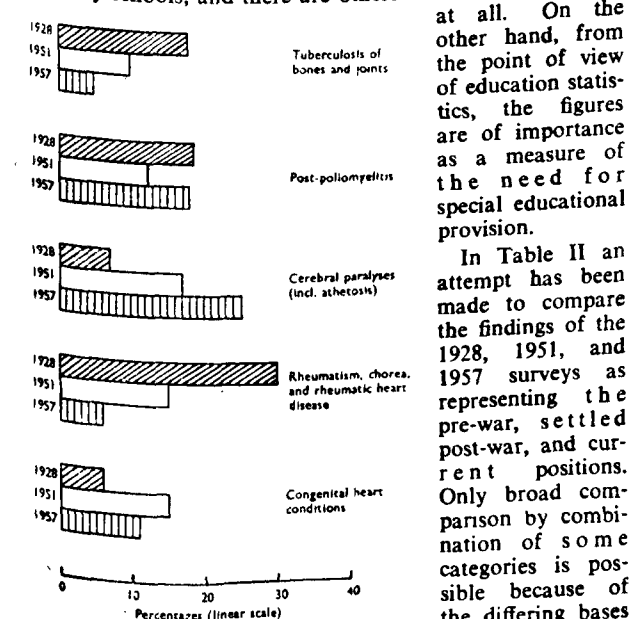


FIG. 1.—Percentage distributions of pathological conditions of pupils in schools for the physically handicapped in London, 1928, 1951, and 1957.

may possibly have been put into the wrong category, but, because of the magnitude of the differences between the successive surveys, such minor errors will not radically affect the pattern of change over the years. In Table II the numbers recorded are also shown as percentage distributions and as rates per 1,000 of the total school rolls (see also Figs. 1 and 2).

Discussion

As Table II shows, the population of the schools for physically handicapped has fallen more steeply than has the total London school population; the incidence per 1,000 of the school population of attendance at schools for the physically handicapped in 1957 was less than half what it was in 1928. The most marked decrease has been, as would be expected, in juvenile rheumatism and in non-pulmonary tuberculosis. Juvenile rheumatism (including chorea) has fallen from 1.96 per 1,000 through 0.6 to 0.16; and non-pulmonary tuberculosis has fallen from 1.14 through

0.40 to 0.16 also. It is sometimes forgotten that 30 years ago poliomyelitis was so important; in 1928 poliomyelitis was second only to rheumatism as a reason for admission to schools for the physically handicapped, with an incidence of 1.21; in 1951 the incidence was 0.53 and in 1957 it was 0.54, again the second most common cause of admission, but now second to the cerebral palsies.

The incidence of cerebral palsy has gone up from 0.49 through 0.72 to 0.77; even the actual numbers have increased from 314 to 342. We know that many very severely handicapped children are now admitted to special schools, and this may well have affected this change. The incidence of arthritis, progressive muscular dystrophy, kidney disease, and brittle bones has increased, but the numbers involved are not large. Congenital heart disease had caused 251 admissions (0.39) in 1928 and 241 in 1951, a much higher incidence (0.59), but by 1957 there were only 146 children left with congenital heart disease, a fall in the incidence to about what it was in 1928 (0.33). It would take a special inquiry to reveal the reasons for these variations. The incidence of disabilities due to injuries has fallen from 0.18 to 0.06, but this still means that 26 children are needlessly crippled. For those who do not know the special schools, it should be said that the stay of amputees, for example, is not long, and usually they soon return to ordinary schools.

The school for the physically handicapped is usually a single-storied building, too often some 30-40 years old, and not too well suited to its present function. There are usually about 100 children in the school and there are not more than 20 in a class. All children are conveyed to and from school in special coaches which call at their homes or points convenient to them. In 1928 no treatment was given in the schools, and children who required it had to attend

FIG. 2.—Rates (per 1,000 of total school roll) of pathological conditions of pupils in schools for the physically handicapped in London, 1928, 1951, and 1957.

TABLE II.—Comparison of 1928, 1951, and 1957 Surveys of Pupils in Schools for the Physically Handicapped in London

Condition	Numbers Recorded			Percentage Distributions			Rates per 1,000 of Total School Rolls		
	1928	1951	1957	1928	1951	1957	1928	1951	1957
Tuberculosis of bones and joints	726	161	73	17.9	9.7	5.5	1.14	0.40	0.16
Post-poliomyelitis	771	214	240	19.0	12.9	18.1	1.21	0.53	0.54
Post-rickets	78	1	1	1.9	0.1	0.1	0.12	0.00	0.00
Cerebral palsy (including athetosis)	314	294	342	7.7	17.8	25.8	0.49	0.72	0.77
Rheumatism and chorea	166	244	72	4.1	14.8	5.4	0.26	0.60	0.16
Rheumatic heart disease	1,088	5	3	26.9	0.3	0.2	0.05	0.01	0.01
Bronchiectasis, etc.	33	9	11	0.8	0.5	0.8	0.01	0.02	0.02
Diseases of kidney	6	26	19	0.1	1.6	1.4	0.10	0.06	0.04
Arthritis	61	33	14	1.5	2.0	1.1	0.12	0.08	0.03
Osteomyelitis	79	37	22	1.9	2.2	1.7	0.03	0.09	0.03
Progressive muscular dystrophy	22	241	146	0.5	14.5	11.0	0.39	0.59	0.33
Congenital heart (including circulatory) disease	251	10	10	6.2	0.6	0.8	0.01	0.02	0.02
Brittle bones	7	193	180	0.2	11.6	13.6	0.35	0.48	0.41
Other congenital defects	223	30	26	5.5	1.8	2.0	0.18	0.07	0.06
Accidents	115	158	166	2.8	9.5	12.5	0.19	0.39	0.37
Other conditions	121			3.0					
Total	4,061	1,657	1,325	100.0	100.0	100.0	6.36	4.08	3.00
Total school rolls	639,000	406,000	443,000						

hospitals, losing valuable educational time in travelling and waiting. In 1951 a start had been made in providing physiotherapy in the schools, and by 1957 it was available in all the schools, together with speech therapy, and where a group of deaf cerebral-palsied children are gathered together a teacher of the deaf can visit them. In the old schools there is inadequate provision for these services, but in the new schools, built and building, the planning is excellent.

There are some children, too severely handicapped for the special schools of the London County Council, who may be at hospital schools or schools run by independent organizations and supported by the local education authorities, while others, about 60, receive teaching at home.

There has been a double change over the years, some handicapped children being received into the normal school community and others being drawn out of the home and the hospital into the special schools. Accordingly, it should not be assumed that all the decrease over the last 30 years is due to an improvement in the health of the child population. Much of the change is, however, due to just this. It is not that there are children with chorea or rickets in ordinary schools—there is no chorea, there is no rickets.

Summary

A survey was made in 1957 of the reasons given for admission of the 1,325 children in London's schools for the physically handicapped. The diagnoses were coded under the International Statistical Classification (W.H.O., 1957). 93 different conditions were recorded. The most common reason for admission was cerebral palsy (312), followed by poliomyelitis (240) and congenital heart disease (127).

This survey is compared with previous surveys made in 1928, when there were 4,061 children in these schools, and in 1951, when there were 1,657. The incidence of the main groups of diseases in these three surveys is examined.

The changes observed—the falling incidence of juvenile rheumatism and non-pulmonary tuberculosis, the rise of cerebral palsy—are discussed and the reasons for the general decline in the numbers in schools for the physically handicapped are examined.

Thanks are due to Mr. W. F. Houghton, education officer, and Dr. J. A. Scott, principal school medical officer, for permission to publish this report and to the staff of the schools and the public health department who helped in its preparation.

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The Exhibition of Medical Records at the Royal College of Physicians of London (November 26 to December 12) covers nearly 400 years, from the end of the fifteenth to the middle of the nineteenth centuries. Among the many exhibits on view are the first ordinance book of the Fellowship of Surgeons (c. 1492-7) which contains the text of the Bye-laws of the unincorporated Fellowship of Surgeons of the City of London; and the Letters Patent incorporating the College of Physicians in London, granted in 1518. The earliest subscription book of the Archdeaconry of Chichester shows the subscription of Elizabeth Strudwicke, of Kirdford, who was licensed to practise as a surgeon in 1673; this is "probably one of the earliest examples of a female surgeon." Among the other 59 exhibits are the articles of agreement between David Irish, "prakticiner in physick," and Joseph Chitty, of Whitneys, Surrey, to cure the latter's wife of "hypocondriak melancholy madness" for £5 down and a further £5 on completion of the cure. The catalogue of the exhibition (price 2s. 6d.), with an introduction by Mr. L. M. PAYNE, assistant librarian, Royal College of Physicians, gives further details.

REMITTENT INSULIN-INSENSITIVE DIABETES

BY

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Following total pancreatectomy the adult human requires about 60 units of insulin a day (Young, 1951), but this figure is probably less than the actual daily insulin secretion because the operation also presumably diminishes the production of glucagon—a hyperglycaemic hormone secreted by the alpha cells of the islets of Langerhans. Many diabetics actually require much more than 60 units of insulin daily to keep them in good health, and Bornstein and Lawrence (1951) and Bornstein (1953) have shown that some diabetics have normal serum insulin levels. In such cases diabetes is probably due to insulin insensitivity rather than to actual insulin deficiency *per se*, but the mechanism of this insensitivity is not yet clear. A number of hormones are known to counteract the hypoglycaemic effects of insulin, and it is possible that the endocrine secretions of the anterior pituitary, thyroid, and adrenal glands, and of the alpha cells of the pancreas, may each be involved to varying degrees in different cases. Several physiological and pathological processes are known to be associated with decreased insulin sensitivity, including puberty, pregnancy, thyrotoxicosis, infection, and metabolism in a high carbohydrate diet. In some cases, however, there seems to be no obvious cause for the observed fluctuations in insulin requirements.

A number of diabetics are seen in Singapore who exhibit this fluctuation to an extreme degree. Some of these patients require over 200 units of insulin daily for a period, though later their insulin requirements may fall to zero. The following eight cases are striking examples of this syndrome, and others have been observed.

Case 1. 720 Units of Insulin Daily. Over 3 Years' Complete Remission

A 52-year-old Malayalam taxi-driver was admitted to hospital on April 18, 1954, with a history of a cough for five months, and fever, polyuria, weakness, loss of weight, and excessive thirst for six weeks. He was found to be a diabetic with gross cavitating tuberculosis of the right upper lobe. His sputum contained acid-fast bacilli and his urine showed sugar and acetone. A glucose-tolerance test revealed a fasting blood sugar of 215 mg./100 ml., rising to 270, 332, 384, and 316 mg. at half-hourly intervals. Treatment was begun with streptomycin and isoniazid, and he was controlled on soluble insulin. The progress of his glycosuria and insulin administration is summarized in Fig. 1. It will be seen that ultimately 720 units of insulin were required daily to control his glycosuria. Later the insulin requirements fell away to zero, and on February 14, 1955, a glucose-tolerance test showed a fasting blood sugar of 83 mg./100 ml., rising to 120, 148, 170, and 154 mg. at half-hourly intervals. Meanwhile his pulmonary tuberculosis had also improved, and an arrangement that had been made in May, 1954, to fly him to London for a right upper lobectomy was cancelled. Anti-tuberculosis therapy was finally stopped on November 2, 1954, at which time his sputum was negative, his E.S.R. was 2 mm., and his chest x-ray film showed only mild residual fibrosis.

This patient has remained fit and well, and has never had a recurrence of his diabetes or tuberculosis. He has weathered a number of other infections, including influenza and gastro-enteritis, without any complication.

Case 2. 360 Units of Insulin Daily. 22 Months' Complete Remission

A slim Ceylonese jeweller aged 46 had a cough for nine months and was admitted to hospital on April 23, 1954, in pre-diabetic coma. He was found to have bilateral cavitating tuberculosis, and a glucose-tolerance test showed a fasting blood sugar of 181 mg./100 ml., rising to 217, 290, 385, and 363 mg. at half-hourly intervals. He was treated with insulin, streptomycin, isoniazid, and P.A.S. It was found that 360 units of insulin were required daily to control his diabetes, but after 12 days at this dosage his insulin requirements slowly began to fall, and insulin therapy was finally stopped on July 11. A glucose-tolerance test was then normal. His tuberculosis continued to improve and anti-tuberculous drugs were stopped on February 15, 1955. In May, 1956, he began to have increased thirst and polyuria, and found that he had glycosuria. He has since remained a fairly stable diabetic, and for the last year has been well controlled on tolbutamide.

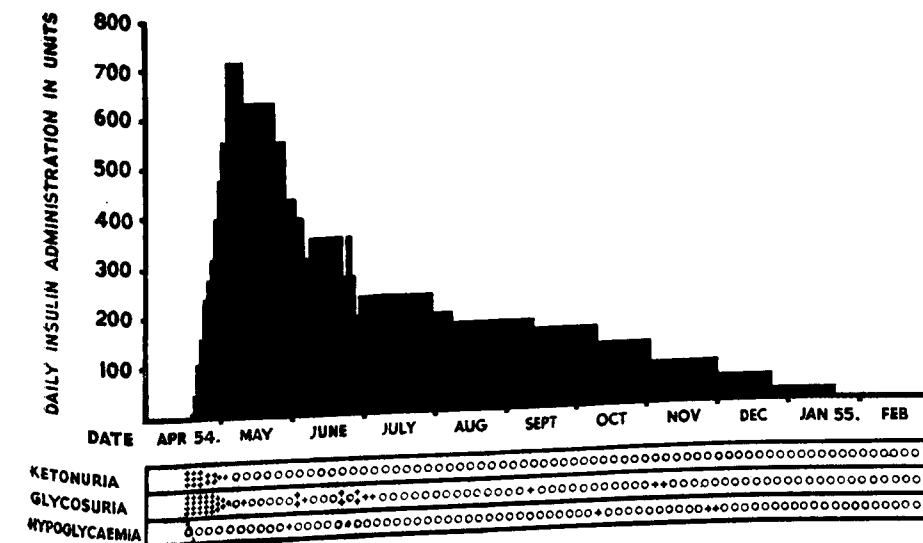


FIG. 1.—Insulin administration with related urinary findings and hypoglycaemic attacks (Case 1).

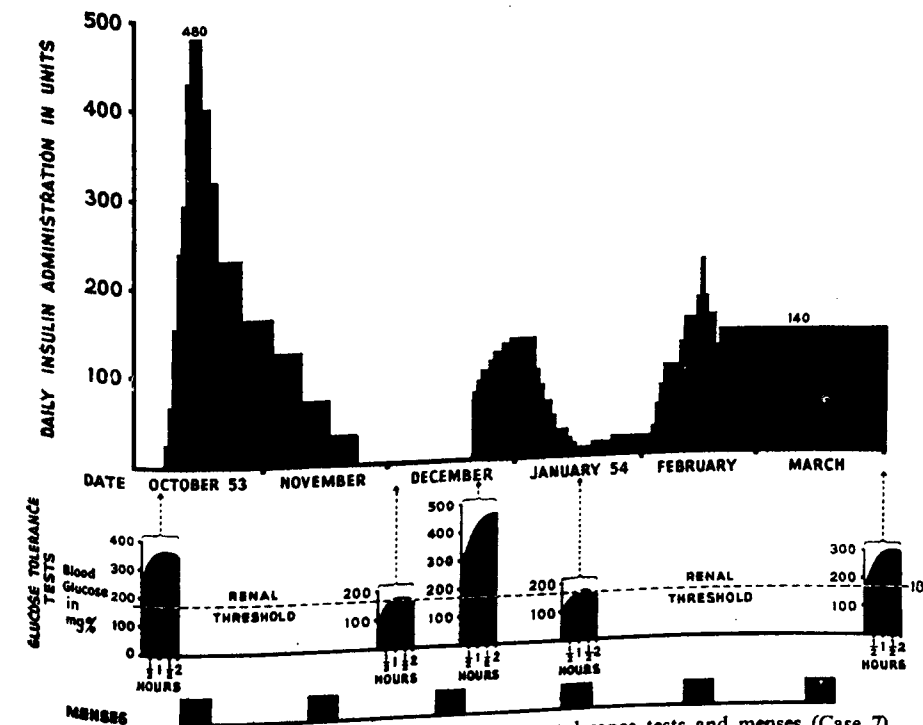


FIG. 2.—Insulin administration with related glucose-tolerance tests and menses (Case 2).

Case 3. 360 Units of Insulin Daily. 27 Months' Complete Remission

A 24-year-old Indian housewife was well until August, 1954, when, in the 29th week of her first pregnancy, she noticed she had polyuria and felt very thirsty. Her urine was found to contain acetone and sugar, although at regular monthly checks these had previously been absent. A glucose-tolerance test showed a fasting blood sugar of 394 mg./100 ml., rising to 450, 455, 478, and 491 mg. at half-hourly intervals. She was admitted to hospital for stabilization on insulin, and for two weeks required 360 units of insulin daily. Yet over the course of 10 days her insulin requirements fell to zero. The baby appeared to be large, and so labour was induced at 34 weeks. During and following a normal delivery the patient's blood sugar remained within normal limits and the baby's fasting blood sugar after delivery was 52 mg./100 ml. The patient remained well and breast-fed her baby. She had no recurrence of diabetes, and regularly tested her urine without finding glycosuria until January, 1957. She was then in the seventh month of her second pregnancy and again had to have up to 360 units of insulin daily. Her insulin requirements fell just before parturition, but this time she has had to continue on a small daily dose of insulin.

Case 4. 400 Units of Insulin Daily. One Year's Complete Remission

A 52-year-old Chinese noticed the gradual onset of increased thirst, general weakness, and polyuria. He was found to have sugar and acetone in his urine. A glucose-tolerance test on January 7, 1954, showed a fasting blood sugar of 462 mg./100 ml., rising to 480, 512, 520, and 520 mg. at half-hourly intervals. The patient was 5 ft. 4 in. (163 cm.) tall and weighed 244 lb. (110.7 kg.). He was instructed to take a low carbohydrate slimming diet, and was stabilized on 400 units of insulin daily as an out-patient. His weight remained constant, and he was therefore admitted to hospital, and maintained on a slimming diet of 1,000 calories. There was an immediate reduction in his insulin requirements to 80 units a day, and as he lost weight his requirements gradually fell to zero. A glucose-tolerance test then showed a fasting blood sugar of 107 mg./100 ml., rising to 121, 148, 172, and 168 mg. at half-hourly intervals. He was discharged weighing 208 lb. (94.3 kg.) and kept at that weight for about a year. His weight then rose again and his diabetic symptoms recurred. He refused to slim again, and is now symptomatically controlled on tolbutamide.

Case 5. 240 Units of Insulin Daily. 38 Months' Complete Remission

A 42-year-old Cantonese washerwoman presented with polydipsia, loss of weight, general weakness, pruritus vulvae, and polyuria in December, 1953. There was no evidence of infection. Her urine contained sugar and acetone, and a glucose-tolerance test showed a fasting blood sugar of 405 mg./100 ml., rising to 436, 472, 506, and 512 mg. at half-hourly intervals. She was controlled on insulin, and for five months her requirements remained stable at 240 units daily. She then suddenly began to have severe hypoglycaemic reactions and insulin administration was stopped. No glycosuria occurred, and six days after being well controlled on 240 units of insulin daily a glucose-tolerance test showed a fasting blood sugar of 88 mg./100 ml., rising to 121, 148, 164, and 160 mg. at half-hourly intervals. She remained well without treatment for 38 months, and periodic urine sugar tests were always negative. Then in September, 1957, she gradually developed diabetes again, and has since been well controlled on tolbutamide.

Case 6. 320 Units of Insulin Daily. Partial Remission

A slim 31-year-old Gurkha policeman had a sudden onset of increased thirst and polyuria associated with a common cold. He was found to have sugar and acetone in his urine, and a glucose-tolerance test showed a fasting blood sugar of 163 mg./100 ml., rising to 192, 232, 226, and 196 mg. at half-hourly intervals. His cold subsided in three days and he was stabilized on insulin, ultimately receiving 320 units daily for a period of 91 days. For no apparent reason his requirements then fell to 10 units a day and he was well controlled on this dose for six weeks. Eventually his requirements slowly rose to 240 units daily. He is now well controlled on tolbutamide.

Case 7. 480 Units of Insulin Daily. One Month's Complete Remission

A 16-year-old Franco-Pakistani schoolgirl noticed the onset of increased thirst and polyuria three weeks before she was admitted to hospital on October 6, 1953. She had no evidence of infection. Her menses began five years previously and were regular and normal. She had acetone and sugar in her urine, and a glucose-tolerance test showed a fasting blood sugar of 275 mg./100 ml., rising to 320, 370, 370, and 362 mg. at half-hourly intervals. The progress of her diabetes is summarized in Fig. 2. It will be seen that she required 480 units of insulin daily at one period, and later had two remissions before finally becoming a stable diabetic requiring 140 units of insulin a day. She has remained stable on this dosage, and is now a very fit student of economics in London. Her menses were not related to the fluctuations in her insulin requirements.

Case 8. 280 Units of Insulin Daily. Three Complete Remissions, One of Over 3 Years

A Dutch business man aged 63 was admitted to hospital in July, 1953, because of an acute exacerbation of gout. Although he had suffered from gout for 30 years he had apparently never been treated with colchicine. He was therefore tried on the drug and his gout quickly improved. However, he developed glycosuria, and a glucose-tolerance test showed a fasting blood sugar of 168 mg./100 ml., rising to 186, 224, 210, and 195 mg. at half-hourly intervals. His diabetes was controlled on 240 units of insulin a day, but after six weeks at this dosage his insulin requirements began to fall and insulin administration was stopped in November, 1953. His urine remained sugar-free until March, 1954, when, following another exacerbation of gout and subsequent colchicine therapy, he was again observed to develop diabetes. On this occasion he required 280 units of insulin daily for two weeks, and then his insulin requirements gradually fell and stabilized at 80 units daily. He then went to

South Africa for a holiday, and in August, 1954, apparently had a mild coronary thrombosis followed by a severe hypoglycaemic attack. A glucose-tolerance test was reported to be normal and his insulin administration was stopped. On returning to Singapore in September his urine was confirmed to be sugar-free. However, in November he again developed acute gout, took colchicine, and developed diabetes. A glucose-tolerance test on this occasion showed a fasting blood sugar of 176 mg./100 ml., rising to 195, 220, 224, and 210 mg. at half-hourly intervals. His diabetes was controlled on 80 units of insulin daily for five weeks, and then for the third time his insulin requirements fell to zero.

It was thought possible that his attacks of diabetes might be related to his colchicine therapy, and he was therefore started on probenecid. This has been successful, and since May, 1955, he has never had severe gout, insulin, or glycosuria.

Discussion

The eight diabetic cases described above each required over 200 units of insulin daily for more than seven consecutive days. In every case this period of insulin insensitivity was temporary, seven patients later having complete remissions, and one (Case 6) requiring only 10 units of insulin a day.

Diabetes mellitus insensitive or resistant to insulin is apparently uncommon in Europe and North America. In Joslin's very large experience of diabetes he records seeing up to 1952 only 20 patients who required over 200 units of insulin a day (Joslin, Root, White, and Marble, 1952); and Smelo (1948) found records of only 29 such cases in the world literature up to 1940, and another 25 cases in the subsequent English literature up to 1948. Yet in Singapore, I have observed 38 diabetics in the past five years who each required 200 or more units of insulin on at least four consecutive days, and it is not uncommon to find that diabetics here require over 100 units of insulin daily for long periods. The average insulin requirements of 165 diabetics in Singapore, selected only to exclude advanced pulmonary tuberculosis or incipient diabetic coma, was found to be 57.5 units a day (Tan and Wells, 1957), and, although no comparable figures are available, this seems likely to be higher than the average for diabetics in Britain. If this is so, one explanation may be that a higher proportion of the diabetics in Singapore fall into the older arteriosclerotic non-ketotic insulin-insensitive group, well described by Himsworth (1936) and Lawrence (1951).

To some extent the incidence of this type of diabetes may be genetically determined, as inferred by the findings of Lister, Nash, and Ledingham (1951). Another possible explanation is that most of those who developed insulin-sensitive ketotic diabetes in Singapore prior to 1945 died during the Japanese occupation because of the insulin shortage, producing a relative scarcity of this type of diabetic in Singapore at the present day. Conversely, the non-ketotic insulin-insensitive diabetics for whom insulin administration was not essential may actually have been benefited by the food shortages of the occupation which forced them to have restricted diets.

It has been suggested that the finding of insulin insensitivity may sometimes be false, owing to deterioration of the insulin used (Palmer, 1948). In the Tropics this possibility always has to be considered; but investigations in Singapore, including comparative assays in some of the cases reported above using insulin preparations specially flown here straight from the factories, have not shown any evidence of deterioration in the Singapore insulin stocks, even when these were at their recommended expiry dates.

Over-enthusiastic insulin administration may sometimes result in confusion between maximum insulin tolerances and optimum insulin requirements. It was the practice, however, in the management of the cases reported here, to keep the insulin administered so far as possible at the minimum which would adequately control the patient's glycosuria (cf. Fig. 1).

Remissions in diabetes of the duration and degree reported here appear to be rare in the literature, but Joslin *et al.* (1952) have commented that "remissions of the disease are common when the exciting cause for onset is removed and prompt aggressive treatment, soon after the onset of diabetes . . . is instituted." In Cases 1, 2, and 6 above, the exciting cause seems to have been infection. In Case 3 diabetes developed in the seventh month of pregnancy on two occasions, and in Case 8 the onset of diabetes seemed on three occasions to be related to episodes of gout treated with colchicine. In the remaining three cases, however, no exciting cause for the onset of diabetes was found.

Experience in Singapore certainly confirms that if diabetics are rapidly stabilized on soluble insulin, raising the total dose each day by one-fifth to one-third of the previous day's dose until no more than a trace of glycosuria is present, it is very common to find some degree of remission reflected by reduction in the daily insulin requirements. Such "aggressive" treatment inevitably results in occasional attacks of hypoglycaemia, but full insulin coma is rare if the insulin dosage is reduced at the first sign of hypoglycaemia and is thereafter kept at the minimum dose which controls the glycosuria. Where insulin is given hesitantly, the dosage being increased slowly, and particularly when full control of the glycosuria is never achieved, it is most unusual to obtain a remission. The chance of obtaining a complete remission seems worth the risk of an occasional hypoglycaemic attack, and personal experience of the latter is a valuable addition to a diabetic's education.

Experience with these cases, however, confirms that patients should be warned, "once a diabetic, always a diabetic." Although in the cases here reported there have been complete remissions for 38, 27, 22, and 12 months, all the patients have relapsed except Cases 1 and 8, who have had remissions of over three years. These two patients are still regularly testing their urines for sugar, despite naturally increasing optimism.

Before the introduction of carbutamide and tolbutamide, diabetics of the type reported here always presented difficult problems in management. In hospital it was possible to adhere to the "aggressive" scheme of treatment described, but when the patient was discharged the rapid fluctuation in insulin requirements still necessitated daily consultation and adjustment of the insulin dosage. In some cases the patients learnt to adjust their own dosages safely, and others telephoned for advice every morning before taking their insulin. There appeared to be no advantage in giving several injections of soluble insulin daily, and so, once they were over the severe phase in hospital, most of these patients gave themselves a single injection of protamine-zinc insulin each morning.

It is now apparent that many of these patients can be well controlled on tolbutamide instead of insulin, and the oral treatment has the great advantage that the dosage required seems to fluctuate only slowly and over a small range. Now that a high proportion of Singapore diabetics are receiving tolbutamide therapy it is unlikely that many more of these insulin-insensitive cases will be recognized here. A few diabetics, however, have been observed to have remissions while on tolbutamide, and it may be that they would have been insensitive to insulin.

Summary

A diabetic syndrome is described in Singapore, characterized by marked insulin insensitivity and periods of complete or partial remission. During these remissions the patients may sometimes remain fit and well, with no glycosuria for long periods, without insulin administration or any other treatment for diabetes. Eight examples of this syndrome are reported, and others have been observed. It is suggested that the insulin requirements of diabetics in Singapore tend to

be higher on average than those in Britain, and that this may be partly due to selective elimination of insulin-sensitive diabetics in Singapore during the Japanese occupation.

I am grateful to Professor G. A. Ransome for permission to publish the case reports of those patients who were admitted under his care.

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SEVERE INSULIN LIPODYSTROPHY AS A POSSIBLE CAUSE OF INSTABILITY IN DIABETICS

BY

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Abnormal reactions in subcutaneous fat to injections of insulin have been recorded since its discovery. Such reactions have been termed "lipodystrophy," and should not be confused with the so-called "insulin lumps" which usually result from improper injection technique. Lipodystrophic reactions have been classified thus:

(a) *Lipo-atrophy*—the usual type of abnormal reaction, the incidence varying from 33% (Yohalem and Pollack, 1949) to 55% (Paley, 1953) of an adult diabetic population receiving insulin.

(b) *Lipohypertrophy*—a less common complication in adult diabetics, the incidence ranging from 3 to 6.5%. An example of lipohypertrophy is shown in Fig. 1.

Joslin *et al.* (1952) state that insulin lipodystrophy is a harmless complication, since no important structures are damaged, and it is annoying solely on account of the cosmetic effect. Other workers believe that these lesions in the subcutaneous fat may influence the absorption of insulin. Lamar (1950) suggests that insulin "resistance" and increased insulin dosage are more frequent in atrophic lipodystrophies, apparently resulting from continuously impaired absorption. He suggested that "brittleness" is more frequent in the hypertrophic nodular type, where insulin absorption from one or more depots may at times be added to the current dose, with the production of severe hypoglycaemic symptoms.

At the diabetic clinic at Leeds General Infirmary a number of diabetic patients with severe lipo-atrophy have had great difficulty in finding a suitable subcutaneous site for insulin injections. Diabetic control has been poor, and on changing injections to a site where fat was normal, such as the abdomen or buttocks, they have experienced hypoglycaemic attacks. Clinically it appeared that the injected insulin was utilized more efficiently from the normal sites, but, as they were out-

patients at the time, all the factors influencing insulin absorption and utilization were not strictly controlled.

Diabetic patients exhibiting moderate to severe lipodystrophy as defined previously (Paley, 1953) were examined with respect to stability of diabetic control. Of 53 such patients, 28% were classed as unstable

(as defined by Fryers, Paley, and Tunbridge, 1954). The total incidence of unstable patients at the diabetic clinic at Leeds General Infirmary was 17%. Superficially it would appear that patients with lipodystrophy have a greater incidence of instability, but statistically the difference is not significant.

The evidence would suggest that lipo-atrophy is not a major cause of instability in diabetics, but in view of its frequency it seemed necessary to investigate whether it is a contributing factor.

To test this hypothesis, six patients, each showing marked lipo-atrophic changes at the insulin injection sites and each a known unstable diabetic, were admitted to the diabetic annexe, Pinderfields General Hospital.

The disease had been present for more than five years in each patient, and they had been under careful supervision in the past.

Method

The patients, all females, were observed during an initial period lasting from 4 to 10 days. During this period they were maintained on their accustomed dose and type of insulin. No change was made in the site of injection, whether this had been into the atrophic or normal fat areas. No effort was made to improve the diabetic control during the study and there were no changes in insulin dosage. Although there was great variability in blood-sugar values observed, confirming the unstable nature of the disease, no hypoglycaemic attacks occurred and there was no ketosis.

Diet and exercise were rigidly controlled. The insulin dosage was checked and insulin was injected by a nursing sister or a doctor. Times of meals and times at which blood sugar was measured were the same throughout the experiment. Capillary blood was used throughout for blood-sugar determinations, and was estimated by the method of Hagedorn and Jensen (Harrison, 1937).

Three anatomical regions for injection were selected—namely, (a) intramuscular, (b) normal fat, and (c) atrophic fat. Each patient received injections in each anatomical area for one week. The sequence of areas for injection was randomized according to the accompanying Table.

The blood sugar was estimated at 8 a.m., 11.30 a.m., 3.30 p.m., and 9 p.m. The values were then analysed to demonstrate a difference in the time of day for the occurrence of high or of low blood sugars. This daily pattern of variations was obtained by plotting the mean deviation from the daily mean at specified times of the day for each patient from the three different anatomical sites.

The experimental design was described by Crump (1952) and further elaborated by Fryers *et al.* (1954) and Paley (1954). The statistical treatment is one of analysis of variance (Fisher, 1946).

Patient	Injection Site		
	1	2	3
E.P.	a	b	c
H.S.	b	c	a
D.B.	c	a	b
M.C.	a	c	b
M.B.	b	a	c
L.W.	c	b	a

Injection regions: (a) intramuscular, (b) normal fat, (c) atrophic fat.

Similarly, three female patients with severe lipohypertrophy were investigated under these experimental conditions. In this group, insulin injections were merely alternated at a week's interval between the hypertrophic areas and normal fat.

Results

Analysis of the blood-sugar estimations in the six female patients with lipo-atrophy shows no statistical difference at any time of the day for two patients, D.B. and L.W. (Chart for D.B. is shown in Fig. 2, A). Although significant differences in mean blood-sugar levels are encountered in the other four patients, no definite pattern of response emerges.

Thus a significant depression of blood sugar is observed at fasting level when patient E.P. receives the insulin into an atrophic area (Fig. 2, B); whilst a significant depression of mean blood-sugar levels is observed at 9 p.m. in patient M.C. when the results from both intramuscular injection and those from atrophic area are compared with the response from injection into normal fat (Fig. 2, C).

Conversely, a significant depression of mean blood sugars at 9 p.m. is observed in the normal and intramuscular sites when compared with the atrophic area for patient M.B. (Fig. 2, D). As if to emphasize the completely random nature of these results, patient H.S. shows a significant depression at 9 p.m., when the results from injections into normal fat are compared with intramuscular injection and also those into atrophic fat areas (Fig. 2, E).

When the results from the three patients with hypertrophic lipodystrophy are analysed two patients show no significant difference between the mean blood-sugar levels at any time of the day for injections into the hypertrophic and normal fat areas. The two curves for each patient are almost identical. Patient F.R., with severe hypertrophic lipodystrophy, was first maintained by injections into normal fat during the pre-investigation period; the first experimental area was also normal fat.

Although marked intra-daily variations of mean blood sugars were observed from injections in this site, no hypoglycaemic symptoms developed. The second experimental area was the hypertrophic fat. Here a significantly lower mean blood sugar was observed at fasting level with insulin injections into the hypertrophic areas, and slight hypoglycaemic symptoms were noted on the last two nights of the trial in this area (Fig. 3).

Discussion

Lipodystrophy has usually been considered a harmless complication of diabetes, and it was Lamar (1950) who first suggested that alterations in insulin absorption may be influenced by both atrophic and hypertrophic lipodystrophies at the sites of injection. Only scanty references to this topic can be found in the literature—those by Aubertin (1954) and Davis (1955)—although it appears to be a common clinical impression that insulin is "absorbed" more efficiently from normal fat than from an area showing lipodystrophy.

A direct comparison of a group of patients with severe lipodystrophy and a group with no lipodystrophy did show

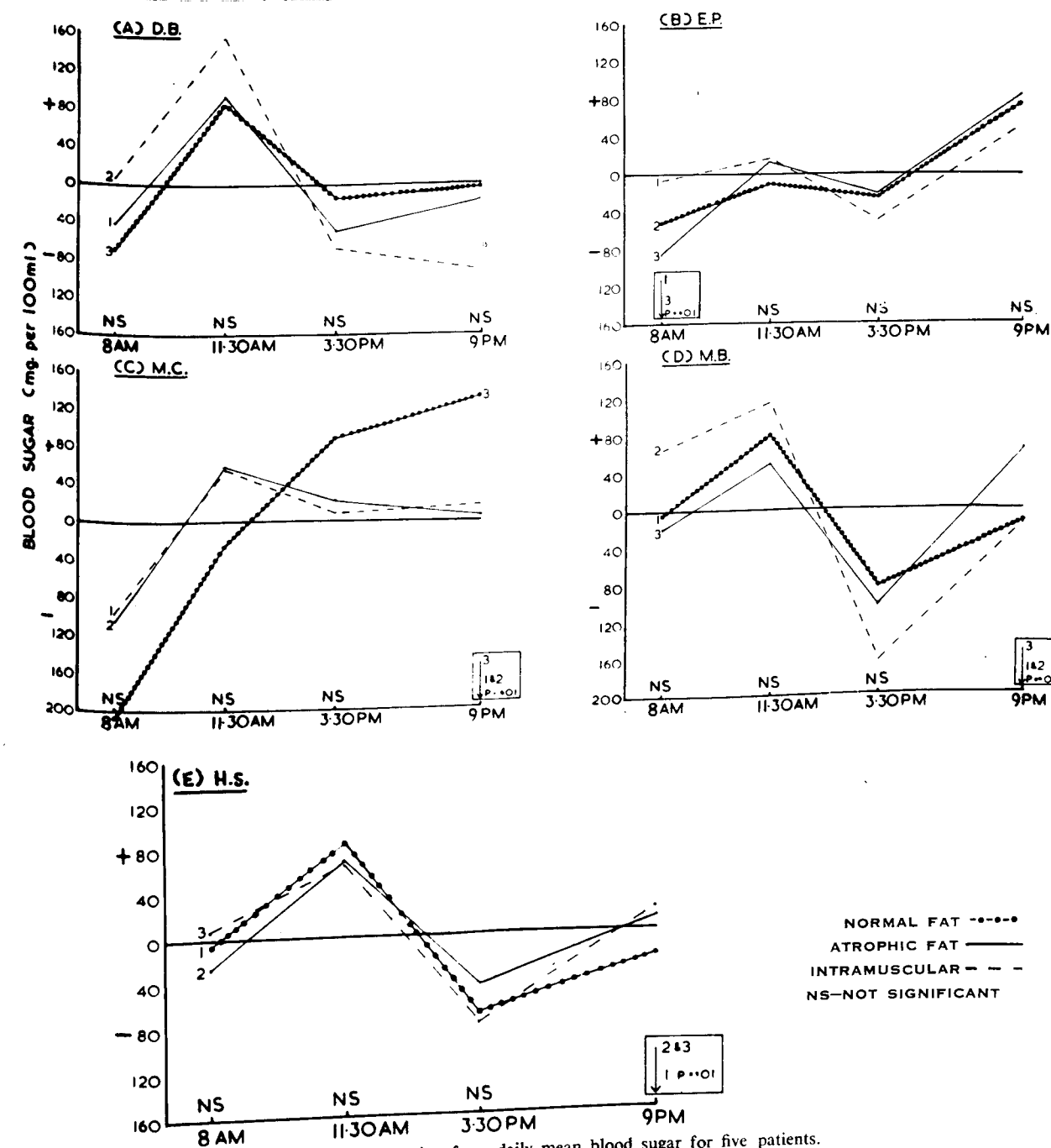


FIG. 2.—Mean deviation from daily mean blood sugar for five patients.

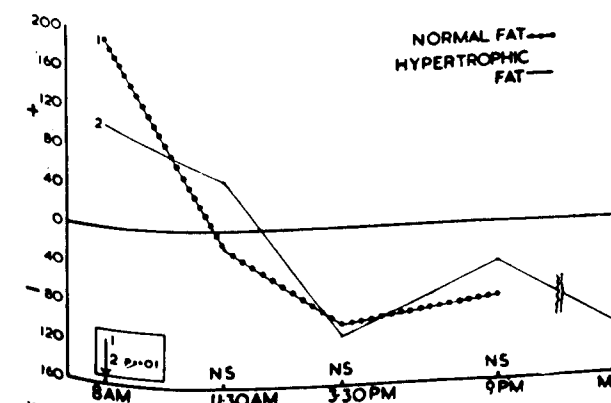


FIG. 3.—Mean deviation from daily mean blood sugar for Patient F.R.

a higher incidence of instability in the former, though the difference was not statistically significant. Such an analysis, however, does not take into account all the factors associated with diabetic control, and in fact the result could be invalid.

Three sites for injection were selected—abnormal fat area, normal fat area, and intramuscular area. The intramuscular area was selected in order to see if there was a significant change in diabetic control, and, furthermore, in patients with severe atrophic sites it could then be recommended as a temporary alternative site for therapeutic insulin injections. Previous studies (Paley, 1953), and the present investigation, have shown no muscle atrophy to be present clinically in any of these patients. Lawrence (1928) stated that there was evidence that intramuscular injections of insulin may produce local necrosis.

Since unstable diabetic patients are subject to large and rapid swings of blood-sugar levels it seemed reasonable

to suppose that this experimental design could help to solve the problem of insulin absorption from lipodystrophic sites.

This study has shown that injection of insulin into atrophic fat sites does not appear to alter diabetic control and, similarly, that intramuscular injections of insulin do not cause an increased variation in blood-sugar levels. Instability in diabetic patients therefore appears to be entirely independent of the site of injection of the insulin.

Similarly, in the three patients with hypertrophic lipodystrophy no fixed pattern of blood-sugar levels emerged. In only one patient did a significantly lower blood-sugar level occur when insulin was injected into the hypertrophic area. If this effect is due, as Lamar (1950) suggests, to the occasional flooding of insulin from these hypertrophic depots, then it is surprising that this phenomenon occurred only once in the whole study. It is more likely that this solitary episode of hypoglycaemia was entirely independent of the site of insulin injection.

Summary

Six unstable diabetic patients with severe atrophic lipodystrophy and three patients with severe hypertrophic lipodystrophy were studied to ascertain whether insulin lipodystrophy was a factor in their instability.

The experimental design was an adaptation of one used in insulin therapeutic trials, and each patient acted as her own control.

No pattern of significant differences was observed in the blood-sugar curves obtained from different injection sites, and therefore lipodystrophy cannot be regarded as a cause of diabetic instability.

In view of the belief that intramuscular injections of insulin cause tissue necrosis, it is of interest that no untoward effects occurred from such injections given for four to seven days.

We thank Dr. J. Adler and his assistant for the blood-sugar estimations, and the ward sisters, dietitian, and patients for their willing co-operation in these trials. We also thank Professor R. E. Tunbridge for permission to study his patients.

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The considerable educational activities of the National Association for Mental Health are summarized in its latest Annual Report for the Year 1957-8. Its longest-established course is for school medical officers and is on the ascertainment of educationally subnormal children and mental defectives. Recent changes in the school health services and in the general approach to mental deficiency pointed "to a re-orientation of the course as a whole," but agreement on the precise nature of it in future has not yet been reached. Various refresher courses have also been held, and a new project was a residential course on "Mental Health in the Public Health Field." It was held in April this year, and was attended by ten medical officers of health from the north of England. Students who came from overseas to attend the courses included two from Malta and one from Trinidad who on returning to their own countries will set up entirely new services for the mentally handicapped. Courses for chaplains in mental and mental-deficiency hospitals were found to be useful in enabling doctors and chaplains to discuss problems of concern to both.

CONTAMINATION OF OPERATING-THEATRE AIR WITH *CL. TETANI*

BY

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Cases of post-operative tetanus have been attributed by Robinson, McLeod, and Downie (1946) and by Sevvit (1949) to dust-borne contamination. Both reports imply that such contamination of dust was probably exceptional, in one hospital because of its nearness to grazing pastures, in the other because of the use of plaster hair in repairs to the theatre suite; and in both reports it is suggested that these risks would be reduced by improvements in theatre hygiene, including the use of plenum ventilation with filtered air.

A recent study in this hospital (Lowbury and Lilly, 1958) has shown that *Clostridium welchii* could be isolated from the air at most times, and that these organisms are apparently carried into the hospital with outdoor air; a plenum-ventilated dressing station showed significantly smaller numbers of *Cl. welchii*. In this paper we report a study on the incidence of airborne *Clostridium tetani*. It shows that small numbers of *Cl. tetani* could be found usually in the street and often in the exhaust-ventilated theatres; but none were found in a dressing station which was plenum-ventilated with filtered air. A simple technique for the recognition of toxigenic *Cl. tetani* is described. Some results of examination of dust, soil, faeces, and burns for *Cl. tetani* are also reported.

Methods

Sampling

Bacterial samples from air were collected with a large slit sampler (Bourdillon, Lidwell, and Thomas, 1948), and sometimes also by settle plates, on to nutrient gelatin (20%), which was then melted at 37° C. and distributed into bottles of cooked-meat broth. These, in most of the tests, were heated at 65° C. for 30 minutes before incubation; in later tests the gelatin itself was heated before addition to the cooked-meat broth. After four days' incubation and again after 12 days' incubation at 37° C., Gram-stained films of the cultures in cooked-meat broth were carefully examined for terminal spore-bearing bacilli. When these were present the culture was examined by the methods described below for the presence of *Cl. tetani*.

Samples of faeces and soil were inoculated in cooked-meat broth, which was heated at 80° C. for 10 minutes before incubation. Road dirt, hospital dust, and burn swabs were inoculated in cooked-meat broth, which was heated at 65° C. for 30 minutes before incubation. Gram-stained films were examined, as above, after four days' and after 12 days' incubation.

Isolation and Recognition of *Cl. tetani*

Cultures in cooked-meat broth showing terminal spore-bearing bacilli were subcultured by wire loop to the water of condensation in Fildes (1925) slopes. After anaerobic incubation in a Mackintosh and Fildes jar for 48 hours, the slopes were examined with a hand lens. If a characteristic fine filamentous swarming edge of growth was present, it was subcultured to a second Fildes slope; swarming

growth on this slope, after two days' incubation, was subcultured to cooked-meat broth. All bacilli with round terminal spores were found to swarm in this manner on Fildes slopes. Cooked-meat subcultures were incubated for four days, examined for purity in Gram-stained films, and tested as follows.

(i) Pairs of mice were given injections at the root of the tail of 0.2 ml. of culture to which 2.5% calcium chloride had been added immediately before the injection; one mouse of each pair had received an intramuscular injection of 3 units of antitoxin 24 hours and again one hour before the injection of culture.

(ii) Tubes of sugar media (glucose, maltose, lactose, sucrose, and salicin) containing strips of iron were inoculated and examined for evidence of fermentation after incubation at 37° C. for five to seven days.

(iii) Loeffler's inspissated serum slopes were inoculated, incubated anaerobically for five days, and examined for evidence of digestion.

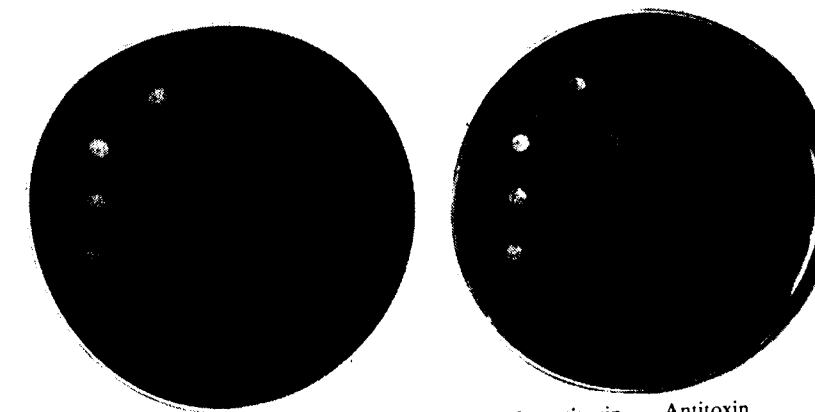
(iv) Blood-agar plates (with 4% agar), one half of which had previously been spread with 0.1 ml. of undiluted therapeutic tetanus antitoxin, were inoculated in corresponding positions on both sides with the cultures of presumptive *Cl. tetani*; a straight wire was used for the inoculation. Nine cultures and a positive control could be tested on one plate. After two days' anaerobic incubation at 37° C., the plates were examined for growth and for haemolysis inhibited by antitoxin.

Terminal spore-bearing bacilli were described as toxigenic *Cl. tetani* if, after 18 hours, they had killed or caused tetanic spasms in an unprotected but not in a protected mouse. None of the organisms which gave these reactions were found to ferment any of the sugars or to digest a serum slope. On the antitoxin-controlled blood-agar plate—an adaptation of the Nagler plate test (see Lowbury and Lilly, 1955; Lilly, 1958)—toxigenic strains of *Cl. tetani*, including 11 reference strains from the National Collection of Type Cultures, caused good zones of haemolysis on the side without antitoxin, but no haemolysis on the antitoxin-treated side of the plate (see Fig.).

Diagnostic Value of the Antitoxin-controlled Blood-agar Plate ("Bench Mouse")

Fifty strains of terminal spore-bearing bacilli from air subcultured from Fildes slopes were tested both in mice and by the antitoxin-controlled blood-agar plate test, or "bench mouse." All of these strains killed or caused tetanus in unprotected mice, and showed haemolysis only on the side of the plate without antitoxin. One strain was positive in the mouse only on a second test, the first having failed to cause tetanus or to kill the unprotected mouse; it was retested because the "bench mouse" was positive.

Haemolytic strains of streptococci (20 each of groups A, C, D, and G), of *Cl. welchii* (20) and of aerobic spore-bearing bacilli (20) were tested and found to cause haemolysis on both sides of the plate.



"Bench mouse" examined by transmitted light (on left) and by reflected light (on right). The right half of the blood-agar plate was spread with tetanus antitoxin before 10 strains of *Cl. tetani* were spotted in corresponding positions on the two sides. After two days' anaerobic incubation there was growth on both sides, but haemolysis only on the side with no antitoxin.

In view of the identical results obtained by the two methods of testing, we relied on the "bench mouse" for recognition of *Cl. tetani* in the later part of this study.

Air Samples Examined

Samples were taken in the exhaust-ventilated operating theatre on 14 days, in the plenum-ventilated dressing station of the burns unit on 8 days, and in a covered road outside the hospital on 9 days. The ventilation system of the dressing station (Bourdillon and Colebrook, 1946) had Vokes "kompak" and "multivee" filters in series. Samples of approximately 690 cu. ft. (19.5 cubic m.) (30 minutes' sampling) were taken. On six days four such samples were taken in each of the three environments. To obtain some idea of the numbers of *Cl. tetani* present, the gelatin was well mixed after melting and added in four lots each of 15 ml., 7.5 ml., 3.25 ml., and (road samples only) 1.6 ml. to cooked-meat broth. In the other samplings the entire contents of the gelatin plates—that is, 30 minutes' sampling yield—were added to cooked-meat broth. We also examined a series of cultures representing replicates of 32, 16, 8, 4, and 2 minutes' sampling in each environment.

For 23 consecutive days we exposed for periods of six hours settle plates of gelatin for *Cl. tetani* and of a selective medium for *Cl. welchii* (Lowbury and Lilly, 1955) in the theatre and in corridors.

Results

Cl. tetani in the Air of Operating Theatre, Dressing Station, and Road

Table I shows the results of sampling for 30 minutes in each of these three environments on a number of occasions. *Cl. tetani* was isolated from 24 out of 27 samples taken in the road, from 33 out of 50 taken in the operating theatre, and from none of 23 taken in the plenum-ventilated dressing station.

Table II shows the cumulative results of sampling air from all three environments on each of six days by a semi-quantitative technique. Again the air from the road is shown to yield *Cl. tetani* more often than air from the operating theatre, and none were found in the dressing station. The probable number of *Cl. tetani* in these samples cannot be assessed with accuracy. When the Poisson series is applicable, 30% of samples fertile would imply the presence of a mean number of 0.3567 organisms per sample (Fisher, 1946). Approximately 30% of air samples of 345 cu. ft. (9.77 cubic m.) from the operating theatre and of air samples from the road of 86 cu. ft. (2.43 cubic m.) contained *Cl. tetani*. This gives some indication of the range within which counts of *Cl. tetani* might be expected to fall; it is clearly much lower than the counts of *Cl. welchii* in the same operating theatres (usually between 5 and 25 per 100 cu. ft. (1.76 and 8.82 per cubic m.) of air).

There was some support for these findings in the results of settle plate culture; 18 out of 23 settle plates from the theatre yielded *Cl. welchii*, but none of the 23 comparable settle plates examined for *Cl. tetani* was positive; 4 out of 15 settle plates from a busy corridor did yield *Cl. tetani*.

The distribution of *Cl. tetani* in air was irregular: when different volumes were examined on the same day, some samples of 690 cu. ft. (19.5 cubic m.) yielded no *Cl. tetani*, but occasionally a sample of 46 cu. ft. (1.3 cubic m.) was positive. The only day on which no samples from the operating theatre yielded *Cl. tetani* was one of continuous rain. The highest proportion of positives was found in dry weather. *Cl. welchii* was previously found to vary with weather in the same way (Lowbury and Lilly, 1958).

TABLE I.—*Cl. tetani* in Samples of Air (690 cubic feet—19.5 cubic metres)

Place	Samples Yielding <i>Cl. tetani</i>	Total Samples	Days
Road	24 (89%)	27	9
Operating theatre (exhaust-ventilated)	33 (65%)	50	14
Burns dressing station (plenum-ventilated)	0	23	8

TABLE II.—Cumulative Results of Sampling for *Cl. tetani* on Six Days in Road, Operating Theatre, and Dressing Station

Volume of Sampling Medium Tested (ml.)	Corresponding Volume of Air Tested		Proportion of Samples Yielding <i>Cl. tetani</i>		
	c. ft.	Cubic m.	In Road	In Exhaust-ventilated Operating Theatre	In Plenum-ventilated Dressing Station
15.0	345	9.77	11/24	7/24	0/24
7.5	172.5	4.88	10/24	1/24	0/24
3.75	86.25	2.44	6/24	0/24	0/24
1.875	43.125	1.22	0/8	—	—

Small numbers of air-borne *Cl. tetani* were found in the environment of another city hospital and of a hospital in a rural district. The air of an operating theatre in the latter, which was ventilated by open windows, also yielded *Cl. tetani*.

Other Reservoirs of *Cl. tetani*

Cl. tetani was isolated from 6 out of 7 samples of garden soil, 5 out of 5 samples of ward floor dust, 5 out of 6 samples of street dust, 8 out of 11 trouser turn-ups of laboratory staff, and 10 out of 35 specimens of human faeces. It was not found in any of the 273 swabs from burns which we examined.

Discussion

These studies show that very small numbers of *Cl. tetani* could usually be found in the air of a city hospital; since rather more of these organisms were found in the air outside the hospital and none at all in a dressing station ventilated with filtered air, it appears that contamination was introduced from outside, and was drawn into the operating theatre by exhaust ventilation. The same source of *Cl. welchii* and exclusion of that organism by plenum ventilation with filters have been described elsewhere (Lowbury and Lilly, 1958).

In spite of the regular isolation of *Cl. tetani* from air in these studies, tetanus has not occurred in any patient following an operation in this hospital during the past nine years. The risk of clinical infection from the small numbers of *Cl. tetani* which we found in the air must therefore be extremely remote. From the data presented by Robinson and others (1946), it seems that post-operative tetanus may result from an increase in the amount of environmental contamination with *Cl. tetani*. On the other hand, the rarity of tetanus may simply reflect the sparsity of tetanus bacilli in the environment. It would be useful to know what degree of contamination with *Cl. tetani* is found in theatres in which patients are known or thought to have contracted post-operative tetanus. Spores of *Cl. tetani* can germinate and produce toxin in tissues only under special and, perhaps, exceptional conditions. Although tetanus may follow trivial injury (see Press, 1948), it is nevertheless a rare sequel even of severe lacerated wounds in unprotected patients, and tetanus following rectal operations is a rarity in spite of the relatively frequent presence of *Cl. tetani* in human faeces. As in the case of gas gangrene, we may suppose that self-infection by faecal tetanus bacilli is a possible source of post-operative infection (particularly in abdominal surgery), but, as such cases sometimes occur in small outbreaks, infection from the environment is perhaps more important.

The functions of plenum ventilation in operating theatres are (1) to remove staphylococci and other organisms liberated in the theatre, and (2) to exclude dirt and bacteria from air admitted to the theatre. The latter, as our studies

have shown, include *Cl. tetani*, and *Cl. welchii*, which can be effectively kept out by cotton-wool and fibre filters in series.

Summary

Samples of approximately 690 cu. ft. (19.5 cubic m.) of air from an exhaust-ventilated operating theatre, a plenum-ventilated dressing station, and the road outside the hospital were examined for tetanus bacilli. These were sparsely present in 24 out of 27 examples from the road and 33 out of 50 samples from the operating theatre; none were found in 23 samples from the dressing station.

Cl. tetani was found also in all specimens of hospital floor dust, in trouser turn-ups of laboratory staff, and in 10 out of 35 human faecal specimens; it was not found in any of 273 swabs from burns.

These findings are discussed in relation to the occurrence and prevention of post-operative tetanus.

A simple plate technique (the "bench mouse") for the recognition of toxigenic *Cl. tetani* is described and illustrated.

We thank Mr. W. Cater, A.I.O.T.T., for assistance in air sampling; Dr. R. E. O. Williams for suggestions on the collection of samples; the clinical director, surgeons, and nursing staff of this hospital for their co-operation; and Mr. R. Gill for the photographs.

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CLEANSING OF HOSPITAL BLANKETS

BY

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Several investigators have shown that the usual methods of laundering do not effectively reduce the bacterial contamination of blankets (see Blowers and Wallace, 1955). This unsatisfactory state of affairs is tolerated only because of the great practical difficulties in devising a method of laundering which is cheap, effective, and adaptable to normal laundry procedures.

We were recently asked to report on the bacteriological efficiency of laundering blankets at Guy's Hospital. In the course of this work it was noted that the standard of cleanliness achieved was much better than expected as judged by reports in the literature and by previous observations by one of us (C. G. A. T.) in a similar investigation at another hospital.

It has been suggested that our findings may be of interest to others who are concerned with laundry hygiene.

Materials and Methods

Laundry Methods Used for Blankets.—Blankets were washed in a Tullis washing-machine fitted with interrupter gear. The machine was filled with 80–100 gallons (360–450 litres) of soft water (0° H) at a temperature of 100° F. (37.8° C.) to which was added 4 oz. (120 g.) of "Crex" (20% solution of sodium sesquicarbonate) and 8 oz. (240 g.) of "sulphanol T" paste.† Twenty blankets were washed on each occasion. The washing process lasted 10 minutes and was followed by two rinses each of 100 gallons (450 litres). Immediately after the second rinse excess moisture was removed from the blankets by the means of a Broadbent 36-in. (90-cm.) hydro-extractor. The blankets were then transferred to another floor of the laundry and dried by air at 180° F. (82° C.) for 45 minutes in a Broadbent heated tumbler. They were then stored in a secluded part of the laundry on wooden racks under cover of clean cotton sheeting.

Source of Blankets.—Samples were taken on eight separate occasions at intervals from October, 1957, to April, 1958. Blankets arriving in the laundry from medical and surgical wards were taken at random and compared with blankets which had been laundered on the previous day and which were awaiting issue to the wards.

Method of Sampling.—The sweep-plate technique was found to be satisfactory. The blanket to be tested was held flat on a horizontal surface and six to-and-fro sweeps were made over a distance of 1 ft. (30 cm.) with an inverted Petri dish. A duplicate sample was then taken from another part of the blanket. The medium employed was nutrient agar containing 0.01% phenolphthalein diphosphate. After incubation at 37° C. for 18–24 hours counts were made of (a) total colonies, and (b) colonies of *Staph. aureus*. Colonies of *Staph. aureus* were recognized when colonies of typical appearance gave a bright red colour when the plate was held over a bottle of strong ammonia (Barber and Kuper, 1951): when necessary the identity was confirmed by means of the slide coagulase test.

Studies on Antibiotic Sensitivities.—These were performed using Evans's "sented" tablets.

Studies on Air-borne Contamination.—Settle plates were used to measure the air contamination in different parts of the laundry during normal working conditions. Plates of nutrient agar were exposed for known periods of time, and after incubation for 18–24 hours counts were made of total organisms and *Staph. aureus*. The results were expressed as organisms falling on 1 sq. ft. (0.093 sq. m.) per minute.

For studying the passage of air currents through laundry machinery *Serratia marcescens* was used as a marker organism. Heavy aerosols of this organism were produced from a broth culture by means of an atomizer, and the resulting distribution of the organism was then studied: air contamination was measured by means of settle plates; dry blankets were sampled by the sweep-plate technique; wet blankets were sampled by pressing the blanket directly against the nutrient medium; and various parts of the inside and outside of laundry machinery were sampled by means of swabs moistened with nutrient broth.

Smoke produced by exposure of titanium tetrachloride was used for detecting the predominant air currents under different conditions of ventilation.

Results

Table I shows the results of a series of counts taken over a period of six months for blankets arriving dirty in the laundry compared with counts after the laundry processes were complete.

Evidently the laundering processes greatly reduce the population of both total organisms (95.7% are removed) and *Staph. aureus* (98% are removed). It should be noted.

*A preparation of sodium sesquicarbonate manufactured by Imperial Chemical Industries Ltd., designed to produce mildly alkaline conditions.

†An anionic detergent based on sulphonated fatty alcohols supplied by Skilbeck Bros. Ltd.

TABLE I.—Comparison of Blankets Before and After Cleaning

	Before Cleaning	After Cleaning
No. of blankets sampled	100	100
Total No. of organisms isolated	47,818	2,034
Total No. of <i>Staph. aureus</i> isolated	1,085	22
<i>Staph. aureus</i> isolated expressed as a percentage of the total organisms	2.3	1.1
No. of blankets yielding <i>Staph. aureus</i>	87	15

however, that even with the small number of organisms (2,034) isolated from the laundered blankets in the above experiments no fewer than 22 colonies proved to be *Staph. aureus*, and that 15 out of 100 laundered blankets were contaminated with this organism. In separate experiments in which samples of fluff from freshly laundered blankets were collected on culture plates sown with *Staph. aureus* there was no evidence that the blanket fibres inhibited the growth of this organism.

The sensitivities of 50 colonies of *Staph. aureus* isolated from dirty blankets were compared with those of 50 *Staph. aureus* isolated during the period of this survey from patients in the wards. The results are shown in Table II. It will be seen that the two groups of organisms show a similar sensitivity pattern.

TABLE II.—Comparison of the Sensitivities of *Staph. aureus* Isolated from Blankets and from Patients

Antibiotic	<i>Staph. aureus</i> from blankets % resistant	<i>Staph. aureus</i> from patients % resistant
Penicillin	68	70
Chloramphenicol	6	8
Streptomycin	40	36
Tetracycline	32	36

The results of air studies in this particular laundry were largely negative, in the sense that, although air contamination occurred at various stages in the laundering process, no significant recontamination of blankets could be detected.

Settle plates exposed to the air in the room in which incoming articles were sorted showed, as expected, that the air was heavily contaminated: it was usually found that 300–600 organisms were falling on 1 sq. ft. (0.093 sq. m.) per minute. On the other hand, in the room used for storing the laundered blankets the air was relatively clean, and, at a period of maximum activity when blankets were being issued only 23 organisms were falling on 1 sq. ft. (0.093 sq. m.) per minute.

Experiments with aerosols of *Serratia marcescens* made it possible to study air-borne contamination of blankets during the various laundering processes, but in fact no important contamination was noted. For instance, although large volumes of air were drawn into the hydro-extractors there was no evidence that this caused significant contamination of the blankets inside. Similarly, though the hydro-extractors themselves produced a moderate increase in air contamination, this was of no account, since this contaminated air had no access to that part of the laundry in which the blankets were finally dried and stored.

Discussion

The results of laundering blankets in the way here described compare favourably with the results of many other accepted methods. One factor causing a fall in bacterial counts may be the use of sulphonated fatty alcohols as the cleansing agents, since the other procedures involved are in common use in many large laundries. However, the methods described are not ideal, since large numbers of organisms, including *Staph. aureus*, can still be isolated from the freshly laundered blankets. As suggested by Frisby (1957), the ultimate solution of the problem presented by hospital

blankets may be the replacement of woollen blankets by blankets made of some material which can withstand boiling and other rigorous laundry procedures.

When considering laundry hygiene, attention should not be directed solely to the process of washing. It is clearly important to see that freshly washed articles are not recontaminated.

In sorting dirty articles of clothing in a laundry it is usual for air contamination to reach high levels. Again, large laundries have powerful appliances which by design or accident draw in large volumes of air and then expel dust or aerosols into the environment. Obviously it is important that this contaminated air should not have access to regions of the laundry where freshly laundered articles are exposed.

By very simple methods—exposing plates to the air during normal working conditions, producing artificial contamination with aerosols of an easily recognizable organism, and studying the prevailing air currents with smoke—it is possible to detect these sources of contamination.

We cannot generalize on the steps which should be taken to remove such sources of contamination, since these will largely depend on the layout of individual laundries. However, it seems likely that quite simple alterations in ventilation or the siting of machinery or sorting-rooms and store-rooms will usually improve the hygiene of laundries where these defects still exist.

Summary

Hospital blankets are often contaminated with pathogenic organisms which are not removed by accepted methods of laundering.

A simple method of laundering blankets is described which, though not ideal, appears to give better results than many of the methods in current use.

In planning methods of laundry procedure it is important to guard against air-borne re-contamination of freshly laundered articles.

We acknowledge the help received in the course of this investigation from Mr. H. Besser, the laundry manager at Guy's Hospital.

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Medical Memorandum

Agranulocytosis with Thrombocytopenia following Chlorothiazide Therapy

Chlorothiazide (6-chloro-7-sulphamyl-1,2,4-benzothiadiazine-1,1-dioxide), an orally effective non-mercurial diuretic agent, has been employed extensively both in hospital and in general practice during the past year. This drug is believed to be free of toxicity, and the only side-effects observed occasionally have been mild gastro-intestinal disturbances. One case with a maculopapular rash and pruritus has been noted by C. K. V. van Dommalen (1958, personal communication) following the use of chlorothiazide, but no other toxic manifestations have been published. It is therefore worth recording a case of fatal bone-marrow dysplasia following treatment with chlorothiazide.

CASE REPORT

A man aged 70 was admitted to hospital with a history of having collapsed in the street four weeks previously. He had been treated with digoxin and chlorothiazide at home for acute congestive cardiac failure due to hypertensive heart disease. The total amount of chlorothiazide administered

was 25 g. over a period of 13 days. He had received no other drugs, and there was no history of occupational exposure to chemicals or radiation. He was transferred to hospital after four weeks' treatment because of the development of delirium and incontinence over the previous two days. On admission he was found to be mildly confused, with a generalized maculopapular and purpuric rash over the face, trunk, and extremities. A pyrexia of 100.4° F. (38° C.), mild congestive cardiac failure, left hydrothorax, and a strongly positive Hess test were noted. There was no enlargement of lymph nodes or spleen. Tendon jerks in the lower limbs were absent and proprioception and deep sensation lost. Next day his condition deteriorated, he became mildly jaundiced, and there was further extension of the rash. He died six days after admission.

Investigations.—On his admission there was a normocytic normochromic anaemia with haemoglobin of 10.1 g. per 100 ml., and 3,000 white cells per c.mm. (lymphocytes 97%, monocytes 3%). Examination of two blood films revealed only a single eosinophil polymorph, and, although a few of the lymphocytes were atypical, no primitive forms were seen. The Paul-Bunnell test and W.R. and Kahn tests were negative. Two days later the white cells numbered 900 per c.mm. (neutrophil polymorphs 14%, lymphocytes 73%, monocytes 10%, atypical cells 3%). The neutrophil polymorphs stained histochemically showed a high alkaline phosphatase content. Platelets were 76,000 per c.mm., and E.S.R. 44 mm. in one hour (Westergren). Blood urea was 140 mg. per 100 ml., serum bilirubin 1.8 mg. per 100 ml., and thymol turbidity 4 units.

The direct Coombs test and Schumm's test were negative. Electrophoresis of the plasma proteins showed an increase in α_2 globulin. Serum electrolytes were: sodium 133 mEq/l., chloride 94 mEq/l., and potassium 3.9 mEq/l. Examination of the pleural fluid showed a simple transudate containing fresh blood.

The cause of the antecedent heart failure was confirmed at the post-mortem examination as being due to dilatation of a hypertrophic left ventricle. There was extensive purpura in the skin, the white matter of the brain, and the intestine. The bone marrow was replaced macroscopically by fibro-gelatinous tissue, and histological examination of that obtained from the sternum, lumbar vertebral body, and shaft of the femur showed it to be very hypoplastic. Myelocytes and some metamyelocytes were seen, but mature granulocytes were scanty. Erythropoiesis was normal or only slightly depressed. There was a relative increase of plasma and reticulum cells and a great increase in free iron. The number of megakaryocytes present in the marrow had also strikingly increased.

COMMENT

It is impossible to avoid the conclusion that the marrow disturbance in this case was due to an idiosyncratic reaction to chlorothiazide. The dosage of chlorothiazide was high but not excessive. The maculopapular element of the rash had the familiar characteristics of a drug eruption, and the purpura was linked with a severe thrombocytopenia. The combination of a low platelet count in the peripheral blood with large numbers of megakaryocytes in the marrow is the antithetical phenomenon that has been noted by Weisfuse *et al.* (1954) in the case of quinidine. The agranulocytosis, which was almost complete at one stage, is a frequent finding in this type of reaction, and the patient had not been exposed to any other potentially toxic material.

We thank Dr. H. E. S. Pearson who was in charge of this case, and Dr. P. Darby for the histological reports.

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Reviews

ROLE OF THE SOCIAL SCIENTIST

Medical Sociology: Theory, Scope, and Method. By Norman G. Hawkins, B.Ed., Ph.D. (Pp. 290+xx. 51s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications, 1958.

When asked (soon after a divorce) what she thought of men Miss Hedy Lamarr is reported to have said: "Men are fine, love is fine; it's marriage I'm a little disappointed in." If one were asked about the possible contribution of the social sciences to medicine one would be tempted similarly to reply: "The social sciences are fine, but social scientists are sometimes a little disappointing." And the reasons, one would suggest, have their origin in their attitude to the natural sciences; they have at once too much respect and too little knowledge. As a result they have taken the methods of the natural sciences but not their standards, whereas it would have been preferable to have taken the standards but not the methods.

The theme of *Medical Sociology* is the role of the social scientist in medicine. His field, it is suggested, comprises "social epidemiology, the study of cultural factors and social relations in connexion with illness, and the social principles in medical organization and treatment." His contribution to understanding of the aetiology of the disease is illustrated by reference to specific diseases: "Any social scientist who wishes to discuss tuberculosis intelligently must first disabuse himself of the notion that infection is the predominant aspect of the disease." "Demography, comparative cultural studies, research in family and occupational experience, and physiological evidence, all indicate strongly that the two diseases [schizophrenia and tuberculosis] are associated with dissolution of the supportive cultural matrix and consequent severe or prolonged stress." "The beneficial effect of milk on stomach ulcer evidences lack of emotional satisfaction as the cause of the ulcer." (If the last—a quotation from another source—is intended to be funny it is written with a very straight pen.) Although quoted out of their context these three examples are fairly representative of the style and content of this book, which can only make the reader with a biological background more than ever doubtful about the contribution to be expected from social scientists to medicine. What is least satisfactory about their approach is the confidence with which they answer difficult questions, before we know the answers to much simpler ones.

T. McKEOWN.

ULCERATIVE COLITIS

Ulcerative Colitis. By Harry E. Bacon, B.S., M.D., Sc.D., L.D., F.A.C.S., F.A.P.S. With contributions by Paul T. Carroll, B.S., M.D., and Leroy W. Krumpman, M.D. (Pp. 395+xix; illustrated. £6.) Philadelphia and Montreal: J. B. Lippincott, 1958.

The author of this monograph has had a large experience of ulcerative colitis, for he has treated more than 400 patients with the disease during the past 16 years. Although a surgeon, he believes that the majority of patients with ulcerative colitis are best treated by conservative means, and he himself operated on just over one-quarter of his patients. In other words, his approach to the disease is not narrowly surgical, and the first half of the book is devoted to a consideration of aetiology, pathology, symptomatology, diagnosis, complications, and non-surgical treatment. This part of the book is an excellent review which every doctor interested in the disease could read with pleasure and profit. It is always interesting for a physician to observe the comments of a surgeon on medical forms of treatment, and Dr. Bacon survives the test well, although it must be remarked that few specific types of medical treatments have been tried under sufficiently stringent conditions

for scientifically valid results to emerge, so that their use depends upon opinion rather than fact. There is a view, widely held in Britain but even more so in the U.S.A., that ulcerative colitis is a psychosomatic disorder, so it is not surprising that formal psychotherapy is often regarded as the essential line of treatment. Dr. Bacon does not find that this approach has much to commend it, stating that "our experience demonstrates unequivocally that psychotherapy has been entirely unsatisfactory." He advocates that the clinician dealing with the organic side of the disease should himself serve in the capacity of psychiatrist, and he gives his views on the way that this can be done.

The second half of the book is a detailed account of the surgical treatment of ulcerative colitis and the results obtained. The opening chapter, which deals with the indications for surgery, is of general interest, and the author sets out his views with clarity and good sense. The remaining chapters are chiefly of interest to surgeons, as various operations are examined in detail. In so far as I, a physician, am able to judge, these chapters are excellent in their way, even though in places the non-surgeon feels inclined to echo the sentiments of the little girl who wrote: "This book teaches me more about penguins than I wish to know." The author is in line with most other expert bowel surgeons in preferring to do a primary colectomy with ileostomy rather than carrying out ileostomy and subsequently proceeding to subtotal or total colectomy. So far as the actual fashioning of the ileal stoma is concerned—a procedure of utmost consequence for the patient's future health—it is interesting to note that he himself uses as a routine the everted, full-thickness type of stoma devised by Mr. B. N. Brooke, of Birmingham, England. It is also interesting to note that he considers that there are some patients in whom it is possible to carry out ileo-proctostomy very satisfactorily and thus preserve normal defaecation, a procedure which Mr. S. O. Aylett has championed in this country, although many surgeons judge it to be an unsatisfactory operation.

All in all, this monograph is one which can be commended to surgeons and physicians alike.

S. C. TRUELOVE.

A CENTRE OF CLINICAL INVESTIGATION

Ward 4. The Mallinckrodt Research Ward of the Massachusetts General Hospital. By James Howard Means. (Pp. 187+x; illustrated. 36s.) Cambridge, Mass.: Harvard University Press. London: Oxford University Press, 1958.

This is the story of how the first of the modern whole-time professors of medicine at Harvard built, in 1924, a ten-bedded ward with three times its area of laboratories, and so made possible one of the formative centres of clinical investigation. The book also discusses the nature of research and describes in detail the patients in the ward at one given moment; but it is mainly concerned with the results achieved. This part is very skilfully written—a most readable account which will open the eyes of every layman who has any interest in science. It gives clear descriptions of such complicated and muddling things as the interrelations between bone diseases, calcium metabolism, the parathyroids, and kidney diseases which would also clear the air for doctors. In short, there are few books better worth recommending to both lay and medical readers. But one of the chief medical interests of the book is what Dr. Means has to say about the morals of clinical investigation. He is a doctor in the best sense, and he faces honestly, and with a new constructive approach, the ethical problem involved in "subjecting patients to prolonged study both for their own benefit and that of others." He lifts the subject to the level of the concept of the active co-operation of the patient as a member of the team: "indeed, patients no less than investigators have shown both loyalty and devotion to the cause of research." The suggestions on how this may be done will be, to many doctors, the most valuable part of the book. It is a pity that the impression is conveyed that all research workers in the world were given in Ward 4.

the opportunity which enabled them to establish themselves, and that every advance in medicine in the last thirty years has come from this one source, but those who have tried to write this sort of account will sympathize with the difficulty of distributing credits fairly without being maddeningly pedantic.

CHARLES NEWMAN.

MUSCULO-SKELETAL DISEASES

Orthopedic Diseases. Physiology-Pathology-Radiology. By Ernest Aegerter, M.D., and John A. Kirkpatrick, jun., M.D. (Pp. 602+xii; illustrated. 87s. 6d.) Philadelphia and London: W. B. Saunders Company, Ltd. 1958.

The physiology, pathology, and radiology of a considerable number of diseases of the musculo-skeletal system are described. Many of the subjects considered in the greatest detail are those conditions which have attracted attention during the last quarter of a century. The authors make no pretence about any original observations, but have collected information from good papers, extracted the subject-matter suitable for their book, and illustrated it with excellent reproductions from well-chosen radiographs. It is essentially a book for postgraduates, who would look elsewhere for the clinical features of the disease, but they will find lucid reading on the blood chemistry and pathology in this text. It is hardly surprising that the authors find it difficult to group some conditions, but it is unexpected to find non-osteogenic fibroma and solitary bone cyst in a chapter on circulatory disturbance, and all types of slipped epiphyses in the category of metabolic disease, although it is agreed that all or many are of unknown origin, and it does not appear that trauma is to be considered the only cause in any cases. Hamartoma seems to be a useful term to include osteoma, enchondroma, and other suchlike conditions. There is plenty to study in this book, as chapters include congenital and developmental disturbances, abnormal vitamin, thyroid, and parathyroid function, as well as a large section dealing with many aspects of tumours of the skeleton and soft parts. Photomicrographs are well chosen and of good quality and size. The publishers have made this book very readable by the high standard of production of letterpress and illustrations.

ST. J. D. BUXTON.

PSYCHOLOGY OF MEDICAL PRACTICE

The Psychology of Medical Practice. By Marc H. Hollender, M.D. (Pp. 276+x. 45s. 6d.) Philadelphia and London: W. B. Saunders Company. 1958.

Dr. Hollender claims that his book is "grounded in psycho-analytical psychology," but he has skilfully avoided the jargon of psycho-analysis in order to appeal to the general physician, surgeon, or practitioner. He has done his work well, and there is much sound advice and food for thought in these pages. He points out that to arrive at the correct clinical diagnosis is not always enough. The patient sometimes has his own diagnosis, and if real peace of mind is to be achieved this must be uncovered and discussed. The patient will reveal his own ideas only when he feels assured of a sympathetic hearing. The author suggests that the patient wants two things from his doctor; relief from his symptoms and also the comfort of a kindly parent figure. The book is enlivened by suitable case histories and an admirable selection of quotations and aphorisms, old and new. "A patient has no more right to all the truth than he has to all the medicine in your saddle bags." "All slowly dying persons can be helped by the kindly physician."

This is a book which can be read with profit by all doctors interested in clinical medicine. It deals with the handling of many types of patients and their relations. The chapter on the use of medications is below the standard of its fellows. I would like to suggest two omissions which might well be remedied in a subsequent edition: in the chapter dealing with the cancer patient the organization of "Cancer

Anonymous" should be discussed; secondly, although hospital routine is mentioned, it is worthy of much more consideration. It is a pity such a concise book of 276 pages should cost so much.

C. A. H. WATTS.

In *The Ministry of Pensions and National Insurance* (pp. 162; Allen and Unwin, Ltd.; 18s.) Sir Geoffrey King, a former Permanent Secretary to the Ministry, gives an account of its organization and function. He describes its origins, the system of statutory authorities who decide claims and hear appeals, and the various pensions, benefits, and allowances administered by the Ministry. A chapter on reciprocity and international agreements is included.

The proceedings of the first national congress of the Società Italiana de Cancerologia, held in Milan on April 8 and 9, 1958, have been published in two parts in *Atti della Società Italiana de Cancerologia*, a supplement to the journal *Tumori* (Casa Editrice Ambrosiana, Milan). The first volume is devoted to carcinoma of the breast, the second to cancer of the oesophagus.

A Synopsis of Otorhinolaryngology, by J. F. Simpson, I. G. Robin, and J. C. Ballantyne, with a section on neurology of the ear, nose, and throat by C. H. Edwards, is a recent addition to the "Synopsis" series published by John Wright and Sons, Bristol (pp. 443, illustrated; 1957; 42s.). It is designed primarily as a revision manual, having especially in view the needs of those studying for postgraduate examinations in oto-rhino-laryngology.

Formula for Death, by Fernand Gigon (pp. 223, illustrated; Allan Wingate, 15s.), is an account of the effects of the atomic bombing of Hiroshima and Nagasaki, with case histories of some of the victims who survived but later suffered from the delayed effects of nuclear radiation. It has been translated from the French by Constantine Fitz Gibbon.

According to T. F. Schlaegel, emotional factors play a part in all conditions involving the eyes. In his *Psychosomatic Ophthalmology*, written in collaboration with M. Hoyt (pp. 523; Baillière, Tindall and Cox, 1957; 88s.), he stresses the importance of the psychological investigation of ophthalmological patients. The book is divided into five sections, in which are discussed the role of psychiatric factors in disease, general conditions involving the eyes and about which psychological factors are known, disturbances of function and structure of the visual apparatus, ocular conditions without specific anatomical location, and the psychosomatic approach to treatment.

The Chronically Ill, by Joseph Fox (229 pages; Vision Press, 25s.), is based on the author's experience over many years as administrator of a home for the aged and a small chronic-diseases hospital in the United States. He defines the chronic diseases and describes their emotional and psychological effects. Attention is paid to the sociological and economic effects of chronic illness, the types of care required, and what can be done by way of rehabilitation.

Collected Papers of the Mayo Clinic and the Mayo Foundation, Vol. 49, contains reprints and abridgments of papers published by workers at the Clinic and Foundation and received during 1957. It comprises 30 papers reprinted in full, 86 abridged, 22 in abstract form, and 608 by title only. The volume (827 pp.) is obtainable from W. B. Saunders Company, price 91s.

Medical Electrical Equipment, written by 21 contributors under the editorship of Robert E. Molloy (pp. 312, illustrated; George Newnes, Ltd., 35s.), provides information on the principles, operation, care, and maintenance of electrical apparatus used in hospitals and clinics. It is intended for those who do not possess a deep knowledge of electricity. Full information is included on the elimination of possible dangers to staff and operators.

Selected Papers from the Institute of Cancer Research: Royal Cancer Hospital, and from the Royal Marsden Hospital, Vol. 11 (1956), comprises reprints of 98 papers published by the staff and research workers on all aspects of cancer research.

The Handbuch der Neurosenlehre und Psychotherapie, edited by V. E. Frankl, V. E. von Gebattel, and J. H. Schultz, is being published in parts at approximately monthly intervals by Urban und Schwarzenberg, Munich. When completed it will consist of five volumes each of 700-800 pages. Up to the present six parts have appeared. Single parts are not sold separately; the price of those so far published is D.M. 107.

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KIDNEY TRANSPLANTATION IN IDENTICAL TWINS

The immunological obstacles to a successful transplantation are probably much more severe with homografts of kidneys than with homografts of skin. A skin homograft will succeed if its recipient's tissues can be induced to accept it. Although they can be made to do so in laboratory animals by taking advantage of the principle of immunological tolerance^{1 2}—a principle which is known to apply to human beings—the problems of applying it in clinical practice have yet to be overcome. With kidney homografts, however, there is the additional problem of making the graft accept its recipient, for the experimental work of W. J. Dempster^{3 4} and of M. Simonsen^{5 6} on kidney homografts in dogs uncovered histological appearances which led to the bold inference that certain cells in the graft were reacting upon antigens present in the host.⁶ "Graft-against-host" reactions have now been demonstrated experimentally by R. E. Billingham and L. Brent⁷ and by Simonsen,^{8 9} and it is now widely believed that they are responsible for "late deaths" that occur when, for example, mice which have been given lethal doses of irradiation are protected by the injection of bone marrow cells taken from mice of different inbred strains.¹⁰⁻¹²

The existence of these two obstacles, neither yet surmounted in clinical practice—the immunological reaction of host against graft and of graft against host—makes the future of kidney homotransplantation look rather bleak. Over a period of thirteen years fifteen true homografts of kidneys have been attempted at the Peter Bent Brigham Hospital.¹³ Five of the homografts worked temporarily, and one lasted as long as five and a half months; but in the

end all failed. Nevertheless there is important surgical progress to report: J. E. Murray, J. P. Merrill, and J. H. Harrison¹³ have recently summarized their experience with the transplantation of kidneys in seven cases in which the donors and recipients of the grafts were identical twins. Four of the patients had chronic glomerulonephritis, one had subacute glomerulonephritis, and two had chronic pyelonephritis. Six were in a terminal state of irreversible uraemia; the seventh patient, a 14-year-old boy, was operated on because of the retardation of growth and psychological difficulties associated with the bilateral nephrostomies performed a year beforehand. Their respective donors, who were proved to be their identical twins by detailed blood matching and the reciprocal exchange of skin grafts, had fully normal renal function. Their willingness to sacrifice one kidney should not be passed over lightly: "A major operation on a normal person, not for his own benefit, requires a brusque re-evaluation of traditional surgical thought. Is any risk, no matter how slight, ever justified?" But the immediate and long-term risks must not be exaggerated, for "a person with one kidney can have a normal life expectancy with normal renal function: in fact, one in every thousand persons is born with only one kidney, often unknown to himself or his physician."

The kidneys were grafted not into the renal fossa, which has certain disadvantages, but into the iliac fossa, anastomosis being made between renal and hypogastric arteries and between renal and external iliac veins; the ureter was sutured to the bladder mucosa. One patient failed to develop renal function, and this was the only surgical failure. In most cases a copious outflow of dilute urine began before the operation was over. Four subjects, one operated on 3½ years ago, are essentially normal and have returned to ordinary life; one has borne a child. A fifth died after four months as a result of the reappearance of her original disease in the transplanted kidney, and a sixth, though still alive eight months after operation, has developed ominous signs of impaired renal function. The existence of a third independent example¹⁴ of the reappearance of the original kidney disease in a normal transplant gives added weight to the possibility that "there are factors in the circulating plasma capable of transmitting glomerulonephritis in the human."

These seven cases make a brilliant surgical record. They show that kidney transplantation in man can be a thoroughly successful surgical procedure, in spite of the unnatural environment and blood supply of the graft, its denervation, the interruption of lymphatic drainage, and the physiological trauma associated

- ¹ Brit. med. J., 1955, 1, 1139.
- ² Billingham, R. E., Brent, L., and Medawar, P. B., Phil. Trans. B, 1956, 239, 357.
- ³ Dempster, W. J., Brit. med. J., 1951, 2, 1041.
- ⁴ Brit. J. Surg., 1953, 40, 447.
- ⁵ Simonsen, M., Buemann, J., Gammeltoft, A., Jensen, F., and Jorgensen, K., Acta path. microbiol. scand., 1953, 32, 1.
- ⁶ Brit. med. J., 1954, 1, 922.
- ⁷ Billingham, R. E., and Brent, L., Transplant. Bull., 1957, 4, 67.
- ⁸ Simonsen, M., Acta path. microbiol. scand., 1957, 40, 480.
- ⁹ Cock, A. G., and Simonsen, M., Immunology, 1958, 1, 103.
- ¹⁰ Barnes, D. W. H., Ford, C. E., Ibbery, P. L. T., Koller, P. C., and Loutit, J. F., J. cell. comp. Physiol., 1957, 50, suppl. 1, 123.
- ¹¹ Trentin, J. J., Proc. Soc. exp. Biol. (N.Y.), 1956, 92, 688.
- ¹² Brit. med. J., 1958, 2, 1151.
- ¹³ Murray, J. E., Merrill, J. P., and Harrison, J. H., Ann. Surg., 1958, 148, 343.
- ¹⁴ Hume, D. M., Merrill, J. P., Miller, B. F., and Thorn, G. W., J. clin. Invest., 1955, 34, 327.

with its removal. The procedure is at present applicable to the small but by no means negligible number of persons—about 1 in 180—who have identical twins. It is not of course applicable when the donor is someone other than the recipient's identical twin, because of the intervention of the immunological factors mentioned above.

Much basic experimental work has still to be done on the use of renal homografts. We most urgently need to know, for example, if the immunological reaction of a kidney graft against its host can be in itself a sufficient cause of failure, even when the reaction of the host against the graft has been eliminated. If it were surgically feasible to transplant whole kidneys successfully in rats we should not have to wait long for an answer, for rats are available in inbred strains, and it is therefore easy to devise a situation in which the graft can react upon the host although the host cannot react upon the graft. If this approach is unworkable, it will be necessary to abolish the host reaction by x-irradiation or by the induction of tolerance. By one such means or another, it is most important that the question should be answered.

INFLUENZAL PNEUMONIA

The 1957 epidemic of influenza caused by the Asian variant of type A virus had several unusual features. It reached its height in Europe and the United States in the late summer and autumn instead of in the winter. Among very large numbers of cases most were uncomplicated, but when pneumonia developed it sometimes assumed a fulminating form, and in many, although not all, of the severe pneumonias the secondary infection was staphylococcal. A survey¹ by the Public Health Laboratory Service of 477 fatal cases of pneumonia during this period—in a majority of which influenza virus was demonstrated when it was looked for—showed that staphylococci were present in the lung and sputum of 62% of all cases, but in a higher percentage among children of school age and in a much lower percentage in old persons. A fulminating course, leading to death within two days of admission, was commonest in children of under 5, and least common after the age of 45.

These findings cannot be compared directly with those of a further survey described in the opening pages of this issue by Dr. Neville C. Oswald, Dr. R. A. Shooter, and Mr. M. P. Curwen, although they agree in pointing to secondary staphylococcal infection as the most dangerous complication in this epidemic. This material consisted of 165 cases of influenzal

pneumonia in undergraduate teaching hospitals in London, of which 20 (12%) were staphylococcal, together with 135 cases of staphylococcal pneumonia occurring in other hospitals and in the armed Services. These two series enabled a searching comparison to be made between the features of staphylococcal and non-staphylococcal pneumonia during this epidemic. The mortality of the former was high in every age group, and not significantly greater in the elderly (33%) than in children (30%), whereas in non-staphylococcal pneumonia it was small in every age group but the highest. In staphylococcal pneumonia consolidation was more extensive, 37% of patients having three or more zones involved, compared with only 19% in the other cases. There were corresponding differences in the height and duration of the fever. The discussion of a separate category of gravely ill patients, possibly to be classified as examples of "fulminating" infection, is complicated by the inclusion of a further series of 79 patients, making a total of 379: there were in all 132 such patients, of whom 76 (58%) died, and they included 71 (54%) with staphylococcal infection.

Unfortunately the conclusions which can be drawn about the merits of different forms of treatment are less definite. Oswald and his colleagues discuss the indications for steroid therapy and tracheobronchial intubation, giving qualified approval to the former and granting that the latter may sometimes be advisable. Their material presumably afforded no certain information about the usefulness of staphylococcus antitoxin, old stocks of which are said to have been rapidly and unexpectedly consumed by enthusiasts for this form of treatment. None of these measures can compare in importance with chemotherapy, if effective chemotherapy is possible. This is precisely where reliable information ceases to be forthcoming. Owing to the frequency with which two or more drugs had been given, either together or successively, no valid conclusions could be drawn about the relationships between therapeutic response and antibiotic sensitivity as determined *in vitro*. This is not at all surprising: the more severe and acute an illness, the greater the urge to try every promising remedy, especially when a laboratory report suggests that some change is indicated.

Although we are told nothing about the relative merits of different antibiotics in treating these patients, we are provided with highly significant information about the sensitivities of the staphylococci to them. It is very necessary to classify these organisms into those causing infections originating outside hospital and those likely or almost certain to have been acquired since admission, and

this was done in the survey of the Public Health Laboratory Service and in the series of Oswald and his colleagues. In the former the frequency of resistance to penicillin in home infections was 35% and in the latter 49%. For staphylococci from infections developing in hospital the corresponding figures were 70% or 100% (according to the duration of hospitalization) and 93%. There are corresponding differences in Oswald's series for streptomycin and tetracycline, 62% and 74% respectively of presumably hospital strains being resistant to these antibiotics, compared with 12% and 22% of outside strains. The prospects of successful therapy with the usual antibiotics therefore seem to depend considerably on the circumstances in which the infection developed. Resistance was rare to both chloramphenicol and erythromycin, especially to the latter, and, since erythromycin is much the more active of these two antibiotics in this infection, it is probably the drug of choice. In a gravely ill patient with staphylococcal pneumonia, particularly if this has developed in hospital, it should be given forthwith, preferably by the intravenous route initially to achieve an immediate effect, without awaiting the results of sensitivity tests. Treatment with this drug, or with novobiocin, was in fact advocated by T. Simpson² on the basis of experience with 25 cases in this epidemic. Reluctance to use the later antistaphylococcal antibiotics for fear of acquired bacterial resistance may be commendable in dealing with minor sepsis, but to bring it into the argument in face of one of the most acute of medical emergencies is to lose all sense of proportion.

PRIVATE GENERAL PRACTICE

The B.M.A. has consistently recognized the importance of maintaining and encouraging the existence of private general practice side by side with the general medical services provided under National Health schemes since 1911 and 1948. The active Private Practice Committee of the B.M.A. is sufficient witness of this. Some old-fashioned socialists may hold up their hands in horror at the idea of two types of general practice being set up to meet the needs of a mythically conceived one type of human being. They admit—at least by their silence—the need for socialist Prime Ministers to have special private doctors, and for socialist Cabinet Ministers sometimes to take therapeutic advantages denied the rest of us. Even in an egalitarian world most men are less fortunate than others. Those who claim that the existence of two types of practice is wrong should be careful what they say if they imply—as they usually do—that private practice is better for the patient than public, State-provided, practice. The G.M.C. sees that

all doctors have a minimum standard of medical education. Medical schools insist that the students they accept for training have a minimum standard of general education. In this way the public is safeguarded, and can check against a public *Medical Register* the claim of a man or woman to be a qualified practitioner of the healing art. Not all doctors so registered are equal in intelligence, ability, or even in moral standards, as the biannual meetings of the G.M.C. show. But at least they have a proficiency that has been tested, and a basis for developing fresh skills.

For some doctors the idea of working in a State medical service is abhorrent. They fear the prospect of a third party coming between them and their patients. They dislike the bureaucrat and his forms, orders, and regulations. They would rather treat a patient free of charge than accept a price on his head. They are strong individualists. Out of such reactions arose the movement that found its leader in the late Lord Horder, who, while still a member of the B.M.A. Council, started the Fellowship for Freedom in Medicine. The majority of conformists in the N.H.S. probably dislike such untidy institutions, these assertions of individuality in the new society of deadly levellers. But for a sturdy nucleus the possibility of private practice means the possibility of private choice and decision and the possibility of rising by private initiative and effort, with the risk of falling by the wayside taken into full consideration.

The cost of modern medical care being what it is, some 90% of the population must have some insurance cover for the risks of ill-health. For quite a number of people the N.H.S., however excellent it may be in many respects, falls short of what they want. No one, for example, would expect a busy man like the Prime Minister or the Leader of the Opposition in the House of Lords to queue up in a doctor's surgery under the N.H.S. Just how far down the list of V.I.P.s this expectation evaporates no one has determined. (The art of V.I.P.-ship has yet to be written by Mr. Stephen Potter.) But, just as many people have insured under various provident schemes against the expense of private hospital treatment, so would many like to insure against the cost of treatment in private general practice. In its current *Bulletin* the Fellowship for Freedom in Medicine describes such a scheme now inaugurated by the British United Provident Association, and the benefits to be obtained under it.

Any movement which fosters private practice should be encouraged. It is in line with B.M.A. policy. It takes account of the fact that some doctors and some patients dislike the regimentation unavoidable in a State scheme. And any increase in private practice will lessen the heavy burden now borne by the State and its compulsory taxpayers. Many general practitioners of first-rate ability much prefer to do their work in a State-provided service. They would be the first to take into account the fact that some of their colleagues would much rather enjoy the sense of freedom that goes with the private practice of medicine, however insecure the prospects may be.

¹ *Brit. med. J.*, 1958, 1, 915.

² Simpson, T., *Lancet*, 1958, 1, 373.

HAZARDS OF POLLEN EXTRACTS

The injection of antigens, especially pollen extracts, carries the risk of sudden death even when correctly given. The total number of deaths recorded in the medical literature following skin testing or treatment with antigens, dating back to 1911, when desensitization was introduced, hardly exceeds twenty,¹ but opinions differ on how often such cases are published. Some are known to have gone unrecorded. E. Bruun² collected five deaths following injections of antigens in Scandinavia in the "past three or four years," but had no deaths in his own clinic during fourteen years. W. T. Vaughan and J. M. Black³ listed three cases of death and ten of constitutional reactions following injections of pollen extracts; they cited an investigation by Vaughan and D. M. Pipes,⁴ who, on carefully questioning fifty doctors attending a meeting of the American Medical Association, found that twenty-five had either personally observed or had heard of cases of allergic shock or death.

F. F. Furstenburg and L. N. Gay,⁵ of the Johns Hopkins Hospital, found seventy-five constitutional reactions following 29,547 pollen injections, an incidence of 0.25%. They were unable to find any cause in one half of the fifty "clinic group," nor in two-thirds of the twenty-five "private patients." There were no deaths. Gay⁶ writes that such reactions are encountered in spite of all precautions and will occur in any group so long as our present methods of treatment prevail—a viewpoint which is still unfortunately true.

N. Hjorth⁷ has recently drawn attention to the instability of pollen solutions. He has shown that partial emptying of a vial (from 10 ml. to 1 ml. three to twenty-one days previous to testing) reduces the potency of the pollen antigen. Indeed, the last millilitre in a 10-ml. vial had approximately only the same potency as the first millilitre of a similar vial containing a tenfold lower concentration. Hjorth refers to the work previously carried out on tuberculin solutions, in which a similar effect had been attributed to adsorption on the glass surfaces. It was found that it could be eradicated by the addition of stabilizers, of which "tween 80" was the most effective, addition of 0.005% being sufficient to prevent adsorption.^{8,9} Hjorth recommends that, until the problem has been investigated and a suitable stabilizer tested, vials of antigen solutions should be discarded when they have been half emptied. This applies not only to solution used for hyposensitization but also to that used for skin testing.

Incorrect dosage and incorrect techniques increase considerably the risk of severe reactions. It is worth

emphasizing that a small-bore needle and a syringe suitable for giving the exact dose are best used, and reading of the labels on the bottles needs to be exact. The plunger of the syringe should be withdrawn for an adequate time to be certain that the needle is not in a vein. Yet even with correct techniques constant care is necessary with each individual and with each injection. Pollen solutions vary, and it is worth taking special care when changing from a used bottle to a full one. The presence of a "cold" or other infection should always be inquired for before giving an injection, for infection will lower the patient's threshold, and the dose should then be reduced or temporarily withheld.¹⁰ Most authorities are agreed that injections should be given subcutaneously and that both patient and doctor should look for any reactions. The development of a local reaction is an indication for lowering and not increasing the next dose.¹⁰⁻¹²

Pollen injections undoubtedly help a reasonably high proportion of pollen-sensitive patients,¹³ and in expert hands constitutional reactions are uncommon, while death is a very rare occurrence indeed. However, before advising pollen hyposensitization for any patient, it is worth carefully assessing the severity of the hay fever or of the pollen asthma and perhaps trying a year of symptomatic therapy first.

RESEARCH INTO TREATMENT OF TETANUS

Tetanus is now usually treated in the clinic by giving a general anaesthetic, or barbiturate, or by injecting a neuromuscular blocking agent such as D-tubocurarine. These measures affect the respiration, D-tubocurarine causing paralysis. While they have been used with success, they impose a severe burden on the nursing staff, which must be highly skilled. The time for which treatment is required may be as long as three to four weeks. In consequence there is a need for a drug which can suppress the convulsions without interfering with respiration and without causing loss of consciousness.

A useful start in this direction has been made by D. R. Laurence and R. A. Webster, who have described a method for examining drugs in rabbits.¹ By injecting tetanus toxin into the gastrocnemius muscle of a rabbit they produced local tetanus, and they recorded the electrical activity resulting in the muscle. The spontaneous activity which they observed was irregular, but they elicited bursts of activity by striking with a hammer the frame in which the animal was supported. The hammer hit the frame every minute, and the activity which resulted was measured. To decide on the testing procedure they studied the effect of two substances, mephenesin and thiopentone. Having waited until the tetanic activity was uniform during successive periods of five minutes, they injected the substance intravenously and determined the time for which the activity was suppressed. By using groups of rabbits, and determining the mean effect of each of two doses of a drug, they were able to work out a procedure for making a

quantitative comparison of one substance with another on the same rabbits.

In a second paper² Laurence and Webster have described the application of this method to the four compounds chlorpromazine, thiopentone, betanaphthoxyethanol, and mephenesin. They found that chlorpromazine was far and away the most active, the relative potencies being 266, 5, 3.8, and 1. By their method other derivatives of phenothiazine which they also tested came out as having potencies of the same order as chlorpromazine, with the noteworthy exception of acetylpromazine, which was no less than 10 times stronger than chlorpromazine. Promazine was about half the strength of chlorpromazine while promethazine was about one-third the strength. The authors say that clinical tests on acetylpromazine are in progress. The work has obviously been done critically and with great care, and provides an elegant demonstration of how an effect which would seem very difficult to measure can in fact be measured by a proper application of the principles of biological assay.

PHYSICALLY HANDICAPPED CHILDREN

The number of children in special schools for the physically handicapped is not a direct index of the incidence of malformations and crippling diseases but of those grades of disorder which would prevent a child from benefiting by attendance at an ordinary school. Thus the persistent ductus arteriosus ligated in early childhood raises no educational problems; and most children with milder acyanotic congenital or rheumatic heart disorders attend ordinary schools. The term "physically handicapped" is but one of several categories of children needing special education: for instance, children with visual, hearing, and personality defects, epileptics, and the educationally subnormal all have places of their own in the educational system. The numerous children handicapped by respiratory allergy have been traditionally grouped apart under the quaint heading of "delicate." There are two main reasons why chronic asthma might be accorded the status of a "physical" handicap: it causes an inordinate loss of schooltime, and the severely asthmatic older child, on the verge of pulmonary heart failure, presents formidable problems of care and prognosis.

Elsewhere in this issue W. T. Palmer and D. Pirrie (p. 1326) examine the reasons given in 1957 for the admission of London children to schools for the physically handicapped and compare their findings with those recorded in surveys carried out thirty years and seven years previously. The countrywide figures¹ show that physically handicapped children, in the strict sense used in this L.C.C. study, are about 10% of all the handicapped children who need special education. The experience of most school medical officers would be in accord with the findings in London. There has been a steep drop in the proportion of children with bone

and joint tuberculosis, and also of those with rheumatism and its cardiac complications. This decrease is even steeper when measured against the total school population, since the number of children in L.C.C. special schools has contracted from 4,061 in 1928 to 1,325 in 1957. This itself is a measure of success in the prevention of two major diseases. By contrast, a far greater proportion of places in the special schools are now occupied by children with cerebral palsy, and there is a small increase in those with congenital heart defects, though these, with the after-effects of poliomyelitis, show a reduction in relation to the total school population. Progress has been made in other directions also, for the special schools now educate many severely handicapped children who would formerly have been kept in hospitals or at home. And, on the other hand, many children who are less severely handicapped are retained in the ordinary schools, or are quickly promoted back to the ordinary schools after, for instance, amputation. These are changes which have done much to help children overcome their disabilities.

In London and other large urban areas most of the children with physical handicaps can attend day schools. Unfortunately in other parts of the country many of these children have to be placed in residential schools, because it would be impracticable to set up special day schools within reach of all the small groups. Another difficulty is the placing of children who have two or more handicaps: nation-wide pooling of resources leads necessarily to residential education for the majority of such children. Children with cerebral palsy may have such a multiplicity of defects—of locomotion, sensation, speech, hearing, intellect, and emotional adjustment—that their care requires especially complex provision. Here again the more densely populated areas have some advantage in convenience of organization.

COAGULATION BY LIGHT

A powerful new apparatus is now in use at Moorfields Eye Hospital, London, for the treatment of retinal detachment. It is a light coagulator which has been developed by Dr. Meyer Schwickerath, of Bonn, and is made by Zeiss. The principle is that of the burning-glass used to focus the sun's rays to ignite wood. The source of light in this apparatus is an electric arc enclosed in a quartz tube containing xenon gas under high pressure. This light is passed through an optical system of lenses and emerges via an ophthalmoscope mirror. The surgeon can direct a filtered portion of the full beam into the patient's eye, and when it is accurately placed on the fundus lesion he can switch on the full beam for a fraction of a second. The normal refractive power of the eye focuses the beam on the retina and a minute retinal burn is produced. Several applications will seal off the area under treatment.

The treatment is carried out under local anaesthetic, and the patient is aware of no more light than that of a battery ophthalmoscope. The absence of any surgical cutting, the accuracy, and the precise control of the

¹ Bruun, E., *Acta allerg.*, 1955, 8, 143.

² ——— *ibid.*, 1955, 8, 134.

³ Vaughan, W. T., and Black, J. M., *Practice of Allergy*, 3rd ed., 1954, London.

⁴ ——— and Pipes, D. M., *Amer. J. dig. Dis.*, 1936, 3, 558.

⁵ Furstenburg, F. F., and Gay, L. N., *Bull. Johns Hopk. Hosp.*, 1937, 60, 412.

⁶ Gay, L. N., *The Diagnosis and Treatment of Bronchial Asthma*, 1946, Baltimore.

⁷ Hjorth, N., *Acta allerg.*, 1957, 11, 249.

⁸ Guld, J., Magnus, K., and Magnusson, M., *Am. r. Rev. Tuberc.*, 1955, 72, 126.

⁹ Magnus, K., Guld, J., Waaler, H., and Magnusson, M., *ibid.*, 1956, 74, 297.

¹⁰ Williams, D. A., *Brit. med. J.*, 1955, 1, 1469.

¹¹ Tuft, L., *Clinical Allergy*, 2nd ed., 1949, Philadelphia.

¹² Harris, M. C., and Shure, N., *Practical Allergy*, 1957, London.

¹³ Frankland, A. W., *Int. Arch. Allergy*, 1955, 6, 45.

¹ Laurence, D. R., and Webster, R. A., *Brit. J. Pharmacol.*, 1958, 13, 330.

² ——— *ibid.*, 1958, 13, 334.

method make it useful in selected cases. It is at present confined to the treatment of retinal holes and thin areas not deeply detached, macular and central retinal holes, Eale's disease and retinitis proliferans, retinal haemangiomas, small malignant melanomas, iris tumours, and optical iridotomy.

THE LIVER AND DIABETES INSIPIDUS

Although not usually regarded as one of the endocrine glands, the liver plays a major part in the hormonal control of the body by virtue of its capacity to inactivate and excrete most of the natural hormones. This particular function of the liver has been intensively studied in relation to the metabolism of sex hormones,¹ but more recently it has been shown that the adreno-cortical steroids are treated likewise.² The retention of water conspicuously shown by many patients with hepatic cirrhosis and less conspicuously by patients with acute hepatitis suggests that the hormones concerned in water metabolism might also be inactivated and prepared for excretion by the liver. At least two types of hormone are active in water and mineral excretion—the adreno-corticoids, exemplified by aldosterone, and the anti-diuretic hormone of the posterior pituitary—and there is conflicting evidence as to which is involved in the water retention associated with disease of the liver. The demonstration by Ralli and colleagues³ that in acute hepatitis the urine contains an excess of some anti-diuretic principle directed attention to the posterior pituitary as the source, but subsequent work by J. J. Chart and E. S. Shipley⁴ has shown that the main anti-diuretic component of the urine of such patients is not water soluble and is probably steroidal in character.

A remarkable case recently reported from Hungary⁵ throws some further light on this problem. A young woman sustained a mild head injury resulting in concussion but no loss of consciousness. Some seven months later she developed typical diabetes insipidus and other signs of hypothalamic disorder, and her fluid intake reached 10 litres daily. Her diabetic condition progressively deteriorated until two months later, when she developed a typical attack of viral hepatitis. Her fluid intake and output fell dramatically and became stabilized at about 1 litre per day after three weeks, and at this level it has remained for the past four years apart from a temporary rise during a subsequent attack of scarlet fever.

The sequence of events in this patient can leave little doubt that as a result of the head injury the function of the posterior pituitary became seriously impaired. The coincidence of the improvement of the diabetes insipidus with the onset of the viral hepatitis does suggest that anti-diuretic hormone was being secreted by the pituitary but was insufficient, in the presence of normal hepatic

inactivation, to control the renal output of water. As soon as this inactivation was impaired by the hepatitis the renal output was again controlled. If the diabetes insipidus had again relapsed when the liver recovered, this interpretation of the facts could hardly be questioned, but in the absence of such relapse it is at least conceivable that the relationship between the events was only coincidental, not causal. Study of similar cases in the future should readily resolve this doubt and establish unequivocally the importance of the liver in the metabolism of the pituitary antidiuretic hormone in man.

FOUR PER CENT.

The Government is to increase the basic pay of doctors in the National Health Service by 4% as from next January 1. This is the second adjustment of remuneration (the first, of 5%, was in May, 1957) in the interim period before the Royal Commission on Doctors' and Dentists' Remuneration reports, which, so the Minister of Health told Parliament last week, is not expected before next summer. He added that the increase was without prejudice to the Commission's recommendations and that Sir Harry Pilkington, the chairman, had informed him "that it will not embarrass the Commission in any way." The method of distributing the money is to be discussed with the B.M.A., but the Government itself has vetoed any increase in consultants' distinction awards. Thus for the third time these awards, which are pensionable, have been excluded from pay adjustments, and they remain unchanged from the figure fixed when the Health Service began. Indeed, the value of the A and B awards was relatively reduced in 1954, when their holders did not receive as big an increase in basic pay as other consultants. It would not have cost the Treasury much to make a small acknowledgment to merit, and enterprises outside State control long ago found they could ill afford not to foster this quality. Medical officers of health are also excluded from the increase, as they were excluded from the previous one, because their remuneration did not come within the terms of reference of the Royal Commission.

The Government's decision follows repeated representations by the B.M.A. for a further interim increase, beginning over a year ago. At that time there may have been some justification for refusal owing to the country's financial state and fear of inflation. Now, when the nation's economy appears to be in bounding health, 4% is a meagre figure to dole out—at a date still to come—to a profession which has waited all too long for a fulfilment of the promise obtained by Dr. S. Wand from Mr. Denis Vosper, then Minister of Health, in June, 1957,¹ that if it seemed unlikely that the Royal Commission could report by Easter, 1958, then he "would certainly consider any representations your Council might make, including a claim for a further interim adjustment." The increase probably does no more than preserve the value of the 5% that was given in May, 1957.

¹ *Brit. med. J., Supplement*, June 22, 1957, p. 356.

Drug Treatment of Disease

INSOMNIA

BY

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The purpose of this article is to discuss drugs used for insomnia. That they should form only a small part of the treatment must be stressed, but the wider aspects of the problem, though of great importance, cannot be encompassed in this account. It must be noted that insomnia is one of the few states which we are called upon to control without, as a rule, any certainty that it exists. We have to accept the patient's statement that he is sleepless, but the extent of his insomnia can be determined only in the minority who are under observation in hospital. Wakefulness in the night is almost always exaggerated, though in good faith.

In the British Isles, about one in every ten prescriptions issued under the National Health Service is for barbiturates and other hypnotics. It seems improbable that justification exists for this state of affairs.

Physiology

For the human subject sleep at frequent intervals is a biological necessity. Third-degree methods of interrogation have shown that deliberate and protracted prevention of sleep can bring about a complete collapse, both mentally and physically. The insomnia which we are called upon to treat is never of this degree and duration, and is very rarely harmful. This is a point of importance to be stressed to the patient.

Many people are worried about insomnia, not because they fail to sleep at all, but because they cannot sleep when they get to bed. In other words, the conventional nocturnal rhythmicity is lacking. No fundamental law dictates that each person shall sleep from, say, six to eight hours at night. Such a habit is purposely cultivated from childhood onwards. With it is associated a series of virtually conditioned reflexes. Superimposed upon the natural physical and mental tiredness is all the ritual of preparing for bed—the bringing of the evening's activities to a conclusion, the retirement to the bedroom, the undressing, the donning of night attire, the soft light of the room, the warmth of the bedclothes, the quiet, the contentment, the relaxation, and finally the oblivion. Anything calculated to disturb this accepted procedure can defer sleep, be it a strange house, unaccustomed cold or heat, anxiety and worry, or distractions and noise outside. The alleviating of insomnia calls for much more consideration and advice than the mere proffering of a mentally obliterating drug. Despite extensive physiological research, the precise mechanism of sleep remains undiscovered.

Pharmacology

Drug treatment of insomnia remains essentially empirical. What it does, in effect, is: (1) subdue cortical activity, such as anxiety, and (2) depress the nervous system generally so that the threshold is raised to external stimuli, notably noise. What is important is that these effects should be achieved without attendant danger, either to the vital centres of the brain or to the rest of the body. The simple act of taking a tablet at bedtime may itself become incorporated in the ritual, so that it can never be discontinued.

Soporific concoctions are not exclusively a modern delusion. Apothecaries in past centuries ventured their potions, of which the mandrake is but one example, upon those tortured by sleeplessness. Lacking though many of these brews may well have been in pharmacological potency, there is

little doubt that they quite often brought about the desired result. Of the older remedies, however, one of unquestionable effect is still available—namely, alcohol. On the central nervous system this behaves not as a stimulant but as a depressant. Its progressive action from the higher centres downwards carries the subject through stages similar to those seen in general anaesthesia—induction, excitement, anaesthesia, medullary depression—the second of these being regarded as a release phenomenon. Small doses of alcohol may thus conspire to that dreamy state characteristic of anaesthetic induction and so serve as a prelude to sleep. Too much can easily give rise to excitement and thwart the purpose for which it is taken. This possibility notwithstanding, a little strong drink taken on retiring may serve in some people, especially the aged, as an appropriate "night-cap." Large draughts of weak liquor like beer, on the other hand, are to be avoided, if only for the reason that an overloaded stomach is disturbing and an overloaded bladder later may be more so.

Chloral and Paraldehyde

Trichloroacetaldehyde, $\text{CCl}_3\text{CH}(\text{OH})_2$, or chloral hydrate, is a relatively simple chemical compound which is quite easily synthesized. It was introduced as a hypnotic by Liebreich in 1869 with the idea that, in the body, it might be converted to chloroform, CHCl_3 —at that time well on its way to becoming established as an anaesthetic. In fact it is now recognized that chloral hydrate undergoes reduction in the tissues to trichlorethyl alcohol, the substance ultimately responsible for the effects on the central nervous system.

Pure chloral hydrate is a crystalline substance with a pungent smell and bitter taste. Applied externally it is an irritant, even to the extent of causing vesication. Strong solutions are similarly irritant to the alimentary mucosa, so that vomiting and purging may occur. More dilute solutions are less troublesome in this respect, but, even when sweetened, they are unpalatable, for the burning taste is very difficult to disguise. Yet after oral administration absorption of this drug is rapid and a therapeutic dose can maintain hypnosis for six to eight hours. What is more, the therapeutic ratio is very wide, so that only with very excessive doses does medullary depression occur. The cardiovascular system also escapes damage. There is consequently a good deal to be said in favour of chloral hydrate, on grounds of both efficacy and safety. Its taste is the outstanding drawback and even this may be a deterrent to habituation. Unlike the barbiturates, chloral preparations cause no "hangover."

For adults it is convenient to prescribe chloral mixture *B.N.F.*, $\frac{1}{2}$ fl. oz. (14 ml.) well diluted with water to be taken at night, this dose containing 20 gr. (1.2 g.) chloral hydrate with syrup of orange. This preparation supersedes the old draught of chloral *B.P.C.*, or haustus chloralis, $1\frac{1}{2}$ fl. oz., which contains the same amount of drug but in liquid extract of liquorice. There is no rationale at all in combining a bromide with chloral hydrate in a hypnotic mixture. For children there is the chloral elixir for infants *B.N.F.*, with 1 gr. (65 mg.) in each 60 minims (3.5 ml.), flavoured with syrup of blackcurrant. The dose can be adjusted according to age. The *B.P. Codex* also includes a chloral and potassium bromide mixture for infants which is not to be recommended.

Dichloralphenazone is a complex of chloral hydrate and phenazone which has recently been devised. It is the active

¹ Evans, J. M., et al., *J. clin. Endocr.*, 1952, 12, 495.

² Brown, H., Willardson, D. G., Samuels, L. T., and Tyler, F. H., *J. clin. Invest.*, 1954, 33, 1524.

³ Ralli, E. P., Robson, J. S., Clarke, D., and Hoagland, C. L., *ibid.*, 1945, 24, 316.

⁴ Chart, J. J., and Shipley, E. S., *ibid.*, 1953, 32, 560.

⁵ Hankiss, J., *N.Y. St. J. Med.*, 1958, 58, 2219.

constituent of "welldorm" tablets, each of which contains 10 gr. (650 mg.) of the substance. The usual dose for an adult is two tablets before retiring, swallowed whole with a draught of water. The unpleasant taste of chloral hydrate is entirely absent, and even if the tablets are chewed they are only slightly bitter. Limited experience suggests that they are as effective, dose for dose, as ordinary chloral hydrate. No claim is made that the phenazone component is analgesic.

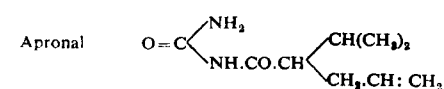
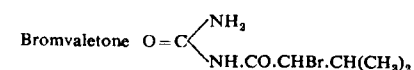
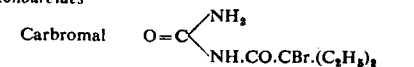
Paraldehyde (CH_3CHO)₃ is a polymer of acetaldehyde (CH_3CHO). Safe and effective as the drug may be, its taste and persistently penetrating smell preclude its oral administration in the ordinary course of practice. It is best avoided in cases of gross hepatic disease. In febrile states it is prone to cause excitement. There are occasions, however, when it is of considerable value. For instance, nocturnal bronchial asthma, temporarily relieved by adrenaline, may be followed by sound sleep if paraldehyde is then administered. This use is not to be confused with the intramuscular injection of 5 ml., so useful in overcoming status asthmaticus.

Furthermore, for the seriously ill patient (for example, with heart failure or carcinomatosis) who is unable to sleep except fitfully from full doses of chloral or barbiturate, the administration of 10% paraldehyde in saline (enema paraldehyde *B.P.C.*) in a dose of 30 ml. of the enema per stone of body weight (4.7 ml. per kg.) will almost always prove highly effective. It should not be given to a patient heavily narcotized with morphine or heroin, because the superimposed depression on the respiratory centre may be dangerous. It may be given with advantage at night just as the therapeutic effect of an opiate is beginning to wear off.

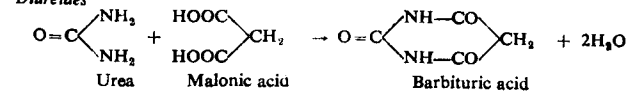
Ureide Derivatives

Urea is pharmacologically inactive towards the central nervous system, yet a number of its derivatives are depressants. Thus:

Monoureides



Diureides



Barbituric acid itself is not active, but many of its derivatives, formed mainly by substitution on the terminal >CH_2 grouping, are potent. These are the barbiturates.

Carbromal *B.P.* is a white, odourless, crystalline powder which is practically tasteless. The official preparation is carbromal tablets *B.P.*, usually containing 5 gr. (0.32 g.) each. The dose is 1 to 3 tablets—that is, 5 to 15 gr. (0.32–1 g.) at night. The hypnotic response is mild and of fairly short duration, but acute overdosage is unlikely to occur. Repeated administration, however, may give rise to itching of the skin, erythema, pigmentation, and widespread purpura from increased capillary permeability. Habituation occasionally arises, usually in subjects of inadequate personality. Its main value is for the light sleeper or as a weak substitute to be used in breaking the barbiturate habit. It is to be found in a wide range of proprietary preparations on sale to the public; it is not scheduled as a poison.

Bromvalerone is a mild and safe hypnotic. It appears in various proprietary sleeping tablets and tranquillizers. "Persomnia" contains carbromal and bromvalerone. Apronal ("sedormid"), the prescribing of which has been almost completely discontinued, is a fairly feeble hypnotic

and can give rise to thrombocytopenic purpura, which is more dangerous than the relatively rare purpura of carbromal.

Barbiturates

Most of the barbiturates are white crystalline solids with a slightly bitter taste. The free acids are sparingly soluble in water, but the sodium salts dissolve readily and tend to be absorbed more rapidly from the gut. With a few exceptions, like the sulphur-containing compounds, they can be taken by mouth in tablet or capsule form. Their action is almost entirely confined to the central nervous system, the higher centres appearing to be subdued first of all. But the medulla is soon involved and respiratory depression may follow. Death from overdosage is due primarily to respiratory failure, with cardiac failure ensuing in consequence. Both alcohol and paraldehyde potentiate the action of barbiturates. Such a conjunction may be dangerous.

Pharmacologically the barbiturates may be classified according to their duration of action:

Long-acting—e.g., barbitone, phenobarbitone.

Medium-acting—e.g., amylobarbitone, amylobarbitone sodium, pentobarbitone, butobarbitone.

Short-acting—e.g., cyclobarbitone, quinalbarbitone.

Ultra-short-acting—e.g., thiopentone, thialbarbitone.

To give a long-acting substance like phenobarbitone as a hypnotic is misguided. For patients who have difficulty in getting off to sleep a short-acting drug is usually chosen. For those on the other hand who fall asleep promptly but wake in the early hours of the morning, a medium-acting compound is preferable, if given at bedtime. Alternatively the short-acting quinalbarbitone may be taken on waking in the night. The ultra-short-acting barbiturates are used as intravenous anaesthetics.

The barbiturates presented in colourful capsules require no effort in prescribing and appeal strongly to patients. But overdosage, accidental or deliberate, is a real danger and accounts for many deaths annually. In theory only a week's supply should be prescribed, but this is impracticable. In any case, a determined suicide can save supplies for his terminal adventure, or indeed avail himself of the gas oven. It is our duty to warn the patient of the danger of these drugs and to advise that they be kept in a cupboard inaccessible to children. A common complaint is of "hang-over" in the morning. The explanation of it eludes us. Some patients take barbiturates nightly and yet suffer no depression in the day. Others are conscious of mental slowness and fatigue starting about 2 p.m. and lasting for 3–4 hours. Irritability, prolonged reaction-time, and lack of zest can usually be detected in the confirmed barbiturate consumer. Repeated dosage may give rise to skin rashes, and habituation is common. Despite their wide usage, therefore, the barbiturates have obvious shortcomings. To add to the confusion they are presented in great variety, with a multiplicity of proprietary names and often in a series of combinations. Their relative merits are not easy to ascertain. There is much to be said for restricting the prescribing of barbiturates to those listed in the *British National Formulary*.

Because all barbiturates are Schedule IV poisons the prescription must state in every case the name and address of the patient, the total quantity of the preparation ordered (the total number of capsules or tablets and the strength of each), the dose, the full signature of the prescriber, and the date.

Other Hypnotic Drugs

Glutethimide ("doriden") is a synthetic compound, chemically α -ethyl- α -phenylglutarimide, which is distinct from the barbiturates. It acts as a moderately powerful hypnotic, a therapeutic dose given by mouth having an onset of action within half an hour and lasting for about six hours. Tablets of doriden each contain 0.25 g. of the active principle, and the dose is one to two tablets at night. Clinical trials suggest that this preparation therapeutically is the

approximate equivalent of cyclobarbitone. Side-effects reported include nausea, skin rashes, and, occasionally, excitement. It seems a reasonable alternative to the barbiturates, with probably less likelihood of respiratory depression and certainly less "hangover." Experimentally, this drug is of great interest, for its analogue β -ethyl- β -methyl glutarimide or bemegride ("megimide") is a stimulant to the central nervous system.

Methylprylone ("noludar"), whose active constituent is chemically 3:3-diethyl-2:4-dioxo-5-methylpiperidine, is a depressant of the central nervous system. Clinical experience in Great Britain is so far limited, but a clinical trial suggested that it was therapeutically of the same order as butobarbitone and amylobarbitone sodium. The dosage is one to two tablets, each containing 200 mg., at night. No side-effects have so far been reported.

Thalidomide ("distaval") is another non-barbiturate hypnotic, discovered and developed in Germany and so far not widely tried in Great Britain. It is too early yet to say that habituation and addiction do not occur. Tablets of "distaval forte" each contain 100 mg. thalidomide. The dose for hypnosis is one tablet at night. Side-effects and toxicity are said to be absent, but there is some suggestion of interference with thyroid activity.

Many drugs might be termed indirect soporifics in that by removing a disturbing symptom nocturnal sleep follows. For instance, intestinal hypermotility with rapid filling of the colon is much commoner in the brain-worker than in those of gluttonous habits. Here dry extract of belladonna (60 mg. (1 gr.) at night, or better tricyclamol chloride ("lergine," "elorine chloride") 50 mg. may calm excessive gut movement and provide undisturbed sleep. Drugs which relieve pain and cough fall into the same category.

As emphasized at the outset, it is more important to inquire into the causes of sleeplessness than to give drugs. Such simple matters as exercise, type of meal, quantity of fluid taken in the evening, and so forth may have an important bearing on a natural approach to insomnia.

Finally, tranquillizers are not suitable as soporifics.

THE ART OF CONSULTATION

FIFTH JAMES MACKENZIE LECTURE

On November 22 the College of General Practitioners held its annual meeting in the Great Hall of B.M.A. House. During the morning Dr. G. F. ABERCROMBIE delivered the College's fifth James Mackenzie Lecture, taking as his subject "The Art of Consultation." The general theme of his lecture, said Dr. Abercrombie, was that the family doctor must learn to manage, not only the patient and his relations and friends, but upon occasion his specialist colleagues also. The family doctor must remain in control unless, with the patient's consent, he delegated his authority temporarily and for some special purpose.

A Stroll down Harley Street

Inviting his audience to accompany him on a stroll down Harley Street, he said they would listen respectfully when the talk was of Pancoast's syndrome or Schimmelbusch's disease, but they would not be impressed by statistics. As a family doctor, he was not concerned with percentages, but only with people one at a time. The average expectation of life without operation might be so-and-so, but that was not the point. The point was what would happen to his particular patient. How his heart still warmed to the surgeon who wouldn't operate. And they should take kindly to the surgeon who said, "It is rather a good idea to regard the husband as one of the physical signs," and to the physician who wrote, "But you know her better than I do, and if you have any other view I hope you will let me know."

The art of consultation was not simply a question of sending a patient away for a second opinion. It was the careful

selection of the man who by training and temperament was the most suitable for the matter in hand. His position in the profession, his standing in his specialty, his skill, his appearance, his manner, and his gift of tongues had all to be considered. When Dr. Abercrombie began in practice they knew their men pretty well, for they met them in person at every opportunity. His partner made it perfectly plain to all his patients that, if they wished, a consultation would immediately be arranged, but also that, if he himself felt the need for a second opinion, no objection should be offered. In that way, he had met many physicians and surgeons from hospitals other than his own, and had learned a great deal from them.

Absolute Equality

When a consultant and a general practitioner met, no matter how distinguished the one or how obscure or different the other, they met on terms of absolute equality, the one to give, the other to receive, but not necessarily to adopt, the advice tendered. The consultant had to be careful here. He should be patient while the practitioner told his tale; he should not wave away, as of no account, the x-rays that had been brought; and he should not, with a brisk, "Well, I don't think we need discuss this together, need we?" deprive the practitioner of the opportunity to consider what was to be said to the patient, before it was said. Beyond all doubt a consultation was of immense value to the general practitioner, for it afforded him priceless opportunities of keeping up to date.

Consultations were arranged, generally speaking, either for information or for action, though often of course for both purposes. Dr. Abercrombie then gave some admirable examples of the first, often the "reassuring" type. "These men," he commented, "gave their opinions with absolute assurance. I may have had an idea, but their reasons were so convincing that they converted the idea into a certainty." Such opinions were first class; there was nothing woolly about them. He then recounted a rather different experience.

"A lady, 14 weeks pregnant, and her 4-year-old daughter, simultaneously developed German measles. The mother knew all there was to be known at that time about pregnancy and German measles, and I immediately obtained confirmation of the diagnosis from a dermatologist. Thence to an obstetrician, who, though clearly in favour of terminating the pregnancy, asked that his opinion be confirmed by a colleague. The second was just as hesitant as the first, and I had finally to take her to a physician before the operation could be done. This physician simply said, 'You can't do anything else.'"

Often, of course, one got no help at all from a consultation. Harley Street, in his experience, was reluctant to confess itself stumped. "It would be better sometimes if it did, and the exceptions are refreshing."

A Chance for the College

Cases of cancer of the breast were always distressing, for if at all possible there had to be a mutilating operation. The question was, "How much?" and the practitioner would know his surgeons well enough to be able to forecast what operation any of them would recommend in an individual case. The practitioner's responsibility was not lessened but rather increased thereby. But at any moment now, it seemed, continued Dr. Abercrombie, some pharmaceutical firm would announce a new drug for the treatment of cancer, and, if the history of antibiotics and of tranquillizers was any guide, that announcement would be followed within a matter of months by a dozen such discoveries. Their College would then have an immense opportunity if they were ready for it. "Have we a plan for the immediate investigation of such new remedies?" Their new building was to be alongside the Royal College of Surgeons and the Imperial Cancer Research Fund. They ought now, in anticipation of something revolutionary in the treatment of cancer, to have a consultation with those bodies, and prepare a scheme for assessing the value of new therapy.

"No man should die of acute or obscure disease without a consultation," Sir Clifford Allbutt had said as long ago as 1889. They would notice he had not said "without a second opinion"; it was "without a consultation." That surely was a right and fundamental principle in the practice of medicine. They all saw from time to time exceedingly rare conditions, of which they had had no previous experience—so rare, perhaps, that even the specialist they proposed to call had never seen such a thing before. Even so, and no matter how confident they might be that they had arrived at the correct diagnosis and had instituted the best possible treatment, they should always hold to the principle that no man should be allowed to die of acute or obscure disease without the benefit of a consultation. Allbutt, whose regard Sir James Mackenzie especially valued, had gone on to say—to the students at Charing Cross Hospital—"It is you touchy young men, just out of the schools, who give us the trouble—who bridle up at the suggestion of a consultation and declare that nothing more can be done."

Modern investigations were not an unmixed blessing, and sometimes their specialist colleagues were hypnotized by them. A physician had even refused to see a child patient with him outside his hospital, for fear that his opinion would be valueless before she was "investigated." Some years ago he had shown a child with a congenital heart lesion to a consultant. The consultant told him that his hospital had just started a clinic for such cases, and his answers to a question or two convinced Dr. Abercrombie that he had temporarily lost sight of what might be best for his patient in the desire to add another case to the new venture. He had become for the moment a collector, and the patient a rare and interesting specimen.

Captain of the Team

He had said that the family doctor received, but did not necessarily adopt, the advice given. He might feel convinced that a particular line should be taken, but be unable at first to find anyone to agree with him. He must then bide his time, advocating his plan, here a little, there a little. The family doctor really came into his own when specialist opinions differed. In this dilemma, all looked to him to find the right solution, and he must take his courage in both hands and rise to the occasion. Heaven knew he would not always be right, but he would by that time have specialized on that particular patient to such an extent, and have thought so deeply about him, that he might fairly claim that his advice should be followed. What should be done in the not very uncommon situation when pathological investigations drew blank, x-rays were indecisive, and specialists uncertain? The family doctor must accept the responsibility and make a decision, and to do that he should state the problem to himself in the simplest possible terms.

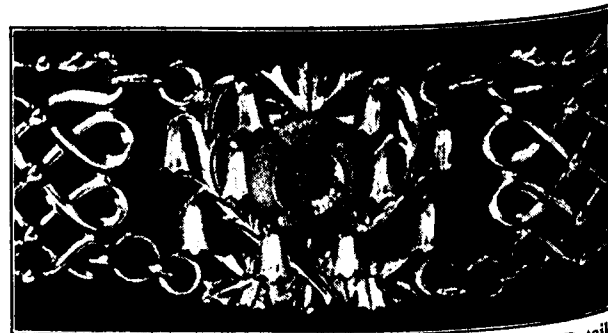
A great deal of the art of consultation could be very simply stated, said Dr. Abercrombie in conclusion. "Choose your man well, meet him yourself, remember that he is not infallible." A second opinion was a very poor substitute for a consultation. How much better to meet, to discuss, to agree, to explain to the patient and obtain his consent! It was now somewhat out of fashion to describe family doctors as the spearhead or backbone of the profession. Teamwork was the slogan; but he hoped they would agree with him when he said that if the family doctor was to be a member of the team he must be its brains and captain.

Reporting on the progress of the Perinatal Mortality Survey on November 12, Dr. NEVILLE BUTLER, its director, said that the return of completed questionnaires received by the Survey up to October 31 had now reached 95% of the 18,005 live-births notified between March 3 and 9, and 91.3% of the 8,316 perinatal deaths notified in March, April, and May. At least 85% of the 2,700 perinatal deaths notified in March had come to necropsy.

COLLEGE OF GENERAL PRACTITIONERS SIXTH ANNUAL MEETING

The sixth annual general meeting of the College of General Practitioners was held at B.M.A. House on November 22. Some 250 members and associates attended.

Dr. F. M. ROSE, chairman of the College council, presenting the annual report, described the College's progress. More than 5,000 members and associates had joined the College since its foundation, an increase of 554 during the year. One new overseas faculty had been formed, in South Australia, making 36 regional faculties in all—25 in the United Kingdom and Eire, and 11 overseas. On July 1, the six faculties in Australia founded their own



Presidential Chain of College of General Practitioners: Detail of the Links. The chain, designed by Mr. A. G. Styles and made in white and yellow gold by Messrs. Garrard and Co. Ltd., was presented to the College on November 22 by the Geigy Pharmaceutical Co. Ltd. It is 40 in. (102 cm.) in length and made of 19 matching pairs of links. The links are alternate medallions portraying a poppy entwined with foxglove and two entwined serpents.

Australian College of General Practitioners based on the constitution of the parent College, and planned with its encouragement and blessing. In the autumn the president paid a successful visit to South Africa to discuss the problem of setting up faculties in that country.

Education and Research

The undergraduate education committee (Dr. RICHARD SCOTT, chairman) has prepared a General Practice Teaching Register of members and associates in the United Kingdom and Eire who are willing to take students into "On practices"; and it has published a handbook "On Undergraduate Education and the General Practitioner." The postgraduate education committee (Dr. GEORGE SWIFT, chairman) has sponsored the work of the College's medical recording service, pioneered so successfully by Drs. John and Valerie Graves, which is proving of special value to doctors living in areas remote from medical teaching centres. That committee has also adjudicated the Upjohn travelling fellowships, supervised the arranging of the Pfizer lectures, and published "Problems of Stress in General Practice." The widespread activities of the research committee (Dr. R. J. F. H. PINSENT, chairman) have continued and 632 members and associates of the College are now on the Research Register. Careful thought is being given to the financial aspects of research in general practice, including the possibility of founding research registrarships. Four issues of the new *Journal of the College of General Practitioners* (Dr. R. M. S. MCCONAGHEY, editor) have been published during the year.

New Premises

In March the College moved into new premises at 41, Cadogan Gardens, Sloane Square, S.W.3, generously provided by its anonymous donor. All meetings of council and its committees are now held there. A college library (Dr. J. P. HORDER, honorary librarian) is being developed, and the practice equipment and premises committee (Dr. J. C. T. SANCTUARY, chairman) is preparing a demonstration

room. There are bedrooms for members and associates visiting London.

Elections and Presentations

Dr. I. D. GRANT was unanimously re-elected president for 1958-9. His portrait by Mr. Norman J. Miller Miller was presented to the College by the chairman of the Scottish Council (Dr. W. S. GARDNER) on behalf of members and associates in Scotland. A magnificent presidential chain of office (see Fig.) was presented by Mr. H. L. ADDLESHAW on behalf of Geigy Pharmaceutical Co. Ltd.

Dr. Albert Schweitzer, O.M., Dr. W. N. Pickles, C.B.E., Dr. W. A. Conolly (Australia), Dr. A. Barrett Jameson (New Zealand), and Dr. M. R. Stalker (Canada) were appointed honorary fellows of the College. Dr. J. K. Paterson (Upton, Huntingdonshire) was presented with the Butterworth gold medal (1957-8) for an essay on "Second Opinions," the second prize being awarded to Dr. S. G. Gang (Cardiff). The subject for the 1958-9 Butterworth gold medal will be "The Child is Father of the Man." (Essays must be submitted to the chairman of the awards committee not later than September 19, 1959.) Seventeen Upjohn travelling fellowships (up to £200 each) were presented to: H. W. Ashworth, M. H. S. Bound, Margaret P. Coshaw, W. G. Daynes, V. G. Doyle, T. S. Eimerl, R. N. R. Grant, D. M. Hughes, A. J. Laidlaw, J. B. Longmore, W. J. H. Lord, D. W. MacLean, D. H. McVie, A. E. de la T. Mallett, Charlotte Naish, E. J. R. Primrose, and F. H. Staines. Six Public Welfare Foundation prizes (£40 each) were presented to the following final-year students: E. E. Barnard, J. C. Burn, W. J. C. Conn, Christine E. J. Dandie, P. W. Kershaw (all of Edinburgh University), and C. Venning (Charing Cross Hospital Medical School).

The following faculty representatives were appointed to the Sixth College Council (1958-9): L. W. Batten (North London), R. H. A. Elder (South London), E. A. W. Marien (East London), R. Cove-Smith (West London), George Swift (South-east England), J. C. T. Sanctuary (Northern Home Counties), W. G. Tait (Thames Valley), D. Scott Napier (East Anglia), R. M. S. McConaghey (South-west England), D. L. Crombie (Midland faculty), K. M. Foster (North Midlands), R. A. Murray Scott (Yorkshire), S. Freeman (North-west England), R. Harkness (North-east England), W. L. Selkirk (Merseyside and North Wales), J. N. M. Parry (Welsh faculty), Richard Scott (South-east Scotland), W. S. Gardner (West of Scotland), J. M. Henderson (East Scotland), G. Swapp (North-east Scotland), G. H. Clement (North Scotland), A. S. Boyd (Northern Ireland), V. G. Doyle (East of Ireland), J. P. J. Little (West Ireland), J. C. Walsh (South Ireland), A. B. Jameson (Auckland), H. E. W. Robertson (Canterbury), H. E. M. Williams (Otago), E. J. Marshall (Wellington), Mary Robertson-Glasgow (Kenya). Four elected members of council, to replace those retiring, were appointed: J. Fry, J. M. Hunter, R. J. F. H. Pinsent, and G. I. Watson.

College Business

The report of the criteria committee (Dr. K. McD. FOSTER, chairman), on a possible examination on the conduct of general practice as one of the criteria for future membership of the College, was discussed. A motion that no action be taken about this for five years was lost, and the report was referred to the faculties for their consideration. The College by-laws were amended, and, by almost unanimous agreement, the annual subscription for members was raised from three to five guineas. The chairman thanked the B.M.A. for its generosity in allowing the College the use of its Hall; and Dr. G. F. ABERCROMBIE moved a vote of thanks to Dr. Rose.

At a meeting of the new council held later, Dr. F. M. Rose was appointed chairman, Dr. Annis Gillie, vice-chairman, Dr. H. L. Glyn Hughes, hon. treasurer, and Dr. J. H. Hunt, hon. secretary. Drs. G. F. Abercrombie, H. N. Levitt, and Charlotte Naish were appointed additional members of the council.

Symposium on "Dyspepsia"

On Sunday, November 23, under the chairmanship of Dr. I. D. GRANT in the morning and Sir FRANCIS FRASER in the afternoon, 180 members and associates of the College attended a symposium on "Dyspepsia." The trustees of the Wellcome Foundation generously provided the

auditorium, and also morning coffee, lunch, and tea for the whole audience. The main speakers were Drs. S. J. Carne, Desmond O'Neill, Richard Scott, R. R. Bomford, H. N. Levitt, and Mr. H. Daintree Johnson.

MEDICINE ON TELEVISION

ITS PRESENTATION TO THE PUBLIC

A discussion on "Presenting Medicine to the Public on Television," arranged by the Scientific Film Association, was held at the Royal College of Surgeons on November 19. The principal speaker was Mrs. MARY ADAMS, who until her retirement this year was assistant to the Controller of Television Programmes at the B.B.C. Her talk was followed by short telerecordings of admittedly controversial sequences from five B.B.C. programmes, including *The Hurt Mind*, *Your Life in Their Hands*, and *On Call to a Nation*, and then by a general debate. Dr. R. F. WOOLMER, chairman of the medical section of the S.F.A., was in the chair, and the audience comprised doctors, a number of whom were those directly concerned, as advisers, in medical television to the public; health educationists; and directors, producers, and technical staff from the B.B.C. and I.T.A.

Mrs. Mary Adams on Televising Medicine

"On the whole," said Mrs. ADAMS, immediately putting her audience on its mettle, "people in professional circles tend to talk about television without having seen it." It was said that only about 10% of a professional audience would be found to have a set. She believed, however, that in presenting medicine to the public, television had a future which could be both healthy and constructive. Many ingredients were involved. First there was the question of the health of the individual as well as the health of the individual in society. Then there was the medium itself, and not only the techniques, which were themselves complicated, but also the people who manipulated them, with their anxieties and attitudes, and the predilections of individual producers. There was the ingredient of the authority by which these programmes reached the public, authority which came from Parliament and the Postmaster-General and through the board of governors of the B.B.C. and the governing body of I.T.A. Another ingredient, often forgotten, was the audience. It was a mixed audience, and there was something queer about television whereby people seemed to have to view. So, although one talked about people being able to switch off if they did not want to see an operation, they did not in fact do so. There were also the assessors of programmes—Mr. Dickson Wright and some of his colleagues in the B.M.A., as well as the professional critics in the press and elsewhere, and scientific assessors working in viewer research.

"Medicine has always been a satisfactory and 'good' subject for television from the earliest days," continued Mrs. Adams. This was not surprising, because medicine exercised a striking fascination for people; no doubt it had something to do with Western ideas about death. It was true in all countries with television, even behind the Iron Curtain. Exactly the same kind of controversy as that in the *British Medical Journal* and the Press had been aroused in Prague recently by the same kind of programme, and it had elicited the same kind of response—the mass of viewers agreeing, the medical profession somewhat divided, a few being worried about consequences which they did not know about.

Pros and Cons

Television was an entertainment medium, and every programme had to be considered in that light, or at any rate in that context.

The main argument against these programmes was the charge of sensationalism. "I do not know what 'sensationalism' is quite," said Mrs. Adams. "I think it only means that the people behind the programmes are being immoral in their motivations. If so I have not met any of them. They are only anxious to do their best." On superficiality, she agreed that television was in some

ways a very superficial medium. Those inside were extremely anxious that the doctor-patient relationship should not be disturbed in the wrong way. Yet it might be right to disturb it. Turning to the arguments in favour, Mrs. Adams said that there was now a "climate" for the scientific and medical, and to let medicine opt out of this general climate would be quite unthinkable. One also had to remember that a large number of other agencies were doing the same thing, so it was difficult to disentangle the effect of television. Research into the effect should be asked for by all, including the medical profession. It was important also to experiment with new techniques and personalities in programmes. Mrs. Adams had been impressed by the argument of Dr. M. Keith Thompson in the *British Medical Journal** that there was a tendency for television as it existed now and under its present authorities to put on the screen the most orthodox methods. "We come down fairly heavily on the side of the orthodox," she agreed. Television had received much help and stimulation from the medical profession, but on the whole the ideas for programmes had come from the television people. She would like to see the reverse process—the medical profession saying, "This is a subject which ought to be aired and we will help you."

The audience were then shown the five short sequences from B.B.C. television programmes.

Discussion

Mr. A. DICKSON WRIGHT, who opened the discussion after the film sequences, said he did not realize this was going on: it seemed to have developed to a tremendous degree. Hypochondriasis was running through the world. He was appalled by it.

Dr. C. M. FLETCHER, who has appeared in a number of the programmes, replied that hypochondriasis had existed in the 15th and 16th centuries, for example; these programmes did not produce it, though they might transfer it to a new organ. He suggested that the College of General Practitioners might help in research on the effects of the programmes. For people to know what medicine could do to-day was nothing but reassuring. He had thought it a mistake to include the operation of portocaval anastomosis in *Your Life in Their Hands*, but he had been convinced of his mistake. Some builders had remarked they never thought surgeons were as good as that—"they're as good as plumbers." Here was something they could understand.

A psychiatrist, while agreeing that the general public had always been interested in medicine, felt that television, which reached millions, had a special responsibility. Programmes like that on smoking and lung cancer and those dealing with the prevention of illness were useful, but whom was a film about ether abreaction going to help? He had seen people who were not willing to be treated by E.C.T. and ether abreaction, because they had been frightened.

Dr. M. WARE said he had read the report on the effects of *The Hurt Mind* programmes, and thought it scientifically unreliable. Standards of assessment should be more stringent. When questions of treatment arose, a doctor might need to spend much time preparing some patients, while others could be told quickly. A programme going to an enormous audience could not make that sort of allowance. On television personalities, Dr. Ware commented: "I am not sure it would be a good thing in medicine if there were a lot of 'radio doctors.'" In *On Call to a Nation* he had been rather shocked at a consultant's comments that, if the general practitioner had sent the patient earlier, more could have been done. Did it do good to say that in that type of programme?

Dr. D. STAFFORD-CLARK also agreed that much more "feed back" was needed on the effect of programmes.

The general practitioner who acts as medical adviser for I.T.V.'s *Emergency Ward 10* said that Tessa Diamond, sitting next to him, who originated the feature, had reacted very unfavourably during the sequences of the operation and the ether abreaction. He thought these might be suitable

*March 8, 1958, p. 578.

when there was "lock and key" television for specialized audiences. He had found no increase in hypochondriasis as a result of *Emergency Ward 10*, although he understood that, following a programme in the series in which a man died after a wasp sting, 20 minutes later two people with wasp stings had presented themselves on the doorstep of a St. John's Wood doctor.

RESEARCH DEFENCE SOCIETY

MR. RICHARD FORT'S STEPHEN PAGET LECTURE

For the jubilee of the Research Defence Society this year the Stephen Paget lecturer was Mr. RICHARD FORT, B.Sc., M.P., the representative of the House of Commons on the Medical Research Council. He chose for the subject of his lecture, delivered at the Zoological Society of London on November 18, "Irrationality in Public Life." At its conclusion he made two suggestions: First, that it would be worth considering the setting up of a new research council to promote research—which would include research on irrational behaviour—in the field where medical and social science meet; and, second, that workers in this scientific borderland should be invited to give future Stephen Paget lectures, so as to foster the application of scientific method to the study of human behaviour.

Irrationality in Public Life

Mr. Fort said the subject of his lecture had been suggested to him by the irrational basis of the appeal of anti-vivisection: irrationality was also the basis of much that happened in public life, as any politician knew. Most of the knowledge we had of the extent and causes of irrationality was derived from practical experience rather than theoretical study, which demanded difficult techniques of interviewing and mathematical analysis in order to get scientifically satisfying results. He thought much more fundamental research was needed to describe and analyse irrationality.

Sir Alan Herbert had drawn our attention to certain "witch words," words that aroused emotions without making people think what they meant. "Vivisection" itself, "puppy" and "kitten" for "dog" and "cat," were examples from the anti-vivisectionists. In public life there were many others, ranging from "democracy" to "victimization." Fifty years ago Graham Wallas, in his book *Human Nature in Politics*, had emphasized how irrational was most people's approach to politics despite the façade of self-interest or other rationalist arguments often used in political debate. Despite absurdities and obsolete ideas Graham Wallas's analysis of political behaviour was still broadly true. The closed mind was almost as common in politics as in anti-vivisection.

One of the features common to politics and other activities in which the irrational is an obviously powerful force was that people were stimulated to act. Those so stirred often showed by their arguments or writings that their emotions had been aroused by some stereotype which simplified thinking, so far as their action was based on conscious thought at all. In politics there was the long-haired, ranting radical and the top-hatted, pot-bellied capitalist. Many Conservatives still resented Mr. Bevan's "vermin" speech of ten years ago. "The reality behind these stereotypes, if any, is surely drawn from some long-past abuse or situation by now overcome." Another feature of the irrational in public life was the importance of the small pressure groups which specialized in arousing to action those only mildly interested. There was also an apparent parallel between the intensity with which irrational causes were pursued and what was usually described as the "climate of opinion."

Mr. Fort believed that people would continue to act on the irrational as they always had done. Because of this, he suggested, there was need for much research into irrationality.

To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in current use.

Histadyl E.C. (Eli Lilly and Co. Ltd.).—Each fluid ounce (30 ml.) contains codeine phosphate 1 gr. (65 mg.), ephedrine hydrochloride $\frac{1}{2}$ gr. (32 mg.), thenylpyramine fumarate $1\frac{1}{2}$ gr. (87 mg.), ammonium chloride 10 gr. (650 mg.), chloroform 1 minim (0.05 ml.), with alcohol 5% and menthol and flavouring agents.

This is a combination of a cough suppressant, a bronchodilator, an antihistamine, and an expectorant. It will no doubt be fairly effective in relieving irritating cough, and probably has much the same effect as codeine phosphate alone or with ephedrine. It is worth bearing in mind that ephedrine given at night may keep the patient awake.

N.H.S. basic price: 16 fl. oz., 10s. 5d.

Dequadin Pessaries (Allen and Hanburys Ltd.).—Each pessary contains 10 mg. of dequalinium chloride (deca-methylene bis-(4-aminoquinolinium chloride)), and they are offered for the treatment of vaginitis caused by monilia (*Candida albicans*) or trichomonads. Dequadin, which is not an antibiotic, is effective against a wide range of bacteria and yeasts. Its value in the treatment of oral thrush has been reported on, but its efficacy as a trichomonocide has not yet been confirmed. Two clinical observations are here pertinent. First, when vaginal moniliasis is diagnosed, glycosuria should be excluded, as it is a frequent predisposing cause. Secondly, the cure of trichomonas vaginitis seems to depend more on the length of time for which treatment is conscientiously carried out than on the use of any individual trichomonocidal drug.

N.H.S. basic price: 30 pessaries with applicator. 6s. 8d.

Correspondence

Antibiotic Therapy for Bronchitis

SIR,—Dr. A. H. Luscombe (*Journal*, November 15, p. 1226) need expect no guidance from the Ministry of Health as to the propriety of prescribing prophylactic antibiotics to his chronic bronchitics. He should, however, translate his moral obligation to his patients into practical therapeutics. The case for prescribing these drugs is irrefutable. In this industrial practice in 1956, 5,318 working days were lost and £2,128 paid in sickness benefit because of acute and chronic bronchitis. At £50 per annum I can therefore afford to treat 40 patients regularly with antibiotics and still save the country 5,318 working days at £2 a day, i.e., £10,000 per annum.

Dr. Luscombe's dilemma is in fact a false one. His moral duty to the patients—to treat them as well as possible—in no way conflicts with his duty to the community—i.e., to make sure that his patients contribute of their best to the common welfare.—I am, etc.,

H. W. ASHWORTH.

Darbishire House Health Centre,
Manchester, 13.

SIR,—Dr. A. H. Luscombe (*Journal*, November 15, p. 1226) describes in his letter a problem common to many of us at the present time. The evidence accumulates that tetracycline, whether in short or long courses, benefits many patients with chronic bronchitis. To my mind there can be no doubt that our first duty is to the patient and that we must risk conflict with the costing department of the Ministry of Health. It would be wrong if we withheld a treatment because of the cost, if the treatment is demonstrably the best. Moreover, if there is benefit, it does not seem right to select on economic grounds only those patients who work.

Our dilemma would be lessened if the two pharmaceutical companies which make the tetracyclines found it possible to

reduce the price. We ourselves can usefully study the natural history of the disease in order to discover in due course whether some patients are benefited more than others, and whether prolonged prophylaxis or treatment in the exacerbation is more appropriate.—I am, etc.,

London, N.W.1.

J. P. HORDER.

Antibiotics in Acute Tonsillitis and Otitis Media

SIR,—Dr. John Fry's article (*Journal*, October 11, p. 883) does not seem to have attracted the attention it deserves. It suggests among other things that rheumatic fever is now so rare (he has seen no cases in ten years) that there may be no point in treating sore throats with antibiotics in the hope of averting rheumatic fever. In this area it is not quite so rare and there have been six cases in this practice in 12 years, but of these four did not seek medical advice for a preceding sore throat and of the two who did one was treated with a sulphonamide and the other with penicillin; as they developed rheumatic fever it would seem possible, therefore, that the damage may be done in the very early stages of the sore throat and that by the time the patient seeks treatment it is too late for penicillin to alter the outcome. The same appeared to be the case in Dr. Fry's patients with acute nephritis. It would be interesting if other practitioners could produce figures on this point. Patients whose sore throats are treated with penicillin for ten days are said not to get rheumatic fever,¹ but is there adequate evidence that treating them for the four or five days which Wheatley² found to be customary in general practice is equally effective?

Regarding otitis media, I think one can be fairly certain that the results reported in the M.R.C. trial³ are due not to penicillin but to decreased virulence of the organisms. As Dr. Fry points out, the results were much the same whether antibiotics were used as a routine or not, and in my own practice in which penicillin is used in less than 10% of cases without perforation, the results are virtually the same as those found in the M.R.C. trial. Once perforation has occurred, it seems reasonable to give antibiotics if the discharge does not rapidly cease, as Poulsen⁴ found that residual deafness was more or less proportional to the length of time the discharge persisted; discharge lasting less than a fortnight did not result in hearing loss, while discharge for eight weeks or more always led to some degree of deafness.

If one could be sure that the antibiotics were harmless, the main issue involved would be that of expense. But are they harmless? In examining the new boys at a public school, I have found that unilateral deafness is both commoner and more severe among them than among the local children. When the latter get otitis media they are not given routine antibiotics; on the other hand the deaf new boys at the public school almost invariably give a history of otitis media treated with antibiotics. This unfortunately proves nothing, but now that it seems to be accepted that the sulphonamide treatment of otitis media can be the cause of deafness, is it not time to consider whether antibiotics may not sometimes do the same, and whether their use should not be confined to selected cases? Whatever treatment is used a certain percentage of cases always have slight residual deafness, provided that the tests employed are sensitive, though when a whispering test is used the incidence of deafness is commonly reported to be nil. Wilson,⁵ for instance, found that after penicillin treatment 18% showed some degree of hearing loss, while on inadequate dosage of penicillin the figure rose to 35%. Popper,⁶ who claims to have seen 93 cases of such antibiotic deafness, states that the fluid in the middle ear, sterilized by antibiotics, often becomes a jelly-like mass which may eventually organize into fibrous tissue, with consequent loss of hearing.—I am, etc.,

PETER A. WALFORD.

Felsted, Essex.

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- 3 Medical Research Council, *Lancet*, 1957, 2, 510.
- 4 Poulsen, I. P., *Acta otolaryngologica (Stockh.)*, 1950, 38, 120.
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Case of Penicillin Reaction

SIR,—The following case illustrates the value of chloropropenpyridamine maleate in the treatment of penicillin reactions.

A woman aged 62 was admitted to hospital with fractures of both malleoli. A blister developed over the lateral malleolus which became septic. It was treated with five daily injections of 500,000 units of "penaquacaine." Nine days after the last injection the patient developed a rash resembling prickly heat. Next morning there was localized swelling of the upper lip. Other clinical features were shivering, urticaria, redness of the eyes, swelling of the eyelids, face, scalp, back of neck, wrists, buttocks, and backs of hands, pallor, generalized aching pains, mistiness of vision, tachycardia to 112 beats per minute, and pyrexia to 101° F. (38.3° C.). Injections of adrenaline 5 min. (0.3 ml.) temporarily alleviated the pruritus. Ephedrine, phenobarbitone, and anti-pruritic lotions caused only slight improvement. On the third day, chloropropenpyridamine maleate was begun in doses of 8 mg. orally two-hourly to three doses, followed by gradual reduction in frequency of administration. This caused rapid and complete alleviation of all symptoms, but when the drug was stopped severe generalized urticaria recurred, and persisted until after three days' further treatment with the above drug and cortisone acetate. The condition was finally cured by the arrival of rain, associated with a drop in temperature from 105° F. (40.6° C.) to 65° F. (18.2° C.).

Another patient was admitted at the same time with severe urticaria following penicillin injections, and she also responded to chloropropenpyridamine maleate.—I am, etc.,

Administrative Hospital
Naurn, Central Pacific.

S. V. HUMPHRIES.

Poliomyelitis Vaccines

SIR,—The review of the present position regarding poliomyelitis vaccines by my friends Professor G. W. A. Dick and Dr. D. S. Dane (*Journal*, November 15, p. 1184) must carry great authority, and yet it seems doubtful whether they have presented a balanced analysis of the present position. Thus they consider that trials of the oral vaccines now available are only justified in countries which cannot afford the Salk type. In coming to this conclusion they infer confidence in the ultimate success of the Salk type of vaccine, though I can hardly believe that they are entirely happy about the ultimate prospects of this method. Both methods of protection have a long list of theoretical advantages and disadvantages, and it is surely unrealistic to condemn one method without also considering the disadvantages of the other.

Further, in taking such a strong line against clinical trials of the live poliovirus vaccines now available, they may be condemning a method which, for all they know, might prove to be both safe and effective. This is surely a very defeatist attitude to a problem to which the whole world requires an answer. It seems to be vital to discover quickly whether oral vaccines can be used safely, and it is at least doubtful whether the laboratory tests for increased virulence *en passage* mean very much.

Professor Dick also raises the possibility that virulent polioviruses may be largely eliminated from communities which are efficiently immunized with potent formalized vaccines. He has shown, however, that attenuated strains may become more virulent, so he is in fact suggesting that the Salk type of vaccine might lead to the disappearance of polioviruses in this country. Such a situation might well become dangerous, and I would have thought that this suggestion throws doubt on the prospects of our national programme. If on the other hand our experts think that the maintenance of a flourishing alimentary canal infection with polioviruses is a desirable accompaniment of the present programme, then the sooner we find out which strains to encourage the better. Perhaps Professor Dick would clarify his own hopes and fears a little further on these points.—I am, etc.,

Department of Neurology,
United Oxford Hospitals.

W. RITCHIE RUSSELL.

Medicine on Television

SIR,—The long-awaited discussion between Mrs. Mary Adams (pro) and Mr. Dickson Wright (contra) regarding medical television programmes took place at the Royal College of Surgeons last Wednesday (see p. 1351). It was a disappointing occasion, with an over-lengthy apologia from Mrs. Adams, a dreary but partly necessary interim of film recordings of sample programmes, and a witty rejoinder by Mr. Dickson Wright. He evidently, like many of us, distrusts anything new. There followed a disjointed statement of various views, sometimes amusingly put; but this scarcely went beyond allusions to audience reactions and criticisms of the technique and representativeness of certain programmes.

Some must have gone away feeling that this highly important topic had received merely superficial attention. One was left with the impression that nothing had been achieved, for nothing had been altered. Two schools of thought departed as they had arrived, each to dig its heels in deeper, the one to preserve the dignified secrecy of its craft, the other determined to serve further half-baked doses of medical fare.

For it must be admitted that the programmes shown were poor, and quite unworthy of the magnificent means of communication put into our fumbling hands by the brilliance of television inventors and engineers. In this one must side with Mr. Dickson Wright, whose censures were largely just and wise. Yet one must agree with Mrs. Adams in her assertion that television has come to stay, as indeed it has, like nuclear physics. The question is, Who knows how to use them for the public weal? In regard to both few would disagree that a constructive use is desirable, and constructive of happiness as well as pleasure, for the two are not the same. We clamour for entertainment, and often miss happiness in our greed for it. Like the Press and radio, television is under endless pressure to entertain its audience; and as Mrs. Adams said, the audience does find medical matters entertaining. Mankind at large is attracted by gruesomeness, perhaps by his fear of death (the only basic point made by Mrs. Adams). It is a curious foible, and television will be forced to decide whether to encourage it or not; and if it decides to do so it will further have to examine its own motives. Unless its present mode of presentation of some medical affairs changes, it will have to decide between hypocrisy and sensationalism.

To present complex operations and problems of disease with the scantiest of preliminary acquaintance with normal arrangements is to invite a charge of hypocrisy, for this is not education but entertainment. It is like presenting an intricate repair job in the innards of a motor-car to an audience completely ignorant of even the normal workings of the mechanical beast. And how ignorant that audience is of its body's healthy activities—and this includes most television producers! A medical man spends two or three years of intense study of the normal chassis before he ever begins to learn damage and repair. How then can the public be other than baffled and perhaps queasy over some of the medical programmes already shown—just like a young medical student who goes to an operation out of curiosity long before he has the knowledge to appreciate clearly what is going on? Medicine is not fittingly turned into a peep-show, and, if it is, the public will be filled with misapprehensions unless a more intelligent policy is forthcoming.

However, and even if one agreed with the restrictive views of Mr. Dickson Wright, one must face the inevitability of television at least dabbling in medicine, even in the gore and Grand Guignol. Already other medical men of a supposedly more liberal persuasion are offering their services. One must hope their more liberal views of the nature of medicine itself will triumph, and that a healthier policy will prevail. It is a sad, and perhaps unwise, thing to encourage mankind to dote on gruesome spectacles of disease and death. Man is born into the life with health, energy, and hope to achieve what he can. Some attention to disease is the

common lot; but let it be limited to what is necessary. Any probing by the public into the arcana of disease must be balanced by an equal knowledge of the healthy normal, if things are to be seen in proportion. Otherwise the procedure is merely morbid and quite unlikely to add to human happiness, however much it panders to dubious pleasures. This is the challenge which faces television: if it brings the problems of disease to the public, is it also prepared to show enough of healthy human biology to make disease intelligible entertainment or enlightenment?—I am, etc.,

Anatomy Department,
Guy's Hospital Medical School.

ROGER WARWICK.

Qualified Pen-names

SIR,—I was not surprised to read in the *Lancet* (November 15, p. 1065) the protest from Dr. H. M. Sinclair about the issue by the B.M.A. of a booklet by "John Clyde, M.D., M.A., Ph.D., B.Sc."—apparently "one of the foremost nutritionists in the world." Dr. Sinclair accuses the B.M.A. of misleading the public, because this great expert's name cannot be found in the *Medical Register*—published, I may add, to enable the public to distinguish the qualified from the unqualified. The booklet, it appears, is issued under the auspices of the popular health journal, *Family Doctor*, published by the B.M.A. On other occasions I have noticed strange names given a pseudo-authority by respectable degrees and diplomas in this magazine. Such a habit seems to me as reprehensible as putting phony degrees after real names.

What surprises me is that you, Sir, as Editor of the *British Medical Journal*, can countenance such a practice. In view of the fact that you periodically restrain innocuous outbursts of the fact that you periodically restrain innocuous outbursts of naughtiness on my part from appearing in the *British Journal of Ophthalmology*, I assume that you have some overall responsibility for all B.M.A. publications, even although you may not be concerned with the details of their editing. We look to you to preserve standards—not to let them down; and the profession and the public with them.—I am, etc.,

STEWART DUKE-ELDER.

Institute of Ophthalmology,
University of London.

* The Editor of the *B.M.J.* has no responsibility whatsoever in connexion with *Family Doctor* and its associated publications. We would therefore prefer to make no comment on the practice to which Dr. H. M. Sinclair and Sir Stewart Duke-Elder draw attention.—Ed., *B.M.J.*

Wider Scope for Gluten-free Diets

SIR,—We have been interested in the report by Dr. John W. B. Forshaw (*Journal*, October 25, p. 1020) of a considerable improvement in his patient suffering from post-gastrectomy steatorrhoea with the use of a gluten-free diet. We have experience of a further surprising benefit from such a diet. The following is a brief account of the case, which will be published in greater detail later.

The case we refer to is one of chronic relapsing pancreatitis with extreme calcification of the gland. Steatorrhoea of a marked degree was present which was associated with gross nutritional disturbance. We considered that his steatorrhoea might conceivably be partly pancreaticogenous, partly due to malabsorption. He was placed on a gluten-free diet, with resultant dramatic improvement shown, for example, by a weight increase, maintained over the past three years, of about 40 lb. (18 kg.) from his previous weight of 100 lb. (45 kg.) and a change over these years of the vitamin-A absorption curve from that characteristic of extremely poor intestinal absorption to that characteristic of a pancreatic deficiency. We have been unable to persuade this patient to use gluten again on a trial, but he has asked to be excused, for he ascribes all his present good health to a gluten-free regime.

Both our case and Dr. Forshaw's indicate that gluten sensitivity or toxicity may play a part in the clinical manifestations of disorders, other than certain forms of idiopathic steatorrhoea. They also suggest that dietary adjustment of this somewhat unusual sort may help some cases of pan-

creatic disease. This would appear to be a more reasonable approach than a current tendency which would link in the mind gluten (or its by-products) with idiopathic steatorrhoea and nothing else.

The vitamin-A absorption studies have been carried out as part of a study on this problem with the help of a grant-in-aid from the Medical Research Council of Ireland, which we wish to acknowledge with thanks.

—We are, etc.,

University College, and
St. Vincent's Hospital,
Dublin.

OLIVER FITZGERALD,
R. P. TOWERS,
D. J. HINGERTY.

Early Diagnosis of Mental Defect

SIR,—I was very interested to read Dr. Brian H. Kirman's paper (*Journal*, November 15, p. 1215) on the diagnosis of mental defect in young children. I would agree with him that it is usually quite unjustifiable to ascertain a child under the age of 5 years as ineducable. I agree, too, that a diagnosis of mental deficiency should never be made on the basis of bad or abnormal behaviour in a young child. No paediatrician would think of such a thing.

I disagree, however, with Dr. Kirman's comment that "it is possible to recognize only severe mental defect at an early stage. . . . The predictive value of tests under the age of 5 years is very low." I have now completed a study which proves that exactly the opposite is the case, indicating that mental retardation can be diagnosed with a high degree of accuracy in the first two years and in many cases long before the first birthday. It is true that "even in severe defect early accomplishments are sometimes normal for the age." Except in the case of degenerative diseases, this applies to gross motor development only, and all should know that this is the least useful field of development by which to assess a child.—I am, etc.,

Department of Child Health,
University of Sheffield.

R. S. ILLINGWORTH.

Detection of Ovulation

SIR,—I have only one helpful criticism to make of your very excellent annotation (*Journal*, November 15, p. 1213) on the modern problem of how to estimate the exact time of ovulation by the "clintix" method. I would emphasize that in my experience any result of putting a clintix, on or without a holder, into the vagina with a view to observing the glucose concentration is faulty and very often entirely negative when done by the patient, or in the consulting-room. The test is, however, of great assistance and importance if the clintix is inserted *via* a Fergusson or other speculum directly into the cervical canal.

I am drawing attention to this latter manoeuvre because this test has proved of even more value than the Spinnbarkeit test, the occult blood test, and the repeated DaPaz test of the cervical mucus.—I am, etc.,

London, W.1.

V. B. GREEN-ARMYTAGH.

N-Phthalyl Glutamic Imide

SIR,—N-Phthalyl glutamic imide is a drug with sedative properties and very low toxicity sold in this country under the proprietary name of "distaval." It has been found impossible to calculate the traditional LD50 because a dose of 5 g. per kg. is well tolerated by mice. The suggested dose range in man is 25 to 50 mg. two to four times daily as a sedative, and 50 to 100 mg. as a hypnotic at night. Its effects have been described by Jung,¹ Kunz *et al.*,² Esser and Heinzler,³ and Stärk.⁴

Jung reported that the drug lowered the B.M.R. of thyrotoxic patients, but did not determine whether the depression was due to thyroid suppression. Kunz *et al.* failed to obtain depression of the metabolism of mice. Murdoch and Campbell⁵ studied the effect of varying doses on the uptake of ¹³¹I by the thyroid of nine euthyroid patients. 50 mg. in one patient produced no effect; 100 mg. in one patient had a questionable effect; 150 mg. in two patients had a questionable effect in one and produced partial suppression in another; 200 mg. given to four patients had a questionable

effect in one, produced partial suppression in two, and complete suppression for less than four hours in one; finally 400 mg. (four times the highest recommended hypnotic dose) produced complete suppression for less than four hours in a single patient. They concluded, perhaps rather pessimistically, that "it would seem unjustifiable to use the drug for long-term sedative or hypnotic therapy, pending the results of a more detailed study . . . [in] hyperthyroidism." At the time of the publication of this paper we had begun such a study, and in a letter (*Journal*, February 1, p. 280) expressed the view that in thyrotoxic patients the effects of distaval were negligible compared with those of carbimazole. We have now extended our observations.

Nine thyrotoxic patients have been given single doses of 400 mg. of distaval, and the effects on the immediate uptake of radio-iodine by the thyroid have been measured by the method described by Farran.⁶ No definite effect on the uptake could be demonstrated in any of the patients. In two patients soporific effects were produced by this dose, which is far greater than that suggested by the manufacturers. One patient was treated for a week with a dose of 400 mg. daily. No effect on the thyroid was demonstrated by the above method or by that of Arnott *et al.*⁷

We do not question the accuracy of the observations of Drs. Murdoch and Campbell, and are prepared to believe that in the occasional patient, treated with doses far beyond the suggested range, antithyroid properties may be demonstrated by highly sensitive methods. Such findings are of no practical importance. We have, for instance, found antithyroid properties by the above method in the milk of cows fed on ordinary pasture.⁸ If distaval has a goitrogenic effect no greater than that of cow's milk, we feel that the drug may be given without fear of any damage to the thyroid gland.—We are, etc.,

RAYMOND GREENE.
HELEN E. A. FARRAN.

London, W.1.

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Blood Groups of Mummies

SIR.—The establishment of a laboratory to investigate the blood groups of mummies and the consequent development of new techniques should prove of great value to clinical and forensic haematologists as well as anthropologists. In your annotation on the subject (*Journal*, November 1, p. 1091) you suggest that it is doubtful whether it will ever be possible to detect antigens other than those of the ABO system in post-mortem material which has not been specially preserved. In our view, this suggestion is too gloomy. Antigens which appear to be of the Rh system were demonstrated by us in muscle obtained from South American Indian mummies,¹ and pre-dynastic Egyptian mummies,² using the "inhibition" technique, slightly modified, of Boorman and Dodd.³ These workers have checked the accuracy of their technique against recent post-mortem material and we have confirmed their results. The proof that what we detected were really Rh antigens cannot, of course, be complete, because of the impossibility of carrying out experiments, to test the technique used, on mummified tissue from subjects of known Rh group. However, our protocols indicate that the results are difficult to explain on any other basis.—We are, etc.,

M. LUBRAN.
B. E. GILBEY.

West Middlesex Hospital,
Isleworth.

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Trypanosoma rhodesiense in a Bushbuck

SIR.—Dr. R. B. Heisch, Mr. J. P. McMahon, and Dr. P. E. C. Manson-Bahr are to be congratulated in proving at long last (*Journal*, November 15, p. 1203) that Rhodesian sleeping sickness is a zoonosis. In 1925, under the auspices of the Rockefeller Institute, I visited Tanganyika and was asked by the Governor, Sir Donald Cameron, while watching a cricket match at Tabora, how I viewed the problem. I replied that two things were necessary. First, an aerial survey of the Territory to decide what was to become man-cattle country, and what should remain for the time being fly-game country. Second, some human volunteers, now that "Bayer 205" was available, to discover which game harboured strains pathogenic to man. I pointed to the gang of prisoners who acted as groundsmen. "Impossible," was his reply. It was a Mandated Territory. But a few years later Dr. J. F. Corson offered himself as a guinea-pig and dozens of Africans followed. Now Mr. C. W. A. Guggisberg has provided in his own person the last link in the chain of liberation.

I was informed during my last visit in 1952 that the aerial survey was just completed.—I am, etc.,

London, W.1.

CLEMENT C. CHESTERMAN.

Tuberculous Meningitis after B.C.G.

SIR.—The paper on "Tuberculous Meningitis Following B.C.G. Vaccination," by Dr. Mary Kerr and Dr. J. M. Dunbar (*Journal*, October 25, p. 1019), is less remarkable for the failure of B.C.G. vaccination to protect from tuberculous meningitis than for the circumstances in which the vaccine was used.

A baby aged 2 months was vaccinated on a single unspecified tuberculin test while living in a caravan with her mother, father, and brother, all of whom suffered from pulmonary tuberculosis. The state of the mother's disease at the time is not recorded, the father's disease was "believed to be inactive, though it was still being observed at three-monthly intervals," and the brother had sputum-negative cavitation in the year of the birth and was still receiving chemotherapy. It can therefore justifiably be said that the baby was in contact with one or more actual or potential infectors.

It is an axiom of tuberculosis control that contact between a susceptible infant or other child or young person and an infector should be broken immediately, and where B.C.G. vaccination of a non-reactor is contemplated there should be an interval of six to eight weeks between break of contact and the final pre-vaccinal tuberculin test and a similar or longer interval before resumption of contact. Such safeguards appear to have been omitted in the case reported, and their omission requires explanation, for in the absence of recalcitrance by the parents or brother (of which there is no evidence) it is hard to understand not only why the infant was left in such an environment but also why she was vaccinated in it.

As to the rarity of tuberculous meningitis in children vaccinated with B.C.G. it can be said that in Northern Ireland in 1953-7, 40,274 infants under 1 year were successfully vaccinated, many of whom were contacts. None has yet developed tuberculous meningitis.—I am, etc.,

Whitehead, Co. Antrim.

H. G. CALWELL.

Informing the Hospital

SIR.—With regard to identification of tablets in general practice the problem is a common one. Apart from the rare case of poisoning, one is often asked to re-prescribe tablets in which the patient has great faith when, for various reasons, records are not available of the tablets previously prescribed. Similarly, in cases sent from hospital when patients are on two lots of tablets which are similar, it is often difficult to differentiate between the two. This is particularly the case with small white unmarked tablets such as digoxin, B.P., and phenobarbitone, B.P., a not

uncommon combination. The *Chemist and Druggist* have only partially met the situation with the charts mentioned by Dr. Jane M. Fullerton (*Journal*, November 1, p. 1105). It cannot possibly hope to cover all tablets, including all white unmarked ones.

My idea to solve the problem is simple. All tablet manufacturers, irrespective of whether they are pharmaceutical chemists or merely tablet manufacturers, should be allocated a two- or three-code-letter combination, and this should be stamped on the tablet, followed by (or on the other side in the case of small tablets) the number of the product.

I am told that it is now possible to mark coated tablets. For capsules I suggest a similar marking, or a system of differential colour bands, somewhat akin to that used by the electrical industry for resistors. This would mean that both the source and the name of the product would be readily identifiable by means of a code book (or cards) which could be distributed to chemists and doctors.

With therapeutic advances the problem is getting more chaotic every day, and it is to be hoped that the industry will embark on an overall code system rather than an individual one for each firm.—I am, etc.,

London, W.12.

JOHN D. W. WHITNEY.

Oesophageal Stricture

SIR.—I was most interested in Mr. K. S. Mullard's letter (*Journal*, November 1, p. 1101) but regret that he has failed to grasp the main point in my paper on "Oesophageal Stenosis after Partial Gastrectomy" (*Journal*, October 4, p. 819). The paper related the case histories of two patients both suffering from duodenal ulceration, who for the very first time developed oesophageal obstruction, at an interval of three weeks following Polya gastrectomy. The various theories regarding the possible cause of this were discussed fully in the text. The well-recognized reflux oesophagitis due to acid pepsin was of course considered as a possible causative factor, but was ruled out because the gastric content was neutral in reaction and its peptic activity nil.

The main thesis in the paper was to suggest the possibility of oesophagitis with stenosis due to the reflux of a jejunal secretion of pH 6.5-7.0 in which trypsin could act as the irritant factor. This suggestion was supported by the fact that, when jejunal contents were excluded from the stomach and lower oesophagus by the conversion of the Polya and Billroth I type, the symptoms of oesophagitis disappeared completely. Had the oesophagitis been due to the presence of "gastric mucosa lining the lower oesophagus," as suggested by Mr. Mullard, then the oesophagitis would have persisted. The fact that it did not persist but cleared up completely and the patients have both remained perfectly well ever since demonstrates that Mr. Mullard's views regarding aetiology in these two cases are untenable.—I am, etc.,

Darlington, Co. Durham.

K. C. McKEOWN.

Buzzers for Bed-wetters

SIR.—The Staffordshire County Council have provided for the past year electrical nocturnal alarms for schoolchildren suffering from enuresis.

In view of Dr. Margaret White's letter (*Journal*, November 8, p. 1165) reporting 45 children successfully treated with no failures, it is interesting to compare the results in another area. In Staffordshire a total of 48 cases have been treated, of whom 38 have been greatly improved or cured, and in several of these the child has now been dry for a period exceeding six months. There have been four cases where the child was not improved following the treatment, and one case relapsed. There were three cases where there was lack of co-operation on the part of the parent or the child. In one of the remaining cases, the child would not persist with the use of the machine owing to fear caused by the sounding of the bell during the night. The average duration of the treatment as mentioned by Dr. White is some two or three months. On the whole the results were con-

sidered very encouraging by the parents and medical staff, and the scheme is being extended.

In passing it may be noted that the "improved or cured rate," i.e. 79%, with the enuresis alarms, compares very favourably with the improvement using pituitary snuff reported by Holt¹—i.e., 8 out of 60 cases improved.—I am, etc.,

School Health Service,
Stafford.

H. BINYSH.

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Foreign Body in Endotracheal Tube

SIR.—Accidents and near calamities due to blocked endotracheal tubes are probably not as rare as may be thought. There must be a natural reluctance on the part of many anaesthetists to report their mishaps, valuable though such reports should be to their colleagues.

The letter by Dr. K. A. Stewart (*Journal*, November 15, p. 1226) brings to mind a similar occurrence some months ago. The patient, an obese middle-aged woman, was being anaesthetized for reduction of a nasal fracture. A rubber endotracheal tube was passed, which had been taken from a tray containing a number of such tubes with Rowbotham connexions attached. Manual inflation with oxygen from the reservoir bag met with resistance, and the patient became cyanosed. She was resuscitated with difficulty after the tube had eventually been removed. Inspection of the endotracheal tube afterwards showed it to be completely blocked by the top of a glass ampoule, firmly wedged in the Rowbotham connexion. No satisfactory explanation could be found as to how it had got there.—I am, etc.,

London, W.1.

E. H. RAINER.

Sweet Tooth and Decay

SIR.—In view of the conflicting impressions of Mr. F. T. Ransom (*Journal*, September 6, p. 638) and Dr. V. M. Osborne (*Journal*, November 15, p. 1229) on the effects of chewing sugar-cane and of the incidence of dental caries it is desirable that a large-scale inquiry should be undertaken to determine the dental health of the children in the West Indies. Meanwhile may I draw attention to the small survey made in 1948 by the late J. D. King in the sugar- and non-sugar-cane producing areas of Trinidad and British Guiana, among children aged 12-14 years? The non-cane districts had an insignificantly larger percentage of carious permanent first molars than the cane districts in both colonies, and the children in British Guiana had a significantly larger proportion of carious teeth than the children in Trinidad. The incidence and extent of caries in the upper first and second permanent incisors—these teeth are generally the most susceptible of those in the anterior part of the denture and their labial surfaces are accessible to friction during the consumption of sugar-cane—was significantly larger in the cane districts of Trinidad than in the non-cane districts, but in British Guiana the non-cane districts had an insignificantly larger value than the cane districts. The incidence of caries in these teeth was greater in Trinidad than in British Guiana. The incidence of caries in all the fully erupted permanent teeth was high and the activity of the disease was of a similar order to that in the urban district of the Isle of Lewis and in South-East London children. In Trinidad the children from the non-cane districts had more gingivitis than those from the sugar-cane areas, and in British Guiana the incidence and extent of gum lesions was greater in the non-cane than in the cane districts. There was a large association between gingivitis and calculus deposits, and the advantage of the cane districts was probably due to the extent to which cane was able to dislodge dental calculus and counteract any other source of irritation. Susceptibility to parodontal disease or dental caries was little, if at all, affected by sex or race, Negro and East Indian.

An investigation to discover the effect of increased sugar intake on caries in children over a period of two years was described in a Medical Research Council *Special Report*.² The conclusion arrived at was that, "provided a child is

In spite of his busy life, Haultain seemed, until recently, quite tireless, so marked was his enthusiasm for all he undertook. His friends were legion, and to them the kindly hospitality of Haultain and his wife was freely offered and will be recalled with deep gratitude. That never-failing, happy greeting from Theodore will be greatly missed—we are the poorer for his loss. To his widow, daughter, and two sons is extended the deepest sympathy.—E. C. F.

S. LOUISE FRASER, M.B.E., M.D.

Dr. S. Louise Fraser, formerly honorary obstetric surgeon to the York Maternity Hospital, died at a Bournemouth nursing-home on October 14. She was 84 years of age.

Sarah Louise Fraser was born at Inverness on January 28, 1874, and was educated at Inverness and Notting Hill High Schools and at Bedford College, London. She studied medicine at the London (Royal Free Hospital) School of Medicine for Women, and graduated M.B., B.S. from London University in 1900, proceeding to the M.D. in 1908. Part of Dr. Fraser's early professional experience was gathered at the York Dispensary, which then employed three resident doctors whose work in effect was to provide a free domiciliary service for the poor of the city. In 1906 she started her own practice in York, and soon afterwards she was elected to fill a vacancy on the honorary staff of the dispensary, where she held a weekly clinic for women and children, and became an *ex officio* member of the board of directors.

At that time York had no maternity hospital, but Dr. Fraser persuaded her fellow-directors to launch a public appeal for subscriptions, and as a result, in 1908, the Ogleforth Maternity Home came into being in a house capable of accommodating five patients. As time went on neighbouring houses were added to the home until, in 1923, it was handed over to the local authority. From Dr. Fraser's concern about the health of the babies born in the home came her idea of an infant welfare scheme in York, and again she was fortunate to have the support of the board of directors of the dispensary. At first the results from the scheme seemed disappointing to her, but, when steps were taken to provide free meals for the mothers attending the infant welfare centre, the good effect on the babies' health was soon discernible.

During the first world war Dr. Fraser was medical officer at the Nunthorpe Hall auxiliary hospital, and for her services was appointed M.B.E. in 1920. From 1926 she began to spend much of each year abroad, but in 1938 she returned to England and thenceforward lived at various places, ultimately at Bournemouth. Even at an advanced age she still retained a keen interest in medical matters and in the profession which she had served so well.

F. G. LESCHER, M.C., M.D., F.R.C.P.

Dr. F. G. Lescher, consulting physician to the Derbyshire Royal Infirmary, died at his home at Mackworth, near Derby, on November 12. He was 70 years of age.

Frank Graham Lescher was born on May 19, 1888, and was educated at Stonyhurst and at Caius College, Cambridge, where he obtained a second class in the Natural Sciences Tripos in 1910. From Cambridge he went on to St. Bartholomew's Hospital, qualifying in 1913 and graduating M.B., B.Chir. in the following year. At Bart's he was house-physician to Dr. (later Sir Walter) Langdon-Brown and he was also senior house-surgeon at the West London Hospital. Having joined the R.A.M.C. in 1914, he gave distinguished service as a medical officer to a field ambulance, winning the Military Cross with two bars and attaining the rank of major. In 1918 he was taken prisoner. On return to civilian life he proceeded to the degree of M.D. and settled in practice in Derby, where he was appointed assistant physician to the Derbyshire Royal Infirmary. Becoming full physician in 1931, he continued to serve the hospital until his retirement in 1954. In his later years he was consulting physician to the Burton-on-Trent General Infirmary and to the Derby City Hospital. Having gained the Membership of the Royal College of Physicians in 1934, he was elected to the Fellowship ten years later. A Territorial officer, he was for a time A.D.M.S. to the 46th North Midland Territorial Division, and during the second world

war he was a group medical officer in the Emergency Medical Service. Dr. Lescher leaves a widow and two daughters.

A colleague writes: Beginning in general practice, Dr. Graham Lescher later confined himself to consulting work, in which his ability was recognized and valued throughout a wide area. But essentially he put his hospital work first. He was a sound physician with a leaning towards neurology. Many resident medical officers profited by his teaching, and his colleagues could always benefit by discussing medical problems with him. He published a number of valuable papers. From 1922 to 1927 he was honorary secretary of the Derby Division of the B.M.A. and eventually chairman (1935) and also president of the Derbyshire Branch (1937). But he directed his main energies to the work of the scientific medical societies in Derby and the East Midlands, in whose meetings he frequently took active part. He was particularly good at demonstrating a clinical case. A man of considerable energy, he did not let his outside duties interfere with his hospital or private work. He played golf with his colleagues and later on became an enthusiast for fishing.

H. M. WILSON, O.B.E., M.B., B.Chir., F.R.A.C.S.

Mr. H. M. Wilson, consulting surgeon to the Hastings Memorial Hospital, New Zealand, and a former president of the New Zealand Branch of the B.M.A., died at his home at Havelock North on November 12. He was 82 years of age.

Harry Montefiore Wilson was born in the province of Hawke's Bay in New Zealand, the son of Mr. H. C. Wilson, of Napier, who fought in the Maori wars as a member of the armed constabulary. From the Collegiate School, Wanganui, Harry Wilson entered Trinity Hall, Cambridge, in October, 1895, obtaining his B.A. three years later. He then went on to St. Mary's Hospital for his clinical training, and graduated B.Chir. in 1902 and M.B. in 1906. Before returning to New Zealand he held the appointments of house-physician at St. Mary's Hospital and house-surgeon at the Birmingham General Hospital and the Hospital for Sick Children, Great Ormond Street. In 1903 he became assistant medical officer at the Wellington Public Hospital, New Zealand, and two years later resident medical officer at the Napier Hospital. From 1908 to 1911 he was in practice, first at Waipukurau and then at Waipawa, both in the province of Hawke's Bay. He settled at Hastings in 1911, becoming honorary surgeon to near-by Napier Hospital and helping to found the Memorial Hospital at Hastings. During the first world war he served as a captain in the N.Z.M.C. In 1927 he became a foundation Fellow of the Royal Australasian College of Surgeons. A member of the British Medical Association for 53 years, he was chairman of the Hawke's Bay Division in 1922-3 and again from 1948 to 1950, and president of the New Zealand Branch in 1941-2. He was appointed O.B.E. in the 1951 Birthday Honours. He is survived by a son and four daughters.

A. E. HAY, M.R.C.S., L.R.C.P.

Dr. A. E. Hay, who was in general practice in the Isle of Wight for most of his professional life, died at his home at Brading, in the island, on October 19, the day after his 80th birthday.

Arthur Edgar Hay was born at Felpham, Sussex, and was educated at the Elizabeth College, Guernsey, King's College School, Wimbledon, and King's College, London. Qualifying in 1904, he held the appointments of house-surgeon, house accoucheur, and house-physician to the women and children's department at King's College Hospital and house-surgeon and casualty house-surgeon at the Queen's Hospital for Children, Bethnal Green. He then settled in Cowes, in the Isle of Wight, where he built up a large family practice and acted as an honorary medical officer to the Frank James Memorial Cottage Hospital. He

was also the local Poor Law medical officer and public vaccinator. He lived and worked at Cowes until 1944, when continuing ill-health compelled him to curtail his activities considerably, and he went to live in the village of Brading. There he soon established himself just as successfully as in Cowes, though of necessity on a much smaller scale. Ten years later, in 1954, a further deterioration in health forced him to retire completely. He leaves a widow, one son, and three daughters, to all of whom we offer our sympathy.

J. J. O'D. writes: Dr. Hay was a shining example of all that is best in the family doctor tradition of this country. To hundreds of families and for many years he was not only "the doctor" but also the guide, philosopher, and friend, and he achieved that enviable position by the simple process of mixing, quite subconsciously, the ingredients of competence and conscientiousness with those of cheerfulness and generosity. His large practice was matched only by his own capacity for hard work: though he led an extremely full and busy life, he was never too rushed to spare a few moments for conversation, never too tired to be cheerful, and never too irritated to be good-tempered. Despite his own heavy commitments he was ever ready to come to the aid of a harassed colleague, especially one junior to himself; and his arrival, almost invariably accompanied by an amusingly told and reassuring tale of a similar occurrence in his own practice, raised morale and relieved the situation. He was devoted to his family and they to him, and within the family circle he attained a happiness and contentment of mind that were a joy to witness. He will be sadly missed by them as well as by a multitude of patients who will mourn the passing of a fine doctor and a truly great character.

IVOR CHANCE, M.B., B.S.

The obituary of Dr. Ivor Chance was published in the *Journal* of November 15 (p. 1234).

A friend writes: Ivor Chance possessed an amazing capacity for friendship. He endeared himself to all who knew him, irrespective of class or background. His Christian faith was simple and childlike and expressed itself in a life that was truly dedicated to his fellow-men. He loved people and always aimed to heal the whole man. He entered wholeheartedly into the life and work of his Church. Whatever he undertook, whether in his professional sphere or in private life, he did with the utmost enthusiasm, and he had the capacity for infusing in others a comparable zeal. Fearless in his denunciation of injustice of any kind, he had a particular dislike for anything that savoured of cant or hypocrisy. He was blessed with a great capacity for fun: aided by his sense of humour he was able to meet and overcome many difficult situations. A true man of God, he lived out in his daily life his own inward personal faith, and he earned for himself the designation given in the Scriptures to St. Luke—"A beloved physician."

D. B. G. and D. W. D. write: It was our privilege to meet Ivor Chance when he commenced his medical studies with us at the Middlesex Hospital medical school in 1941, and our lifelong friendship which followed was inevitable. He had an unflinching sense of duty to his patients and friends, and was fundamentally sincere in all he said and did. He had an extraordinary ability to make friends in all walks of life, regardless of age, creed, or colour. His firm Christian faith, tireless energy, and great sense of humour enabled him to live a full, though sadly short, life and to overcome cheerfully all obstacles and disappointments. These qualities, coupled with his clinical ability and perseverance, inspired the love and respect of colleagues and patients alike. The memory of Ivor Chance's way of life is sure to remain a refreshing example to those who knew him. We extend our sincere sympathy at his untimely passing to his family, and especially to his wife, who shared his many ideals and Christian conviction and was able to contribute so much to his work as a medical missionary during their three years in Uganda.

Medical Notes in Parliament

INTERIM PAY AWARD

Sir HUGH LINSTAD (Putney, Con.) asked the Minister of Health on November 20 what action, in the light of his recent estimate that the Royal Commission would not report until next summer, he proposed to take in respect of the remuneration of doctors and dentists employed in the Health Service. Mr. D. WALKER-SMITH stated that the Government proposed to make a further interim increase of 4% in the current basic remuneration of doctors and dentists in the National Health Service with effect from January 1, 1959. This interim increase would, of course, be without prejudice to the recommendations of the Royal Commission, but he had consulted the chairman and he had informed him that it would not embarrass the Commission in any way. The method of distributing the additional remuneration would be discussed with the two professions.

Mrs. LENA JEGGER (Hölborn and St. Pancras South, Lab.) referred to this reply on November 24, when she said it had given in the country the impression that these rather stingy and *ad hoc* handouts to the medical and dental professions indicated a complete lack of Government policy for the Health Service. Could the Minister of Health say that in these days of expanding economy this concession could be taken as encouragement by all the other ancillary workers who had claims before the Minister and who were entitled to better treatment from the Minister? Mr. WALKER-SMITH said that if the country had formed any such impression it would be an erroneous one through a wrong understanding of the facts. This was neither stingy nor piecemeal. It was a 4% increase costing £5m., and was given because the Royal Commission was taking longer to report than was originally thought probable.

OTHER ANSWERS TO QUESTIONS

Queen Mary's Hospital, Carshalton

Mr. ERIC FLETCHER (Islington, East, Lab.) asked the Minister of Health on November 17 whether he was aware of the feeling among parents and others against the proposal to close Queen Mary's Hospital for Sick Children, Carshalton; and whether he would reconsider the matter. Mr. WALKER-SMITH said that he had received representations from several sources about the proposal to change the use of this hospital, and he would certainly take these and all relevant factors into account before coming to a decision.

Mr. FLETCHER asked if the Minister would bear in mind that for many years this hospital had enjoyed a high reputation among parents for its special work among children. There would be great concern among parents if it were closed. Mr. WALKER-SMITH said there was no proposal to close the Queen Mary's Hospital, as might appear from Mr. Fletcher's question. The proposals were merely concerned with the change of use. He readily accepted that the hospital had a high reputation, but it was nearly half empty because of the welcome fall in the need for the accommodation for children. Mr. KENNETH ROBINSON (St. Pancras, North, Lab.) said there was a desperate need at Fountain Hospital, which had an equally high reputation, for decent, modern accommodation. Mr. WALKER-SMITH said he had that very much in mind.

Crawley Hospital

Mr. F. GOUGH (Horsham, Con.) asked what progress had been made in the building of Crawley Hospital; and on what date it was anticipated the hospital building would be completed. Mr. R. H. M. THOMPSON, Parliamentary Secretary to the Ministry of Health, stated that tenders had been invited for the first stage of building, with a view to work starting before the end of the financial year. It was estimated that this work would take about two years.

Mr. GOUGH described the whole story of Crawley Hospital as a real public scandal, and an epic of bureaucratic muddle, stubbornness, and stupidity. He had been given assurance after assurance and promise after promise since September, 1954, during which time the population of Crawley had grown by 26,000. Would the Minister instigate an interdepartmental inquiry to look into the matter? Mr. THOMPSON replied that the Minister did not feel that an inquiry was called for. This was a very large and costly scheme, and involved planning on a most extensive scale. The first stage was under way.

Edinburgh Hospital Schemes

Details of the schemes for new hospital building, and for the modernization of hospitals in Edinburgh, were given on November 18 by Mr. J. NIXON BROWNE, Under-Secretary of State for Scotland, in answer to questions by Mr. J. HOY (Leith, Lab.). Building schemes, amounting in all to £1,400,000 already submitted and approved, were in hand or about to start, he said. These are:

New Hospital Building in Edinburgh

Hospital	Scheme	Estimated Building Cost	Provision made in 1958-9
Western General Hospital	Neurosurgical unit	£ 341,000	£ 100,000
	Theatre block (phase I)	97,000	23,200
	suite (" II)	95,750	1,000
	New boilerhouse	108,429	850
Edinburgh Royal Mental Hospital	bacteriology laboratory	126,000	3,000
	Reconstruction and development	522,925	10,000
Gogarburn Institution	New ward block	52,000	6,000
Edinburgh Royal Infirmary	New biochemistry laboratory	51,000	15,000
Queen Mary Maternity Home	12-bedded maternity unit	17,540	2,000
		£1,411,644	£161,050

In addition details of modernization schemes provided for during the current financial year and costing £364,487 were also tabulated.

Future of Royal Infirmary

Mr. A. WOODBURN (Clackmannan and East Stirlingshire, Lab.) called attention to the need for a more speedy redevelopment of the Royal Infirmary, Edinburgh; and asked whether the Secretary of State was satisfied that its bed accommodation was not being too much diverted to non-medical cases. Mr. NIXON BROWNE replied that the Secretary of State was well aware of the problem, which was being urgently examined at his request by a joint planning committee representing hospital and teaching interests and the department. This hospital, like other large teaching hospitals, faced the problem of the continuing care of patients who no longer required highly specialized facilities. The planning committee would have this problem very much in mind in laying down the lines for future hospital development in Edinburgh as a whole.

Mr. WOODBURN said this was one of the most famous hospitals in the world. Accusations that it was being used as a home for old people were causing great perturbation. Questions had appeared in the press about whether the hospital would be diverted from its proper purpose to become a home for old people. Mr. BROWNE replied that the Secretary of State would not wish any such impression to get abroad. This was a big problem, and there were many views on it. It would be wise to await the decision of the planning committee.

Scottish Cancer Services

Mr. W. HANNAN (Glasgow, Maryhill, Lab.) asked what progress had been made in giving effect to the circular setting up the organization of Scottish cancer services;

and, in particular, what means had been adopted for the earlier diagnosis of malignant disease. Mr. NIXON BROWNE told him that a registration and follow-up system for all cases of malignant disease had now been instituted in each of the five hospital regions in Scotland, and regional cancer committees had been established to keep facilities for diagnosis and treatment under review. Early diagnosis was possible only if medical advice was sought at the earliest possible stage, and the Secretary of State had no doubt that the regional committees would consider the best means of securing this.

Mental Defectives in Scotland

Mr. HECTOR HUGHES (Aberdeen North, Lab.) asked the Secretary of State how many mentally defective patients were detained in Scotland, what steps were being taken to ensure that the condition of each was periodically reviewed with a view to release; and how many had been released. Mr. J. S. MACLAY stated that at September 30 there were 5,732 patients under detention and 2,542 under guardianship. Patients were detained on the initiative of the parents or of the local authority with the parents' consent, or by order of the Sheriff. The need for detention was subsequently reviewed by the General Board of Control. He had no statutory authority in these matters. In the first nine months of 1958, 100 patients were discharged and 127 released on licence.

Classified by age groups, the figures are:

Number Aged								Total
Under 16	16-24	25-34	35-44	45-54	55-64	Over 64		
On Institution Registers								
Male	577	804	669	532	350	118	53	3,103
Female	375	569	527	505	388	182	83	2,629
Total	952	1,373	1,196	1,037	738	300	136	5,732
Under Guardianship								
Male	26	420	294	269	204	109	24	1,346
Female	15	307	232	244	218	133	47	1,196
Total	41	727	526	513	422	242	71	2,542

Deaths from Leukaemia

Mr. FRANK ALLAN (Salford, East, Lab.) asked the Prime Minister what investigation had been undertaken by the Atomic Energy Research Establishment or the Medical Research Council to inquire to what degree any significant difference had been found in the content of strontium-90 in the bones of children dying from leukaemia or bone cancer compared with those dying from other causes in Great Britain; whether he would request such investigations if not already undertaken, and whether the results would be published. Mr. H. MACMILLAN stated on November 18 that in the course of a nation-wide survey of the strontium-90 content of human bone a certain number of specimens of bones of children who died from leukaemia had been examined. The results obtained from the survey so far had not demonstrated a difference between these bones and comparable specimens obtained from children dying from other causes. None of the bones examined had come from a case of bone cancer. Should any significant relationship be observed between the level of strontium-90 and the cause of death a special report would be published.

Atmospheric Pollution

Mr. S. SWINGLER (Newcastle-under-Lyme, Lab.) asked on November 18 what progress was being made in reducing the causes of atmospheric pollution. Mr. J. R. BEVINS, Parliamentary Secretary, Ministry of Housing and Local Government, said that dark smoke from chimneys was, with certain exceptions, now prohibited; there was a statutory obligation in force to take all practicable means to minimize grit and dust from industrial furnaces; the number of smoke control areas in operation or preparation was growing at a steady rate; and pollution by noxious or

offensive cases, which was controlled under the Alkali Act, was showing a significant fall. The department was directly responsible for giving technical advice only where the process was subject to control under the Alkali Act. Information indicating where local authorities, industry, and householders could obtain technical advice was given in the three memoranda on the Clean Air Act published by the department.

Mr. G. NABARRO (Kidderminster, Con.) wanted to know what progress had been made by the Department of Scientific and Industrial Research and other research agencies in ascertaining means of purifying exhaust fumes of diesel-powered road vehicles, prior to emission; and, having regard to the rate of increase of carcinogenic diseases commensurate with the increase of such vehicles, and also support for clean air policy, what further Government action in the matter was proposed. Mr. HARMAR NICHOLLS, Parliamentary Secretary, Ministry of Works, said the department had done no research on the purification of exhaust fumes from diesel-powered road vehicles; but results of work carried out elsewhere had shown that the greater part of the smoke from diesel engines could be prevented by proper adjustment, running, and maintenance. The Medical Research Council had no evidence at present to suggest that exposure to diesel fumes was a contributory factor in the causation of cancer.

Doctors' Emigration

Dr. DONALD JOHNSON (Carlisle, Con.) asked the Minister of Health on November 24 if he was aware of the increasing numbers of established doctors who were leaving general practice under the N.H.S. to emigrate; and whether he would make appropriate inquiries into this trend. Mr. WALKER-SMITH stated that he had no reliable evidence of any increase in the emigration of general practitioners, but would gladly study any which Dr. Johnson could produce. Information on the emigration of doctors and dentists generally submitted by the Government to the Royal Commission was published in the Commission's Minutes of Evidence 14-15 for 17-18 April, 1958. Dr. JOHNSON said there was a feature in the *B.M.J.* which showed this trend. If he sent it to the Minister would he consider it? Mr. WALKER-SMITH replied that he would. He would be glad to consider any evidence. Mr. J. TILNEY (Liverpool, Wavertree, Con.) said that, if such emigration was to parts of the Commonwealth that were short of doctors, should it not be encouraged? Mr. WALKER-SMITH said that his responsibility was to provide a Health Service in this country. He was not unmindful of the considerations referred to by Mr. Tilney.

Addiction to Unrestricted Drugs

Mrs. HARRIET SLATER (Stoke-on-Trent, North, Lab.) asked if the Minister's attention had been drawn to the article in the *B.M.J.* on "Addiction to Unrestricted Drugs,"* and what action he proposed to take on the problem raised. She also asked if any further consideration had been given to the restricting of carbromal drugs. Mr. WALKER-SMITH—the Secretary of State for Scotland and I have invited the Interdepartmental Committee on Drug Addiction to consider and advise us upon the problem of preparations, including carbromal preparations, which are outside the scope of the Dangerous Drugs Act but which may be liable to produce addiction or to be habit-forming. The committee have not yet concluded their consideration of this question. Mrs. SLATER said the article was a responsible one, which gave case histories of people who had been affected. Would the Minister speed up both the consideration by the committee and some action to place the drugs on the Poisons List? Mr. WALKER-SMITH—it is certainly a responsible article, but it does not add to the information before the committee, who are proceeding as rapidly as their wide duties permit. Making a drug a poison was a matter for the Poisons Board.

**British Medical Journal*, October 18, p. 950.

Dr. EDITH SUMMERSKILL asked if the Minister would consider enlarging the terms of reference of the committee with a view to improving the machinery devised to examine the various products that were coming on the market. Surely the machinery was not adequate to cope with the increasing number of products being put out by the proprietary houses. Mr. WALKER-SMITH pointed out that the terms of reference were already wide, in that they required the committee to consider whether any revised advice they gave on narcotic drugs should extend to other drugs which were liable to produce addiction or were habit-forming.

Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked that the Minister should keep in mind the possible danger to patients of unnecessarily restricting the freedom of action of medical practitioners. Mr. WALKER-SMITH said that was another question. Guidance was given, he thought acceptably, to the medical profession.

Medico-Legal

ERROR IN DIAGNOSING CANCER

[FROM OUR LEGAL CORRESPONDENT]

A principle, of which out of sympathy it is easy to lose sight, is that a mistake, medical or otherwise, which causes injury is not necessarily negligent. This was illustrated by the recent dismissal in the Court of Appeal (*The Times*, November 19) of an appeal by Mrs. Crivon, of Offham Slope, Finchley, from the dismissal by Mr. Justice Hilbery of an action in which she had alleged negligence against the Barnet Group Hospital Management Committee, the North-west Metropolitan Regional Hospital Board, the late Mr. H. R. Segar, and Dr. D. M. H. Cogman.

Mr. Segar had operated on Mrs. Crivon in May, 1950, for the removal of a small lump in her breast. Dr. Cogman made a pathological examination of a specimen of the lump and reported that he thought it to be cancer. In consequence Mrs. Crivon went to Mount Vernon Hospital and was subjected to deep x-ray therapy for a considerable time. Meanwhile further pathological examinations were made. Senior pathologists at Wellhouse Hospital found no evidence of cancer, and the pathologist at Mount Vernon did not think there was any malignant cancer. The deep x-ray therapy was therefore stopped, but Mrs. Crivon's skin was marked and the surface destroyed, she was exposed to the possible consequences of deep x-ray therapy, and was subjected to the distress, pain, and worry which it involved.

Mrs. Crivon, who conducted her appeal in person, complained that in a matter of such importance to her Dr. Cogman should have taken a second opinion before his diagnosis was acted on. But the evidence of Professor R. W. Scarff was that he was not prepared to say the diagnosis had been wrong, and he might on the slide in question have come to the same conclusion himself. Once a carcinoma had been diagnosed speed of treatment was essential, said Lord Denning delivering the Court of Appeal's judgment, and the fact that a second opinion was not taken and that no further check was made when she went to Mount Vernon did not in the view of the Court of Appeal make out a case of negligence. A wrong diagnosis was unfortunate, but on the evidence the judge had been justified in finding that there had been no negligence in the diagnosis or consequent upon it.

Mrs. Crivon's appeal was accordingly dismissed.

CLAIM AGAINST NORTHERN IRELAND TUBERCULOSIS AUTHORITY

[FROM OUR LEGAL CORRESPONDENT]

On October 20 Lord MacDermott, the Lord Chief Justice of Northern Ireland, dismissed an action by Dr. Joseph Norris Whyte, of Antrim Road, Belfast, against the Northern Ireland Tuberculosis Authority (*Northern Whig*,

October 18). Dr. Whyte, one of the Authority's consultants, had claimed that his contract with the Authority did not entitle them to assign to him the duty of examining for tuberculosis candidates for the Royal Ulster Constabulary, and that he was entitled to receive fees for so doing.

Until 1954 candidates were examined by the Constabulary's doctor, and certain of them were then sent for chest x-ray. By informal arrangement with the secretary of the Authority Dr. Whyte read the x-rays and reported on them. The reports went to the police, and the Authority received one-third and Dr. Whyte two-thirds of a guinea for each report. After 1954 the police ceased paying the Authority, and the two-thirds payment to Dr. Whyte stopped in consequence. Dr. Whyte's case was that his function in making the x-ray examinations and reports was not the prevention of tuberculosis and promotion of public health but simply to see whether the candidates were fit to be recruited into the Constabulary. The Authority's case was that the work fell within the scope of the hospital and specialist services which the Authority was required to provide under the Public Health (Tuberculosis) Act (Northern Ireland), 1946, and that, since under his contract Dr. Whyte's duties were those which might be assigned to him for the purpose of discharging the Authority's obligation under the Act, Dr. Whyte was not entitled to any additional remuneration for carrying it out.

Lord MacDermott held that the work which was done by Dr. Whyte was work covered by his contract which the Authority was entitled to require him to do. It fell within the Authority's statutory duty, and Dr. Whyte was not entitled to additional remuneration for performing it.

The Act which the Glasgow doctor contravened when he signed a medical certificate of incapacity for work without seeing his patient (*Journal*, November 1, p. 1111) was the National Insurance Act, 1946, not the National Health Service (Scotland) Act.

Vital Statistics

Gastro-enteritis in Yorkshire

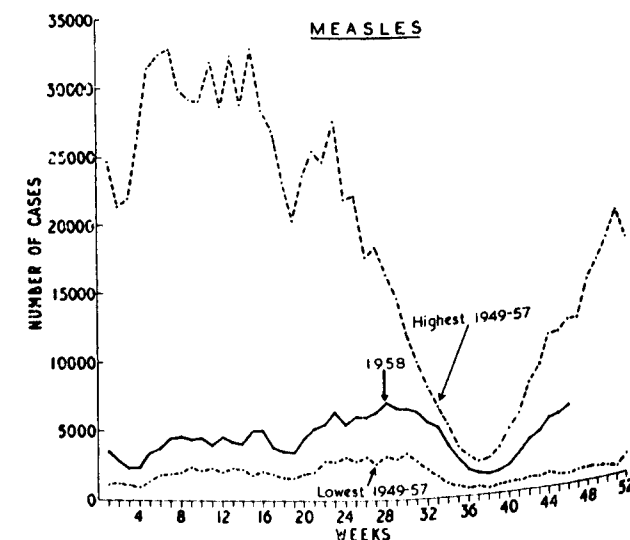
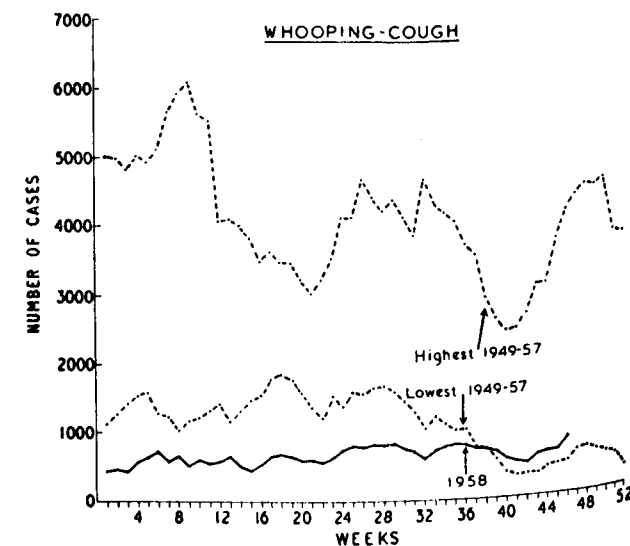
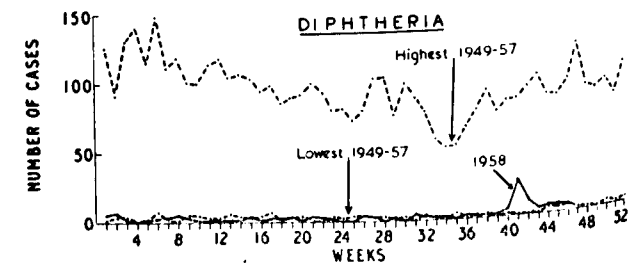
An infectious disease characterized by gastro-enteritis and pneumonia has recently broken out among young infants in the region of Thorne, near Doncaster. 6 deaths had been reported by November 25. The Thorne area consists of two mining communities, Thorne-Moorends and Stainforth-Dunscroft, with a population of 34,000 and a birth rate of 21.3 per thousand population. On October 21 a child of 2 months with gastro-enteritis was admitted to hospital from a caravan site in Thorne. After two weeks the child suddenly developed pneumonia and died in hospital on November 9. A second child, aged 3 weeks, was admitted on November 2 in serious condition and died from pneumonia within 36 hours. This child had had mild gastro-enteritis for some days before admission and had shown no response to thorough drug therapy. At this stage there was no suspicion of any epidemic in progress. Routine stool examination had isolated staphylococci from the stools of these two cases. On the admission of a third case on November 4 investigations were started into finding a common factor. Gastro-enteritis was found to be prevalent among both adults and children.

During November 12 and 13, 3 more deaths were notified in children aged 6 weeks, 6 months, and 1 year. All were admitted in moribund condition and died quickly. All gave a history of mild gastro-enteritis before suddenly developing a rapidly fatal bronchopneumonia. It was now evident that a serious infection was about, especially so as the symptoms preceding the pneumonia were of only a mild nature. The fourth death was reported to the coroner to enable specimens to be obtained for virus research and identification. Inquiry

showed that practically all these patients had been fed on a well-known brand of dried milk, and in view of the isolation of staphylococci from the patients investigations were undertaken to see whether this was a possible source, though it was thought to be unlikely. At the time of going to press a further 11 babies all under 1 year old had been admitted to hospital from this area, 4 from adjacent areas, and 1 (which died) from Hemsworth, a district 20 miles away.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the years 1949-57 (influenza, 1953-7) are shown thus ———, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending November 8 (No. 45) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	6	2	8	0		4	1	0	0	1
Dysentery	626	72	167	4	1	216	28	90	4	
Encephalitis, acute	1	0		0		2	0		0	
Enteric fever: Typhoid	5	1	1	0		8	1	0	0	1
Paratyphoid	4	0	1(B)	0		5	0	1(B)	0	
Food-poisoning	392	29	10	0		126	24	7	1	
Infective enteritis or diarrhoea under 2 years									8	15
Measles*	5,315	307	48	31	307	1,676	30	32	25	19
Meningococcal infection	21	4	10	0	2	28	1	4	1	1
Ophthalmia neonatorum	18	6	5	0		29	2	2	0	
Pneumonia†	294	24	156	1		742	74	279	19	69
Poliomyelitis, acute: Paralytic	59	5		0	5	51	1		3	0
Non-paralytic	23	3		9		10	0			4
Puerperal fever‡	189	21	10	0		5	49	14	0	
Scarlet fever	912	59	103	26	23	444	27	60	14	18
Tuberculosis: Respiratory	497	74	103	16		543	58	132	15	
Non-respiratory	69	7	14	5		67	6	15	1	
Whooping-cough...	643	31	100	104	86	431	17	39	3	10

Venereal Diseases: Gonorrhoea Increasing

In England and Wales during the quarter ending June 30, 1958, 1,055 new cases of syphilis were reported as attending the clinics as compared with 1,244 the previous year. Of these, 163 were classified as primary, secondary, or latent in the first year of infection. 4 cases of congenital syphilis in children aged under 1 year were reported, and 105 cases in persons over that age. New cases of gonorrhoea (with corresponding 1957 figures in parentheses) numbered 6,855 (5,880), of chancroid 64 (51), and of non-gonococcal urethritis (males only) 4,326 (4,280).

New cases of gonococcal infection have sharply increased in both men and women. After the war new cases decreased, and in 1954 reached a record low level of 17,536. Since then they have risen annually, and in 1957 numbered 24,381. This is about the same as the 1949 figures. The increase continued in 1958, and in the first six months of this year 12,911 new infections were seen, compared with 10,953 in the first half of 1957.

Week Ending November 15

The largest fluctuations in the notifications of infectious diseases in England and Wales during the week ending November 15 were increases of 464 for measles, from 5,315 to 5,779, 162 for whooping-cough, from 643 to 805, 63 for scarlet fever, from 912 to 975, and a fall of 196 for food-poisoning, from 392 to 196.

The largest rises in the incidence of measles were 112 in Cheshire, from 262 to 374 (Congleton M.B. 89), 112 in Yorkshire West Riding, from 691 to 803 (Halifax C.B. 197), 84 in Staffordshire, from 156 to 240 (Brownhills U.D. 56), 75 in Lancashire, from 650 to 725 (Liverpool C.B. 138, 75 in Manchester C.B. 81, Preston C.B. 71), and 60 in Surrey, from 120 to 180 (Croydon C.B. 77). No large changes were reported in the local trends of scarlet fever. The largest increase in the number of notifications of whooping-cough was 24 in Lancashire, from 46 to 70. 6 cases of diphtheria were notified, being the same number as in the preceding week.

The notifications of acute poliomyelitis numbered 66, and these were 9 fewer for paralytic and 7 fewer for non-paralytic cases than in the preceding week. The largest returns were Lancashire 12 (Manchester C.B. 5, Denton U.D. 3), Yorkshire West Riding 11 (Huddersfield C.B. 3, York C.B. 2), Harrogate M.B. 2, Hampshire 5 (Southampton C.B. 4), Warwickshire 5 (Birmingham C.B. 4), and Devonshire 5 (Plymouth C.B. 5).

Notifications of dysentery, 614, were 12 fewer than in the preceding week. The chief centres of infection were Yorkshire West Riding 97 (Leeds C.B. 49, Hemsworth R.D. 19), Lancashire 80 (Deptford 14, Lewisham 11, Islington 10), Lancashire 63 (Eccles M.B. 29, Liverpool C.B. 19), Glamorgan-shire 49 (Cardiff C.B. 17, Rhondda M.B. 13), Warwickshire 49 (Coventry C.B. 39, Birmingham C.B. 10), Cambridgeshire 41 (Cherterton R.D. 34), Nottinghamshire 30, Hampshire 26 (Southampton C.B. 18), Essex 24 (Leyton M.B. 15), and Cumberland 20 (Carlisle C.B. 16).

The largest outbreak of food-poisoning was 20 cases in Droylsden U.D., Lancashire.

DEATHS	1958					1957				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	1	1		0		0		0		
Encephalitis, acute		0		0		1			0	
Enteric fever	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years	4	0	0	0	1	0	1	0	1	
Influenza	14	1	0	0	0	24	13	5	10	
Measles		0	0	0	0	0	0	0	0	
Meningococcal infection		0	0			0	0			
Pneumonia	393	32		11	1	52	19	8	18	
Poliomyelitis, acute	3	1	20	0	0	0		0	0	
Scarlet fever		0	0	0	0	0	1	0	0	
Tuberculosis: Respiratory	81	7	10	1	3	11	11	1	4	
Non-respiratory		1	0	0	0	0	1	2	0	
Whooping-cough...	1	0	0	0	1	0	0	0	0	
Deaths 0-1 year	294	36	31	2	11	29	32	6	6	
Deaths (excluding stillbirths)	9,355	839	571	116	158	818	584	126	179	
LIVE BIRTHS	13,748	1148	912	192	372	1129	902	206	430	
STILLBIRTHS	307	30	18			27	22			

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

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Medical News

Travelling Fellowships for 1959-60.—The Medical Research Council invites applications for Rockefeller Travelling Fellowships in Medicine, which are intended for graduates resident in this country who have had some training in research work in medicine, surgery, or medical science; Dorothy Temple Cross Research Fellowships in Tuberculosis, which are offered to suitably qualified British subjects "intending to devote themselves to the advancement by teaching or research of curative or preventive treatment of tuberculosis in all or any of its forms"; Alexander Pigott Wernher Memorial Travelling Fellowships in Ophthalmology and Otolaryngology, which are intended for medical graduates in the United Kingdom and Commonwealth who wish to study the prevention and cure of blindness and deafness. These fellowships are for the academic year 1959-60. Further particulars and forms of application may be obtained from the Secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1, to whom applications should be sent not later than December 31, 1958.

Fulbright Travel Grants.—The United States Educational Commission in the United Kingdom announces that, under the provisions of the Fulbright programme, travel grants are available to citizens of the United Kingdom and dependent territories to go to the U.S.A. for academic or educational purposes, such as study, research, or lecturing. All awards are competitive and are made by the Board of Foreign Scholarships in Washington upon the recommendations of the Commission. All applicants must possess a guarantee of adequate financial support in dollars for their visit, and afterwards they are expected to return to reside permanently in their home countries. Those in the graduate student category are expected to go to the United States for the academic year beginning in September, 1959. For those in the lecturer/research scholar category, travel grants are available between June 1, 1959, and April 1, 1960. The closing dates for applications are March 14 for those travelling between June 1 and August 15, 1959; and June 1 for those travelling between August 16, 1959, and April 1, 1960. Further details may be obtained from the Commission, 71, South Audley Street, London, W.1.

Rockefeller Grants.—For the third quarter of 1958 Rockefeller Foundation grants totalled \$1,777m. Grants for medical education and public health accounted for \$480,107, and for biological and medical research \$232,557. Major grants were provided for research on genetics (in Switzerland and Sweden) and on the mode of action of insecticides (U.S.A.). In Britain the department of chemistry at King's College, Newcastle upon Tyne, receives \$15,000 for work on the chemistry of biologically important compounds, under the direction of Professor J. BADDILEY. Sir HAROLD HIMSWORTH, F.R.S., Secretary of the Medical Research Council, receives a grant to allow him to confer with scientific colleagues in the United States; and Professor C. H. WADDINGTON, F.R.S., professor of animal genetics at Edinburgh, receives support for a study of the influence of science on the visual arts during the twentieth century.

"International Pharmacopoeia."—The W.H.O. expert committee on the *International Pharmacopoeia* met in Geneva last month to discuss the preparation of the second edition. Volumes I and II of the first edition were published in French, English, and Spanish and subsequently translated into German and Japanese. A supplement to these two volumes is being printed, and the committee, which included Mr. T. C. DENSTON, secretary of the British Pharmacopoeia Commission, also discussed the publication of information sheets about new pharmaceutical preparations.

General Optical Council.—Mr. G. G. BAKER, Q.C., Recorder of Wolverhampton, has accepted the invitation of the Privy Council to be chairman of the General Optical Council, which will be established under the Opticians Act, 1958, on January 1. The full membership of the Council is expected to be announced shortly. Mr. A. T. GERARD, of the Ministry of Health, has been appointed registrar of the Council.

Edgar-Gentili Scholarship.—The council of the Royal College of Obstetricians and Gynaecologists invites applications for the Edgar-Gentili scholarship (up to a total value of £1,000 per annum). Its primary object is to encourage research on chorionepithelioma, although work on the trophoblast, its interaction with maternal tissue, or on the placenta may be regarded as relevant. Further details are to be found at p. 52 of the advertisements. The closing date for applications is December 31, 1958.

Lalor Foundation.—For its programme of grants next year the Lalor Foundation offers grants in support of research on the basic biochemical and biophysical mechanisms affecting fertility and reproduction in various species. The grants range from a nominal amount up to \$8,000 a year, and they are designed primarily to assist younger academic research workers. Awards may be granted to nationals other than U.S. citizens, though usually on condition that the research is done at an American institution. The final date for applications is January 14. Further details are obtainable from the Lalor Foundation, 4400, Lancaster Pike, Wilmington, 5, Delaware, U.S.A.

Medical Psychotherapy.—At the International Congress of Psychotherapy, held in Barcelona in September, it was decided to set up an international organization to promote co-operation and the exchange of views between medical psychotherapists, irrespective of their school. The *Acta Psychiatrica* was adopted as the organization's official journal, and it was decided to hold an international congress every three years, the next to be in Vienna in 1951. The following were elected to the committee: *president*, Professor M. Boss (Zurich); *vice-president*, Professor R. SARRO (Barcelona); *hon. secretary*, Dr. H. K. FIERZ (Kreuzlingen, Switzerland); *hon. treasurer*, Professor E. CARP (Leyden); and Dr. J. BIERER (London), Dr. R. EGG-OLFSSON (Stockholm), Professor V. FRANKL (Vienna), and Mrs. E. WEIGERT (U.S.A.).

Society for Psychosomatic Research.—The annual dinner was held at the Royal College of Physicians of London on November 20. The guest of honour was Dr. KURT HAHN, formerly headmaster of Gordonstoun School.

Honorary Degrees at Leeds.—The court of Leeds University has decided to confer the honorary degree of D.Sc. on Mrs. DOROTHY HODGKIN, F.R.S., reader in x-ray crystallography at Oxford, and on Sir RUDOLPH PETERS, F.R.S., at a congregation on May 14.

Dr. R. S. Aitken, Vice-Chancellor of Birmingham University, had conferred on him recently the honorary degree of Doctor of Laws of McGill University.

Sheffield University.—Dr. M. A. WILSON, deputy director of the Public Health Laboratory, Sheffield, has been appointed an honorary part-time lecturer in bacteriology.

Faculty of Medicine, Bristol.—Dr. E. W. BRADFORD, senior lecturer in preventive dentistry and parodontal diseases at St. Andrews, has been appointed to the chair of dental surgery from March 31, 1959. Professor A. I. DARLING will assume the title of "professor of dental medicine."

Guy's Hospital Medical School.—The title of "reader in orthodontics in the University of London" has been conferred on Mr. W. J. TULLEY in respect of his post at Guy's Hospital Medical School.

COMING EVENTS

St. Bartholomew's Hospital.—The 13th Decennial Club will meet on December 6 at the Connaught Rooms, London, W.C.2. Further details may be obtained from the secretaries of the club, St. Bartholomew's Hospital, London, E.C.1.

FitzPatrick Lectures.—Dr. W. S. C. COPEMAN will lecture at the Royal College of Physicians on December 9 and 11 at 5 p.m. His subject will be "Medical Practice in the Tudor Period."

Harben Lectures.—Sir SAMUEL P. BEDSON, F.R.S., will lecture on "The Psittacosis-Lymphogranuloma Group of Infective Agents" on December 8, 9, and 10, at 4 p.m. at the Royal Institute of Public Health and Hygiene, 28, Portland Place, London, W.1.

British Records Association.—Exhibition of medical records (see p. 1328) in the library of the Royal College of Physicians of London until December 12 (weekdays 10 a.m.-5 p.m.; Saturdays 10 a.m.-1 p.m.).

Stubbs's Anatomical Drawings.—A collection is on view in the gallery of the Arts Council, 4, St. James's Square, London, S.W.1, until December 13, from 10 a.m. to 6 p.m. including Saturdays (Tuesdays and Thursdays, 10 a.m. to 8 p.m.).

NEW ISSUES

SPECIALIST JOURNALS AND ABSTRACTS

The journals listed below are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, December 1

DENTAL AND MEDICAL SOCIETY FOR THE STUDY OF HYPNOSIS.—At Royal Society of Medicine, 8 p.m., Dr. A. G. Davies: Hypnosis, Sex, and Sexual Disorders.
GUY'S HOSPITAL.—At Anatomy Lecture Theatre, 5.15 p.m., lecture-demonstration in endocrinology by Dr. P. M. F. Bishop: Hypopituitarism.
● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Chelsea Hospital for Women, 4.30 p.m., Guest Lecture by Mr. Frank Denny: Carcinoma and other Disorders of the Vulva.
LIVERPOOL UNIVERSITY: FACULTY OF MEDICINE.—At Large Lecture Theatre, New Medical School, Ashton Street, 12 noon, Mr. D. P. Choyce: Onchochercal Eye Lesions.
MARLBOROUGH DAY HOSPITAL.—8.15 p.m., film: Aspects of Childhood Psychosis. A discussion will follow.
UNIVERSITY COLLEGE LONDON.—At Physiology Lecture Theatre, Gower Street, W.C., 5.30 p.m., special university lecture in pharmacy by Professor Z. M. Bacq (Liège): Substances Which Protect Against Ionizing Radiations.

Tuesday, December 2

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. C. N. Armstrong: Intersexuality.
ILFORD MEDICAL SOCIETY.—At King George Hospital, 8.45 p.m., Squadron Leader P. Howard: "Some Physiological Aspects of High Speed Flight." Members of Stratford Division, B.M.A. are invited.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. B. Russell: Bacteria on the Skin Surface.
MANCHESTER UNIVERSITY: DEPARTMENT OF OCCUPATIONAL HEALTH AND NORTH-WEST ENGLAND FACULTY, COLLEGE OF GENERAL PRACTITIONERS.—At Theatre 1, Clinical Sciences Building, York Place, 8.30 p.m., Professor R. E. Lane: Some Industrial Diseases.
ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Sir James Paterson Ross: Changing Scene of Surgery.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor G. S. M. Bothe: Closing Mechanism Between Stomach and Oesophagus and its Importance in Surgery of the Gastro-oesophageal Junction.
ST. ANDREWS UNIVERSITY.—At Physiology Department Lecture Theatre, 5 p.m., Dr. J. Iball: Investigating the Molecular Structure of Biological Materials.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. E. A. J. Alment: Foetal Distress and Resuscitation of the Newborn.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.30 p.m., Dr. W. S. Feldberg, F.R.S.: Some Physiological Aspects of General Anaesthesia.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. E. H. Larkin: "Physical" Treatments in Psychiatry.

Wednesday, December 3

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. A. Tickner: Some General Aspects of the Biochemistry of the Skin.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Mr. W. P. Cleland: Secondary Lung Tumours.

INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—5.30 p.m., Dr. I. Friedmann, Dr. D. A. Osborn, and Dr. A. L. Jeames: clinical pathological conferences.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. A. W. Badenoch: Haematuria.

MANCHESTER MEDICAL SOCIETY.—At Large Anatomy Theatre, Manchester University, 4.30 for 5 p.m., Dr. J. D. Spillane: The Cervical Spine.

MIDLAND MEDICAL SOCIETY.—At Birmingham Medical Institute, 8.15 p.m., symposium by Dr. M. J. Meynell, Dr. S. Sevit, and Mr. H. C. McLaren: Prevention and Treatment of Pulmonary Embolism.

● NATIONAL COLLEGE OF RUBBER TECHNOLOGY, Northern Polytechnic, Holloway Road, N.—6.30 p.m., Mr. W. C. Favager: Plastics in Hospital Equipment.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Guest Lecture by Dr. R. I. S. Bayliss: Laboratory Investigations in Endocrinology.

UNIVERSITY COLLEGE LONDON.—(1) At Physiology Lecture Theatre, Gower Street, W.C., 5.30 p.m., special university lecture in pharmacy by Professor Z. M. Bacq (Liège): Substances Which Protect Against Ionizing Radiations. (2) At Anatomy Theatre, Gower Street, W.C., 5.30 p.m., special university lecture by Professor O. E. Lowenstein: Sensory Function and Qualitative Information.

Thursday, December 4

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. E. F. Scowen: Hyperoxaluria.

FOUNTAIN HOSPITAL.—5.30 p.m., symposium: Psychological Research in Mental Deficiency. Papers by Dr. Mary Woodward, Mr. F. Orford, Mr. J. Lyle, Mrs. Lydia Mundy, and Mrs. M. W. Gillian Brandon.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Mr. L. H. Savin: Facies in Disease.

ROYAL COLLEGE OF SURGEONS OF ENGLAND AND INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—At Royal College of Surgeons of England, 5.30 p.m., Otolaryngology Lecture by Sir Stanford Cade: Cancer of the Tongue.

ROYAL SOCIETY OF HEALTH.—At Wulfrun Hall, Wolverhampton, 10 a.m., Dr. P. Phelps and Mr. G. W. Mullett: Radiation Hazards and the Local Authority; Miss Hilary Clark: Some Human Aspects of Over-spill Housing.

ST. ANDREWS UNIVERSITY.—At Physiology Department Lecture Theatre, 5 p.m., Professor J. I. P. James: Early Treatment of the Injured Hand.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Sir Paul Mallinson: postgraduate demonstration in psychiatry.

UNIVERSITY COLLEGE LONDON.—At Anatomy Theatre, Gower Street, W.C., 5.30 p.m., special university lecture by Professor O. E. Lowenstein: Sensory Function and Qualitative Information.

Friday, December 5

● INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. A. D. Porter: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. N. S. Plummer: clinical demonstration.

INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—3.30 p.m., clinical discussion for general practitioners by Mr. Wallace Black: Swellings in the Neck and their Management.

PLYMOUTH MEDICAL SOCIETY.—At Freedom Fields, 8.30 p.m., Professor Alan Moncrieff: Marasmus in Young Children—a new outlook.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 10 a.m., Guest Lecture by Mr. R. V. Cooke: More About Biliary Tract Surgery. (2) 4 p.m., Guest Lecture by Professor N. H. Martin: Myelomatosis.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At Royal Faculty of Physicians and Surgeons of Glasgow, 8.30 p.m., short papers by Dr. W. A. J. Crane, Dr. W. G. Whyte, and Dr. R. Fife.

UNIVERSITY COLLEGE LONDON.—At Anatomy Theatre, Gower Street, W.C., 5.30 p.m., special university lecture by Professor O. E. Lowenstein: Sensory Function and Qualitative Information.

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., joint meeting with East Metropolitan Branch of Pharmaceutical Society. Lecture by Superintendent G. E. Salter (New Scotland Yard): Scientific Detection of Crime.

Saturday, December 6

INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—11.30 a.m., special lecture by Mr. J. A. Sullivan (Toronto): Modern Temporal Bone Surgery.

KENT PAEDIATRIC AND CHILD HEALTH SOCIETY.—At Children's Department, Farnborough Hospital, 3 p.m., Dr. A. Elliott: New Development in Child Health.

MIDLAND THORACIC SOCIETY.—At Birmingham Medical Institute, 3 p.m., Dr. C. W. D. Cole: The Working Foundryman and his Chest.

SOUTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At St. Bartholomew's Medical College, 10 a.m., joint meeting with North-East Metropolitan Regional Tuberculosis Society.

Sunday, December 7

UNIVERSITY COLLEGE HOSPITAL.—10.15 a.m., meet in Rowland Ward Hall, St. Pancras Hospital, St. Pancras Way, N.W. Lecture-demonstration for general practitioners. Clinical demonstration by Lord Amulree: Care of the Aged.

BIRTHS, MARRIAGES, AND DEATHS

DEATHS

Barton.—On October 24, 1958, at his home, Douglas Elliott Barton, M.B., B.S., C.P.H., D.I.H., of Bexley Heath, Kent.
Crabtree.—On November 7, 1958, at Scarborough Hospital, Jane Crabtree (formerly Bamford), M.B., Ch.B., of 2, Holbeck Court, Scarborough, Yorks.
Lewis.—On November 9, 1958, in hospital, Glyndwr Morison Lewis, T.D., M.R.C.S., L.R.C.P.
McLean.—On November 7, 1958, at Eastwood, Notts, Leslie George McLean, M.M., M.B., Ch.B., of 59 Nottingham Road, Eastwood.
Masters.—On November 7, 1958, Edgar James Masters, M.B., B.S., D.C.H., D.R.C.O.G., of Cornerways, The Boulevard, Worthing, Sussex, aged 30.
Porter.—On November 5, 1958, at Godalming, Surrey, Douglas Porter, M.B., Ch.B., D.P.H.
Roberts.—On November 9, 1958, in a nursing home, Wilmslow, Cheshire, Hubert Shearwood Roberts, M.D., late of Southport, Lancs.
Waller.—On November 7, 1958, at The Croft, The Street, Rustington, Sussex, Wathen Ernest Waller, M.D., M.R.C.P.
Whitley.—On November 4, 1958, in hospital, William Frederic James Whitley, M.D., D.P.H., of 44, Church Burn Drive, Morpeth, Northumberland, aged 84.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Serum Lipase and Protease

Q.—What are the normal values of serum lipase and protease (the various trypsin-like enzymes), and what are the approximate values of significance in pancreatitis?

A.—Normal values of serum lipase are up to 12 units. A definition of the units and details of the method are given by Cherry and Crandall¹ and also by Maclay.² Little of the lipase normally present in serum is derived from the pancreas, but in pancreatitis the pancreatic contribution, and hence the total serum lipase, rises—the latter being roughly parallel to the serum diastase—though declining more slowly as the pancreatitis subsides. On the whole lipase estimations add little information to that supplied by diastase estimations, and for this reason, and also because estimation of lipase is not simple, the method has been little used as a diagnostic test.

Methods for estimating serum trypsin have hitherto proved unsatisfactory. But recently Nardi³ has devised a method in which a synthetic polypeptide (α -benzoyl-L-arginine amide hydrochloride) is the substrate, the amide group being split off: the ammonia so formed is a measure of tryptic activity. Nardi's control group (8 normals and 27 patients without pancreatic disease) is small and needs extending to include a group with extensive tissue necrosis. In this control group serum trypsin varied between 0 and 120 units, except in one case of cholecystitis, where the figure was 260 units. In 14 of 16 cases of pancreatitis serum trypsin exceeded 240 units, although in 6 of these cases serum diastase and lipase were normal. In 7 cases of carcinoma of the pancreas serum trypsin was greatly raised in 6, although in 4 of these serum diastase and lipase were normal. Nardi's data suggest that estimation of serum trypsin provides a more reliable test for pancreatitis and carcinoma of the pancreas than estimation of diastase or lipase. In chronic sclerosing conditions of the pancreas all these tests are likely to be negative.

REFERENCES

- ¹ Cherry, I. S., and Crandall, L. A., *Amer. J. Physiol.*, 1932, **100**, 266.
- ² Maclay, E., *Amer. J. med. Tech.*, 1948, **14**, 197.
- ³ Nardi, G. L., *J. Lab. clin. Med.*, 1958, **52**, 66.

Disinfecting Vehicles

Q.—What is the most effective method of disinfecting a vehicle after transport of infectious diseases?

A.—The best method, to leave the inside of the vehicle in an acceptable state, is to use a "white" disinfectant (stable emulsions of crude cresol and the higher phenolic constituents of coal tar in water; on dilution they form weaker emulsions) with a fine spray two or three times, or 25% formalin in industrial spirit with oil of lavender *q.s.* The interior is then wiped down and the doors left open.

Wintering Abroad

Q.—Would wintering abroad help a patient who has attacks of bronchitis each winter, and, if so, where?

A.—A sufferer from winter cough of this character would certainly benefit from avoidance of the climatic conditions that are usual in this country during the first quarter of the year. There is a wide choice of suitable residences abroad. If there is an asthmatic element or any considerable degree of emphysema, altitude demands some attention, since for some indefinite reason, whether physical or biochemical, asthmatic subjects are most comfortable at a critical height, and those with emphysema and any cardiac disability should avoid situations above three or four thousand feet (914–1,219 m.). With these exclusions, the elevated valleys of Davos and Arosa—about 5,000 feet (1,524 m.)—are satisfactory at this time of the year. The banks of the Lake

of Geneva—1,200 feet (336 m.) or so—which are well protected from wind, are also suitable. Of entirely different type are Madeira, the Canaries, Gibraltar, Majorca, the British West Indies, Algiers, and Assouan. The last-named, on the edge of the desert, appeals strongly to me.

There is thus no difficulty in nominating desirable residences: the choice is dependent upon a number of factors apart from climate. Expense may be of crucial importance both in transport and—since a long-term arrangement is contemplated—in residence. Social and psychological considerations demand attention, and into these enter individual tastes and habits. One may be easily reconciled to comparative solitude, and in fact prefer to be left to his own resources, while another suffers intolerable boredom without the provision of social contacts, distractions, entertainments, and recreations. It is clear, therefore, that it is necessary to decide what the patient desires apart from change of climate and to make appropriate inquiries about the circumstances of the various places mentioned, especially if his experience as a traveller has been limited. If I place Assouan in the forefront it is from recollection of my own visits during the months of January–February. I preserve the impression of a perfect climate. This, however, was many years ago and inevitably much alteration in accommodation and other matters must have occurred. Algiers, especially Mustapha Supérieur, has attractive features apart from climate, which, although satisfactory, cannot compete with that of Assouan. By the end of March it is sometimes rather uncomfortably hot. The journey is much shorter than that to Assouan. Transport to all places mentioned is naturally a variable feature.

Cresol Vapour

Q.—Is there any likelihood of cresol vapour being carcinogenic when inhaled frequently in the treatment of some respiratory conditions?

A.—There is no evidence that pure cresol is carcinogenic, and the fraction from coal tar which contains cresols would be unlikely to contain any of the known carcinogenic hydrocarbons in any quantity. Although it is difficult to be certain, it would seem to be unlikely that cresol vapour used in the treatment of respiratory conditions would cause cancer.

NOTES AND COMMENTS

Fibrinosol.—In experimental work to devise a serum test for the early diagnosis of carcinoma use is sometimes made of an organic substance called fibrinosol. Ashe Laboratories Ltd., Ashetree Works, Kingston Road, Leatherhead, Surrey, inform us that fibrinosol is a by-product of their chemical manufacture, and they are willing to supply it free of charge to any hospital on request.

Disclaimer by Professor Aird.—Professor IAN AIRD writes: Would you be kind enough to inform our profession through your columns that the illustrated article which appeared on November 23 in a Sunday newspaper, and in which my name featured, was prepared and published without information from me and without my knowledge, nor did I furnish the illustrations for it.

Correction.—The fifth sentence of Mr. H. H. Nixon's letter on extra skin creases ("Notes and Comments," November 15, p. 1244) should read: "He did not mention that they also had symmetric skin creases . . ." not " . . . asymmetric skin creases. . ."

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: Aitology, Westcent, London. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1. on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad. ADVERTISEMENTS should be addressed to the Advertisement Director, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads*, Westcent, London. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecra*, Westcent, London. B.M.A. SCOTTISH OFFICE: 7, Drumshough Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 6 1958

THE TREATMENT OF VENTRICULAR SEPTAL DEFECT

BY

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The natural history of ventricular septal defect (V.S.D.) is such that few patients survive past the third decade (Brotmacher and Campbell, 1958). It is therefore fortunate that the introduction of the cardio-pulmonary bypass has permitted effective surgical treatment. This bypass is now current practice in the U.S.A. (Kirklin *et al.*, 1957; Warden *et al.*, 1957; Gerbode *et al.*, 1958). The object of this paper is to present a series of 21 patients with V.S.D.s, operated on under total cardio-pulmonary bypass with the Melrose-N.E.P. pump-oxygenator at Hammersmith Hospital. These patients form the major group of a total of 40 operated on in this way for the correction of congenital cardiac defects during the last 18 months.

The Patients.—The ages of the 21 patients ranged from 2½ to 25 years, the average being 8½ years. Of these patients with V.S.D. four had in addition a patent ductus arteriosus. Of the cases without a duct three were unusual. One had a single ventricle, one had two V.S.D.s, and in one the V.S.D. was in an unusual site in relation to the tricuspid valve (Case 13).

Clinical Picture

Symptoms

Infancy is known to be a hazardous period in patients with large V.S.D.s, and over half of the 320 patients of Keith *et al.* (1958) died before the age of 1 year. Similarly, in our cases there was often a history of feeding difficulties, with breathlessness and cyanosis, and very slow weight gain in infancy. After the age of 1 year they did better, though frequent chest infections were still common, and when seen by us they were often remarkably asymptomatic and active. Dyspnoea on exertion was no more than slight in two-thirds and was severe in only one case (Case 2).

Signs

These children were commonly undersized for their age, being on average 18% below the expected weight. Chest deformity with uniform or asymmetrical bulging of the sternum and Harrison's sulcus was frequently noted (Fig. 7). Clubbing was never seen, but slight cyanosis was occasional and was usually peripheral.

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†In receipt of British Council Bursary.

the arterial oxygen saturation being always above 88%. No patient had congestive heart failure at the time of operation.

Jugular Venous Pulse.—This was abnormal in eight, consisting usually of a moderately dominant *a* wave; a really conspicuous *a* wave was seen only once (Case 13).

Arterial Pulse.—The volume was usually normal or slightly small and the rhythm regular. A slight-to-moderate waterhammer quality was found in 11. A striking suprasternal arterial pulsation was found in Cases 14 and 15, which had in addition a patent ductus.

Cardiac Pulsation.—The type of pulsation varied according to the size of the left-to-right shunt and the pulmonary resistance. When the shunt was considerable there was a localized hyperdynamic thrust at the apex, indicating left ventricular enlargement, and a diffuse parasternal heave due to enlargement of the right ventricle. When the shunt was smaller and the pulmonary resistance appreciably raised (around 9 units) the left ventricular thrust was less impressive and the dominant pulsation was that of the right ventricle.

Auscultation

V.S.D. Thrill and Murmur.—These were usually maximal at the left sternal edge, and in most cases the murmur was loud and long, indicating a substantial flow through the defect (Fig. 1A). In the patients with a pulmonary resistance of 9 units or more the murmur and thrill were softer and shorter, owing to reduction in flow through the defect (Fig. 1C).

Apical Diastolic Murmur.—A low-pitched delayed murmur at the apex attributed to a torrential mitral blood flow (Wood, 1956) was heard in all cases. When loud and long the left-to-right shunt was always large (Fig. 1A). We expected, when the murmur was soft and short, that the shunt would be small and the resistance high, but this was not always so. Of the six cases with this type of murmur, four had a large shunt and in two the shunt was small.

Basal Diastolic Murmur.—An early blowing diastolic murmur was heard in the left second to third spaces in eight patients. At operation three were shown to have a ductus, one was proved to have aortic incompetence, and one to have pulmonary incompetence. The cause

of the murmur was not determined in the remaining three and disappeared after operation in one. In these three it was presumed to be due to aortic or pulmonary incompetence.

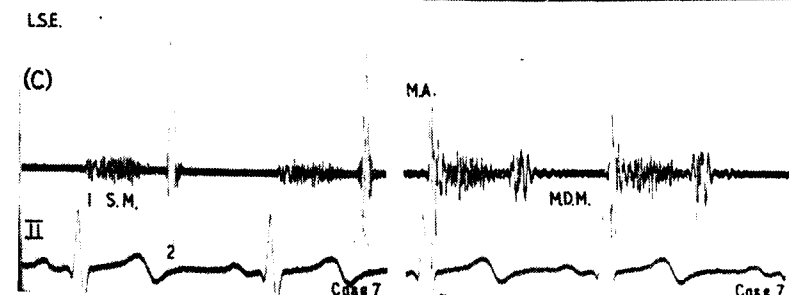
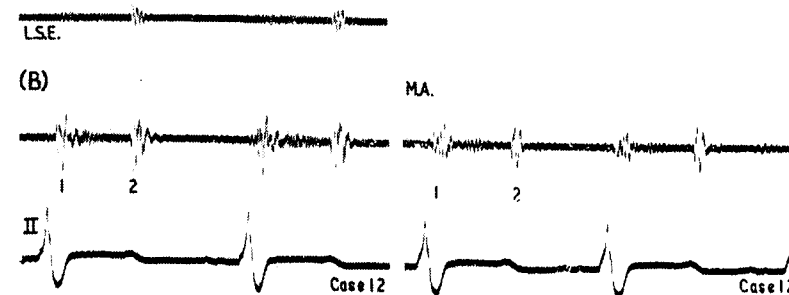
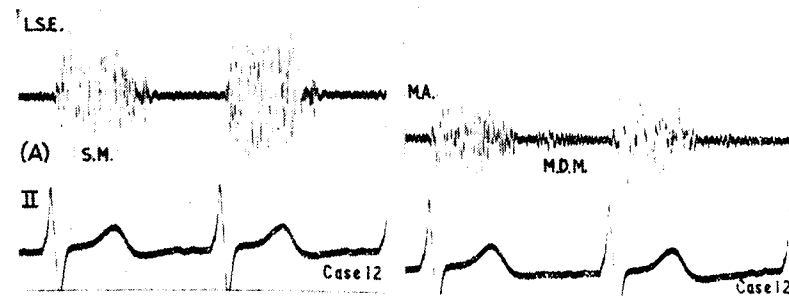


FIG. 1.—Phonocardiograms taken at the left sternal edge (L.S.E.) and at the mitral area (M.A.). (A) Loud long systolic murmur (S.M.) and long mitral diastolic murmur (M.D.M.) in a patient with a large left-to-right shunt and low pulmonary resistance. (B) Same patient as (A) showing disappearance of significant murmurs after closure of defect. A soft ejection systolic murmur is shown. Note appearance of right bundle-branch block. (C) Short soft systolic murmur in a patient with only a small left-to-right shunt and high pulmonary resistance. The second heart sound is very loud and virtually single, and the mitral diastolic murmur is soft and short.



FIG. 2.—Postero-anterior and lateral views of the heart in Case 4 with a large left-to-right shunt and only slightly elevated pulmonary resistance. The right ventricle and pulmonary artery are enlarged and there is pulmonary plethora. Definite left atrial enlargement is seen in the lateral view.

Second Heart Sound.—This was loud and narrowly split in all patients except three. One of these was found to have definite organic pulmonary valve stenosis at operation, one had aortic incompetence and infundibular obstruction and the other (Case 13) had an unusual defect, referred to later.

Other Sounds.—Two cases had a pulmonary ejection click and high pulmonary pressures, but with a substantial shunt. An ejection click at the apex, thought to be aortic, was heard in one patient who had also a patent ductus. No other abnormal sounds were heard in any patient.

Associated Non-cardiac Anomalies

These were usually absent, but one patient had stigmata of the "rubella syndrome" and also a patent ductus. Another patient had right basal bronchiectasis.

Methods of Study

Radiology

The heart was enlarged in every case, being usually moderate in degree with a cardio-thoracic ratio of 55–65%. Enlargement was considerable in two and slight in three. Both ventricles were enlarged in every case. The left ventricle tended to be less prominent in the cases with a high pulmonary resistance. Left atrial enlargement, of slight-to-moderate degree, was present in all save two, of whom one had substantial infundibular stenosis and the other a high pulmonary resistance (14 units). Impressive right atrial enlargement was seen only twice. One of these patients (Case 13) appeared at operation to have tricuspid incompetence; in the other patient (Case 21) clockwise cardiac rotation was found at operation.

Enlargement of the main pulmonary artery was invariable, as was plethora of the lung fields. Intrinsic pulsation of the small branches was well marked in all. The size of the aorta was unremarkable.

Fig. 2 shows the radiological features in a typical case.

Aortography was performed on two patients and one was shown to have a patent ductus (Case 20).

Electrocardiography

Right atrial P waves were found in six cases and were gross in only one (Case 13). Left atrial P waves occurred in 11. Direct evidence of right ventricular hypertrophy (Hollman, 1958) was found in 11, and 7 of these had an RSR pattern in VI and one had complete right bundle-branch block. Direct evidence of left hypertrophy (Cabrera and Monroy, 1952) consisting variously of deep Q waves, tall R waves, or tall peaked T waves was found in 19 (Fig. 3).

Lone right hypertrophy was found in only one (Fig. 4), while solitary left hypertrophy occurred in six. Thus 14 patients had combined hypertrophy. In six of these the right ventricle appeared dominant and in three the left. We had expected that when the left ventricle dominated the

right the pulmonary flow would be higher and the resistance lower than when the right ventricle was dominant. This was not the case, for there was no clear relationship between the cardiographic and haemodynamic findings. Further, it was anticipated that when the right ventricle dominated the

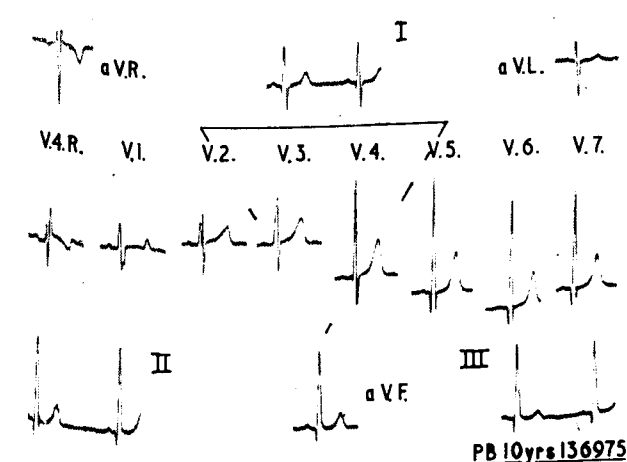


FIG. 3.—Electrocardiogram of Case 19, showing dominant left ventricular hypertrophy with deep Q waves, tall R waves, only small S waves, and tall T waves in V5-V7. Slight right ventricular hypertrophy is present too.

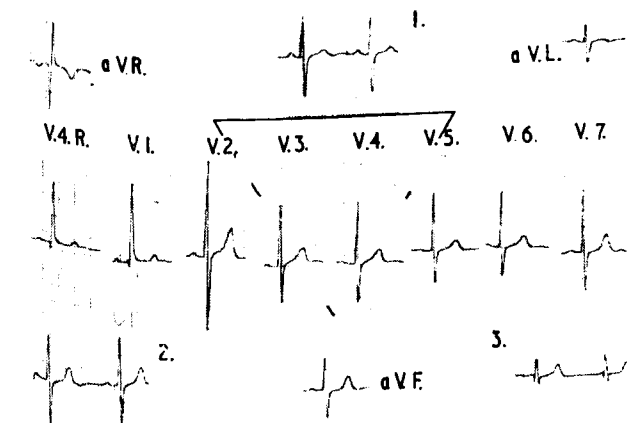


FIG. 4.—Electrocardiogram of Case 1 showing dominant right ventricular hypertrophy with no clear evidence of left ventricular hypertrophy at all. There is a monophasic R wave in V1 with S waves across to V7 and a dominant R wave in lead aVR. There are no Q waves in V5-V7.

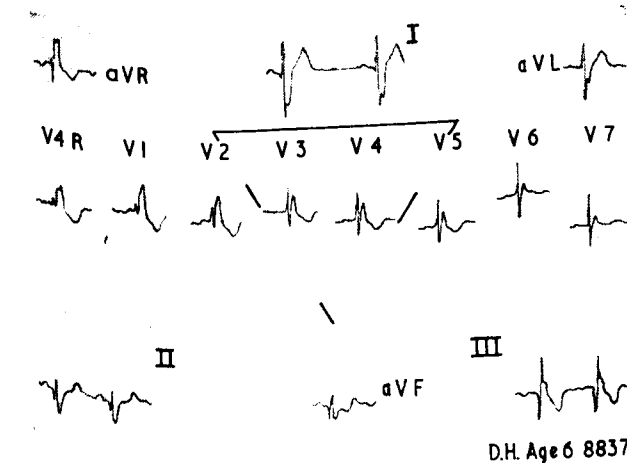


FIG. 5.—Post-operative electrocardiogram of Case 4 showing complete right bundle-branch block with the secondary R wave present even in V7. Well-marked T-wave inversion is present across to V5.

left a smaller fall of right heart pressure would occur than when the left ventricle was dominant, but we were disappointed in this also. Nevertheless we continue to use the cardiogram in the assessment of individual patients in the belief that the presence of left hypertrophy is a favourable sign.

Cardiac Catheterization

This was carried out in every case, and the data were used to estimate the size of the defect, the severity of the pulmonary vascular disorder, and the presence of associated anomalies. The size of the left-to-right shunt was expressed as the ratio of pulmonary to systemic flow.

$$\frac{\text{Pulmonary flow}}{\text{Systemic flow}} = \frac{\text{Systemic A-V O}_2 \text{ difference}}{\text{Pulmonary A-V O}_2 \text{ difference}}$$

The pulmonary arteriolar resistance was expressed in arbitrary units (Wood, 1956), and in cases where the oxygen consumption was not measured an average value for age and surface area was obtained from tables.

The results of this investigation are summarized in Table I.

TABLE I.—Haemodynamic Studies at Catheterization, at Operation, and Results

Case No.	Age	Pulmonary Artery Pressure (mm. Hg)	Pulmonary Systemic Flow Ratio	Pulmonary Arteriolar Resistance (Units)	% Fall in R.V.P.† L.V.P.	Result
V.S.D. Alone						
1	10	100/57	1.5	9*	37	Dead
2	24	39/12	5.0	3*	6	Alive and well
3	5	100/35	1.8	13*	65	" "
4	5	70/20	2.0	4	9	" "
7	7	75/55	1.1	17*	2	" "
8	7	70/40	2.2	6*	41	" "
10	10	83/48	2.0	6	58	" "
11	8	120/70	2.0	9	44	" "
12	10	60/30	2.4	3.5*	37	" "
13	9	42/20	2.5	1.5	13	" "
16	44	75/40	2.7	9.5*	54	" "
17	9	55/20	1.8	5*	8	" "
18	25	17/5	4.5	1*	55	" "
19	11	32/8	3.2	1.5*	31	" "
21	13	44/8	2.6	1.5	16	" "
V.S.D. and Patent Ductus						
5	34	40/20	2.8	1*	27	Dead
14	10	110/60	2.0	20*	5	" "
15	9	70/53	1.3	18*	—	Alive and well
20	34	60/20	3.7	4.5*	28	" "
Two Ventricular Defects						
9	24	72/20	2.6	10*	0	Dead
Single Ventricle						
6	7	75/30	2.0	5	0	Alive and well

* = O₂ consumption assumed.

† R.V.P. = right ventricular systolic pressure. L.V.P. = left ventricular systolic pressure.

% fall in R.V.P. = R.V.P. % before closure minus R.V.P. % after closure.

% fall in L.V.P. = L.V.P. % before closure minus L.V.P. % after closure.

Also see text.

The pulmonary artery pressures ranged from 17/5 to 120/70, and were mostly of the order of 70/50 mm. Hg. The left-to-right shunt was large in all but three cases, the ratio of pulmonary to systemic flow ranging from 1.1:1 to 5:1, with an average of 2.4:1. The pulmonary resistance was usually only moderately elevated, but in four patients it was high. The average for all cases was 7.4 units. An infundibular gradient, usually slight, was found in nine patients and ranged from 7 to 40 mm. Hg. One patient had a 30 mm. Hg gradient at valve level. The oxygen saturation was higher in the pulmonary artery than the right ventricle in four patients, of whom two had an associated patent ductus. In two cases proved to have a ductus the saturation in the two sites was equal. The arterial oxygen saturation was always above 88%, and averaged 93%.

The pulmonary wedge pressure when determined ranged from 5 to 16 mm. Hg (measured from 5 cm. below the sternal angle).

Associated Lesions and Unusual Features

Patent Ductus Arteriosus.—The classical signs were absent, although suspicion was raised by an early diastolic murmur at the left sternal edge in two. Cardiac catheterization

revealed a further rise in oxygen saturation in the pulmonary artery as compared with the right ventricle in only two, even though in another the ductus was found at operation to be large and the ventricular defect small. On x-ray examination the pulmonary artery was always at least moderately dilated. Our experience indicates that when the ductus is patent in the presence of a V.S.D., it is difficult to diagnose pre-operatively with certainty without the aid of retrograde aortography. The importance of the patent ductus in relation to perfusion is discussed below. Patency of the ductus should be suspected if there is a basal early diastolic murmur, if the catheterization data suggest a further left-to-right shunt at pulmonary artery level, or if there are any other features associated with patent ductus, as in one of our patients who had stigmata of the "rubella syndrome" (Heiner and Nadas, 1958).

Obstruction to Right Ventricular Outflow.—Nine patients were found to have infundibular obstruction at cardiomy, while another had definite valvular stenosis. In no case was the obstruction severe enough to reverse the left-to-right shunt, and the pulmonary artery pressure was elevated in all but one.

Pulmonary Valve Lesions.—Two patients had abnormal valves. In Case 5 the cusps were fused and the orifice reduced to 1 cm. in diameter. In Case 18 the cusps were adherent to the pulmonary ring, and this gave rise to pulmonary incompetence with a diastolic thrill.

Atypical Ventricular Defects

Case 6.—This boy of 7 years with a single ventricle was of exceptional interest, for pre-operatively all the signs were those of a straightforward ventricular defect apart from the cardiogram. This showed gross left-axis deviation with extreme clockwise rotation and absent Q waves over the left ventricle.

Case 9.—This patient, a girl aged 2½ years, had two ventricular defects, and pre-operatively the only hint of an associated lesion was a very large diphasic complex in lead I of the cardiogram.

Case 13.—In this girl of 9 years the defect was a low one beneath the septal cusp of the tricuspid valve, and the jet from the left ventricle was directed partly into the right atrium. Clinically the patient was unusual because she had a tall a wave, a widely split second sound, a very large right atrium, and the systolic thrill was near the apex.

Indications and Contraindications to Operation

In view of the known poor prognosis it is clear that all patients with a moderate-sized or large defect should be considered for surgery unless there is some contraindication. It is equally clear that the main hazard regarding closure is the presence of severe pulmonary vascular disease, because patients with this complication have a very high operative mortality and also may derive uncertain benefit if they survive. Thus the difficulty in selecting suitable cases for operation is experienced mainly in those patients who have an elevated pulmonary vascular resistance.

If the pulmonary resistance is so high as to cause an obvious right-to-left shunt with an arterial oxygen saturation below 85%, with or without cyanosis and clubbing, then closure of the defect should not be recommended. Such cases will have only a small left-to-right shunt with pulmonary flow less than 1.5 times the systemic, and the clinical features previously mentioned of a substantial shunt will be absent. The whole clinical picture, in fact, will be dominated by evidence of extreme pulmonary hypertension.

Cases less severe than this first group but with a substantially elevated pulmonary resistance (9 units or more) present the greatest difficulties in selection and a careful consideration of all aspects of the patient is essential. It is doubtful whether any one parameter is of overriding importance. Evidence for the presence of an appreciable left-to-right shunt with only a small or absent right-to-left shunt must be sought, so that a fall in pulmonary artery pressure after closure can be anticipated.

Case 3 can be cited as an example of a patient in this group, for she had a pulmonary artery pressure of 100/35 mm. Hg and a pulmonary arteriolar resistance of 13 units. We were encouraged to operate on her by finding a definite left ventricular thrust at the apex even though the right ventricular pulsation was prominent too, by a long loud V.S.D. murmur and thrill with a moderately loud mitral diastolic murmur, by the presence of a qR pattern in V6 even though R was monophasic in V1, and by a pulmonary flow 1.8 times the systemic. At operation a good drop in pulmonary artery pressure after closure was obtained. On the other hand, a girl of 9 with a pulmonary artery pressure of 80/40 mm. Hg and a pulmonary resistance of 14 units was thought to be unsuitable because of the following features. Clinically the left ventricle was doubtfully palpable, the V.S.D. murmur was not full length, and the thrill rather weak, there was no mitral diastolic murmur, the cardiogram showed deep S waves with no Q waves over the left ventricle, and the pulmonary flow was only 1.2 times the systemic.

The ideal case for operation is typified by Case 12. This boy of 10 years had a pulmonary resistance of 3.5 units, with a pulmonary artery pressure of 60/30 mm. Hg and a pulmonary blood flow 2.4 times the systemic. Clinically there was a quite forceful localized thrust at the apex, a loud long V.S.D. murmur with a strong thrill, and a loud long mitral diastolic murmur. The cardiogram showed a small Q, tall R, and small S in V6 with a prominent peaked T wave, and the predominant deflection in aVR was negative. On x-ray examination he had well-marked pulmonary plethora. At operation his pulmonary artery pressure dropped from 50/20 to 27/20 mm. Hg after closure of the defect.

Anaesthesia

The patients are made very drowsy by premedication, and we have found it best in children to give quinalbarbitone per rectum (4–5 mg./kg., maximum 200 mg.) with intramuscular promethazine (1.5–2 mg./kg., maximum 50 mg.) and pethidine (3–4 mg./kg., maximum 100 mg.). This allows the patient to be weighed without disturbance immediately before induction of anaesthesia by a minimal dose of thiopentone (25–50 mg.). After curarization (tubocurarine 0.5 mg./kg.) the trachea is intubated. Very light general anaesthesia is maintained with nitrous oxide and oxygen, using intermittent positive-pressure ventilation by a pulmoflator.

In the theatre a cannula is placed in a left arm vein for blood transfusion; a nylon catheter is passed from a right arm vein into the thorax for measurement of superior vena caval pressure and serves as an alternative route for intravenous therapy. Blood lost during surgery is estimated by weighing swabs and measuring suction loss, continuous balance being maintained by transfusion with citrated blood. All other intravenous fluids, including those used in manometry, are restricted to a minimum. Intermittent pethidine and tubocurarine are given as needed, with an additional dose of these two drugs before perfusion to anticipate the sudden dilution of circulating anaesthetic agents by blood from the pump oxygenator.

During the period of total bypass the lungs are held in a position of partial inflation with a mixture of helium and 20% oxygen at a steady pressure of 5–8 cm. of water to prevent pulmonary collapse.

After perfusion, ventilation is resumed with 100% oxygen until nitrous oxide is needed to maintain anaesthesia. Usually no more anaesthetic drugs are given; 18 patients spoke as soon as the endotracheal tube was removed, two others gradually returning to full consciousness in two hours. In only one instance was it necessary to reverse residual curarization.

Bronchial secretions have not been increased and aspiration has been unnecessary, but before the end of the operation a Ryle tube is passed through the nose to empty the stomach and is left in place.

Surgical Technique

Approach to the Heart and Great Vessels.—A vertical sternum-splitting incision is made, using a Gigli saw to divide the bone in the midline. The left internal mammary artery is isolated and catheterized with a fine elastic nylon tube for arterial pressure recording. After reflection of the lower pole of the thymus the pericardium is opened vertically in its full extent. Traction sutures hold the pericardium over the edges of the sternum, thus protecting the pleural cavities. A self-retaining retractor spreads the incision. Whilst the heart is being exposed the left common femoral artery is prepared for later cannulation, and through the same incision in the groin the saphenous vein is catheterized for recording pressure in the inferior vena cava.

Examination of the Heart.—Confirmation of the diagnosis is next sought by direct observation of the size of the various cardiac chambers, by palpation of the thrill invariably present, and by measurement of the pressures within the pulmonary artery and the right and left ventricles. A search is also made for any anomaly in the venous return of the heart, particularly for a left superior vena cava, which if present is temporarily occluded. A most thorough search is made for a patent ductus arteriosus, which must be ligated.

Preparations for Cardio-pulmonary Bypass

Half-inch lengths of Paul's tubing are placed around the venae cavae close to their points of entry into the right atrium and are threaded through a rubber tube to form a snare. The ascending aorta is mobilized at a point approximately 2.5 cm. above its origin so that it will later be possible to occlude it by a clamp put across it at this site. Just proximally a purse-string suture of 5/0 silk is placed through the adventitia of the aorta on its anterior aspect. At this stage heparin (3 mg./kg. body weight) is given. A stainless-steel cannula is inserted into the previously prepared site in the common femoral artery, and this is then connected to the arterial line of the pump oxygenator. Each vena cava is cannulated via separate incisions in the wall of the right atrium in the region of the appendage. The tips of the plastic catheters used are positioned to lie approximately 3 cm. beyond the snares, and they are then joined by a Y connexion to a single tube of 1.25 cm. bore which leads to the oxygenator. The caval catheters are of such a size that flow of blood around them to the heart is not obstructed, but they are known to be more than adequate to carry the flow required during bypass. Care is taken to remove all air from arterial and venous pipelines. Elective cardiac arrest (Melrose *et al.*, 1955; Gerbode and Melrose, 1958) is induced in all cases, and the arresting solution (potassium citrate 1 g. in 50 ml. of blood) is made ready at this stage.

Cardiac Bypass and the Intracardiac Procedure

Partial bypass of the heart and lungs is now begun; the clamps previously applied to the arterial and venous pipelines are removed and venous blood flows by gravity into the oxygenator, arterialized blood being returned by the pump into the femoral artery. Stay sutures are inserted into the right ventricle. A few minutes later a partial bypass is made total by tightening and anchoring the snares around the venae cavae; all blood returning to the heart is thus diverted

by the oxygenator, and the heart is seen at once to become much smaller. A small incision is made in the right ventricle between the stay sutures and a low pressure sucker inserted into its cavity; the blood that is aspirated consists of the coronary venous return to the right atrium and the blood returning to the heart from the lungs. Blood sucked in this way is eventually returned to the oxygenator. A needle (18 s.w.g., 8 mm. in length) is next inserted into the lumen of the ascending aorta in the centre of the purse-string stitch, the aorta is then cross-clamped just distally, and the arresting solution injected as rapidly as possible. Within a few seconds cardiac arrest occurs, the needle is withdrawn and the purse-string suture tied to avoid later troublesome bleeding from the puncture site. The ventricular incision is now extended upwards and downwards and the interior of the right ventricle is inspected. The low-pressure sucker is placed in the pulmonary artery after securing a dry field.

The common type of septal defect which lies immediately below the crista supraventricularis can usually be readily identified and adequately displayed for precise closure if traction sutures are inserted at each end of it. The flaccid condition of the arrested heart greatly facilitates the exposure. The defect is closed in two layers by interrupted sutures of silk; care is taken to avoid damage to the leaflets of the aortic valve. When considered necessary for security the second layer of sutures are tied over a small piece of polyvinylformol ("ivalon") sponge. (A very large defect may require insertion of a patch of the same material, as in Case 6.) The rest of the septum is examined for the presence of a second defect, particularly inferiorly in its muscular part. If infundibular narrowing is present sufficient muscle is resected to ensure that there is no

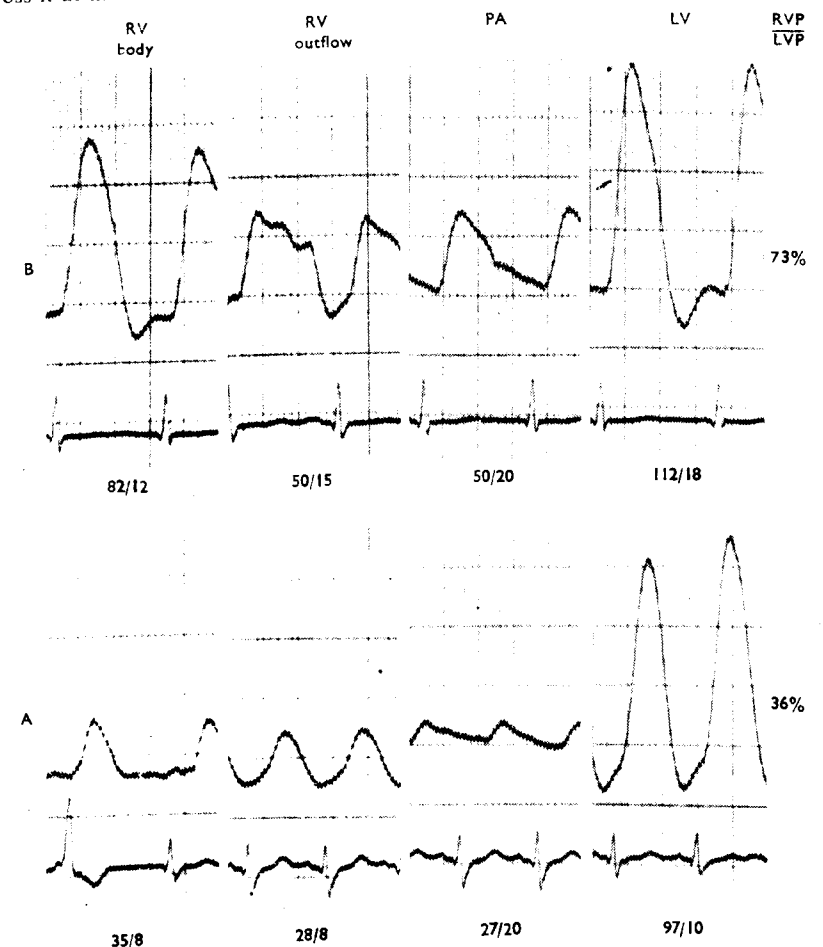


FIG. 6.—Intracardiac pressures in Case 12 before (B) and after (A) closure of the ventricular septal defect. Prior to closure there is a well-marked gradient at the ventricular level. After closure of the defect and infundibular resection the gradient is much reduced. Note also satisfactory fall in pulmonary artery pressure.

obstruction to the outflow tract of the right ventricle (Fig. 6). Distension of the left atrium or left ventricle must be prevented at all costs. If bronchial flow is at all great the infundibulum must be resected before closure of the defect. In the presence of an excessive reflux of blood into the left ventricle through an incompetent aortic valve care is taken to prevent distension of this chamber by direct drainage through the left atrial appendage and mitral valve.

The incision in the right ventricle is next sutured, leaving the closure incomplete centrally where the original stay sutures were inserted. The aortic clamp is released; a coronary blood flow thus begins again and the arresting solution is washed out of the myocardium. The blood that



Fig. 7.—Photograph of boy (Case 16) two weeks after operation, showing the median sternotomy scar. The chest deformity, so common in patients with a ventricular septal defect, is also well seen.

initially wells up through the incompletely sutured ventricular incision is discarded, as it is rich in potassium citrate, but after about 15 seconds the low-pressure sucker is reintroduced into the ventricle and the coronary return collected and passed on to the oxygenator. Within one to three minutes cardiac contractions begin, and, as soon as it is found that the beat is powerful enough to eject blood into the aorta against the pressure maintained in it by the pump, the sucker is withdrawn and suture of the ventricle completed. A short while later the caval snares are released and a partial bypass is re-established. The arterial

inflow from the pump is steadily reduced as the patient's heart resumes full activity and responsibility for the circulation. At this stage intracardiac pressures are measured again and compared with the initial figures in order to confirm correction of the defect.

Closure.—The catheters are withdrawn from the cavae and the atrial incisions repaired. The cannula is also removed from the femoral artery and the incision in its wall carefully repaired. Protamine sulphate (4.5 mg./kg. body weight) is now given in order to restore the clotting mechanism of the blood. Haemostasis is carefully secured before closure of the chest is begun and tubes are placed to drain the pericardial sac and the mediastinum, and if either pleural cavity has been opened this is also drained; all tubes are led through underwater seals and continuous suction is applied.

The Perfusion

The perfusion was without difficulty in all but one of these patients in whom a large patent ductus arteriosus which could not be ligated made perfusion impossible. A patent ductus is a direct route from the aorta to the open heart through the pulmonary vessels, and a high proportion of the blood delivered to the aorta is returned to the machine and fails to perfuse the patient.

A flow rate of 2.4 litres per square metre of body surface was maintained throughout the bypass, which flow allowed but little variation in arterial and venous pressures. The smallest patient received 1.2 litres a minute, the largest 4.3 litres a minute.

The average perfusion was of 39 minutes (30–68 minutes), during which time elective cardiac arrest was maintained for an average of 24 minutes (13–52 minutes).

Venous drainage was obtained by gravity, a difference of 25 cm. (10 in.) being established between the height of the operating table and that of the oxygenator. This differential was always in excess of that required, and on every occasion a screw clamp on the outflow tube had to be partially closed to maintain a normal venous pressure within the great veins. Great care was taken to adjust this clamp accurately, it being felt that such adjustment gives the least possible disturbance to vascular tone and ensures a smooth perfusion.

Return of oxygenated blood into the common femoral artery was always carried out at a line pressure of less than 200 mm. Hg. This pressure, reflecting as it does both the resistance of the cannula and that of the patient's vascular bed, can be used to measure the flow rate from the pump. As the mean pressure in the aorta is known, then the pressure created by the cannula can be determined. Previous calibration of each cannula enables an accurate measurement of flow rate to be obtained from this pressure measurement.

Oxygenation was always adequate, as was carbon dioxide removal. At no time was the rotational speed of the oxygenator excessive, and usually it was below 50 revolutions a minute. Heat loss from the oxygenator was prevented by radiant-heat lamps and the body temperature maintained within 1° C.

Removal of blood from the open heart was never a problem, cross-clamping the aorta producing an almost dry field. Blood contained in the heart at any time was removed by gentle suction and stored in a settling helix before return to the heart-lung machine. An additional high-vacuum suction was available, but blood recovered in this manner was rarely re-used. The pressure in the superior and inferior venae cavae as well as intra-aortic pressure was continuously displayed and recorded. Both the electrocardiogram and the electroencephalogram were similarly monitored.

Post-operative Care

At the conclusion of the operation the patient is carefully lifted from the operating table on to a weighing machine. After allowance for drainage-tubes and dressings his weight is compared with the pre-operative figure. The difference in weight forms a useful check on blood and fluid balance derived from swab-weighing and measurement during the operation. The patient is placed on his bed in the operating theatre and transferred to the recovery ward. An oxygen tent, adequately cooled and humidified, is placed around the head of the patient, and tubes are reconnected to drainage bottles and continuous suction at 3 cm. of Hg vacuum.

A clear record is kept, on which blood transfusion is shown balanced against drainage from pleural and pericardial cavities, and watery fluids infused are balanced against urinary output and gastric aspirations. It is our practice to limit fluid for the first 24 hours to avoid gastric distension. The Ryle tube is aspirated intermittently for the first 24 hours, should nausea or gastric distension warrant it.

Intravenously dextrose 5% with sodium chloride 0.3% is given, 400 ml. per square metre of surface area during the first 24 hours and 800 ml. per square metre during the second 24 hours. Thereafter normal diet is quite rapidly resumed.

During the first 24 hours pulse and blood pressure are charted at 15-minute intervals and the patient is turned and encouraged to cough and breathe deeply. It is found useful to introduce the younger child to an oxygen tent pre-operatively so that his post-operative surroundings are not too unfamiliar. Parents are invited to visit the children as soon as they are in the recovery ward and every few hours thereafter.

Post-operative Drugs. If the patient has been already digitalized pre-operatively this is continued. Otherwise

digitalis is withheld unless the pulse rate is unduly rapid or the jugular venous pressure high. If heart block is present isoprenaline is administered as a suppository (2.5 mg.) should the heart rate fall below a figure at which a satisfactory blood pressure can be maintained. The precise figure cannot be stated, as the age and condition of the patient is the determining factor. In the two patients in this series who required this drug its use was continued at lengthening intervals from five-hourly for the first 48 hours. Antibiotics, consisting of penicillin, streptomycin, and chloramphenicol, are used prophylactically for the first four days. Some patients received erythromycin and novobiocin, but these drugs were not well tolerated.

Convalescence.—The patients were allowed up at the end of a week and were usually discharged from hospital at the end of three weeks. A number of patients had a rise in jugular venous pressure during the first week post-operatively, but this fell gradually during the last ten days in hospital. These children tend to be extremely active during the last week and can make a marked contrast with the pre-operative picture.

Post-operative Complications

Chest haemorrhage was a problem in only two patients. In all cases the clotting mechanism has been rapidly restored to normal; the platelets have been reduced at the end of the perfusion to an average of 60,000 c.mm., but the figure rises to normal early in the post-operative period. The usual blood loss has been less than 500 ml. In two patients the loss was over 1 litre and probably contributed to their death. Both were patients in whom a fall in pulmonary artery pressure had not been obtained, so that pressures on the right side of the heart were unusually high. It is possible that bleeding may have occurred from manometric puncture sites or the cardiac wounds.

Pulmonary Complications.—Coughing and deep breathing is not easy during the first few post-operative days, though we believe it is less difficult if the midline sternum splitting incision is used. In several of our cases expectoration of sputum has been a problem, but in only one instance was a tracheostomy required. The left lower lobe requires an especially careful watch as it is somewhat displaced by the enlarged heart, and the left main bronchus is often narrowed by the large pulmonary artery. Pulmonary oedema has not been encountered.

Infection.—Localized wound infection occurred in two patients, but in no instance was there any suggestion of infection of the blood stream.

Heart-block.—Transient heart-block has occurred in several patients during the period immediately following re-establishment of the heart-beat. Complete heart-block persisted in two patients, in one of whom the idioventricular rate was too low to support an adequate blood pressure even after intravenous isoprenaline in repeated doses of 0.1 mg. The artificial pacemaker connected directly to the ventricle maintained a satisfactory rate and blood pressure until the child's sudden death 10 hours post-operatively (Case 9). In the other patient the use of isoprenaline was satisfactory.

Surgical Pathology

Septal Defect.—In all patients the right ventricle was grossly enlarged, with a well-marked thrill best felt over the outflow tract and the base of the pulmonary artery. The right atrium was normal in size in all cases except one; in this latter instance the jet of blood passing through the defect was blowing the septal cusp of the tricuspid valve back into the atrium, producing tricuspid incompetence (Case 13). In all our patients the defect was located high up on the septum but inferior to the crista supraventricularis: the upper margin of this defect was formed by the annulus of the aortic valve, with the right and posterior aortic leaflet visible immediately beyond the rim. The lower margin of the defect was formed by the muscular interventricular septum, but often had a well-developed fibrous rim. One

patient (Case 9) had in addition a second defect in the muscular septum, and in Case 6 there was a single ventricular chamber. Excluding this last case, the size of the defect varied from 1 to 3.5 cm. in diameter.

Coexistent Patent Ductus Arteriosus.—In our first patient a patent ductus was not suspected until perfusion was started and a shunt from the systemic circulation into the pulmonary artery was encountered. Perfusion proceeded normally after ligating the duct. In all subsequent patients the left pulmonary artery was deliberately explored from inside the pericardium in order to exclude the presence of a ductus, and in this way two further undiagnosed ducts were discovered. One of these was successfully ligated, but the other, a thin-walled friable ductus 2.5 cm. in diameter, tore during mobilization and led to death (Case 15). The ductus diagnosed by aortography (Case 20) was ligated without difficulty.

Infundibular Obstruction.—This was present to some degree in nine of the cases. In all cases the obstruction was due to an irregular but generalized hypertrophy of the muscle of the outflow tract and the crista supraventricularis which appeared to be part of the generalized right ventricular hypertrophy. As much infundibular muscle was removed as was necessary to relieve the obstruction, and post-operative manometry rarely revealed a gradient or more than 10 mm. Hg.

Results

Mortality

Of the 15 patients with a ventricular defect as the sole lesion only one died. Among the four patients with an additional patent ductus, two died. A patient with two defects also died, but one with a single ventricle survived.

As previously mentioned, one of the deaths occurred on the table when it was found impossible to ligate a large ductus. The other three occurred between 5 and 36 hours after operation, and were of a similar pattern with sudden cessation of respiration after a period of restlessness and low blood pressure. None of these patients had more than a slight fall in pulmonary artery pressure after closure of the defect, and it seems possible that death was due to abrupt right ventricular failure. Two of these three had a moderate-to-large haemothorax, one of which was treated by open operation.

Reduction in Right Heart Pressures with Closure

We consider that a substantial fall in right ventricular and pulmonary artery pressure after closure of the defect is an important sign, since it indicates that much of the pulmonary hypertension was due to flow rather than to changes in the pulmonary vessels and therefore that the long-term results from closure of the defect are likely to be good. It also indicates that the defect is substantially closed and that no other lesion causing a further left-to-right shunt—such as a second V.S.D.—is present. In order to take account of changes in systemic pressure after closure we have expressed the right ventricular systolic pressure as a percentage of the left (R.V.P./L.V.P.%), and these pressures have been measured at operation in all cases. Prior to closure, R.V.P./L.V.P. ranged from 37 to 100%, with an average of 67%.

After closure of the defect the right ventricular pressure fell in 16 patients and was unchanged in 4. The extent of the fall has been expressed as R.V.P./L.V.P.% before closure minus R.V.P./L.V.P.% after closure—for example, before 100%, after 63%, fall=37%. The fall in pressure averaged 33%, with a range of 8 to 58%. Details are available in Tables I and II. A small fall in pressure does not imply a poor result if the initial pressure, as in Cases 2 and 4, is low, but otherwise it presumably indicates that considerable pulmonary vascular disease is present.

In the whole group of 20 patients whose defects were closed the R.V.P./L.V.P.% after closure was close to normal in five, slightly elevated in eight, moderately raised in three, and high in four.

TABLE II.—Operative Findings, Anatomical and Haemodynamic

Case No.	Size of Defect (cm.)	Infundibular Hypertrophy	Infundibular Gradient, mm.Hg		R.V.P. %* L.V.P.		
			Before	After	Before	After	
V.S.D. Alone							
1	3×2	0	0	0	100	63	
2	1.5×1.5	0	0	0	37	31	
3	1.5×1	0	25	5	94	29	
4	2×1	+	50	2	38	29	
7	1.5×1.5	+	16	6	74	72	
8	2×2	+	36	10	86	45	
10	2.5×2.5	0	3	10	92	34	
11	3×3	+	25	17	83	39	
12	3×2	+	32	7	73	36	
13	1.5×1.5	+	7	0	51	38	
16	2.5×2.0	0	0	0	100	46	
17	1×1	0	0	5	63	55	
18	3.5×3.5	+	70	4	100	45	
19	2×2	+	14	10	70	39	
21	2×1.5	+	20	15	71	55	
V.S.D. and Patent Ductus							
5	2×1.5	0	0	0	67	40	
14	2×2	+	10	20	91	86	
15	0.7×0.7	—	—	—	—	—	
20	1×1	0	0	9	93	66	
Two Ventricular Defects							
9	(1) 1×1 (2) 1×1	0	0	0	75	96	
Single Ventricle							
6	3.5×3	0	12	14	96	96	

* R.V.P. % = right ventricular systolic pressure
L.V.P. % = left ventricular systolic pressure

Post-operative Assessment

On discharge from hospital three to six weeks after operation all the patients were active and well. The exercise tolerance was improved in most patients. This was particularly obvious in a boy of 2½ years with a huge left-to-right shunt (Case 2), who from being unable to walk more than 20 yards was able to run vigorously without distress. In one patient (Case 7) who had a very small shunt with a high resistance, and no fall in right heart pressures after closure, there was but little improvement.

The jugular venous pressure and pulse were normal in all except the patient with a single ventricle in whom a high venous pressure persisted for several weeks. The arterial pulse sometimes retained its waterhammer quality and one patient still had complete heart-block, with a rate of 90. The cardiac impulses were usually less marked after operation, but the diminution in right ventricular heave depended on the fall in right ventricular pressure obtained.

The most striking change in physical signs was, however, found on auscultation. The thrill and murmur of the ventricular defect disappeared in all patients (Fig. 1B), and in only two instances did a mitral diastolic murmur persist. In these two patients the defect appeared on other grounds to be closed, and the murmur is attributed to mild congenital mitral stenosis; one of these was the patient with a single ventricle who also had a loud apical systolic murmur possibly due to mitral incompetence. Soft or moderate ejection systolic murmurs at the left sternal edge were quite common post-operatively and probably originated in the infundibulum or pulmonary artery; they were sometimes best heard near the apex. A basal diastolic murmur persisted in four. The second heart sound remained loud and closely split in Case 7, who still had substantial pulmonary hypertension after closure, but otherwise was usually softer and was sometimes widely split from right bundle-branch block.

The electrocardiogram in most cases showed a constant and unusual pattern. There was complete right bundle-branch block with the secondary R wave persisting as far as V5-V6 together with striking T-wave inversion in all chest leads. These appearances were presumably due to the intracardiac manoeuvre and the ventriculotomy (Fig. 5).

Radiological assessment is probably not very profitable so soon after surgery, but in one case there was considerable diminution in heart size, and others have shown a definite reduction in pulmonary plethora.

Indicator dye-dilution curves performed on two patients post-operatively (Cases 5 and 6) have demonstrated the absence of a left-to-right shunt. Cardiac catheterization is being deferred until a year or more after closure of the defect.

Conclusions

Our results harmonize with those of other workers in showing that closure of ventricular septal defects can be carried out in special centres as a routine surgical procedure with an acceptably low mortality in suitable cases. The indications and contraindications to operations have been outlined, but in assessing cases for operation we have experienced two main problems: first, the detection of additional lesions; and, second, in predicting whether a good haemodynamic response will result from closure.

The most important additional defect is a patent ductus, for it renders perfusion impossible. As already mentioned, this lesion was definitely diagnosed (by aortography) in only one of our four patients with it, though it was queried in one other. We suspect the diagnostic difficulty may lie in the fact that in patients with a V.S.D. the duct is virtually functionless and therefore gives rise to practically no direct signs. Support for this hypothesis is given by the absence of a thrill over the ductus at operation in three of the four patients and by the findings in Case 20. In this last patient, prior to aortography, 2 ml. of indicator dye was injected into the aorta via a retrograde arterial catheter, and no recirculation due to dye entering the pulmonary artery (Swan and Wood, 1957) was found. Further, at operation, no change in right heart or systemic pressure was noted when the duct was ligated. One patient (Case 21) was found at operation to have severe aortic incompetence, and clinically this was not diagnosed with certainty.

The other problem is that of predicting which patients will achieve a substantial fall in pulmonary artery pressure after closure. In this respect, other workers (Zimmerman *et al.*, 1957) have emphasized the importance of the actual level of the pulmonary artery pressure, but in our series this has not been helpful. We believe that the pressure must be considered in relation to pulmonary flow and that it is useful to calculate the pulmonary arteriolar resistance. However, the difficulty in young children of measuring the oxygen consumption, and also other factors, make the calculated resistance in many cases at best an approximation. It may turn out to be just as helpful to consider simply the oxygen saturation in the pulmonary artery, which has been over 80% in all our patients whose pulmonary pressure fell after closure. As mentioned earlier, it is necessary to consider all aspects in deciding for or against operation in the borderline cases with a high pulmonary resistance. No patient should be categorically denied operation if there is evidence of an appreciable left-to-right shunt, but when the pulmonary resistance is high and the unfavourable features already mentioned are present, a much higher operative mortality must be faced. It is clear from our results, however, that a number of patients who might in other centres be considered inoperable have had their defects successfully closed.

It must be emphasized that, in such a rapidly expanding field, views necessarily change fast as a result of new experience. Firm rules should not therefore be formulated until opinion has crystallized in the light of further knowledge of the problems involved.

Summary

Twenty-one patients with ventricular septal defect have been treated by open surgery using extracorporeal circulation.

The clinical features, indications for operation, surgical technique, and post-operative care are presented.

The results of surgical treatment are given and the implications of these are discussed.

We are indebted to Dr. R. E. Bonham-Carter, not only for referring many of these patients, but also for his continued encouragement and support; to Dr. J. D. James and Dr. P. B. Booth and the staff of the North London Blood Transfusion Service for their unfailing co-operation; to Professor J. V. Dacie and his colleagues in the department of haematology in the Postgraduate Medical School of London; and to the matron and nursing staff of Hammersmith Hospital. To Mr. J. R. Robson, Mr. E. Gains, Miss M. Murphy, and Mrs. E. Victor, the technical staff of the department of surgery, and to Mr. C. Lordon and the staff of the workshops of the Postgraduate Medical School we owe a special debt of gratitude.

Mr. Z. F. Kellerman and the staff of Messrs. New Electronic Products Ltd. have since 1950 given generously of their services and have unhesitatingly met the technical challenge.

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Natural Causes, a new play on a challenging theme by Mrs. Vera Colebrook, was given a number of performances in London last month at the Hovenden Theatre Club. The action of the play takes place in the country house of an old lady who has just suffered a cerebral haemorrhage, complicated by the onset of pneumonia. Her family doctor had previously given her a solemn promise that should she fall seriously ill he will not administer any antibiotic or other drug that may prolong her life—or, rather, “prolong her death.” On the insistence of her daughter-in-law, a well-known London consultant is called in: he advises injections of penicillin. The family doctor refuses to give these, telling the consultant of his promise and insisting that there is all the difference in the world between administering a lethal dose and withholding a life-saving drug. The old lady's two children want their mother to die as she had lived, with dignity and without fear of mental deterioration. But her shrewish daughter-in-law desires only that her mother-in-law's life might be prolonged for the sake of the benefits her annuity brings to the family. The Hovenden Players, directed by Miss Valery Hovenden, were completely successful in bringing out the realism of this situation. A philosophical nurse—who assumes a more pronounced Irish brogue with private cases, because “it goes down so lovely with the patients”—adds a touch of humour to the play, which is not concerned with “mercy killing” but rather with the truth or otherwise of Clough's “Thou shalt not kill, but needst not strive officiously to keep alive.” The whole vexed problem, while remaining unsolved, is given an unexpected twist by the London consultant at the end of the play.

STAPHYLOCOCCAL INFECTION RESISTANT TO CHLORAMPHENICOL, ERYTHROMYCIN, AND NOVOBIOCIN EFFECT OF ANTIBIOTIC COMBINATIONS ON THE EMERGENCE OF RESISTANT STRAINS

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Control of the use of antibiotics in hospital communities is imperative if we are to combat the adaptability of the staphylococcus to these agents. Until recently most hospitals in Great Britain have tried to keep erythromycin and novobiocin in reserve, to be used only for the treatment of staphylococcal infection resistant to all other antibiotics. By 1957, however, about 50% of all staphylococcal infection occurring in many hospitals was found to be resistant to penicillin, streptomycin, and tetracycline, so that erythromycin and novobiocin inevitably had to be used more extensively.

The danger of the increased use of these two drugs is obvious, since it is well recognized that staphylococci develop resistance to erythromycin and novobiocin more readily than to any other antibiotic except streptomycin (cf. Hobson, 1954; Garrod and Waterworth, 1956; Lin and Coriell, 1957). Moreover, this change occurs quite often during the treatment of staphylococcal infections with erythromycin (Thomson *et al.*, 1956) and novobiocin (Nichols and Finland, 1956), and the spread of erythromycin-resistant strains in a hospital where the use of this antibiotic is extensive may be very rapid (Lepper *et al.*, 1954).

In an attempt to combat this situation a policy for the control of antibiotics was introduced into this hospital at the beginning of April, 1958. The essential items of the policy were: firstly, abandonment of penicillin except in certain wards of the hospital, and, secondly, the use of two antibiotics in combination wherever possible and always when erythromycin or novobiocin was used.

About six months previously a cross-infection committee was appointed to investigate staphylococcal infection in the hospital and to introduce measures for its control. The effect of these measures and that of the antibiotic policy are inextricably confused. Nevertheless analysis of the antibiotic sensitivity pattern of all staphylococcal infections in the hospital throughout the year has brought to light certain facts about the emergence of erythromycin- and chloramphenicol-resistant strains which are considered worth reporting.

*In receipt of a grant from the Medical Research Council.

Bacteriological Methods

All staphylococcal infections in the wards of the hospital between October 1, 1957, and September 30, 1958, were studied bacteriologically. The period covered thus included six months before the introduction of the antibiotic policy and the first six months of its operation. The strains of *Staph. pyogenes* isolated were tested for sensitivity to penicillin, streptomycin, tetracycline, chloramphenicol, erythromycin, and novobiocin by the ditch-plate method. The concentration of antibiotics used in the ditch was: penicillin, 10 units per ml.; streptomycin, 50 or 200 g. per ml.; chloramphenicol, 50 g. per ml.; and tetracycline, erythromycin, and novobiocin 25 g. per ml. The Oxford staphylococcus was streaked across the centre of each plate as a control.

Strains were recorded as sensitive if they showed a degree of sensitivity similar to that of the Oxford staphylococcus, resistant if they grew up to or across the ditch, and partially resistant if there was an intermediate degree of inhibition. Representative strains were also tested by a serial dilution method in broth. The latter tests showed that strains recorded as partially resistant were often only two to four times less sensitive than the standard organism, but strains recorded as resistant always showed a more than eightfold difference.

Most of the strains on first isolation and those showing a change in sensitivity pattern were phage-typed by the method of Williams and Rippon (1952) using 21 phages.

Antibiotic Administration

After the introduction of the antibiotic policy in April, 1958, the use of drug combinations caused an increase in the consumption of most of the antistaphylococcal antibiotics except penicillin. The approximate changes were as follows: Penicillin, $\div 3.2$; tetracycline, $\times 1.4$; chloramphenicol, $\times 1.6$; erythromycin, $\times 2$; novobiocin, $\times >5$.

In the six months following the introduction of the antibiotic policy 284 patients were treated with chloramphenicol, 275 with erythromycin, and 170 with novobiocin. The most frequently used combinations were erythromycin and novobiocin (108 patients) and erythromycin and chloramphenicol (69 patients). Further details of the use of these three antibiotics are given in Table I. Similar figures are not available for the period before the antibiotic policy.

TABLE I.—Number of Patients Treated with Chloramphenicol, Erythromycin, and Novobiocin, April 1–September 30, 1958

	Total	In Combination with				Alone*
		Chlor.	Eyth.	Novo.	Other Antibs.	
Chloramphenicol	284	—	69	8	70	137
Erythromycin	275	69	—	108	45	53
Novobiocin	170	8	108	—	25	29

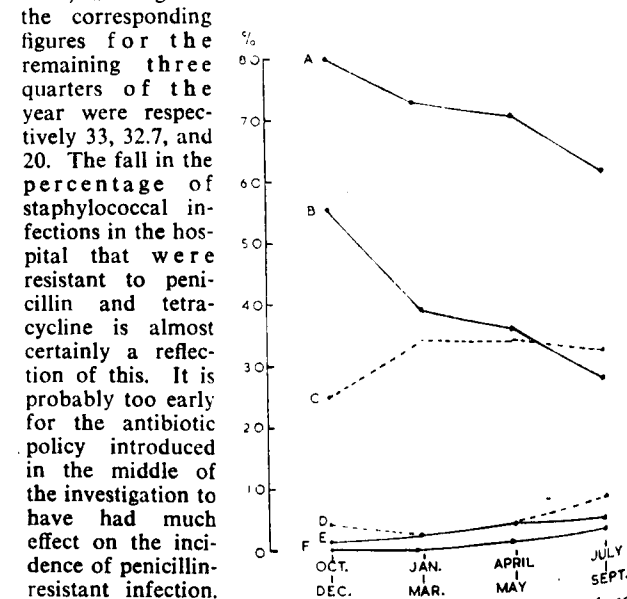
* Or in combination with a sulphonamide preparation.

Analysis of Sensitivity Patterns

A total of 982 staphylococcal infections were present in the hospital during the year. Antibiotic sensitivity has been analysed separately for each quarter, and the results are presented in the Chart. The total numbers of staphylococcal infections in each quarter were respectively 247, 245, 270, and 220.

It will be seen that the incidence of infection resistant to penicillin fell from 80% at the beginning of the year to 60% at the end. This is associated with a corresponding fall in the incidence of tetracycline-resistant infections (from 55% to 27%), practically all of which were also resistant to penicillin and which were in most instances the result of cross-infection in the hospital. The percentage of infections resistant to penicillin and sensitive to tetracycline rose slightly in the second quarter and thereafter remained steady.

In the first quarter of the year the incidence of staphylococcal infection resistant to penicillin and tetracycline was 46 per 1,000 admissions to the hospital. The cross-infection committee appointed at the beginning of the investigation recommended a number of measures for the control of cross-infection which were put into operation throughout the year. Probably as a result of these, although seasonal influences cannot be excluded, the corresponding figures for the remaining three quarters of the year were respectively 33, 32.7, and 20. The fall in the percentage of staphylococcal infections in the hospital that were resistant to penicillin and tetracycline is almost certainly a reflection of this. It is probably too early for the antibiotic policy introduced in the middle of the investigation to have had much effect on the incidence of penicillin-resistant infection.



The percentage of infections resistant to chloramphenicol, erythromycin, and novobiocin remained low throughout the year. Since, however, nearly all these infections were also resistant to penicillin, streptomycin, and tetracycline, their importance cannot be exaggerated. The figures for erythromycin in each quarter were respectively 4.8, 2.8, 4.0, and 6.4, and the significance of the slight rise in the last quarter is increased by the accompanying fall in the incidence of multiple resistant infection as a whole.

Chloramphenicol-resistant Infection

The incidence and source of chloramphenicol-resistant infection are summarized in Table II. In the whole year there were 30 infections resistant to this antibiotic, and on

TABLE II.—Chloramphenicol-resistant Infections

	Total No. of Infections	No. of Strains of <i>Staph. pyogenes</i>	No. of Strains also Resistant to Erythromycin
Oct. 1 to March 31	14	11	4
April 1 to Sept. 30	16	12	4
	30	23	8

Source of Chloramphenicol-resistant Strains

Isolated from patients on admission	3	1
Chloramphenicol-sensitive strain developed resistance to chloramphenicol during treatment with:		
Chloramphenicol and erythromycin	5	2
Erythromycin alone	1	1
First strain isolated from patients who had been treated with:		
Chloramphenicol alone or plus tetracycline	2	1
Chloramphenicol plus erythromycin	3	1
Erythromycin plus tetracycline	1	1
Other strains	8	1
	23	8

All strains were resistant to penicillin, streptomycin, and tetracycline except those isolated on admission. All strains were sensitive to novobiocin and vancomycin.

the basis of bacteriophage typing it was shown that the 30 infections were probably caused by 23 strains of *Staph. pyogenes*. Three of the strains showed partial resistance and 20 were recorded as resistant. It will be seen that there is no significant difference in the figures before and after introduction of the new antibiotic policy.

Of the 23 strains involved, three were isolated from patients on admission. The remaining 20 were all resistant to penicillin, streptomycin, and tetracycline, as well as to chloramphenicol, and seven, together with one strain isolated on admission, were also resistant to erythromycin. In six instances strains of the same phage-type were isolated on two occasions from the same patient, the first being chloramphenicol-sensitive and the second chloramphenicol-resistant, and three of these strains developed resistance to erythromycin at the same time. Five of the six patients from whom these strains were isolated had been treated with chloramphenicol and erythromycin, and one with erythromycin but not chloramphenicol.

In 14 cases the only staphylococcus isolated was chloramphenicol-resistant. Five of the patients from whom these strains were isolated had previously had chloramphenicol and one erythromycin. The remaining eight strains were isolated from patients who gave no history of recent antibiotic treatment.

Erythromycin-resistant Infection

Table III summarizes the information in relation to erythromycin-resistant infection. In the whole year 23 strains of *Staph. pyogenes* resistant to this antibiotic were responsible for 44 infections. In the first half of the year eight strains caused 19 infections, whereas in the first six

TABLE III.—Erythromycin-resistant Infections

	Total No. of Infections	No. of Strains of <i>Staph. pyogenes</i>	No. of Strains also Resistant to Chloramphenicol
Oct. 1 to Mar. 31	19	8	4
April 1 to Sept. 30	25	15	4
	44	23	8

Source of Erythromycin-resistant Strains

Isolated from patients on admission	3	1
Erythromycin-sensitive strains developed resistance to erythromycin during treatment with:		
Erythromycin alone or plus tetracycline	3	1
Erythromycin plus chloramphenicol	4	2
First strain isolated from patients who had been treated with:		
Erythromycin alone or plus tetracycline	3	1
Erythromycin plus chloramphenicol	4	1
Chloramphenicol without erythromycin	3	1
Other strains	3	1
	23	8

All strains were resistant to penicillin, streptomycin, and tetracycline except those isolated on admission. All strains were sensitive to novobiocin and vancomycin.

months of the antibiotic policy 15 strains caused 25 infections. Two of the 23 erythromycin-resistant strains were recorded as partially resistant and 21 as resistant. It was noted, however, that many strains which were resistant on primary isolation became less resistant after subculture in the laboratory. Thirteen of the strains were tested against spiramycin: three were as sensitive as the Oxford staphylococcus, four showed a twofold, and six a fourfold increase in resistance to this antibiotic.

Three of the strains were present in patients on admission. The remaining 20 were all resistant to penicillin, streptomycin, and tetracycline, as well as to erythromycin, and eight were also resistant to chloramphenicol. In seven cases erythromycin-sensitive and erythromycin-resistant strains of the same phage-type were isolated consecutively from the same patient, and three of the strains showed a corresponding increase in resistance to chloramphenicol.

All seven patients had been treated with erythromycin—four in combination with chloramphenicol and three alone or in combination with tetracycline, to which the initial strain was not sensitive.

In 13 instances the only strain of *Staph. pyogenes* isolated was erythromycin-resistant. Ten of the patients concerned had previously had antibiotic treatment: three with erythromycin alone or plus tetracycline; four with erythromycin and chloramphenicol; and three with chloramphenicol but not erythromycin. The remaining three strains were isolated from patients who had not had recent treatment with antibiotics.

TABLE IV.—Novobiocin-resistant Infections

	Total No. of Infections	No. of Strains of <i>Staph. pyogenes</i>
Oct. 1 to March 31	2	2
April 1 to Sept. 30	7	2
	9	4

Source of Novobiocin-resistant Strains

Novobiocin-sensitive strain developed resistance to novobiocin during treatment with:		
Novobiocin alone	1	1
Novobiocin plus erythromycin	2	1
Other strains	1	1
	4	4

Three strains were resistant to penicillin, streptomycin, and tetracycline; and sensitive to chloramphenicol, erythromycin, and vancomycin. One strain was sensitive to penicillin, streptomycin, tetracycline, chloramphenicol, erythromycin, and vancomycin.

Novobiocin-resistant Infection

Throughout the year only four strains of *Staph. pyogenes* resistant to novobiocin were isolated (see Table IV), two in each half. Three of the strains were each isolated from only one infection. The fourth strain was responsible for infections in four children and two nurses in the same ward.

Three of the strains were also resistant to penicillin, streptomycin, and tetracycline, and sensitive to chloramphenicol, erythromycin, and vancomycin. One strain which developed resistance during novobiocin treatment was sensitive to all other antibiotics tested. The source of the strain which caused six infections is completely unknown. The remaining three strains all developed resistance during treatment with novobiocin, in two cases given in combination with erythromycin and in one case given alone.

Association of Chloramphenicol and Erythromycin Resistance

A number of observations in this study indicate an association between chloramphenicol and erythromycin resistance. Thus eight of the erythromycin-resistant strains were isolated from patients who had previously had erythromycin and chloramphenicol. In no instance, on the other hand, was an erythromycin-resistant staphylococcus isolated from a patient treated with erythromycin and novobiocin, in spite of the fact that after the introduction of the antibiotic policy 108 patients were treated with the latter combination and only 69 with erythromycin and chloramphenicol.

No fewer than 8 of the 23 erythromycin-resistant strains also showed resistance to chloramphenicol. In three cases strains of the same phage-type were isolated on two occasions from the same patient, the first being sensitive to both these antibiotics, and the second resistant. Two of the patients concerned had been treated with chloramphenicol and erythromycin, and one with erythromycin only. Three other strains showing this double resistance came from patients who had recently had antibiotic treatment, one with both the antibiotics concerned, one with erythromycin, and one with chloramphenicol.

With two strains, both of which were responsible for small outbreaks of infection (reported elsewhere; cf. Barber and Dutton, 1958), the resistance to chloramphenicol was inconstant. Thus strains resistant to penicillin, tetracycline, and erythromycin of a single phage-type infected several patients in one ward, and some of the cultures isolated were grossly resistant to chloramphenicol, whereas others were as sensitive as the Oxford staphylococcus. In one case the initial patient had been treated with erythromycin only, and in the other the patient had had a number of antibiotics, including chloramphenicol, but had never had erythromycin.

It seems probable from these observations that there is some cross-resistance between erythromycin and chloramphenicol, and preliminary studies *in vitro* have shown this to be the case. The investigation will be published in full elsewhere (Csillag and Barber), but it has already been found that strains of *Staph. pyogenes* rendered resistant to erythromycin by passage in this antibiotic develop a moderate and sometimes transitory increase in resistance to chloramphenicol.

Discussion

This investigation emphasizes the danger of erythromycin-resistant infection becoming a hospital problem if the unrestricted use of erythromycin is permitted. Since there is evidence of cross-resistance between erythromycin and chloramphenicol, combined treatment with these two antibiotics offers no solution. Monnier and Schoenbach (1951) and Fusillo, Romansky, and Kuhns (1953) demonstrated a similar increase in resistance to chloramphenicol when staphylococci were passaged in the presence of tetracycline compounds. A study of cross-resistance with chloramphenicol and other antibiotics is now in progress.

Combined treatment with erythromycin and novobiocin seems more promising. Lowbury (1957) showed that the combination of these two antibiotics delayed the emergence of erythromycin-resistant staphylococci *in vitro* and *in vivo*. In the investigation here recorded no erythromycin-resistant staphylococci were isolated from 108 patients treated in this way. This number is, of course, small, and it is too early to say whether this combination will do more than postpone the evil day; but even this is of value, since it might tide us over until new antibiotics were available.

Scott and Waterworth (1958) treated 110 patients suffering from boils with a seven-day course of erythromycin (55 patients) or E 129 (55 patients) and found no instance of increased bacterial resistance to either antibiotic. Coagulase-positive staphylococci were, however, isolated from only 15 of the original boils after treatment, although a further 23 strains, which were isolated from fresh lesions developing during or after treatment, were also found to be erythromycin-sensitive.

The *British Medical Journal* (1958) asked whether the determining factor in the development of resistance to erythromycin was "the nature of the lesion, dosage, or duration of treatment, or a property of the staphylococcus itself." In the present series length of treatment was not necessarily prolonged, and some of the patients had been treated with erythromycin for only a few days before the appearance of erythromycin-resistant staphylococci. With regard to the lesions, however, although one strain came from a boil treated with erythromycin alone, most of the strains came from more severe infections such as pneumonia, lung abscess, peritonitis, or post-operative sepsis.

The type of staphylococcus concerned is probably of considerable importance. In the present series nearly all the strains showed multiple resistance to antibiotics, and it has been suggested that such strains may be highly mutagenic (Treffers *et al.*, 1954; Barber and Dutton, 1958). All the erythromycin-resistant strains were also shown to belong to phage groups III except for a few strains of type 80. It has been shown that group III staphylococci yield antibiotic-resistant variants more readily than do other strains (Barber and Whitehead, 1949; Rountree and

Thomson, 1949; Barbour and Edwards, 1953), and the same may well be true of phage-type 80 staphylococci, which have recently become a hospital menace (Rountree and Freeman, 1955; Anderson and Williams, 1956; Gillespie and Alder, 1957; Duthie, 1957).

While staphylococci of such virulence and adaptability continue to circulate in hospital communities it is important that the use of erythromycin should remain under strict control. Although novobiocin, vancomycin, ristocetin, and kanamycin have been added to our antistaphylococcal armory, the last three have serious toxic effects, particularly on the eighth nerve. Since novobiocin, like erythromycin, has the defect that staphylococci readily become resistant to it, both should be used sparingly, and neither except in combination with each other or another chemotherapeutic agent.

Summary

A policy whereby antistaphylococcal antibiotics were used only in combination was introduced into a large general hospital.

The antibiotic sensitivity of all strains of *Staph. pyogenes* isolated from infections in the hospital was studied during a period lasting six months before the introduction of this policy and six months afterwards.

Analysis of erythromycin- and chloramphenicol-resistant infection has shown evidence of cross-resistance between these two antibiotics. Of 23 erythromycin-resistant strains, 11 came from patients who had been treated with chloramphenicol (in eight cases in combination with erythromycin and in three cases without). Moreover, eight of the erythromycin-resistant strains also showed resistance to chloramphenicol, although in two cases the patient had been treated with erythromycin but not chloramphenicol.

No such cross-resistance was noted between erythromycin and novobiocin, and of 108 patients treated with this combination none yielded a staphylococcus resistant to erythromycin, although in two instances strains resistant to novobiocin were isolated.

It is a pleasure to thank the many clinical colleagues who co-operated in this investigation and, in particular, Dr. Peter Elmes, without whose energy and enthusiasm the work would not have been possible. Our thanks are also due to Eli Lilly and Company for free supplies of erythromycin ("ilotycin").

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NEPHRITIS IN NORTH YORKSHIRE

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Outbreaks of acute glomerulonephritis have been reported, associated in recent years with *Streptococcus pyogenes* type 12 and sometimes with other types (Rammelkamp, 1954). As the potentially epidemic nature of nephritis may still not be generally recognized, some events in northern Yorkshire during the past 18 months are recorded.

Present Investigation

On March 25, 1957, it was learnt that during the last fortnight in January there had been 24 cases of acute pharyngitis among 56 boys in a residential school for the educationally subnormal, followed 10-19 days later by acute nephritis in four of them and suspected rheumatic fever in a fifth. On February 15 all the children were given oral penicillin, and this was continued for three days. The school, which was situated in a small and rather isolated village, was visited on March 26, and nose and throat swabs and urine specimens were obtained from the 24 children who had been ill. *Str. pyogenes* type 12 was isolated from seven; the urine of three of the four who had had nephritis still contained blood cells in moderate numbers, and that of the fourth was clear; red cells were also present in the urine of five other children, two of these specimens also showing casts.

In order to ascertain the extent and effect in the community of the type 12 infection, the small local primary school (school A), a quarter of a mile (400 m.) away, was visited on March 31 and specimens were obtained from the pupils. It was clear from the results (see Table), and from the fact that a clinical case of nephritis was found, that the outbreak was not limited to the residential school. Six primary schools in villages within a 5-mile (8-km.) radius were therefore visited during the next few days, and evidence of type 12 infection was found in three of them (B, C, and D). The Table shows that 11 streptococcal strains isolated from school C were of a degraded type. Dr. R. E. O. Williams, of the Streptococcal Reference Laboratory, who was responsible for the typing of all the strains

Incidence of *Str. pyogenes* Type 12, Acute Nephritis, and Symptomless Urine Abnormalities in Pupils Attending Certain Schools in March-April, 1957

School	Exam-ined	No. of Pupils			Showing Symptomless Urine Abnormalities	
		Harbouring <i>Str. pyogenes</i> Type 12	With Acute Nephritis		Red Blood Cells	Casts
Residential	24	7 (29%)	4		5	2
A*	26	14 (54%)	1		11	4
B	34	16 (47%)	0		6	0
C	48	11 (23%)	0		13	2
D		(degraded)				
E	38	3 (8%)	0		0	0
F	18	0 (—)	0		0	0
Secondary	570	32 (6%)	0		Not tested	
Form 1B	32	9 (28%)	0		3	0

* In the same village as the residential school.

mentioned in this report, found that these strains belonged to a type related to 12, but he could not be certain whether they were derived from type 12 strains. The strains isolated from the other schools were typed without difficulty. Urine was obtained from the children in the four positive schools (A, B, C, and D), and in one negative school (E). Red blood cells were seen in 31 of the 146 specimens from the positive schools but not in 18 specimens from the negative school. Only one of these children had symptoms of nephritis—the case in school A already mentioned.

Children over the age of 11 years from the affected villages attended a large bilateral secondary school 7 miles (11 km.) away from the centre of the original outbreak. In order to assess the extent to which infection had been carried into an unaffected locality by the older children, it was decided to investigate children at this school. Throat and nose swabs were taken from the whole school early in April and urine specimens were examined from children in the form (1B) showing the highest proportion of type 12 strains. The number of red cells found in the urinary deposits of children from the different schools ranged from 1 to 50 per high-power field; as there was no standard of normality with which to compare these findings, urine samples were obtained from 287 children of similar age in two schools 20 miles (32 km.) away from the affected area. No red cells or casts were found in any of them.

No further cases of nephritis came to our notice until December, 1957, when three occurred in the Northallerton District, some 25 miles (40 km.) north of the original outbreak. Further cases occurred in the York City and Northallerton areas during January and February, 1958, so at the beginning of March circular letters from the county medical officer and from the pathologist in York were sent to all doctors in York and the North Riding warning them of the situation and asking for information on cases of nephritis. During the first six months of 1958, 27 cases were unofficially notified in and around York City, and a further 18 in or near Northallerton. In York, 25 of the 27 cases were admitted to hospital and two were treated at home. Four of the hospital cases were admitted to surgical wards—three adults for investigation of haematuria and one child as an abdominal emergency. All 27 patients were examined bacteriologically, but mostly some time after onset and many had already received antibiotic treatment; *Str. pyogenes* type 12 was isolated from nine cases and type 22 from another. In Northallerton, 15 of the 21 cases were admitted to hospital and six treated at home. Throat swabs were taken from 14 cases; eight yielded *Str. pyogenes* type 12 and one a group B streptococcus. One patient, although having a negative swab, had antibodies to *Str. pyogenes* type 12 in her blood, and another, also with a negative swab, had a sibling from whom a type 12 strain was isolated.

We are thus aware of 53 cases of frank acute nephritis in York or the North Riding during the past two winters—5 in the first winter and 48 in the second. *Str. pyogenes* type 12 was isolated from 19 of them, and many of the remainder were either not swabbed or not swabbed at a suitable time. In addition, 38 children in schools were found to have red cells in the urine but no symptoms of nephritis; *Str. pyogenes* type 12, or a related type, was isolated from 19 of these. All but four of the cases of nephritis had a history of sore throat or otitis media, and so did most of those with haematuria but no clinical illness. In some cases, however, the initial infection was not severe enough for the patient to seek medical advice. No cases followed scarlet fever.

There was no evidence that the infection was transmitted except by direct contact. The sexes were equally affected, and the commonest age group was 5-15 years, which was the group most fully investigated. Nevertheless adult cases of nephritis occurred in both sexes, the oldest being a woman of 37 and a man of 44. The average period between infection and the onset of nephritis in those giving a reliable history was 14 days; the time ranged from 7 to 24 days, but in only two cases did it exceed 18 days.

Summary

An epidemic of nephritis associated with *Streptococcus pyogenes* type 12 occurred in York and in predominantly rural areas of the North Riding during the winter months of 1957 and 1958. In several schools in which there was evidence of type 12 infection in 1957 some children were also found with symptomless haematuria. Spread of infection took place in schools and at home. Symptoms of the initial streptococcal infection were usually present but often slight, and were followed by the onset of nephritis 7 to 24 days later.

We are indebted to Dr. R. E. O. Williams for typing the strains; to Dr. H. Gray, M.O.H. Easingwold R.D., Dr. J. L. Cotton, M.O.H. Northallerton U. and R.D., and Dr. A. K. Thomas, of Tollerton, for their co-operation and help in the investigation; to Dr. J. A. Fraser, C.M.O.H. North Riding of Yorkshire, for his advice on many points; and to all those practitioners who went to the trouble of reporting cases and contacts.

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AN OUTBREAK OF NEPHRITIS IN NORTHAMPTONSHIRE

BY

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In April, 1957, the head teacher of a village school telephoned the county health department to say that three children in the upper junior class at his school had fallen ill with nephritis within a period of a month. A fourth child, in the lower junior class, had been taken by his parents to Portsmouth, where he had become ill; the doctor had diagnosed pyelitis and sent the family home. Another child in the village attending a different school was under observation by the family practitioner with a sore throat and puffiness under the eyes. As a result of this outbreak there was considerable anxiety amongst the parents in the village; some of the children were being kept away from school unnecessarily, others were returning to school in an unfit condition. Although there had been a considerable amount of upper respiratory infection in the infant and lower junior classes in the early months of the year, it was not until April that the upper junior class had been affected, and it was in this month that nephritis had suddenly arisen as a complication.

Investigation

The school, which was visited on the same day, was soundly constructed and the rooms were well ventilated and

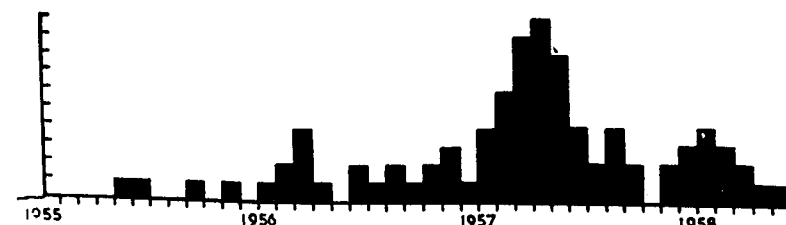


FIG. 1.—Nephritis in Northamptonshire. Incidence of 89 cases by month of onset, May, 1955, to May, 1958.

not overcrowded. All the children and staff were examined, and swabs were taken from any lesions suggestive of streptococcal infection. Group A type 12 haemolytic streptococci were obtained from lesions in two children in the upper junior class in which the cases of nephritis had occurred. One of the two children had a sore throat, the other a sore place in the nostril. The desks occupied by these two children and the children with nephritis were not grouped, but were dispersed among other desks in the classroom.

Apart from reassurance and advice to the head teacher it seemed desirable to assess the size of the outbreak. From discussions with practitioners it was evident that other cases had occurred in near-by villages, and from the paediatric department it was learned that about 25 children from the county had been admitted to hospital with nephritis since the previous October. In order to obtain further information Dr. C. M. Smith, the County Medical Officer of Health, wrote to all doctors practising in the county giving them particulars of the outbreak and asking to be notified of any cases under their care. From the replies received it is possible to present the following information.

Epidemiological Distribution

Only four cases were ascertained in 1955 (Fig. 1). Then in the first quarter of 1956 five children living in Kettering were taken ill; three of them lived in the same neighbourhood—two in houses almost opposite each other. Two months later cases were reported from Wellingborough, where the infection continued until June of the following year. By March and April, 1957, the infection had spread south-west to Northampton County Borough and had reached considerable proportions, the incidence in the county town being reflected in several small outbreaks in the outlying village communities, such as that already described. The infection then appeared to continue south-west, and by the late autumn it looked as though it was dying out. Over the winter months, however, another, and smaller, outbreak occurred, which was centred round Northampton, and again cases occurred in outlying villages and towns which had not been affected in the first outbreak.

It would be unwise to draw conclusions from data which are probably incomplete. Nevertheless, from the cases ascertained it can be said that there was no similarity between the distribution of cases of scarlet fever and nephritis during the period under review. Many of the scarlet-fever notifications were sporadic "dropping" cases, so that inevitably there were occasions when both conditions occurred in the same area at the same time. Beyond this, however, there was no evidence of association in the spread of the two infections.

Age and Sex Incidence.—In all, 89 cases were ascertained. Seventy-three occurred in children, 52% of whom were boys. One child under 3 was affected; 12 cases occurred in children aged 3 and 4 years; 45 cases in children aged 5 to 9 years; 15 cases in children aged 10 to 15 years (Fig. 2); and 16 cases in persons over 15 years.

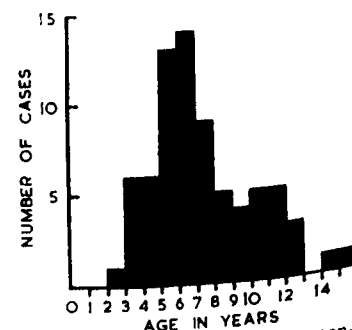


FIG. 2.—Nephritis in Northamptonshire. Age distribution of 73 cases in children.

Clinical Picture

Most of the patients were children and were admitted initially to hospital. Parents gave a history of febrile illness two weeks previously, invariably with a sore throat or other obvious upper respiratory infection. Frequently oral penicillin had been given by the general practitioner. There then followed a period of apparent recovery until perhaps the day before admission, when the child again became unwell, with loss of appetite, lassitude, pallor and puffiness of the face, and, on occasion, headache. In some cases the parents had observed the passing of dark urine. On examination the urine was found to be loaded with albumin and gave a positive chemical test for blood, which was confirmed by microscopy.

Two weeks after the initial infection positive nose or throat swabs were obtained in a high percentage of children; in all others the anti-streptolysin titre was raised. The organism found was invariably the haemolytic streptococcus (Lancefield group A type 12). Approximately 60% had raised blood pressures, and in two cases this was high enough to produce hypertensive encephalopathy. One of these patients presented in the casualty department as a case of sudden blindness.

On admission to hospital the lingering presence of the streptococcus was always assumed and every patient received a 14-day course of intramuscular penicillin. Cases of hypertension were sedated and every patient was confined strictly to bed until the Addis count (a measure of microscopic haematuria) approached normal. When the number of red blood cells in an overnight 12-hour specimen of urine was down to 1,000,000, gradual mobilization of the patient began. He was allowed home when the red cells were less than 500,000. The average length of bed rest required was 15 weeks, though some cases took as long as 20 weeks to produce a normal Addis count. Hypertension rapidly disappeared, usually within 10 days. Several cases had grossly enlarged, pitted, and unhealthy tonsils, and one child had an infected aural polyp. These cases showed slow response to medical treatment, but when surgery was carried out the subsequent improvement was impressive.

After discharge from hospital all cases were followed up. Earlier cases showed an increase in the Addis count associated with comparatively mild upper respiratory infections. Many showed increased counts even without obvious infection. Later patients were sent home on small prophylactic doses of phenoxymethylpenicillin daily, and these have so far shown a remarkable improvement in the follow-up condition. It is too early yet to assess the long-term effects of the disease and the treatment, but from preliminary observations it would seem that there is unlikely to be any gross permanent renal damage.

Discussion

In the present outbreak the exchange of information between the health department and medical practitioners was probably of value. The experience obtained suggests that in future outbreaks of serious infections which are not notifiable it would be a useful measure to alert all practitioners as soon as possible, since early treatment may help in modifying the severity of the attack or preventing complications.

In view of the complications likely to arise from streptococcal reinfection, it is worth while considering whether schoolchildren should not receive special supervision after an attack of nephritis. Teachers could be advised that they should report at once to the principal school medical officer in the event of upper respiratory or cutaneous infections in the class or school. Any child at special risk of nephritis reinfection could then be temporarily excluded. It would seem advisable also that parents should be cautioned of the liability of reinfection, so that crowded gatherings were avoided until the child's resistance was considered satisfactory.

Summary

A description is given of an outbreak of nephritis in Northamptonshire due to group A type 12 haemolytic streptococci. In all, 89 cases were ascertained; 73 occurred in children under 16 years of age, 52% of whom were boys.

Many of the cases were notified by practitioners in response to a circular letter which notified them of the outbreak and asked for particulars regarding cases in their practice. Early exchange of such information would appear to be a useful measure in serious infections that are not notifiable.

No association was noted between the distribution of nephritis and scarlet-fever cases during the period under review.

The cases showed the familiar pattern of acute nephritis, though the severity varied greatly from patient to patient. Albuminuria and transient "frank haematuria" were constant features. Following initial penicillin (intramuscular), prolonged bed rest was the most important part of the treatment, its duration being dictated by weekly microscopy of the urine and E.S.R. estimation.

The importance of keeping post-nephritics free of further streptococcal infection is emphasized. In this respect the oral administration of phenoxymethylpenicillin is a safe and efficient method of prophylaxis. In addition it may be considered desirable to advise parents regarding the risk of reinfection, and for the children to receive special supervision at school.

We thank Dr. C. M. Smith, County Medical Officer of Health for Northamptonshire, for his advice; Dr. I. H. Gosset, consultant paediatrician, for permission to refer to cases under his care; and all medical practitioners in the county, without whose co-operation the outbreak could not have been investigated.

POSSIBLE DISADVANTAGES OF A CHEST RADIOGRAPHY SERVICE FOR GENERAL PRACTITIONERS

BY

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It is common practice in many chest clinics to provide, in addition to normal consultations, special sessions to which practitioners may refer their patients for chest radiography only. These patients form a selected group in that they are usually referred because of symptoms which could arise from respiratory disease. If a chest radiograph shows an abnormality it is mutually understood by practitioner and physician that the patient may be recalled to the clinic for further investigation.

The diagnostic value of this service is demonstrated by the regularly high yield of abnormalities; its possible disadvantages are seldom even discussed. Disease not obvious on the chest film might be found by clinical examination. Moreover, a normal x-ray report from the clinic might allay practitioners' fears and, by false reassurance, delay diagnosis.

The following experiment was designed to determine, in those patients whose chest radiographs were reported as normal, (a) the amount of clinically discoverable disease present on attendance, (b) the incidence of early disease missed on radiography as represented by its appearance within the next few months, and (c) the extent to which normal x-ray reports influenced practitioners in their appreciation of any subsequent development.

Method

The routine "x-ray only" service in this clinic has always been conducted on 70-mm. roll film. Both postero-anterior and antero-posterior lordotic films are taken, and subsequently read by two observers independently to minimize error due to observer variation (Stradling and Johnston, 1955). In addition, during the period October, 1956, to May, 1957, inclusive, with the full co-operation of the practitioners concerned, certain of the referred patients underwent clinical examination at the time of routine radiography. To avoid bias and to obtain a group of suitable size for analysis, a systematic sampling method was employed; all patients born in the month of May were invited to co-operate, and none refused to be examined.

At the clinical interview the physician took a careful history, conducted a full physical examination, including urinalysis, and viewed a full-sized chest radiograph. When necessary, patients were referred to other hospital departments for investigation. When the 70-mm. films were read on the following day the patients' names on these films were obscured to avoid possible recognition before the observers had given their reports. If an abnormality was found during this routine film reading the patient was excluded from further study in the systematic sample even if already examined clinically. Thus further consideration is of a representative group of patients whose miniature radiographs were all considered normal.

During the same months a second systematic sample of patients (all those born in November) was collected for later analysis. These patients were not examined in the clinic, but those who were reported to have normal miniature radiographs were followed up four to eight months later by means of a questionnaire addressed to their practitioners. Inquiries were made to determine subsequent clinical developments within the follow-up period, any further action practitioners may have taken following the report of a normal chest radiograph, and in particular whether this report had led to diagnostic delay through the false reassurance of doctor or patient. It was specifically asked whether the report had been (a) of assistance, (b) of no help, or (c) actually misleading in this respect.

Results

Of 673 patients radiographed during the period under review, 155 (23%) were recalled for further investigation by the routine procedure when the miniature films were read. This again confirms the positive value of such a service and also establishes that the yield of abnormalities was in no way unusual during this period, for in 1955 and 1956 respectively 25% and 18% of the films proved to be abnormal. That the service itself provides representative material for analysis is shown by the figure of 4,000-5,000 miniature radiographs taken annually and the large number of practitioners referring patients.

The 74 patients forming the first systematic sample also proved representative in this respect, for 18 (24%) would have been recalled on viewing the 70-mm. films also. As members of the sample, however, they had already been examined and appropriate action taken. On no occasion was an abnormality discovered by the routine reading of miniature films in a patient already considered normal at the full examination undertaken as part of the experiment. Furthermore, no abnormality was discovered on the large radiographs that was not seen on the miniatures.

There remain in the first sample 56 patients whose miniature films were reported as normal. On physical examination 4 (5.4% of the sample) additional thoracic abnormalities were found in these patients. Two of these conditions (2.7%) proved significant and required treatment: one elderly man suffered from chronic bronchitis aggravated by excessive smoking, which he was advised to stop; another had an acute exacerbation of his chronic bronchitis, which was successfully treated with tetracycline. Relatively insignificant abnormalities not requiring treatment were found in the other two patients: one had mild costochondritis and the other a slight degree of pectus excavatum.

Significant extrathoracic disease was discovered in five patients (6.7%). One young woman had chronic paranasal sinusitis not previously diagnosed, two had iron-deficiency anaemia, and one had severe hypertension requiring hypotensive therapy. The fifth patient had cardiac neurosis: reassurance following full physical examination and investigation with normal findings led to relief of her symptoms. In two other patients (2.7%) insignificant abnormalities were discovered: mild systemic hypertension at the age of 77 and splenomegaly due to chronic malaria, already known to the practitioner.

By chance the second systematic sample also consisted of 74 patients. The number of abnormal reports on the miniature radiographs was 11 (13.5%), and these are not considered further. Questionnaires were circulated in respect of the remaining 63 patients, whose miniature films were reported normal, and every one of the 32 practitioners involved responded to the inquiry. Only two patients are untraced: they failed to revisit their doctors and had apparently left the district.

There remain for analysis 61 replies relating to patients with normal radiographs. All these patients were seen by their doctors soon after the initial radiography, and of the 61 replies, 60 stated that the report had been of assistance in making a diagnosis; usually by narrowing the field of possibilities or practically excluding a more serious pulmonary disease such as carcinoma or tuberculosis. Of these 60 patients, their practitioners had considered 48 normal or to have recovered from the illness which prompted reference for chest radiography. In the other 12 (16.2% of the sample) definite diagnoses were made by the practitioners: bronchitis with or without asthma was present in eight patients (10.8% of the sample) and non-thoracic disease in four others (5.4%). The diagnoses were hepatitis, hypochromic anaemia, alcoholic dyspepsia, and gout.

The subsequent clinical status of all 61 patients was either known or checked on receipt of the replies. None had developed any further disease during the follow-up period. In one, however, carcinoma of the bronchus was diagnosed soon after follow-up was complete. This case is discussed below.

On only one occasion did a practitioner feel that the radiograph had not helped towards a diagnosis. This patient, with pain in the chest and chronic bronchitis, was considered to have two fractured ribs on subsequent clinical examination at another hospital. The fractures, notoriously difficult to diagnose radiologically, were not visible on rescrutiny of our films.

Discussion and Conclusions

Chest radiography services, similar to that described, are now provided for practitioners by a large proportion of chest clinics. The widespread acceptance of such a facility is largely based upon the undoubted convenience to both patient and practitioner and an appreciation by the majority of the profession of its intrinsic value as a diagnostic aid. Moreover, the public health value of these services is very real in the case of tuberculosis: it is usual to obtain a yield of cases approximately 10 times that from mass radiography surveys of presumably healthy populations

(Toussaint and Pritchard, 1944; Sutherland, 1952; Trenchard and Grenville-Mathers, 1952). Early diagnosis, so often achieved when radiology is applied promptly to patients with minor symptoms, helps to prevent further spread of his disease both in the patient and in the community. It is the general practitioner who is most often presented with the diagnostic opportunity. He must act, but can do so only if he has ready access to diagnostic radiology (Stradling, 1948).

Nevertheless, there has always been an uneasy feeling in the minds of some physicians that perhaps such services were misconceived. It is thought by them that the ready availability of chest radiography might encourage slipshod physical examinations; that the x-ray examination might be used as an unwise short-cut to diagnosis or as a method of passing to a colleague responsibility for further action. From this it is argued that diagnostic errors can be avoided only by full physical examination at hospital or clinic whenever patients attend for chest radiography. But this would defeat one of the main aims of routine radiography services—the ability to deal rapidly with as many patients as practitioners choose to refer. Certainly it is only by the use of radiography that patients with minimal or no symptoms will have their pulmonary disease discovered in an early and treatable stage. The fact that the examination is over quickly is one of the main attractions to the patient; many of these relatively fit people would not attend if they thought that a long interview and an examination were involved.

The advantages of such radiography services have long been accepted by most chest physicians as outweighing possible disadvantages. Indirect evidence that this is justified, based on a retrospective survey of radiographs taken at routine consultations in a chest clinic, has been provided by Bradbury *et al.* (1951). In a group of 200 consecutive new patients every one of the 21 shown to have abnormalities on full clinical examination was picked out for recall on resurvey of the radiographs alone.

Our direct assessment of the situation has confirmed our confidence in the radiography service provided. Only 2.7% of the first sample of patients investigated proved to have thoracic disease needing treatment at the time their miniature films were reported normal. The corresponding figure for non-thoracic disease was 6.7%. These abnormalities were all either known to the practitioners concerned or discoverable by clinical examination in the surgery.

Furthermore, it is significant that the figures for non-thoracic disease discovered by physical examination, either under conditions of controlled trial at hospital or in the practitioners' surgeries, proved similar (6.7% and 5.4%). This very similarity indicates to us that practitioners are not apparently being distracted from diagnosing extra-thoracic disease by the report of a "normal" chest radiograph. Far from suggesting that such a report delayed diagnosis, our findings have revealed it as a positive, welcome, and correctly used diagnostic aid. Of the 32 doctors circulated with the questionnaire, 16 added unsolicited footnotes indicating the great importance they attached to a freely available chest radiography service. None of the 61 patients with normal reports on their initial radiographs developed any significant illness during the follow-up period of four to eight months. It is felt that this period is long enough to have revealed any such illness that might have been present at a detectable stage when radiography took place. The bronchial carcinoma diagnosed in one patient soon after follow-up was completed is considered to be an unrelated finding. This patient was admitted urgently with superior vena caval obstruction ten months after the symptoms leading to radiography had subsided. It is unlikely that an earlier diagnosis would have been made had the original radiographs never been taken: the terminal symptoms had been present for only a few weeks.

The success of a freely available chest radiography service depends upon the mutual co-operation of general practitioner and chest physician. Each has his full part to play: the practitioner in referring any patient with even minor

pulmonary symptoms; the physician in detecting the abnormal films and taking appropriate action on these. The practitioner also retains responsibility for those patients reported to have normal films: symptoms must be accounted for and further investigations arranged if this proves difficult. Radiography must be recognized for what it is—a diagnostic aid that must take its place with all others necessary for building up the full clinical picture. Repeat radiography at a suitable interval is essential if suspicious symptoms persist.

In our experience the necessary co-operation is fully obtainable. The high yield of initial abnormalities, the low yield of disease on additional physical examination, and the absence of serious developments during a period of follow-up, all indicate that such services are being used to the best advantage and that they are of the highest clinical and public health value. Disadvantages are more hypothetical than real, and are far outweighed by the advantages to practitioner, physician, and community alike.

Summary

Many chest clinics provide a chest radiography service for general practitioners in addition to the usual consulting sessions. The positive value of such a service is acknowledged, but its possible disadvantages have not previously been investigated.

Clinical examinations were made of 74 patients, chosen by a systematic sampling method from a group referred for "x-ray only." The thoracic abnormalities so discovered in those with normal chest radiographs represented 5.4% of the sample. Another 6.7% had non-thoracic diseases detected by clinical but not by radiological examination.

A second systematic sample was followed up some months later by a questionnaire addressed to the patients' practitioners. This showed that a similar incidence of thoracic and non-thoracic disease had been found by them. It is concluded that practitioners are not distracted from diagnosis by a report of a normal radiograph: such a report often proved of great value in excluding serious disease. The possible disadvantages of a chest radiography service for general practitioners are largely theoretical and are not borne out by practical experience.

We gratefully acknowledge constructive criticism from Drs. J. G. Scadding and Ian Sutherland. Our sincere thanks are also due to the many general practitioners who co-operated so fully and made the survey possible.

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The Ministry of Pensions and National Insurance has again published a *Digest of Statistics Analysing Certificates of Incapacity*. The new volume refers to the year 1955-6, but includes some comparison with previous years. The statistics do not cover illnesses which are too short for a claim to be made or sickness among people not eligible to claim. The *Digest* is available to interested persons on application to the Statistics Division of the Ministry at 10, John Adam Street, London, W.C.2.

GOLDBERG-MAXWELL SYNDROME

REPORT OF THE ANOMALY IN THREE SISTERS

BY

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In 1948 Goldberg and Maxwell described a case of feminine type of male pseudohermaphroditism and collected seven other cases from the literature which they believed belonged to the same group. Up till 1954, altogether 22 examples of Goldberg-Maxwell syndrome have been reported in the literature. Below is the report of this condition occurring in three sisters.

Case Report

A female Hindu, 21 years of age, married, was admitted at the A.H.M. and Dufferin Hospital, Kanpur, for the investigation and treatment of primary amenorrhoea. She looked perfectly feminine. Her height was 5 ft. 5 in. (1.65 m.), chest 35 in. (0.89 m.), and waist 28 in. (0.71 m.). Her breasts were well developed and the areolae and nipples normal. Axillary and pubic hair were absent. On vaginal examination the external genitalia were found to be normal. The labia were shaped normally, the urethra was situated correctly, and the clitoris was of usual size. The vagina was of ordinary dimensions, being 3½ in. (8.9 cm.) in length and quite capacious. The vagina ended in a blind pouch and no cervix was felt or seen, the vaginal vault being a smooth dome with no elevation or depression. Nothing could be felt at the site of the uterus.

The patient had been married two years and was perfectly happy as the female partner. Her sexual inclinations were female and her libido was normal. Her family history was most interesting, as two of her sisters also showed the same abnormality. Her eldest sister, 25 years old, had been married for seven years, but had no children and had never menstruated. Unfortunately a physical examination could not be carried out on her as she was in Calcutta; but from the description given by her sister it was quite obvious that she also suffered from the same anomaly. The second sister was 23 years old, and had been a widow for five years. She had never menstruated and had no issue. Her appearance was feminine and she had well-developed breasts, but axillary and pubic hair was absent. The external genitalia and vagina were normal; the latter ended in a cul-de-sac, and the uterus and cervix were absent. The third, and youngest, sister was 12 years old, unmarried, and had small, adolescent breasts. The axillary and pubic hair had just started to appear and she had menstruated twice. External genitalia were normal. Rectal and vaginal examination could not be done. Skin specimens were taken for biopsy from the second and third sisters, but report on the nuclear sex could not be given as the preservation of tissue was not satisfactory.

Tests for the estimation of hormone levels in blood and urine could not be carried out owing to lack of facilities for hormone assay. Laparotomy was performed on July 25, 1957. The findings were as follows. The uterus was absent, and in its place there was a tiny nodule of fibro-fatty tissue. The tube, gonad, broad ligament, and round ligament were absent on the right side. On the left side the tube was absent; the broad ligament was very rudimentary, ending outwards in a thin crescentic fold. The left gonad was situated in the region of the left iliac fossa, attached by a fold of peritoneum to the posterior abdominal wall. It was about 3 in. (7.6 cm.) long and 1½ in. (3.8 cm.) wide, and consisted of cysts 2 mm. to 1 cm. in diameter. A large piece was taken from the left gonad as a biopsy specimen, and the abdomen was closed.

The histological report on the specimen was: "Section shows number of tubular structures separated by a variable amount of fibro-collagenous stroma. These tubules are lined by one or two layers of rounded cubical cells. The cytoplasm of some of these cells is vacuolated or clear in appearance. The stroma in between these tubules contains small islands of Leydig cells. The latter are rounded or ovoid in shape, having intensely eosinophilic cytoplasm."

Discussion

Although only 22 cases of Goldberg-Maxwell syndrome have been described in the literature from 1948 to 1954, the condition is not so uncommon. In the last 10 months, while working in this hospital, besides the above-mentioned cases of three sisters, I have found this condition also in another patient, who complained of primary amenorrhoea and sterility. A skin biopsy specimen was taken for nuclear sexing, but she did not report back. I think many of these cases are sent away by general practitioners as hopeless cases for treatment from the point of view of producing menstruation or pregnancy owing to the absence of the uterus.

The Goldberg-Maxwell syndrome comprises a very distinctive group of patients in whom the bodily habitus and sexual behaviour are essentially feminine. They are brought up as females, marry, and live as female partners. They consult the gynaecologist for primary amenorrhoea and sterility. The breasts are normal in size, but pubic and axillary hair is absent. The external genitalia—that is, the labia, urethra, clitoris, and vestibule—are normal in shape and situation. The vagina is of normal length and capacity; therefore there is no difficulty in coitus, and many of these patients are able to have orgasm. The vagina ends as a blind pouch, there being no cervix and uterus; although in some cases a fibro-fatty nodule or a vestigial uterus may be present.

The gonads are found in the abdomen, usually in the position of the ovaries, but may be situated elsewhere in the abdomen and attached to the posterior abdominal wall by a small mesentery. The broad and ovarian ligaments are absent or rudimentary. These gonads resemble an infantile type of ovary in appearance, being long, bulky, and lobulated. Cysts are sometimes present in their substance. On histological examination the gonads are found to be devoid of ovarian elements, but present the structure of immature, sterile, cryptorchid testes as typically found in the case reported in this article.

According to Goldberg and Maxwell, the urinary F.S.H. output is high (at least 96 M.U. in 24 hours), indicating primary gonadal deficiency; and 17-ketosteroid output is within normal range. Vaginal smears indicate a fair degree of oestrogenic stimulation of vaginal mucosa.

It has been said that the absence of pubic and axillary hair is a genetic abnormality comparable to the various congenital abnormalities found in ovarian agenesis or Turner's syndrome. Another feature of the Goldberg-Maxwell syndrome is the very strong family incidence, as will be obvious from the above case report of three sisters and from Schneider's cases, six of which occurred in one family and were spread over three generations.

Although some authors advocate the removal of gonads for fear of occurrence of neoplasm in cryptorchid testes, this point is highly debatable. Removal of these gonads may lead to unpleasant climacteric disturbances, as the gonads are responsible for the production of oestrogens, and not the adrenal cortex as thought by some. For this reason the syndrome has also been described under the heading of "oestrogen-producing testes." Adrenocortical function has been tested in various ways in these cases, but impairment of function of adrenal glands has not been found.

The nuclear sex of these cases is male. Jost and other workers have carried out certain experiments on animals by which they explain the occurrence of male nuclear patterns in these anatomically female cases. They postulate the

female form to be the basic or neuter, and the male differentiation to occur only in the presence of functioning testes during development of the embryo. Graham, in his experimental study in cats, has pointed out that sex chromatin can be recognized in the early embryo before the gonads have appeared, and therefore the sex is genetically determined and does not depend upon the hormonal status of the individual. Hoffenberg and Jackson have explained the varieties of gonadal dysgenesis and the various forms of human intersex by postulating three closely connected genes situated on the same chromosome. These authors have postulated one gene for infantilism or intrauterine hypogonadism—called "I"; one gene for shortness of stature, "S"; and one gene-complex for various anomalies of vegetative system called "A." According to them, the infantilism in gonadal dysgenesis results from very early failure of the developing gonad (their factor I), with consequent feminization of genital tract and body form. If gonadal dysgenesis occurs at a later stage of the male embryonic development, partial development along masculine lines will already have taken place. Further development of the genital tract will be of the female type, and thus "male pseudohermaphroditism" will result. This is equivalent to their "I" factor coming into operation at a slightly later stage. They conclude thus: "I" alone (slightly later in genetic male) = male pseudohermaphroditism; "I" (slightly later in genetic male) + S + A = male pseudohermaphroditism with short stature and anomalies.

The observations of Jost and Graham have led to the adoption of the term "gonadal dysgenesis" in preference to "ovarian agenesis." It also suggests that the Goldberg-Maxwell syndrome is, in fact, a variety of gonadal dysgenesis, where genetic development has failed in its attempt to produce a normally functioning testis and therefore the basic female pattern has continued. In this syndrome the failure to develop has probably occurred at a very early stage of development of the embryo, with the emergence of a complete feminine form and none of the male features. We can therefore say that the Goldberg-Maxwell syndrome is the earliest form of male pseudohermaphroditism.

Summary

The syndrome of Goldberg and Maxwell occurring in three sisters has been described.

The various features of the syndrome have been surveyed in detail.

The genetic aspects of the syndrome have been discussed in the light of modern work, and a hypothesis is produced to account for the syndrome.

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AN ERYTHROPOIETIC FACTOR PRODUCED IN THE KIDNEY

PRELIMINARY REPORT

BY

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A systematic study has been made of the response in mice to x-irradiation of the kidneys. The exteriorized kidneys were exposed to a single x-ray irradiation. The doses ranged between 100 and 18,000 r. By irradiation of the kidneys in mice a condition was produced resembling the essential features of glomerulonephritis in man with increasing nitrogen accumulation in the blood, anaemia, acidosis, oedema, hypertonia with hypertrophy of the heart, atrophy and granulation of the kidneys, albuminuria, haematuria, cast formation, decreased concentration of the urine to isosthenuria, and final collapse in a uraemic condition.

Experimental Findings

After 8,000 to 12,000 r increased blood pressure was observed in 10 days, whereas after 1,000 r about 8-12 months was necessary for this development. After unilateral nephrectomy and irradiation of the remaining kidney with 500 r the blood urea level increased in the course of five months. With the same procedure, and using 8,000 r, a rise in blood urea was observed after five days.

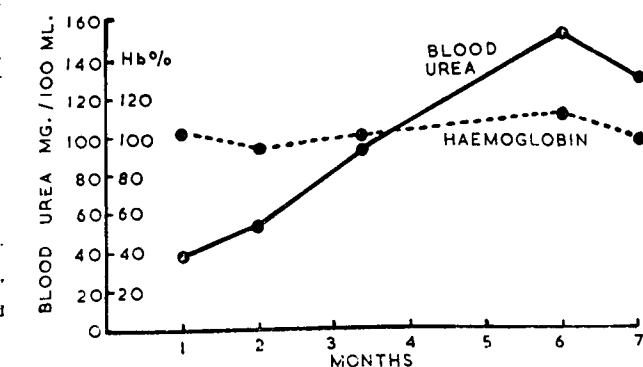
The anaemia caused by x-ray irradiation of the kidneys in mice was hypochromic to normochromic. The bone marrow showed a hypoplastic erythropoiesis.

In experiments with irradiation of the total amount of kidney tissue, the first changes observed were an increase of the blood urea level and a decrease in the haemoglobin values. Even at a time when the rise in blood urea was only from 20 to 23-24 mg. per 100 ml., a decrease in the haemoglobin value could be traced. It is therefore unlikely that the former caused the latter.

Through variation of the experimental procedure it has been possible to demonstrate the following.

1. In mice having a very small amount of kidney tissue shielded during the irradiation, the haemoglobin is maintained at a higher level than that usually found in connexion with the increased blood urea figures observed in these animals, and higher than in the animals with all the kidney tissue irradiated.

2. If one-quarter to one-third of one kidney is shielded during the irradiation the haemoglobin values may be maintained at the normal level, in spite of the development of



Blood urea and haemoglobin values in a mouse after unilateral nephrectomy and irradiation of approximately three-quarters of the remaining kidney with 8,000 r.

a considerable uraemia. The Chart shows the blood urea and the haemoglobin values in an animal which had been subjected to unilateral nephrectomy and irradiation of approximately three-quarters of the remaining kidney with 8,000 r. After six months the blood urea had reached 153 mg. per 100 ml., whereas the haemoglobin value was in the normal range, actually 111%.

3. Irradiation of one kidney and formation of an intra-peritoneal cutlet of the ureter from the other non-irradiated kidney is associated with normal haemoglobin values.

These experiments indicate that the failure of the kidney as an excretory organ and the development of the anaemia are parallel phenomena and independent of each other. These experiments also indicate that the kidney produces a principle of importance in erythropoiesis.

Table I gives the reticulocyte counts in (a) mice with both ureters ligated, (b) mice with total nephrectomy, (c) mice with partial nephrectomy, and (d) normal mice with intact kidneys. In all the groups acute anaemia was produced through bleeding. No reticulocyte reaction was found in the nephrectomized animals, whereas a reticulocytosis developed in the animals with ligated ureters. These observations correspond well with the findings of Jacobson *et al.*

TABLE I.—Reticulocyte Count in Mice Bled ("Stimulus") in Connexion with Different Operations

Operation	Stimulus	Reticulocytes %					Hb % 6 Days after Operation
		Before Operation	After Operation				
			12 Hours	24 Hours	2 Days	6 Days	
Ligation of ureters ..	Bleeding	2.7		4.7	Dead		
Total nephrectomy	"	2.1	2.3	2.2	"		
Partial nephrectomy (half a kidney left intact) ..	"	2.0	4.2	5.9	7.0	21.3	
Controls. No operation	"	2.9	6.5	13.0	13.2	32.1	
						48 50	

Each group comprises three mice.

TABLE II.—Reticulocyte Count in Serum-injected Mice

Condition of Experimental Animals	Stimulus	Reticulocytes %					
		Before Serum Inj.	After Serum Injection				
			1 Day	4 Days	6 Days	8 Days	10 Days
(A) Uraemic mice with anaemia (irradiated kidneys)	"Activated" serum	2.7	6.3	7.8	8.4	6.2	
(B) Normal mice	"	2.4					
(C) Nephrectomized mice	Bleeding "activated" serum	2.6	4.3	4.0	4.7	3.4	1.6
(D) Uraemic mice with anaemia (irradiated kidneys)	Ultra filtrate of "activated" serum	2.4		7.5	9.3	12.7	9.7

Each group includes three to five mice.

(1957), who studied the erythropoietic titre in rats and rabbits, nephrectomized or with ligated ureters. The reticulocyte reaction seemed to be stronger in the animals with intact kidneys than in those with reduced kidney substance.

Serum from bled normal mice ("activated" serum) injected into mice with anaemia after irradiation of their total kidney mass produces reticulocytosis. As shown in Table II A, the reticulocyte response is considerable, in spite of a severe uraemia and acidosis, even after a single injection of "activated" serum (0.3 ml.). These experiments show that the bone marrow of uraemic mice responds to an erythropoietic principle present in the blood of bled animals. This erythropoietic principle is able to counteract the anaemia caused by irradiation damage in kidneys.

"Activated" serum will also produce a reticulocyte response in normal mice with normal haemoglobin values (Table II B). This observation may explain the polycythaemia sometimes seen in connexion with renal tumours, and it may indicate that the principle observed may be a factor of importance also for the normal erythropoiesis.

As mentioned above, after an acute haemorrhage no reticulocyte response is found in nephrectomized mice. If the nephrectomized animals are injected with "activated" serum a reticulocyte response develops (Table II C).

Table II D summarizes the results of experiments with injection of protein-free ultrafiltrate from "activated" serum into mice with anaemia after irradiation of the kidneys. Also this protein-free filtrate contains an active principle.

Conclusion

An attempt has been made to demonstrate morphological structures, which may be related to the functional findings recorded above. In normal mouse kidneys stained with crystal violet and light green (Wilson, 1952) the juxtaglomerular cells show definite granules. In mice with anaemia produced through daily bleeding there is in some instances a distinct reduction of the number of granules in the juxtaglomerular cells and diminution of the individual granules.

Some months after unilateral nephrectomy and x-ray irradiation of the greater part of the other kidney no granules are found in the juxtaglomerular cells in the non-irradiated part of the kidney, and none or very few and small granules in the irradiated part. In bilaterally irradiated kidneys the granules in the juxtaglomerular cells are well preserved and the cells may even appear to be increased in size, with enlargement of the individual granules.

Further studies of the possible relationship between the alteration of the granules in the juxtaglomerular cells and the erythropoiesis are in progress.

ADDENDUM.—Since erythropoietin is regarded as a protein or a protein-bound non-filterable principle, and since the ultrafiltrate of "activated" serum is effective in anaemic mice with irradiation-induced nephritis but gives no reticulocytosis in normal mice, the indication is that the substance active in nephritic mice is different from erythropoietin. It can also be demonstrated that the serum from nephritic mice with anaemia can induce reticulocytosis in normal mice (erythropoietin effect). Further investigations indicate that the erythropoietic principle which is active in nephritic mice is connected to the granules of the juxtaglomerular cells. Such a substance may be referred to by the name of "juxtaglomerulin." A detailed account will be published later.

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A proposal that W.H.O. should be asked to consider organizing an International Public Health and Medical Research Year was unanimously endorsed by the U.N. General Assembly's social, humanitarian, and cultural committee in New York on November 12. The committee adopted a resolution under which the Assembly would invite W.H.O., in accordance with its agreement with the United Nations, to consider a recommendation to organize the Year and to adopt ways of intensifying international co-operation in health matters. Under the finally adopted resolution, the Assembly would state its desire to combat widely prevalent diseases such as malaria, tuberculosis, smallpox, cholera, cancer, cardiovascular ailments, leprosy, and poliomyelitis, and to solve other serious health problems. The resolution, after noting other fields of effort such as the use of atomic energy in medicine and popular health education where international co-operation might be intensified, invites W.H.O. to inform the next General Assembly session (in 1959) of its reaction to these proposals.

HAEMOGLOBIN-H DISEASE

BY

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Haemoglobin-H was first described in 1955 by Rigas, Koler, and Osgood. It differs from the other abnormal haemoglobins so far described in that its inheritance cannot be followed by electrophoresis in its heterozygous and homozygous forms. Usually in the haemoglobinopathies, adult haemoglobin (HbA) and the abnormal haemoglobin are present in approximately equal quantities in the heterozygous state. In the homozygous state all or nearly all the haemoglobin present is of the abnormal type, the patient showing the features of the appropriate disease. In patients with haemoglobin-H disease the proportion of abnormal haemoglobin found varies from about 10 to 35%. It is irregularly found in relatives of these patients. In both these respects it resembles the appearance of haemoglobin-F in thalassaemia. Clinically, haemoglobin-H disease is very similar to thalassaemia minor. Two cases of this rare disease are reported in which red-cell survival and marrow iron turnover have been studied.

Methods

1. *Electrophoresis* of haemoglobins was carried out on Whatman No. 1 and No. 31 extra thick chromatography papers, using a horizontal technique in barbiturate buffer pH 8.6, M=0.05. By this technique HbA₂ can be separated from HbA.
 2. *Red-cell survival time* was estimated using the patient's own cells labelled with radioactive chromium (⁵¹Cr) as described by Joske, McAlister, and Prankerd (1956).
 3. *The radioactive iron* (⁵⁹Fe) turnover was studied by the technique described by Harris, McAlister, Prankerd, and Singh (1957).
 4. *The foetal haemoglobin (HbF) percentage* was estimated by the method of Singer, Chernoff, and Singer (1951).
- Identification of Haemoglobin-H.*—The abnormal haemoglobin found in the cases described was identified by comparison with a sample kindly supplied by Dr. J. C. White and by moving boundary electrophoresis carried out by Dr. E. M. Shooter and Mr. R. E. Skinner.

Case Reports

Case 1.—A Greek Cypriot, aged 23 years, living in London, attended hospital complaining of occasional nocturnal epileptic fits. He had always been pale and had had a few attacks of jaundice. When he was 7 years old he was treated in a sanatorium for tuberculosis. On examination the only abnormal physical signs were pallor, slightly icteric conjunctivae, and a just palpable spleen. When he was first seen his reticulocyte count was 7.5%. This gradually fell to normal at the time of the radioactive studies.

Case 2.—A Greek Cypriot woman, aged 22 years, living in London, attended hospital complaining of feeling unduly tired and weak during the past two years. On examination there were no abnormal physical signs apart from slight pallor. Her spleen was not palpable.

The investigations in both cases are set out in the table below.

Analysis of the Cases

	Case 1	Case 2
Haemoglobin	11 g./100 ml.	10 g./100 ml.
Red cell count	5.9 m./c.mm.	4.9 m./c.mm.
Packed cell volume	39%	37%
Mean cell diameter	7.7 μ	7.4 μ
Mean cell volume	28 g./100 ml.	25 g./100 ml.
Mean cell volume	66 cubic microns	75 cubic microns
average thickness	1.4 μ	1.7 μ
Reticulocytes	7.5%–2%	3.5%
Red film	Marked variation in size and shape. No target cells.	Marked variation in size and shape. No target cells.
Red cell osmotic fragility (Normal range, 0.48–0.30% saline)	0.42–0.21% saline	0.45–0.24% saline
Foetal haemoglobin	3.3%	3.2%
Schumm's test	Positive	Positive
Direct van den Bergh	Negative	Negative
Total plasma bilirubin	1.3 mg./100 ml.	0.5 mg./100 ml.
Urinary urobilinogen (Schlesinger's test)	Slight excess	No excess
Radiographs	Skull: normal Skeleton: normal	Skull: normal Humerus: normal

Results of Radioactive Iron and Chromium Studies

Figs. 1 and 2 show the results of these analyses. The uptake of ⁵⁹Fe was reduced over the marrow sites in the fourth and fifth lumbar vertebrae, but was increased in the shafts of the long bones.

These results are interpreted as showing a reduction in marrow activity per unit volume of marrow, but an increase in total marrow volume due to peripheral spread in the skeleton. The reduction in marrow activity was more pronounced in Case 1. In both cases the ⁵⁹Fe uptake over the spleen and liver showed no evidence of extramedullary red cell production. The rate of ⁵⁹Fe appearance in the red cells was slightly increased—T_{1/2}* Case 1=3.0 days, Case 2=2.7 days (normal=3.1 ± 0.2 days)—indicating a slightly increased out-pur of red cells.

The ⁵¹Cr survival time of red cells was slightly reduced in Case 2—T_{1/2}†=13 days (normal 22–24 days)—and the mean cell life may be calculated to be about 70 days. There was no evidence of any excessive red cell destruction in the spleen. In Case 1 the ⁵¹Cr survival time of the red cells was almost normal—T_{1/2}†=20 days—but earlier there had been undoubted indirect evidence of haemolysis.

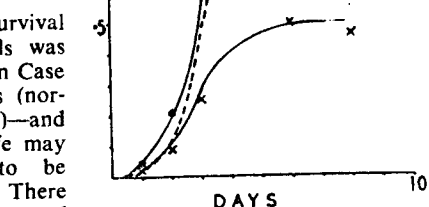


FIG. 1.—Uptake of ⁵⁹Fe measured as relative activity over L. 4 and 5. Vertical axis=Relative units of radioactivity. x—x=Case 1. ●—●=Case 2. ----=Normal.

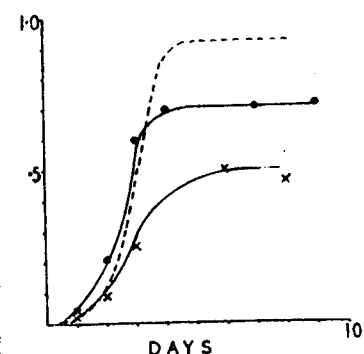


FIG. 2.—Rate of appearance of ⁵⁹Fe in red cells. Vertical axis=Fraction of injected ⁵⁹Fe in red cells. x—x=Case 1. ●—●=Case 2. ----=Normal.

The Family of Case 1

1. Aged 68. Her blood contained about 10% of haemoglobin-H and she had the clinical and haematological picture of haemoglobin-H disease. Haemoglobin 9 g./100 ml.
2. Deceased.

*Half the time taken for the radioactive iron in the red cells to reach equilibrium.

†Half the time taken for the disappearance of radioactive chromium from the peripheral blood.

3. No abnormality found on clinical and haematological examination. Osmotic fragility of red cells within normal limits. Foetal haemoglobin 2% of total.

4. No abnormality on clinical and haematological examination. Osmotic fragility of red cells was within normal limits. Foetal haemoglobin less than 2% of total.

5. Case 1, described.

6 and 7. No haemoglobin-H found on paper electrophoresis. Foetal haemoglobin less than 2% of total.

Paper electrophoresis did not show any increase of HbA₂ in any of the relatives of Case 1.

The Family of Case 2

1. Paper electrophoresis showed no haemoglobin-H. Haemoglobin 8.9 g./100 ml. This anaemia responded to the administration of iron, her haemoglobin rising to 12 g./100 ml. Foetal haemoglobin 2% of total.

2. Not examined.

3. Electrophoresis showed haemoglobins A and H. She was suffering from a mild anaemia, similar to Case 2; haemoglobin 10.4 g./100 ml. Occasional target cells seen in blood film. Foetal haemoglobin less than 2% of total.

4. Case 2, described.

5. Not examined.

6. Paper electrophoresis showed no haemoglobin-H. Foetal haemoglobin less than 2% of total.

7. Paper electrophoresis showed no haemoglobin-H. Foetal haemoglobin 5% of total. (Child aged 1½ years; haemoglobin 13 g./100 ml.; normal red cell fragility.)

Paper electrophoresis did not show any increase of HbA₂ in any of the relatives of Case 2.

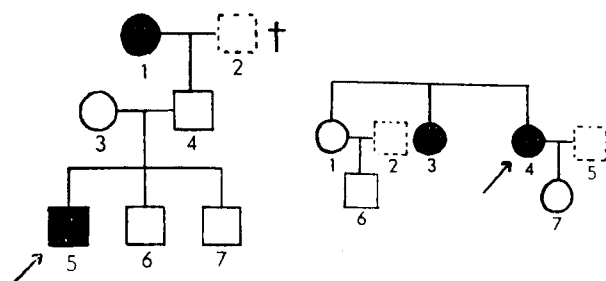


Fig. 3.—Family tree of Case 1. Fig. 4.—Family tree of Case 2.

Discussion

The results described show that haemoglobin-H disease is characterized by a slight reduction in the life span of red cells which is not associated with splenic destruction. There is a decrease in marrow activity, which is compensated for by marrow extension, and this results in a slight increase in total red cell output. Output, however, does not compensate completely for haemolysis. The life span of red cells appears to be variable, as a patient who at one time showed clear evidence of haemolysis later had an almost normal cell survival. These findings are similar to those in thalassaemia (Bailey and Prankerd, 1958), which the disease closely resembles in clinical features and haematological findings. However, it differs from thalassaemia minor in that HbA₂ is not increased in the patients or their relatives (Vella, Wells, Ager, and Lehmann, 1958). The cases so far reported have been from races in which thalassaemia occurs (Vella *et al.*, 1958); and Motulsky (1956) states that haemoglobin-H disease is the result of the interaction of the thalassaemia and "H" genes. Our two families show no evidence to support this theory, as none of the relatives have thalassaemia.

Summary

Four cases of haemoglobin-H disease are reported from two Greek Cypriot families living in London. One case from each family has been studied in detail, and results of red cell survival time and marrow iron turnover are presented. The familial nature of the disease is demonstrated.

We are grateful to Dr. E. A. Blake Pritchard for permission to study and publish Case 1.

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TOXIC PSYCHOSIS FOLLOWING ATROPINE EYE-DROPS

BY

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It is well known that atropine may produce a delirium in addition to its more characteristic autonomic effects, and that in certain sensitive subjects these effects will arise with normal pharmacological doses. It is less well known that atropine can produce delirious states with minor or absent peripheral signs of intoxication and that severe mental reactions can follow routine instillation of atropine eye-drops.

The case described is one of acute toxic psychosis caused by routine atropinization of the right eye over a period of three and a half weeks in the course of treatment of retinal detachment.

The condition is rare in adults and few cases have been reported in the literature (Hopkins and Robyns-Jones, 1937; Listwan and Whealy, 1953; Schinko, 1954), but it is suggested that milder degrees of mental disturbance often seen after eye surgery and attributed to emotional stress of the post-operative regime may be due in part to atropine intoxication.

Case Report

The patient was a married woman of 33, without children, intelligent, and described by her family as somewhat highly strung, emotional, and imaginative. After the death of her father two years ago she had spent three days in a neurosis unit, the diagnosis being reactive depression with hysterical features. There was a similar episode 11 years ago after the death of her first husband, but without admission to hospital.

The medical history included rheumatic fever at the age of 12, followed by a slight persistent tachycardia, and myopia requiring 10 dioptries correction. She had recently worn contact lenses. There was no significant family history.

On June 29, 1957, she was admitted to Moorfields Annexe, Highgate, with a right temporal retinal detachment. Treatment with bed rest, double eye pads, and daily instillations of 1% atropine sulphate drops was instituted. On July 4 she was transferred to Moorfields Hospital, where the atropine drops were instilled twice daily. At this time she was judged to be "unstable in temperament," and phenobarbitone, ½ gr. (32 mg.) t.d.s., was added to her treatment.

Diathermy and subretinal aspiration was performed on July 8 under thiopentone, gallamine triethiodide, gas and oxygen, with premedication by "omnupon" and scopolamine. There were no complications. Atropine drops twice daily, eye pads, and strict bed rest were continued until July 19, when masked glasses were substituted for the pads.

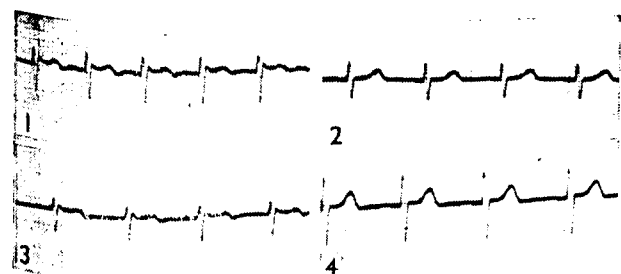
more liberty of movement was allowed in bed, and the phenobarbitone was replaced by chlorpromazine, 25 mg. t.d.s.

Over the next four days she became increasingly noisy, disorientated, and irrational, and required oral and intramuscular barbiturates. By July 23 she was quite unmanageable and was transferred to Three Counties Hospital on an Urgency Order.

On admission she was disorientated in time and place, was amnesic for recent events, mistook identities, and asked if she was to have an operation. She was restless and garrulous, refused to stay in bed, called out in terror, and at times wept uncontrollably. She stated that she had seen the Cross and "boats to sail away in," and had heard the voices of near relatives. She believed people to be talking about her and plotting against her. At times she showed partial insight.

On examination she was of average physique; the right pupil was fully dilated and the left less so and reacting to light; the gait was slightly ataxic; there was a tachycardia of 150 a minute, and the blood pressure was 170/90. There were no other abnormal physical findings.

Next day her mental state had deteriorated. She was resistive and hostile, offered violence, was incontinent, and refused food. This state was not continuous, but was broken by more lucid intervals, during one of which she was sufficiently quiet for an E.C.G. tracing to be taken. This showed (first tracing in Figure) a regular sinus tachycardia,



E.C.G. Lead V₁. (1) On admission (July 24). (2) At 11 a.m. on August 13. (3) At 3.45 p.m. on August 13—atropine sulphate, 1/66 gr. (1 mg.), given at 11.10 a.m. (4) At 6.45 p.m. on August 13—neostigmine, 1 mg., given at 4 p.m.

rate 130, with diphasic T wave throughout the chest leads and some elevation of the ST segment. The white-cell count was 15,000, with a polymorphonuclear leucocytosis; Hb, 102%; W.R. negative; E.S.R. 7 mm./hr.; urine, N.A.D.; chest x-ray examination N.A.D.

At this stage the diagnosis lay between an acute schizophrenic reaction and a toxic delirium, the latter being more probable because of the lucid intervals, visual hallucinations, and disorientation, together with the myocardial findings. It was tentatively suggested that the condition might be due to atropine poisoning, but this was discounted by outside medical opinion; for fear of neglecting the post-operative care of the eye the drops were continued.

By July 25, despite sedation, her mental condition had deteriorated further and tube feeding had to be instituted. Electroplexy was considered, but thought to be too dangerous in view of the toxic state of the myocardium. The pulse rate remained at approximately 150. It was decided to discontinue atropine, and within 24 hours there was some improvement in her mental state.

After 48 hours the pulse rate had fallen to 96, but mentally she was relapsing again and refusing nourishment. It was now thought that her myocardial condition had improved enough to allow electroplexy, which was indicated by her continued overactivity, resistiveness, and refusal to take nourishment. Daily E.C.T. was given until July 30, by which time she had greatly improved, was normal in behaviour and mood, and had no disturbance of cognitive function. Over the next few days, however, she again became more

labile emotionally, rather demanding and querulous, and was expressing paranoid ideas.

By August 6 she had gained in insight and was more settled, but still emotionally unstable and liable to tears. On the 8th a suture was removed from the eye by our visiting ophthalmic surgeon and a satisfactory report given on the state of the retina. An E.C.G. tracing taken on August 9 was within normal limits, rate 96.

In view of the possibility that this patient might need further treatment to her eyes in the future, it was considered important to assess the part played by atropine in the aetiology of her psychosis, so on August 9 an injection of atropine sulphate, 1/100 gr. (0.65 mg.) was given subcutaneously, with the suggestion that it was a sedative. Six hours later she developed a garrulous, emotional, paranoid, hallucinated state resembling in lesser degree her condition of the previous week. Systemic effects were negligible. Unfortunately she was too uncooperative to permit a further E.C.G. being taken. Next morning she was more settled, but still showed some pressure of ideas and a tendency to form illusions.

In order to eliminate the possibility that this was a chance relapse, and if possible to have electrocardiographic confirmation of the effects of atropine, a further trial dose of the drug, this time 1/66 gr. (1 mg.), was given subcutaneously at 11.10 a.m. on August 13, again with the suggestion that it was a sedative. An E.C.G. was taken (second tracing in Figure) 10 minutes before the injection and was normal, rate 96. By midday she showed pressure of ideas and increased lability of affect, but no significant systemic effects or alteration of the pulse rate. By 2 p.m. she complained of a burning sensation in the palms of her hands and in her brain, and said she felt she could no longer contain herself or suppress her feelings. She began to make absurd accusations against the hospital and demanded her immediate discharge on the grounds that her room was a locked cell (untrue) and that the tea was not strong enough. She asserted that patients were being given nicotine injections to make them cough, and that others were being gassed. She could smell the gas (not true) and insisted that she could hear men laughing, her sister's voice, and the click of billiard balls. Visual hallucinations were also suspected.

An E.C.G. taken at 3.45 p.m. (third tracing in Figure) showed the same slight elevation of the ST segment and diphasic T wave as in the tracing taken on admission (first tracing in Figure). There was no increase in sinus rate.

At 4 p.m. 1 mg. of neostigmine was given, and a further E.C.G. taken at 6.45 p.m. (tracing 4 in Figure) showed that the myocardial changes produced by the atropine had resolved. Her mental condition, however, did not settle markedly until next morning, and not completely until three days later.

She was discharged on August 16, and has since remained well and has returned to work.

Discussion

Listwan and Whealy (1953) described the characteristic mental symptoms of atropine intoxication as a confusional state with vivid visual hallucinations, restlessness, muscular incoordination, and later increased emotionalism with a short period of retrograde amnesia. In our case all these features were present together with aural and olfactory hallucinations. Peripheral post-ganglionic cholinergic effects were minimal apart from the tachycardia on admission. It is thought that the E.C.G. changes were due to direct action on the myocardium, as in the model psychosis there was no increase in sinus rate.

Fleury and Marx (1949) pointed out that intoxication is not due to transconjunctival absorption but to the swallowing of atropine-laden tears. In 1% atropine sulphate, each drop contains 1/110 gr. (0.6 mg.). Assuming complete absorption, three drops in the normal subject will produce parasympathetic paralysis, six drops restlessness, and 15 drops mental symptoms and ataxia. In sensitive subjects

mental or peripheral symptoms will follow much smaller doses. Children (Tyson, 1889; Kelyack, 1890; Scally, 1936; Duggan, 1937; Belz, 1949; Fleury and Marx, 1949) and the elderly (Métivier, 1935) are particularly affected.

Recommendations to reduce the risk of side-effects from atropinization of the eye have included the use of a 0.5% solution, precautions to avoid concentration of the solution by evaporation, and compression of the internal angle of the eye to obstruct the lacrimal duct during instillation (Belz, 1949; Fleury and Marx, 1949).

It would be interesting to know if any positive correlation could be found between the more minor emotional disturbances and restlessness which often accompany eye surgery, and any particular dosage or method of atropine administration.

Summary

A case is described in which an acute confusional psychosis resulted from the routine administration of 1% atropine sulphate drops in the treatment of retinal detachment. The psychosis was accompanied by myocardial changes giving rise to considerable concern. Other peripheral signs of atropine intoxication were absent. A remission of the confusional state followed discontinuation of the eye-drops and a short course of electroplexy; paranoid trends and emotional lability persisted for a further few days.

At a later date, in order to establish a diagnosis, small test doses of atropine were given by injection. Both the psychotic symptoms and the myocardial change seen when the patient was having atropine eye-drops were reproduced.

The literature concerning mental symptoms following the use of atropine eye-drops is reviewed and possible preventive measures against intoxication are described.

It is suggested that closer investigation might be made into the origin of states of minor emotional disturbance, usually attributed to psychological stress, in patients undergoing eye surgery with prolonged routine atropinization. E.C.G. changes appear to be useful in establishing a diagnosis of atropine sensitivity where other peripheral signs of intoxication are lacking.

Our thanks are due to Dr. Leslie Ford, medical superintendent of Three Counties Hospital, for permission to publish this case, to Dr. L. G. M. Page, deputy medical superintendent, for his help and advice, and to Dr. D. W. Hill for details of treatment at Moorfields Eye Hospital.

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Opening a conference on cerebral palsy, held in London on November 21 by the British Council for the Welfare of Spastics, Mr. R. H. M. THOMPSON, Parliamentary Secretary to the Ministry of Health, said that the overall needs of children and young people suffering from cerebral palsy were early ascertainment, full assessment, expert treatment, education, training for future employment, and continuing aftercare in the community. At the same time the parents needed guidance in the child's home management, and help in coping with their own numerous practical and personal problems. The need was to build up a system of comprehensive care available to sufferers throughout their lives. Mr. Thompson thought the greatest need was for further understanding of the causation of the disease, for it was only in this way that we could prevent it. Research into its causation and treatment would ultimately be of benefit to children suffering from other handicaps also.

RENAL COLIC AND ANURIA FROM ACETAZOLAMIDE

BY

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Acetazolamide, "diamox," is a sulphonamide derivative and inactivates carbonic anhydrase. By oral administration it is rapidly absorbed, and is excreted largely unchanged by the kidney within 6-12 hours. The inhibition of carbonic anhydrase leads to increase of sodium bicarbonate in the urine and increased potassium output.

Acetazolamide is widely used for glaucoma and as a diuretic in cardiac disease, and is reputedly very free from serious complications; only three papers have appeared in America reporting complications and none at all in Great Britain, which is the reason for the publication of this case.

Case Report

The patient, a man aged 54, was quite well until 5.30 p.m. on May 1, 1958, when he passed urine normally. Shortly afterwards urgency developed and a quantity of "very thick urine" was passed with pain. Pain then developed in the right loin; it radiated to the groin and was associated with frequency, penile pain, and haematuria. He was seen by Dr. J. Williams, who diagnosed renal colic.

Next day the patient voided 15 oz. (425 ml.) of clear urine in the morning and complained only of a dull ache in the right loin. Later, severe low back pain developed with left-sided abdominal pain and vomiting.

On May 3 the severe low back pain and vomiting continued and no urine was passed for 24 hours. The patient was admitted to Leatherhead Hospital; temperature 99° F. (37.2° C.). No stones were seen by straight radiograph. Cystoscopy (lignocaine gel analgesia) showed the bladder to be empty but otherwise normal. The right ureter was inactive and a catheter could not be passed beyond 1 cm. The left ureter was obstructed at 5 cm., but a catheter with stylet was successfully forced through and bloody urine poured down the ureteric catheter under considerable pressure.

The ureteric catheter was tied in and 38 oz. (1,077 ml.) drained through it during the night. Distaquaine penicillin, 300,000 units, was given daily for six days from May 3. Sulphonamide crystalluria was diagnosed, and sodium bicarbonate, 60 gr. (4 g.) 4-hourly, was given orally and intravenous saline discontinued early, as the patient took well by mouth.

On May 4 the blood urea was 95 mg. per 100 ml.; plasma CO₂, 16.1 mEq/l.; serum chlorides, 106 mEq/l.; sodium, 139 mEq/l.; potassium, 4.6 mEq/l. Urine: bladder and left ureter, sterile; red cells ++; no crystals.

Progress was satisfactory; urine drained well from the ureteric catheter and the left renal pain was relieved at once. After about 12 hours the patient voided a few ounces of urine around the catheter; this was thought to be from the right kidney, as relief of right renal pain then occurred. The blood pressure was 150/85. The ureteric catheter was removed on May 6 after retrograde pyelography had shown a curious beaded appearance at the lower end of the ureter which might have been due to oedema or collections of crystals. The blood urea had fallen to 72 mg./100 ml.

The following day the patient was passing clear urine, but a peak of temperature followed, due to pyocyanus infection of the urine, which responded well to a five-day course of chloramphenicol.

On May 18 the patient was discharged well with a blood urea of 29 mg./100 ml.

Discussion

The diagnosis of this case lay between bilateral non-opaque ureteric calculi and crystalluria. The obstruction to the ureteric catheter very closely resembled the blockage experienced in sulphonamide crystalluria.

It was known that the patient had attended elsewhere for blurred vision (? glaucoma) in the left eye; he had improved somewhat on 2% pilocarpine, and was then given acetazolamide as follows: Two tablets on April 25, 26, 27, and 28, none on the 29th, two on the 30th, and one on May 1. The thick urine appeared during the evening of May 1 and was rapidly followed by bilateral renal colic and anuria; it seemed reasonable, therefore, to blame the tablets. Advice was sought from various medical colleagues, and it was concluded that the patient might have been taking sulphonamide tablets instead of the "harmless diuretic" acetazolamide.

Mr. C. R. Davenport, senior pharmacist at King's College Hospital, pointed out the sulphonamide nature of acetazolamide, of which I and most of my colleagues appeared to be ignorant. This seemed to clinch the diagnosis, and Messrs. Lederle, the manufacturers, were contacted, and provided helpful information.

Dr. L. H. Worth reported the following case at the Royal Society of Medicine on February 28, 1956, but the account was not published.

A man, aged 47, was given acetazolamide, 1 tablet twice daily, for two weeks from January 13, 1956, and the dose was increased to 1 tablet thrice daily on January 27. From the evening of January 31 until his death on February 5 he had complete anuria. The bladder was empty and no urine was obtained by ureteric catheterization. No crystals were found to be obstructing the moderately distended and oedematous ureters.

The story in Dr. Worth's case closely resembles the story in the present case.

Persky, Chambers, and Potts (1956) report three cases of ureteric colic following acetazolamide administration. Stones were removed by cystoscopy from the ureter in two patients, and it was suspected that some had been voided naturally in the third. The stones were not analysed. All three patients voided an acid urine, which is against phosphaturia, and it is suggested that the suppression of citrate production was the cause.

Glushien and Fisher (1956) reported post-mortem findings on a man of 55 who had had 250 mg. of acetazolamide thrice daily for four days. The kidneys closely resembled those of patients "succumbing to sulphonamide intoxication," but there was no clinical evidence of renal failure or sulphonamide intoxication during life.

Summary

A case of renal colic and anuria due to acetazolamide is reported.

The condition resembles sulphonamide crystalluria and responds to treatment for that condition.

In no case have sulphonamide crystals been detected, nor has an expected phosphaturia been confirmed.

Further investigation on the urine of patients taking acetazolamide are being carried out and will be necessary to explain the mechanism of this rare but serious complication.

I wish to thank Dr. N. E. G. Richardson for her help in the pathological investigation and Mr. C. R. Davenport and Mr. J. R. Wilson for their help.

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Medical Memoranda

Value of Penthienate Methobromide in Lienteric Diarrhoea and Encopresis in Childhood

Penthienate methobromide ("monodral"), like other anticholinergic drugs, depresses the motility and secretion of the stomach and reduces the motor activity of the intestine. Its therapeutic value in the treatment of peptic ulcer and dyspepsia is accepted, but its value in the treatment of disorders of the small intestine and colon remains unproved. Nevertheless, Ingegno (1954) considers that penthienate can control diarrhoea in patients with an "irritable" or "spastic" colon. I have, however, been unable to find any reference to its use in cases of lienteric diarrhoea and faecal incontinence in childhood. For this reason I record the effect of the drug upon 28 children between 4 and 12 years of age who were suffering from one or both of these complaints.

MATERIAL AND METHOD

Of the 28 patients selected, 12 suffered from lienteric diarrhoea and 16 from faecal incontinence. The patients were seen in a hospital out-patient department, so that the diagnosis of the conditions was largely dependent upon the history and physical examination of each child. Urinalysis, radiological examination, E.S.R., and Mantoux tests were performed where they were considered necessary. Cases of incontinence due to indigestion or chronic constipation were excluded from the series. Twelve of the cases with encopresis probably also suffered from lienteric diarrhoea. To subdivide the group accurately would not be easy, nor would it serve any useful purpose.

Histories obtained from the 12 patients with lienteric diarrhoea showed that the condition had been present for periods varying from two months to three and a half years, and that nine of them had some degree of abdominal pain or discomfort from time to time. In the 16 cases of bowel incontinence the duration of symptoms varied from two months to five years, and 12 of them had diarrhoea and six had attacks of abdominal pain. Ten patients had urinary incontinence as well as faecal incontinence. In four of the 28 children, food, such as soup and fruit, could aggravate their condition. Five other patients were similarly affected by mental strain. In two cases the symptoms may have been partially due to difficulties in training, because one child was mentally retarded and the other was deaf. These factors, however, did not prevent penthienate from having some beneficial effect.

All the patients were treated in the hospital out-patient department. They were advised to take their usual diet, but the fluid intake of the 10 patients with both urinary and faecal incontinence was restricted. In each case penthienate was prescribed, a 5-mg. capsule to be taken two or three times a day after food. Treatment was continued for at least two months.

RESULTS

Of the 12 children with lienteric diarrhoea, 11 became asymptomatic. The patient who failed to respond to the specific treatment was admitted to hospital, where he immediately recovered with no medicine, presumably because of the change in his environment and mode of living. Of the 16 patients who were treated for encopresis, eight obtained relief, and eight partial relief of their complaint. Twelve of these patients also had diarrhoea, and this subsided completely in seven cases and diminished in severity in the remaining five. It is apparent that penthienate therapy benefited almost all of the 28 patients, the results being exceptionally good in those suffering from lienteric diarrhoea only and in half of those patients suffering from faecal incontinence. All but one case obtained some relief of their diarrhoea, and in some cases it was complete.

The influence of penthienate on abdominal pain, which was present in 15 out of the 28 patients, varied: in 10 out of the 15 the pain either disappeared or diminished, and in 5 the frequency and severity of the pain either continued

unaltered or became worse. The aggravation of the pain may have been due to the treatment, for two patients who had no abdominal pain or discomfort prior to penthienate therapy developed it while taking the drug.

Enuresis was noted in nine children. The response of this condition to penthienate was recorded: only one gained normal bladder control, in seven control of the bladder improved, and in one it remained unchanged. It would therefore seem that both abdominal pain and enuresis, when associated with either lenteric diarrhoea or encopresis, are likely to be alleviated by this treatment.

COMMENT

This paper does not describe a scientifically controlled investigation. Neither the methods of diagnosis of the conditions nor those of assessing the results of treatment fulfil the necessary conditions. Nevertheless, from a clinical point of view it is apparent that treatment of lenteric diarrhoea and faecal incontinence with penthienate leads to a marked improvement in most cases. The drug appears to be more effective than older methods of treatment, and when used alone or in conjunction with other remedies constitutes a definite advance in the treatment of these conditions.

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ADDENDUM.—Since this memorandum was submitted for publication three further cases of encopresis and diarrhoea have been treated with penthienate methobromide. In one the encopresis was abolished and in the other two it was greatly improved. The diarrhoea subsided in each case.

Resistant Staphylococcal Puerperal Septicaemia Susceptible to Vancomycin

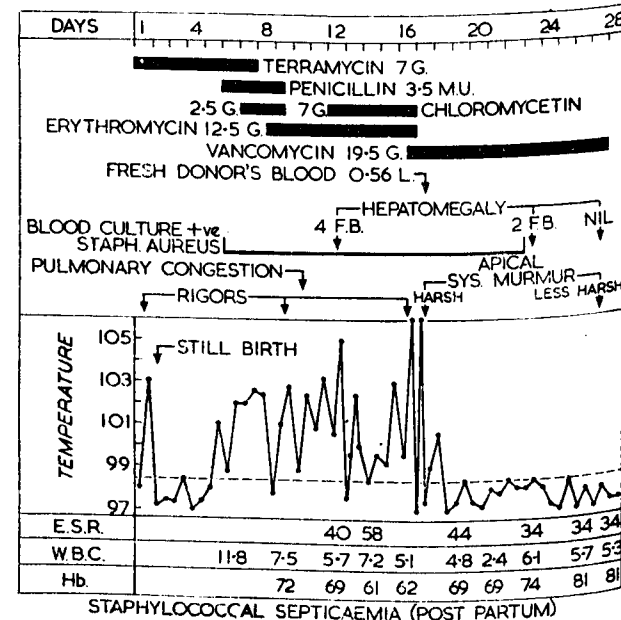
The resistant staphylococcus has for some time been a commonplace in the hospital nursery, and has lately invaded the general surgical wards, causing severe, sometimes fatal, damage. Its spread to the parturient mother, though not yet generally publicized, is obviously only a matter of time, and with this in mind we have thought it might be useful to record our recent experience with such a case.

CASE REPORT

The patient, a 10-para aged 40, was admitted to hospital with ruptured membranes on February 3, 1958, 11 weeks before the expected date of delivery. She continued to drain clear liquor, but as labour did not begin spontaneously antibiotic therapy was instituted after two days with "crystamycin," 1 g. twice daily. There was no change until nine days later, when the patient suddenly complained of severe malaise, and had a rigor with a temperature of 104° F. (40° C.). As the symptoms pointed to an infection of the urinary tract treatment was changed to "sulphatriad" and potassium citrate in high dosage, but, despite the persistence of pyrexia, this was discontinued when the result of urine examination proved negative. Labour began the same evening. The foetal heart sounds had disappeared four hours previously. She was delivered five hours later of a stillborn foetus of 4 lb. 15 oz. (2,210 g.) showing early maceration. The delivery was spontaneous, with a normal and complete third stage. Oxytetracycline ("terramycin"), 250 mg., was given six-hourly, together with vitamin-B complex in high dosage, and the temperature remained normal over the next two days. It then suddenly shot up again, rapidly becoming established as a high fever ranging between 103 and 106° F. (38.9 and 41.1° C.) with subnormal intermissions. The clinical picture was that of a typical septicaemia with recurrent rigors, physical deterioration, liver enlargement, and anaemia. A vaginal swab and repeated blood cultures yielded a profuse growth of *Staphylococcus aureus* resistant to penicillin but sensitive to chloramphenicol and erythromycin. Appropriate combined chemotherapy, details of which are shown in the accompanying Chart, failed to produce any improvement; the septicaemic condition continued unchecked and there

was clinical evidence of localization in the liver and on the heart valves as shown by hepatomegaly, and a harsh apical systolic murmur conducted into the axilla. The general condition of the patient rapidly deteriorated, with increasing hepatomegaly and incipient endocarditis, the E.S.R. remained high between 35 and 40 mm. (Westergren), the Hb percentage diminished from 84 to 57, and the cells showed marked toxic granulation.

At this stage it was decided to try the effect of the new antibiotic vancomycin, and, though not yet commercially available, a supply was obtained from the makers. The



result was immediate and dramatic. After the second eight-hourly intravenous injection of 500 mg., the temperature fell to normal, and, except for a small peak the following day, remained permanently subnormal. Blood cultures became sterile after three days, and the blood picture returned to normal. All the clinical signs and symptoms regressed rapidly and completely, and there was no remission when the drug was discontinued after 10 days, the patient leaving hospital very fit and well after a further 10 days.

COMMENT

Vancomycin is a new antibiotic produced from *Streptomyces orientalis*, an organism found in some Indonesian soils. Fairbrother and Williams (1956) have shown that it is lethal *in vitro* to most strains of *Staph. aureus* resistant to other antibiotics. More important, bacterial resistance to it is apparently unknown (Garrod and Waterworth, 1956). Only a small number of clinical cases have so far been treated (Kirby and Divilbiss, 1957; Griffith and Peck, 1956), but its value, though still largely undocumented, appears to be established, and it would seem the ideal counter to the increasing bugbear of the resistant staphylococcus. It unfortunately has one grave disadvantage—that it can be administered only by the intravenous route.

Vancomycin is manufactured under the trade name of "vancocin" by Eli Lilly and Co. Ltd., and we are much indebted to Mr. Cooke, of this firm, for a generous supply of the drug. We also thank Mr. A. Dickson Wright and Dr. Geoffrey Konstam for clinical advice and help.

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Reviews

HARVEY TERCENTENARY CONGRESS

Circulation. Proceedings of the Harvey Tercentenary Congress. Edited by John McMichael, M.D., F.R.C.P., F.R.S. (Pp. 503+xxiii; illustrated. 50s.) Oxford: Blackwell Scientific Publications, 1958.

This book contains a summary of contributions made at the Harvey Tercentenary Congress last year. The standard of the contributions can be judged from the high international renown of all the contributors. The first part consists of eight short articles centred around Harvey himself, all of them very welcome to the medical historian. The main body of the book presents a most interesting cross-section of modern research on the circulation. It is only on seeing all the contributions to this congress collected together that one fully appreciates how successfully the celebrations were designed to bring out the protean forms of present-day research on the cardiovascular system. What is so striking is that all the contributions except three deal with the problems of blood flow, pressure, or resistance in the various circulations of the body. Harvey concerned himself directly with the question of cardiac output, and Stephen Hales, of Teddington, carried the matter further to quantitative estimation of systemic blood pressure. The largest part of the present work is devoted to the developments of just those problems of circulation which these two investigators originated. It is surprising to realize that these aspects of the circulation, which are indeed the next logical step from Harvey's own work, have had to wait for some 300 years for their further successful development.

It is a sign of our rapidly changing times that in such a book, summarizing present-day work on the heart and circulation, there is only one electrocardiogram and about a dozen radiographs. The large majority of the many illustrations concern haemodynamics and results of the application of the Fick principle. Thus, for those who wish to see where Harvey's original work leads, this book is of inestimable value. Incidentally, the quality of its production matches that of the contributions. Our gratitude to the Harveian Society, and in particular to Mr. Dickson Wright and Dr. Geraint James, for their inspired organization of these timely proceedings must be great indeed. Professor John McMichael has constructed an attractive book out of the varied historical and scientific contributions which constitutes at once a worthy and logical acknowledgment of Harvey's greatness.

K. D. KEELE.

ATOMIC ENERGY AND MENTAL HEALTH

Mental Health Aspects of the Peaceful Uses of Atomic Energy. Report of a Study Group. (Pp. 53. 3s. 6d.) Geneva: World Health Organization, 1958.

This report contains the collective views of an international group of experts "that met in Geneva under the auspices of W.H.O. for nearly a week in October, 1957. Tribute is paid to the stimulus provided by the World Federation for Mental Health, whose executive board had approved a statement and adopted a resolution dealing with the same subject at a meeting held in London earlier in the year. (These are reprinted in two annexes.) Some—but by no means all—of the topics considered in the report proper may be indicated by the main sectional headings. These are: (1) the personal challenge of atomic energy; (2) the question of brain damage from radiation; (3) the socio-economic impact of atomic energy on mental health; (4) unhealthy emotional responses immediately provoked by the advent of atomic energy; (5) mental health tasks. The third annexe is entitled "The Press and Atomic Energy."

It will be seen that the study group did not feel narrowly confined as to what could profitably be discussed and pro-

mulgated. It is conceded that no one can predict with confidence what atomic developments may take place, nor what their effect might be upon both individuals and groups. But it is argued that, whilst the material world may change with dramatic rapidity, human nature—so long as humanity survives—is likely to remain much the same. A liability to irrational fears and irresponsible actions will continue, and may be further intensified by new and startling developments. The basic principles of mental hygiene will maintain their validity. For example, children should "have an upbringing free from anxiety and hate—producing in individuals self-reliance and a sense of responsibility towards others." Again, "the creation of good human relations in the family, the place of work and the community" is of fundamental importance, as is the "education in mental health requirements" amongst "those in responsible positions in public life."

Amongst the "specific suggestions" under the section "Mental Health Tasks" it is proposed "that in local areas small but highly qualified interdisciplinary teams should be formed consisting of, perhaps, a psychiatrist, a psychologist, a sociologist, and a journalist. The plan could be carried out in the central governmental organization as well as in the local district or community." The duties of such teams would include the study of local conditions and local mental health problems; advice—"having regard to modern techniques of vocational selection"—in the selection of the more highly responsible personnel of atomic installations; the instruction of such personnel and of atomic scientists in the "basic psychological principles of human relations"; and in general the education of the public with the assistance of "specialized journalists in human relations."

The report concludes with an oracular peroration: "But in the long run the greatest hope of mental health in the future of the peaceful uses of atomic energy is the raising of a new generation which has learnt to live on terms with ignorance and uncertainty and which, in the words of Joseph Addison, the eighteenth-century English poet, 'rides in the Whirlwind, and directs the Storm.'"

DESMOND CURRAN

ENDOCRINE PATHOLOGY OF OVARY

Endocrine Pathology of the Ovary. By John McLean Morris, M.D., and Robert E. Scully, M.D. (Pp. 151; illustrated. 63s.) London: Henry Kimpton, 1958.

Although it is common knowledge that granulosa-cell tumours of the ovary may produce oestrogens and arrhenoblastomas cause virilization, pathological secretion of hormones by the ovary in other circumstances, and the consequences that may ensue from this, are much less widely appreciated. The admirable monograph by Morris and Scully, two acknowledged experts in this field, should therefore fill an important gap in medical literature. Its purpose, as set out in the preface, is "to correlate the pathological changes occurring in the ovary with the accompanying clinical endocrine findings and to evaluate both in the light of the material available for study." In this it succeeds admirably. The book is beautifully produced, well documented, and illustrated with superb photomicrographs. It begins with a very clear account of the cells of the gonads, which is followed by a summary of their embryology and the part played by hormones in sexual differentiation. The remainder of the introduction is concerned with the currently available hormone assays and with a classification of endocrine effects. There follow sections on non-neoplastic abnormalities of the ovary producing endocrine effects; granulosa-theca-cell tumours; Sertoli-Leydig cell tumours; sex-chord mesenchyme and mixed-cell tumours; lipid-cell tumours; germinomas, teratomas, and related tumours; and, finally, tumours with "functioning stroma." Everyone with an interest in ovarian pathology or in the endocrinology of the gonads can expect to read this book with enjoyment and profit.

G. I. M. SWYER.

LIPIDS AND ATHEROSCLEROSIS

Chemistry of Lipides as Related to Atherosclerosis. A Symposium. Edited by Irvine H. Page, M.D. (Pp. 342+xii; illustrated 63s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1958.

This book is a manifestation of the great increase of interest in atherosclerosis. Various aetiological theories have been proposed, and one of the factors which has been incriminated is dietary fat. The possible aetiological importance of dietary fat and the experimental and clinical evidence for an association of hypercholesterolaemia with atherosclerosis have focused attention on lipid metabolism. The lipids are of major significance in the problems of atherosclerotic heart disease whether they are of primary or secondary aetiological importance. The time is ripe, therefore, for a concise but detailed account of the chemistry of the lipids in relation to atherosclerosis. This book fills the purpose admirably. It contains the proceedings of an international symposium held last year in the United States. The contents include chapters concerning the chemistry or metabolism of cholesterol, fatty acids, triglycerides, phospholipids, and sphingolipids. Perhaps chapters of greater medical interest are those concerning dietary fats and human lipid levels, unsaturated fatty acids in coronary disease, lipoprotein lipase and the nature of the lipaemia clearing reaction, lipoproteins, and the non-esterified fatty acids in plasma.

For those not specifically interested in the problems of atherosclerosis this monograph will, as the title implies, hold limited attraction; for them it is sufficient to quote a statement of practical policy from I. H. Page's well-balanced introduction: "The evidence at present does not convey any implications for drastic dietary change, specifically in the quantity or type of fat in the diet of the general population on the premise that such changes will definitely lessen the incidence of coronary artery disease." For those actively studying atherosclerosis this book should prove most rewarding, and reference will often be made to it.

M. F. OLIVER.

HYPNOTHERAPY

Hypnosis in Health and Sickness. By Gordon Ambrose, L.M.S.S.A., and George Newbold, M.B., B.Sc., M.R.C.S., M.M.S.A., D.R.C.O.G., D.C.H. (Pp. 196. 15s.) London: Staples Press Ltd. 1957.

When the great Liston saw the inhalation of ether producing surgical anaesthesia for the first time at University College Hospital in 1841 he is said to have remarked, "This beats mesmerism hollow." And it has been one of the tragedies of mesmerism and of hypnosis since then that, although sometimes very useful treatments, they have so often turned out to be only temporary palliatives for a wide range of ailments, for some of which better and more specific treatments are always in the process of being discovered. But exponents of hypnotism have never been backward in pressing its therapeutic virtues, and this has resulted in wave after wave of enthusiasm for mesmerism or hypnosis, always followed by profound disillusionment when it has become practised on too wide and indiscriminate a scale.

This particular book seems to be written more for the lay reader than the general practitioner and medical specialist. Note its style: "The cerebellum, which lies behind and below the cerebrum, is divided into two hemispheres," etc. Special care is therefore necessary to avoid the raising of false treatment hopes in the lay mind. But when we turn to such chapters in this book as "Disorders of Women and Hypnototherapy" we find the possibilities of hypnosis discussed in such varied conditions as delayed menstruation, amenorrhoea, pseudocyesis, functional uterine bleeding, dysmenorrhoea, sterility, the menopause, psychogenic leucorrhoea, pruritus vulvae, and so on. And in the field of the neuroses claims are made that hypnosis may help certain patients with anxiety states, depressions, hysterical personalities, obsessional compulsive illnesses, psychosomatic

illnesses, and post-herpetic neuralgia. There are other special chapters on "Hypnosis in Midwifery" and "Hypnosis in Children." A final chapter on "Other Uses of Hypnosis" includes dentistry, obesity, smoking, homosexuality, alcoholism, and sport, and the uses of hypnosis in helping to pass examinations and as an aid to members of the theatrical profession. Few normal, neurotic, and especially hypochondriacal people will fail to find at least one of their complaints, and its treatment by hypnosis, discussed in this book. It is a conscientious and sincere attempt to discuss the possibilities of hypnotic treatment in a whole variety of conditions, and in terms understandable to the ordinary reader. But the general impression left in the lay mind, as it was in the reviewer's, may prove to be an exaggerated one as to the possibilities of hypnotherapy in so many of life's very varied ills.

WILLIAM SARGANT

SURGICAL MANAGEMENT

Principles of General Surgical Management. By H. A. F. Dudley, F.R.C.S.E., with the assistance of B. C. Paton, M.R.C.P.E., I. F. MacLaren, F.R.C.S.E., I. B. Tait, F.R.C.S.E., and G. F. Murnaghan, F.R.C.S., F.R.C.S.E. With a foreword by John Bruce, C.B.E., T.D., F.R.C.S.E. (Pp. 203+viii; illustrated. 27s. 6d.) Edinburgh and London: E. and S. Livingstone. 1958.

This book has been written for house-surgeons, and it contains a deal of practical information set out in a most readable manner. Like some of the better books of its type, it can be read with advantage by those who are more senior. The pre- and post-operative treatment of patients is considered in a sensible manner, with particular reference to the more common complications and their prevention. There is special consideration of abdominal operations and those on the urinary tract, post-operative thrombo-embolism, and parenteral therapy. A chapter is also devoted to investigative work. The author admits to the expression of dogmatic opinion, and in a book of this kind it may well be a virtue. This book would help the surgical dresser in appreciation of his patients, and the house-surgeon who possessed its knowledge would be useful indeed. It can be strongly recommended.

E. G. MUIR.

MATURITY AND BEHAVIOUR

Physical Maturing and Behaviour at Adolescence. By J. M. Tanner, M.D., D.Sc., D.P.M. (Pp. 45; illustrated. 2s. 6d.) London: National Children's Home. 1953.

This is the 1958 National Children's Home Lecture, one of a series devoted to child welfare. It is based largely on material drawn from Dr. Tanner's book *Growth at Adolescence* (Oxford, 1955). Perhaps the only point which calls for comment is a welcome emphasis on the significance of developmental age in relation to educational achievement. The fact that children who mature early appear to be intellectually a little more advanced than those who mature late has some bearing on the reliability of a classification based on an examination at fixed age, such as the 11-plus.

T. McKEOWN

A recent report in this *Journal* drew attention to the prevalence of tuberculosis in domestic animals. Those wishing to learn more of this subject will find it well discussed in *Tuberculosis in Animals and Man—A Study in Comparative Pathology* (Cassell and Co. Ltd., 5 gns.), by Dr. John Francis, professor of veterinary preventive medicine in the University of Queensland. About one-third of this book of 380 pages is given up to the subject of bovine tuberculosis. The next section of the book, the longest, describes tuberculosis in animals other than bovines (including wild animals), and there is a final chapter comparing the pathology and epidemiology of tuberculosis in animals and man. The book is well illustrated, and contains a list of about 600 references.

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PROGNOSIS FOR CHILDREN OF LOW BIRTH WEIGHT

The better survival rates for prematurely born infants, and particularly for those of very low birth weight, result from skilled care by experienced staff in well-equipped units. But improved survival rates do not provide ground for great satisfaction unless proof exists that the survivors live to be happy and to give happiness. Such a shrewd clinician as Sir Robert Hutchison¹ remarked almost twenty years ago: "I have a strong suspicion that, of those who survive, a large proportion turn out defective either physically or mentally." Should this prove to be so, then more efforts must be put into preventing premature births and into developing better treatment, possibly quite revolutionary treatment, for those whose premature delivery is inevitable. A bold attempt to assess the physical and intellectual development of prematurely born children was planned by the Joint Committee of the Institute of Child Health (University of London), the Society of Medical Officers of Health, and the Population Investigation Committee. All premature babies born during a single week in 1946 in England, Wales, and Scotland were matched with a control group of full-term children. The results of this survey have been published in four papers describing their health,² their growth,³ their age at walking,⁴ and their mental ability and school achievement at 8 years of age.⁵ A higher morbidity and mortality extending beyond the first month of life existed in the premature group, the surviving members of which spent 3½ times as many days in hospital during the first two years as did the controls. Although rather shorter and lighter than the controls at 2 and 4 years, almost 40% were of normal or above normal proportions. Babies who weighed less than 4 lb. (1.8 kg.) at birth gained rather better than the others, except

a group whose small size was thought to be genetic. When examined at 8 years the premature children scored slightly but significantly less than their controls at tests of reading, vocabulary, and picture interpretation, this handicap being most obvious in reading. The handicaps did not increase significantly with either falling birth weight or decreasing length of gestation. A small group emerged which was heavily handicapped in all tests and for whose low birth weight no obstetric or genetic explanation was found.

This study on prematurity began with a total of 676 matched pairs. From this, however, 177 were lost by the death of one or other member of a pair, 49 by emigration, 11 by refusal, 16 were untraced in time for testing, 8 were untested because they were educationally subnormal, and 8 because they were ill or handicapped. The final examination of mental ability was carried out on 407 pairs, or 60% of the original sample. Loss from the series of more seriously handicapped children is at least possible. J. W. B. Douglas³ states that "in general the mental handicaps of premature children are small if we exclude those with a history of birth injury or cerebral damage." Although these clinical diagnoses are often made, paediatricians cannot always be certain that damage was sustained before, at, or after birth, and in any event such abnormality is a hazard of prematurity which must be fully taken into account when considering the fate of the prematurely born.

The immediate mortality is still much higher among infants of very low birth weight, and their progress during the first few weeks of life is more commonly interfered with by cyanotic attacks, the pulmonary syndrome, oedema, jaundice, and infection than is that of full-term infants. The mental development of this relatively small group may not be accurately reflected in the mean figures obtained from a large series of prematurely born babies. Of the premature infants studied in Edinburgh by C. M. Drillien and F. Richmond,⁶ 57% were in the range 4 lb. 9 oz. (2 kg.) to 5 lb. 8 oz. (2.5 kg.), and Drillien⁷ showed that among primiparous mothers 49% of infants of 38 weeks' or more gestation were premature by weight, and that among the higher parities the figure was 37%. Most of such babies were in the range 5 lb. (2.25 kg.) to 5 lb. 8 oz. (2.5 kg.). J. H. Hess and E. C. Lundeen⁸ have described the progress of 82% of 259 infants who weighed from 1 lb. 10 oz. (0.75 kg.) to 2 lb. 8 oz. (1.13 kg.). They considered physical development to be average in 43% and mental development in 59%, but gave no details of the criteria of normality. Of 70 surviving

¹ Hutchison, R., *Lancet*, 1940, 2, 799.

² Douglas, J. W. B., and Mogford, C., *Arch. Dis. Childh.*, 1953, 28, 436.

³ ———, *Brit. med. J.*, 1953, 1, 748.

⁴ Douglas, J. W. B., *Med. Offr.*, 1956, 95, 33.

⁵ ———, *Brit. med. J.*, 1956, 1, 1210.

⁶ Drillien, C. M., and Richmond, F., *Arch. Dis. Childh.*, 1957, 31, 390.

⁷ ———, *J. Obstet. Gynaec. Brit. Emp.*, 1957, 64, 161.

⁸ Hess, J. H., and Lundeen, E. C., *The Premature Infant*, 1949, Philadelphia.

⁹ Corner, B. D., *Bristol med.-chir. J.*, 1952, 60, 117.

¹⁰ Knobloch, H., Rider, R., Harper, P., and Pusamannick, B., *J. Amer. med. Ass.*, 1956, 161, 581.

¹¹ Drillien, C. M., *Arch. Dis. Childh.*, 1958, 33, 10.

babies weighing less than 3 lb. 4 oz. (1.5 kg.) at birth, B. D. Corner⁹ reported that 76% were absolutely normal physically and mentally. H. Knobloch and colleagues¹⁰ found that, out of 57 infants whose birth weight had been 3 lb. 4 oz. (1.5 kg.) or less, 44% had an abnormal condition of sufficient severity to cause concern about future development—a figure which contrasted with 8.6% for the rest of the premature infants studied and 2.6% for full-term infants.

The present studies of C. M. Drilien¹¹ are all the more valuable in that she has maintained almost intact a group of 75 infants weighing 3 lb. (1.36 kg.) or less at birth and has personally examined each of the survivors, some only once, but otherwise every six months. Five died before the age of 2 years (one from bronchopneumonia), two were found dead in bed, and two died suddenly before medical assistance could be obtained. The great majority of survivors were considerably below average in both weight and height, the children being disproportionately underweight for height. Poor mental ability was distressingly common. Developmental quotients of 90 or over were found in only 37% of the pre-school group, and of the children of school age only 3 of 21 were of average intelligence. Four children omitted from the published figures have since been found to have intelligence quotients of 92, 90, 67, and 67. Only two surviving children of the original series have not been tested. No correlation was found between particular clinical disturbances in the newborn period and later mental development. Six children suffered from cerebral diplegia. Half the children had a visual defect, amounting to handicap in one-third. The incidence of respiratory infections in the first three years was four times higher than in a matched control group of full-term children. Emotional disorder was found in one-third. Mental damage was less apparent in the children of school age than in those a year or two younger. Drilien suspects that this is a result of improvement in the survival rate in recent years rather than of recovery with age, and further study of her group may supply the answer. The need for well-financed and well-planned research in this field is clear.

DELAYED AUDITORY FEEDBACK

Does the sound of a person's own voice have any effect on how he speaks? This question has been argued from a theoretical standpoint for many years. It has been suggested, for instance, that we may unconsciously control or "monitor" what we are saying by attending carefully to our utterances while we speak, and that certain abnormalities of speech may

result if this process is disturbed. On this view the disorder known as jargon aphasia, in which words are strung together so as to constitute meaningless nonsense or jargon, is the result of a breakdown in the monitoring mechanism. It is assumed that, because these patients cannot understand what is said to them, they also cannot understand what they themselves are saying, and therefore they speak jargon. Against this view it has been pointed out that people with bilateral cochlear or nerve deafness, who also cannot hear what they themselves are saying, do not speak jargon, and conversely that patients who suffer from word deafness, though unable to understand what is said to them and, presumably, what they say themselves, nevertheless have normal spontaneous speech. Such arguments have previously been carried on in a climate sheltered from the cold winds of experimental proof. But the discovery in recent years of the effects of delayed auditory feedback has thrown much light on the question.

Delayed auditory feedback may be explained in the following terms. Normally while we are speaking the sound of our voice reaches the internal ears by conduction through bone and air. The speed of conduction by these two routes has been estimated by C. A. Stromsta¹ as 0.0003 second for bone conduction and 0.001 second for air conduction; normally the aerial route is by far the most important. It may be said, therefore, that we hear our own words 0.001 second after we have uttered them, and this information about the sounds we are uttering constitutes auditory feedback. This is in contrast to kinaesthetic feedback, which consists of proprioceptive information arising from the activity of the organs of speech. If this almost instantaneous auditory feedback is delayed to between 0.09 and 0.3 second, as it can be by electro-mechanical methods, curious effects are produced on the speech of normal subjects. Such a delay in auditory feedback can be achieved by recording the subject's voice through a microphone on to a magnetic tape, from which it is played back after a delay to headphones worn by the subject. In order to be effective in this way, the circuits which produce the delay in auditory feedback must permit of adequate volume and clarity in the voice as transmitted to the subject through headphones. B. S. Lee in 1950² and 1951³ described the artificial stutter produced by this delay in speech feedback, and J. W.

Black⁴ found that the most effective delay period was 0.18 second.

Since this time interest in the technique has grown and several papers have appeared describing the results obtained in normal subjects. B. Spilka⁵ found that when delayed auditory feedback was imposed there were increases in the average duration of syllables, the percentage phonation time, the mean vocal intensity, and in variations of vocal intensity. To these effects may be added a raising of pitch of the voice, flattening of intonation, alterations of stress and disturbance of rhythm, reduplications of consonants and syllables, and substitutions of wrong consonants, syllables, or even words. Sometimes a complete block in speech utterance occurs, resembling that found in severe stammering. J. T. Beaumont and B. M. Foss,⁶ investigating individual differences in susceptibility to delayed auditory feedback, found that, while all normal subjects appear susceptible, adaptation may occur in two ways: first, if the subject speaks very slowly, and secondly if he speaks in short rapid bursts. The rapidity with which adaptation occurs appears to differ between individuals, and Beaumont and Foss conclude that people who are particularly susceptible to the effects of delayed auditory feedback may have something in common with natural stammerers. B. Spilka⁷ attempted to correlate the susceptibility to auditory feedback with various personality types, and concluded that schizoid personalities are not so easily disturbed as others.

These observations show that disturbance in the time relationships between the utterance of speech and the hearing of the sounds uttered may produce a considerable disorganization in speech, and they strengthen the view that auditory monitoring plays a part in normal spoken speech. It would appear that delayed auditory feedback is a spanner which may be thrown into the workings of normal speech, disorganizing it in a predictable way. Some of the uses to which this technique may be put have been illustrated in recent publications. C. N. Hanley and W. R. Tiffany⁸ have used the method for detecting psychogenic deafness and malingering. J. B. Stanton,⁹ in a lecture in 1957 recently published, reviews the speech disturbances produced in normal subjects, and reports the effects of delayed auditory feedback in dysphasic patients. In this study delayed auditory feedback was used as a tool to probe the underlying physiological disturbance in the dysphasic patients. Stanton finds that, unlike the normal subjects, the patients with dysphasia do not all respond in the same manner to delayed auditory feedback. While some of the patients (those with predominantly

expressive dysphasia) showed similar disturbances to those of normal subjects, the speech of others who suffered from mainly receptive dysphasia was actually improved by delayed auditory feedback. A third group with expressive or receptive speech disorders of recent onset was relatively unaffected. This use of delayed auditory feedback as an analytical tool may well lead to a more dynamic concept of the mechanisms of aphasia.

The application of delayed auditory feedback to treatment is not yet clear. E. C. Cherry and colleagues¹⁰ have shown that many stammerers are enabled to speak normally when their auditory feedback is blocked by a loud noise. This effect of neutral noise would seem to be the explanation of the similar results obtained with delayed auditory feedback in stammerers. Possibly the reported improvement⁹ in speech of patients with receptive aphasia while subjected to delayed auditory feedback may have some application to speech therapy. Finally, the results obtained with this interesting new technique also suggest that the traditional distinction between disturbances of formulation and comprehension of speech (the aphasias) and disturbances of utterance of speech (dysarthria, stammering) may be less real than had previously been supposed.

ACCURACY OF DEATH CERTIFICATES

How accurate are death certificates is a question that has been debated more often than investigated. Clearly some causes of death are easier to diagnose precisely than others, and some categories are easier to define unambiguously than others. The statistics are generally believed to be sufficiently accurate for practical use, and by grouping some categories errors can be made to cancel out. A small but interesting study of this problem, including references to previous work on it, has now been published by the Registrar-General for England and Wales.¹

Ten large English hospitals arranged for a double death certificate to be completed on every patient dying in the hospital between February 1, 1955, and July 31, 1955. A clinician completed the first half before necropsy was carried out, and a pathologist completed the second half in the light of his post-mortem findings. In these six months 1,404 cases were accepted into the investigation from the ten hospitals, and pathologist agreed with clinician on the cause of death in 51% of them. To this figure it seems reasonable to add 28% of cases in which the disagreement between pathologist and clinician seemed to the investigators to be verbal rather than factual. In short, about 80% of these deaths were correctly certified by the clinicians.

¹ Registrar-General's Statistical Review of England and Wales for the Year 1956, Part 3, Commentary, 1958, H.M.S.O., 16s. 6d.

² Hammond, E. C., *Brit. med. J.*, 1958, 2, 649.

³ Paton, B. C., *Amer. J. Med.*, 1957, 23, 761.

⁴ *Brit. med. J.*, 1958, 1, 991.

¹ Stromsta, C. A., M.A. thesis, Ohio State University, 1951.

² Lee, B. S., *J. acoust. Soc. Amer.*, 1950, 22, 824.

³ —, *J. Speech Dis.*, 1951, 16, 53.

⁴ Black, J. W., *ibid.*, 1951, 16, 56.

⁵ Spilka, B., *ibid.*, 1954, 19, 37.

⁶ Beaumont, J. T., and Foss, B. M., *Brit. J. Psychol.*, 1957, 48, 85.

⁷ Spilka, B., *J. Speech Dis.*, 1954, 19, 491.

⁸ Hanley, C. N., and Tiffany, W. R., *ibid.*, 1954, 19, 367.

⁹ Stanton, J. B., *Scot. med. J.*, 1958, 3, 378.

¹⁰ Cherry, E. C., Marland, P. M., and Sayers, B. McA., *Nature (Lond.)*, 1955, 176, 874.

The 19% of cases in which the pathologist found fresh evidence at necropsy were chiefly among newborn babies and old people. The difficulty of identifying the exact cause of death in these groups is well known, and the figures show that the difficulty does increase throughout adulthood into old age. Agreement was highest on deaths of patients aged 15-44.

When the various causes of death were considered to see which groups evoked most agreement or disagreement, some striking figures were obtained for cancer of the lung, which was notably under-diagnosed, especially in old patients. Of 87 cases assigned to this cause 8 were found at necropsy to have another cause, and in 30% of the remainder the pathologist found a previously unsuspected cancer of lung or bronchus. Though the doctors who took part in this investigation are not put forward as a representative sample of the profession (they were all members of hospital staffs, for instance), their results suggest that the much higher death rate from lung cancer in Great Britain than in the U.S.A. cannot be attributed to over-reporting of it here, as has recently been conjectured.² Arteriosclerotic and coronary heart disease was another group that caused disagreement, for on 227 certificates clinician and pathologist agreed in only 41%. This agrees closely with the figure of 44% accuracy rate for myocardial infarction found by B. C. Paton³ in a review of necropsies at the Edinburgh Royal Infirmary, discussed recently in these columns.⁴ In the Registrar-General's investigation a particularly notable cause of death which clinicians mistook for coronary disease was pulmonary embolism.

While disagreement about facts was prominent in the diagnosis of coronary disease, disagreement about words largely confused the diagnoses of death from hypertensive disease. Among 86 cases in which this was given as the diagnosis, disagreement between clinician and pathologist was noted in 66 cases (77%). But in 52 of these cases (60%) wording was the cause of difference. This is a natural consequence of the association apt to be found between hypertension and renal or cerebrovascular disease.

TREATMENT OF CARBON MONOXIDE POISONING

An important communication from the Medical Research Council on the use of carbon dioxide in the treatment of carbon monoxide poisoning appears at p. 1408 of the *Journal* this week. After studying the results of some recent experiments by the M.R.C.'s Breathing Apparatus Committee, and of data obtained from independent work on human volunteers, the M.R.C. concludes that "the administration of a mixture of carbon dioxide in oxygen leads to the more rapid elimination of carbon monoxide from the blood than does the administration of oxygen alone."

² Donald, K. W., and Paton, W. D. M., *Brit. med. J.*, 1955, 1, 313.

³ Marriott, H. L., *ibid.*, 1955, 1, 664.

⁴ Hill, A. B., *ibid.*, 1956, 2, 1220.

Three years ago a committee of the M.R.C. considered the problem of whether or not carbon dioxide should be given with the oxygen as a first-aid measure to patients poisoned by carbon monoxide, and recommended that it should not be.⁵ The reasons for this decision were fully set out and are complex, but an important one was that, in the uncontrolled conditions of first aid, carbon dioxide might accumulate dangerously in the patient's tissues. Dr. H. L. Marriott⁶ challenged the committee's conclusion, because he considered, as others have done, that the administration of oxygen and carbon dioxide stimulates the depressed breathing of patients severely gassed with carbon monoxide. It is this view that the M.R.C. endorses in its latest statement.

Though the difference in the results obtained by the two methods of treatment may be small—and none was found in an analysis of some admittedly imperfect statistics⁷—clearly nothing short of the very best is good enough for patients hovering between life and death, as these usually are. And, so far as it can be ascertained, the best treatment does seem to be a mixture of 5% carbon dioxide with 95% oxygen when the patient is suffering from carbon monoxide poisoning. For the treatment of other types of asphyxia and anoxia the M.R.C. continues to advocate pure oxygen.

EPIDEMIC NEPHRITIS

The typing of *Streptococcus pyogenes* has been used for many years as a useful epidemiological device for determining the origin of outbreaks of streptococcal disease and in studies of the spread of streptococcal infection in communities. The type of organism found may also have clinical significance. It has been noticed that certain types, and particularly type 12, are more often associated with the development of nephritis than others. In 1954 M. J. Wilmers, A. C. Cunliffe, and R. E. O. Williams⁸ found that of 31 strains of *Streptococcus pyogenes* recovered from cases of acute glomerulonephritis 28 were of type 12. This is taken a stage further by two articles appearing in this issue. Dr. J. T. A. George and his colleagues describe the finding of four cases of acute nephritis among 24 boys in a residential school who had suffered from acute pharyngitis 10 to 19 days previously. About two months after the sore throats had occurred seven of the boys were still harbouring *Streptococcus pyogenes* type 12, and at this stage red cells were found in the urine of five children not previously suspected of having nephritis. Investigations carried out in neighbouring schools showed type 12 or related strains to be present in some of them; red-blood cells and casts were found in some specimens of urine, but only in the infected schools. Nearly a year later, when there were signs that further cases of nephritis were occurring, letters were sent to all doctors practising in York and the

⁸ Wilmers, M. J., Cunliffe, A. C., and Williams, R. E. O., *Lancet*, 1954, 2, 17.

⁹ Report of Ministry of Health for the Year 1957, Part 2, p. 42. H.M.S.O., 1958.

North Riding. This brought to light 48 cases. In spite of the fact that many of them were not examined bacteriologically until some time after onset of the infection, type 12 streptococci were recovered from a substantial proportion of them. The disease was found most commonly in children of school age, and this was the finding also in the other survey reported by Drs. M. J. Pleydell and W. J. A. Hall-Turner from Northamptonshire. Here investigation of the circumstances of a small outbreak of nephritis in a village school suggested that the disease might be more widespread. Again all doctors practising in the county were circularized by the medical officer of health and asked to report any cases under their care. As a result 89 cases of nephritis, occurring over a period of three years, were brought to notice, and type 12 streptococci were recovered from a high percentage of the cases.

In both these investigations information on the local distribution of nephritis was obtained by asking doctors in the locality to notify cases, and this method was successful in demonstrating the distribution of the disease in the area. Whether such a procedure should be adopted more generally may depend partly on the use that can be made of the information so obtained. It has been suggested that the existence of a case of acute nephritis may justify the use of energetic preventive measures against the spread of streptococcal infection, including the giving of prophylactic penicillin to close contacts.⁹ Pleydell and Hall-Turner mention the advisability of protecting nephritic children from reinfection: one way of doing this would be to exclude them from school when upper respiratory infections were present.

MEDICAL SERVICES REVIEW COMMITTEE

The first meeting of the Medical Services Review Committee, sponsored by the Royal Colleges, the Scottish Royal Corporations, the College of General Practitioners, the Society of Medical Officers of Health, and the British Medical Association, was held on November 27. Sir Arthur Porritt, the chairman, presided, and the following have been appointed as members of the committee: Dr. T. Anderson; Dr. W. Ferguson Anderson; Dr. J. T. Baldwin; Dr. I. R. C. Batchelor; Sir Harold Boldero; Mr. W. S. Braidwood; Mr. R. Brearley; Professor J. Bruce, P.R.C.S.Ed.; Dr. H. D. Chalke; Professor A. M. Claye, P.R.C.O.G.; Mr. E. Cope; Dr. A. B. Davies; Dr. T. B. S. Dick; Miss A. M. Dickens; Dr. J. Fry; Dr. A. Rae Gilchrist, P.R.C.P.Ed.; Dr. I. D. Grant; Dr. C. F. Hawkins; Mr. W. Hawksworth; Mr. R. G. Henderson; Dr. J. H. Hunt; Mr. Arthur Jacobs, P.R.F.P.S.; Dr. A. M. Maiden; Mr. D. F. E. Nash; Dr. I. Rannie; Dr. T. Ferguson Rodger; Dr. J. M. Rogan; Mr. J. A. Ross; Sir James Paterson Ross, P.R.C.S.; Mr. T. Holmes Sellors; Dr. G. Swift; Sir Tudor Thomas; Dr. J. B. Tilley; Dr. F. G. Tomlins; Dr. S. Wand; Professor R. C. Wofinden. The committee's terms of reference are to review the provision of medical services

to the public, and their organization, in the light of ten years' experience of the National Health Service, and to make recommendations.

RE-STENOSIS OF THE MITRAL VALVE

The surgical treatment of mitral stenosis has now been practised for a decade,¹ and with the publication from various centres of reports on patients observed for five years or more the early results of this operation can be assessed. A disappointing outcome in some cases is re-stenosis of the mitral valve, and in a recent article J. R. Belcher² discusses this eventuality. It is too early yet for accurate figures to be obtainable, but a re-stenosis rate of between 2 and 5% is usually quoted. Glover and his colleagues,³ among others, believe that if complete division of both fused commissures has been done at the first operation re-stenosis will not occur: they have not found a case in their own series. Most authors agree that there are two main groups of patients with mitral valve disease who may need a second operation. The first and larger is that described by Belcher as "false re-stenosis," believed to be the result of an inadequate first operation. This may be due to the surgeon's inexperience, and is consequently higher in the earlier cases of his series, but it may also be due to pathological changes such as gross calcification in the valve. It will be interesting to see whether improved surgical techniques in mitral valve surgery, such as C. P. Bailey's⁴ right-sided approach or the transventricular dilatation advocated by A. Logan,⁵ will lower the incidence of re-stenosis in the next few years. Since a rigid valve is more likely to give trouble, division of both commissures, if at all possible beyond R. C. Brock's⁶ critical area of tendon insertion, should restore the valve to maximum mobility and reduce the chances of re-stenosis. Coincident with commissural fusion is the matting together of chordae tendineae below the valve, and the surgeon must ensure that they are separated at operation. Some suggest that if a satisfactory opening of 2½ to 3 fingerbreadths can be obtained by splitting the anterolateral commissure alone the posterior commissure can be left, unless it splits easily. This may reduce the operative mortality, but may also lead to a higher recurrence rate. Belcher found that in his series no second operation was needed in 186 patients who had had good commissural division; but out of 43 patients at whose operations the split was classified as fair five needed second operations, while out of eleven patients with a poor split six had to be operated on again.

Cases of true re-stenosis of the valve after a satisfactory first operation form the second main group, though a much smaller one than those with false

¹ Bailey, C. P., *Dis. Chest*, 1949, 15, 377.

² Belcher, J. R., *Brit. Heart J.*, 1958, 20, 76.

³ Glover, R. P., Davila, J. C., O'Neill, T. J. E., and Janton, O. H., *Circulation*, 1955, 11, 14.

⁴ Bailey, C. P., Bolton, H. E., and Morse, D. P., *Surg. Clin. N. Amer.*, 1956, 38, 931.

⁵ Logan, A., quoted by Belcher, J. R.

⁶ Brock, R. C., *Brit. Heart J.*, 1952, 14, 489.

⁷ Magaroy, F. R., *Brit. med. J.*, 1951, 1, 856.

⁸ Soulié, P., Joly, F., Carloti, J., and Servelle, M., *Amer. Heart J.*, 1957, 54, 695.

⁹ Bywaters, E. G. L., Hallidie-Smith, K., and Thomas, G. T., *Brit. med. J.*, 1957, 1, 1234.

re-stenosis. The cause of this is not certain, but continued rheumatic activity or an attack of subacute bacterial endocarditis is usually blamed. It is not clear how an avascular valve can lay down further fibrous tissue, but F. R. Magarey⁷ has suggested that a platelet and fibrin thrombus forms between the roughened edges, so sticking them together. It is difficult to be certain of the occurrence of true re-stenosis unless the same surgeon does both operations and has accurate records of the state of the valve, or unless the valve can be inspected at necropsy. Ideally, simultaneous estimations of pressure gradients across the mitral valve and of the cardiac output before and after each operation are the only sure way of supporting the evidence of the surgeon's finger *in vivo*. F. Soulié and colleagues⁸ noted that the second operation was always harder owing to increased rigidity and thickening of the valve leaflets and that instrumental dilatation was always needed. In spite of a satisfactory original operation, true re-stenosis may be expected to occur in from 2 to 5% of cases.

E. G. L. Bywaters and his co-workers⁹ recommend the prevention of further attacks of rheumatic fever in children by long courses of antibiotics, and in the United States it is common practice to give penicillin for long periods to patients who have had a mitral valvotomy. The administration of antibiotics might therefore be one possible way of reducing the incidence of re-stenosis. Before a second operation for stenosis of the mitral valve is performed the degree of damage to the myocardium by the rheumatic process, the amount of mitral incompetence present, and the height of the pulmonary vascular resistance should all be assessed, since any of these may be responsible for a poor post-operative result. Operation can only relieve valvular obstruction if proved to be present, and, if successful, it may lessen the severity of these other defects.

FOOTBALL AND THE HEART

The problem of preventing coronary arterial disease is of central importance in cardiology to-day. So far we have only faint clues to its solution, important among these being the effect of diet on the healthy state of the coronary arterial tree, and occupational and possibly racial factors.

Whether exercise, or lack of it, is a factor in the causation of the disease is also an important consideration. Recently William C. Pomeroy and Paul D. White¹ investigated a group of 355 men who had distinguished themselves athletically at football while at Harvard University between the years 1901 and 1930. Coronary arterial disease as a cause of death was only slightly less frequent among this group of athletes than in all adult white males in the State of Massachusetts in the year 1940, chosen arbitrarily as a comparison. More accurate comparison with Harvard graduates of the same age who had not played football was desirable, but the necessary data were not available. Interesting differences, however, were observed within the group of

athletes. One was the higher incidence of "unfavourable family health," which usually meant coronary arterial disease, in the relatives of those athletes developing coronary disease themselves in later life. Another interesting finding was that no member of the group of athletes developed coronary arterial disease who continued to take active and strenuous exercise throughout the rest of his life after leaving the university. It might be supposed that this was a reflection of their good health rather than the cause of it, but against this was the fact that in most cases the habit of active exercise, or abandonment of it, was formed quite early in life, before the onset of the first symptoms of coronary arterial disease. No very significant differences in other factors investigated were noted between those athletes who did, or did not, develop disease of the coronary arteries: these included consumption of alcohol, smoking, diet (about which data were inadequate), and body build. More work is needed to determine the significance of these findings in this small group of athletes, but the tentative conclusion from this study is that an athlete who continues to take active exercise throughout his life is unlikely to develop coronary arterial disease.

RICHARD BRIGHT, 1789-1858

"Richard Bright was an extraordinary man. It is impossible to place geniuses in order, but he would certainly be among the first five or six in our profession." This is what Sir William Hale-White wrote in the *Guy's Hospital Reports* thirty-seven years ago. This article is now reprinted in a special number of this most notable among hospital periodicals, middle in age between the *Lancet* and the *B.M.J.*, as Dr. E. R. Boland told us at a commemorative dinner given by Guy's Hospital Medical School on Monday in the Royal College of Physicians, where Bright was admitted as a Licentiate in 1816 and as a Fellow in 1832. An Englishman who qualified in Edinburgh in 1813, Richard Bright's association with Guy's began as early as 1811. In 1820 he was elected assistant physician to the hospital, and in 1824 full physician. He died on December 16, 1858. It was his "Reports of Medical Cases" in 1827, in which albuminuria and dropsy were causally linked with pathological changes in the kidney, that gave him his fitting place in the history of medicine, and two long papers on what has since been commonly known as "Bright's disease" appeared in 1836 in the first volume of *Guy's Hospital Reports*, the current number of which, in its gold and blue cover, completes the 107th volume with an act of filial piety that will be a delight to all and a collector's piece for the medical historian. We learn from it that when he was 24 Bright wrote to his father, "You must know that surgery is at this moment rising very fast at the expense of medicine—and we must do our best to keep our ground." One of the signs that surgery is still rising very fast is the fact that the editor of this special number dedicated to Richard Bright is a surgeon, Sir Russell Brock.

Drug Treatment of Disease

DRUG TREATMENT OF NEURITIS

BY

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Neuritis is a much misused term. Many of the conditions to which it is sometimes applied are in fact of mechanical origin. For instance, brachial neuritis may be used as a diagnostic label for pain in the arm accompanied by paraesthesiae and neurological signs when in fact the basic cause is compression or irritation of posterior roots by a protruding intervertebral disk or cervical spondylosis, pressure on the brachial plexus by a cervical rib or by drooping of the shoulder girdle in the axillary-inlet syndrome, or injury of a peripheral nerve, as by compression of the median nerve in the carpal tunnel or friction to the ulnar nerve at the elbow in association with cubitus valgus or osteoarthritis of the elbow. Similarly, in the lower limb, sciatic neuritis and femoral neuritis probably do not exist, the majority of cases of sciatica and anterior crural pain being due to mechanical causes, such as protrusion of intervertebral disk or other lesions compressing the nerves or posterior roots. In such cases drug treatment can only be of very limited value and consists of suitable analgesics. The essential treatment for the condition—immobilization, physiotherapy of various types, manipulation, or surgical treatment—varies with the aetiology. The administration of vitamin-B preparations for such conditions has no rational place in treatment.

Multiple peripheral neuritis or polyneuritis is to some extent also a misnomer, but in many of such cases there are changes in the parenchyma of the peripheral nerves. There are many possible causes of polyneuritis, and in some of them drug treatment is of value.

Deficiency of Vitamin B₁

Deficiency of aneurine (vitamin B₁) in relation to the carbohydrate intake may cause peripheral neuritis as a result of disturbance of carbohydrate metabolism in the nervous system at the pyruvate stage. In such cases the amount of pyruvate in the blood is increased, and this can, if necessary, be shown by a pyruvate tolerance curve. Actual deficiency of aneurine in the diet is rare in the United Kingdom, but defective absorption may occur in cases of steatorrhoea, long-continued diarrhoea, extensive resection of the small intestine, and long-continued fever; and a deficiency peripheral neuritis may occur in these conditions. The peripheral neuritis of alcoholism is to a large extent due to aneurine deficiency in relation to the carbohydrate intake.

In such cases treatment should be started at the earliest opportunity before degenerative changes have occurred in the peripheral nerves and when the lesion is still a biochemical one. The first essential is large doses of aneurine by injection, and, as in many cases there is also a deficiency of other elements of the vitamin-B complex, and of vitamin C, these should be given in addition, together with a normal diet. A suitable preparation for starting treatment is "parentrovite" high potency intramuscular injection, each injection of 7 ml. containing aneurine hydrochloride 250 mg., nicotinamide 160 mg., riboflavin 4 mg., pyridoxine 50 mg., and ascorbic acid 500 mg. After daily injections have been given for a week oral treatment should be continued with tab. aneurin. co. fort. (B.N.F.), which contains aneurine hydrochloride 5 mg., riboflavin 2 mg., nicotinamide 20 mg., and pyridoxine 2 mg., a tablet being taken four times a day.

Acute Infectious, Toxic, or Febrile Polyneuritis (Guillain-Barré Syndrome)

Although the aetiology of this type of polyneuritis is uncertain, the evidence suggests that it may be allergic in nature. For this reason it has been treated with cortisone or prednisone. The natural history of the disease is for rapid deterioration to take place over the course of a few days up to two to three weeks; if the patient survives the acute stage, rapid recovery of function usually occurs. This type of natural history makes it difficult to estimate the value of cortisone therapy, but published cases and personal experience certainly suggest that it is of value in stopping deterioration and possibly in hastening recovery. Cortisone should be given as early as possible, and a suitable dosage for an adult is 300 mg. (in divided doses) daily for two days, 200 mg. for two days, and then 100 mg. daily for ten days, the dosage then being gradually tailed off. Prednisone is less likely to cause retention of salt, and for this reason is usually the preferable preparation to give (5 mg. of prednisone being equivalent to 25 mg. of cortisone).

Lead "Neuritis"

This condition is probably the result of a disturbance of resynthesis of phosphocreatine in the muscles affected rather than a disorder of the peripheral nerves. In the last few years the treatment of acute lead-poisoning, such as lead encephalopathy, has been greatly improved by the introduction of the chelating agent calcium disodium ethylenediamine tetra-acetic acid, or sodium calciumedetate ("calcium disodium versenate"), and though reports of its use in lead "neuritis" are scanty it would seem to be the rational method of removing the lead from the body in this condition. When this chelate is administered to a patient with lead-poisoning, the lead replaces calcium in the chelate, the resulting compound being excreted in the urine. The chelated lead compound does not ionize and so there is little danger of causing symptoms of acute lead-poisoning, which was always a risk with the older methods of removing lead from the body.

The preparation is supplied in 5-ml. ampoules containing 1 g. in a 20% aqueous solution; this should be diluted in 250-500 ml. of injection of sodium chloride B.P. or injection of dextrose B.P. and administered by intravenous drip over the course of an hour. For adults this dose should be given twice daily for five days; then there should be a rest for two days, followed by a further five days of treatment. Calcium disodium versenate can be given by mouth, but it is not yet clear how effective this method of administration is in removing lead from the body.

Diabetic Neuritis

The most essential treatment in the peripheral neuritis associated with diabetes mellitus is the adequate control of the disease by diet and in most cases insulin. Patients suffering much pain may sometimes have this alleviated by injections of vitamin B₁₂, a suitable dose being 1,000 µg. daily for a week. In the minority of cases where there is burning pain in the feet, calcium pantothenate 50 mg. three times a day by mouth is sometimes helpful.

Other Types of Polyneuritis

In the rare cases of polyneuritis due to ingestion of arsenic, dimercaprol (B.A.L.) is the best treatment. This

¹ Pomeroy, W. C., and White, P. D., *J. Amer. med. Ass.*, 1958, 167, 711.

TABLE II.—*Indecent Assault Cases at various Ages Grouped in Periods 1937-54*

Ages:	3-	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22+	30+	40+	Total	Yearly Av.
1937-9	9	20	32	22	17	26	13	8	10	11	8	2	5	1	1					1			186	62
1940-4	15	13	23	22	16	18	14	13	4	9	9	2	7	2	0	1				1			179	35.8
1945-9	16	24	39	43	28	28	18	17	5	11	7	10	9	3	1					2			260	52
1950-4*	13	28	32	33	21	18	14	18	12	9	9	10	10	3	2	1				1			233	49
Total for 1937-54																							858	48.3
.. .. 1927-32																							173	28.8 p.a.
.. .. 1933-6																							188	47 p.a.

* Total period of four years and nine months.

cannot be sworn. "The unsworn evidence of a child of tender years is admissible, but when this is given on behalf of the prosecution the accused shall *not* be liable to be convicted unless that evidence is corroborated by some other evidence . . . implicating him." It is allowable to accept as such evidence what was said in way of complaint, provided it was made at "the earliest possible moment." In many cases, however, one cannot use this complaint because there was delay, perhaps because the child did not know the first person met, or the man may have threatened her if she told anyone. As the man is unlikely to assault the child where he can be seen, the case often falls through lack of corroboration.

Difficulty has also arisen where the witness of an offence has been a child under 7 and the unsworn evidence has been disallowed, although the child made a good statement and had obviously been telling the truth. Unless the man admits the offence the case may not be taken to court or it may be dismissed. One bad case concerned a man who kept a shop and bribed little girls into the back room by giving sweets or pennies. He usually took one or two at a time, but it went on for some considerable period, so that, although five or six girls were involved, the statement of each was corroborated by one or more other children. The man was defended in the police court, and he elected to be tried by a jury; but when the case went on to the Sessions the Recorder turned it down, without hearing, because there was no sworn evidence, all the girls being under 7 years, and no complaint had been made.

This problem needs very careful consideration, among others concerning children's evidence in general. One must respect the rights of the individual, but it should not always have to be those of the accused that are respected and those of the injured that are ignored.

Suspected Carnal Knowledge

Apart from the initial rise in the first period after my appointment (Fig. 1) the numbers for carnal knowledge remained fairly steady at about 10 to 14, with the exception of 1937, up to the early war years. After 1940, however, we had many of the Forces of our own and other countries stationed in and around Manchester, and there were always many of them to be found wandering about the city streets. They were met by many young women, including the 14- to 16-year-old girls, with the result that the carnal knowledge cases increased and reached a peak of 32 in 1945. After the end of the war the figure fell to almost pre-war level, but as people settled into peacetime life in the 1950's with greater freedoms, so also did the carnal knowledge cases rise again to 29 in 1952, with an average of nearly 20 cases a year in the last five-year period. They also formed a higher percentage of all the cases seen during the last few years (Fig. 2).

As one would expect, the largest number of cases are found in the 15-year-old group (Table I and Fig. 3). A comparison of the numbers seen in each period of years is given in Table III, in which the increase in the 1950-4 period is clearly shown.

For carnal knowledge it is only necessary to prove penetration with the penis if the girl is under 16 years, as it is an offence whether she gives consent or not. What the graphs cannot show was the change in the type of case history which developed during and after the war. Previously

there were not only fewer cases but in most of them the girl was not a willing partner and had been taken advantage of, possibly because she had been a bit slow in the uptake. But during the war almost all the girls had been going out with members of the Forces or deliberately meeting them in town or near the camps. They were seldom found after the first offence, and, as many of the men were known to

TABLE III.—*Carnal Knowledge Cases, Giving Ages in Groups of Years, 1937-54*

Ages:	11	12	13	14	15	16	17	18+	Total	Yearly Average
1937-9	0	2	3	11	16	4	1	1	38	12
1940-4	0	3	7	15	48	10	1	2	86	17
1945-9	1	0	3	13	42	16	1	0	76	15
1950-4	2	1	5	20	53	10	1	2	94	19
Total	3	6	18	59	159	40	4	5	294	16.6

the girls only as Charlie or Johnny, etc., it was often impossible to track them and take steps against them. These girls therefore were being seen more as being "in moral danger" or "in need of care and protection" than as ordinary police cases.

The voluntary homes run by the various religious denominations to which these girls had to be sent were soon full to overflowing, so the Home Office had to open more remand homes and approved schools in 1942 and 1943. The remand home in Manchester, to which I was appointed as M.O., was fortunately equipped for the treatment of venereal disease, and most of these girls needed such treatment. However, the majority of them went direct from the courts for medical reports and therefore are not included in this survey. Their background was nearly always a broken home of some kind or bad parental influence or example, and their I.Q.s lay on the low side of normal, usually between 70 and 90, though there were some of 60 and under.

The men concerned were for the most part the poorer type of the average man in the Forces, who may have thought that by going with a young girl he might avoid V.D., etc.; but as he was not always the first, he might catch infection which she had acquired from an earlier partner.

The carnal knowledge cases involving girls of 11 and 12 years were mostly those of boys under 16 years. Where girls of 16, and therefore over the age of consent, were concerned, they were either suspected to be pregnant or the history suggested that intercourse had taken place before the age of 16. Over the period 1937-54 there were 70 who were pregnant, about 23% of the cases of carnal knowledge seen. Those girls who were 17 years or over were very mentally slow or known to be defective, and should therefore have had some protection in law; but if they went to court this never seemed to apply. That is one of the points which should have further investigation.

There were also cases of procuration by proprietors of immoral houses, perhaps sending out young girls to be picked up by car kerb-crawlers. Some of these and the remand-home type of girl, even after an approved-school training, may revert to the "streets" and the easy money obtained there, and their treatment is a hard problem. It would be easier if people would believe that extramarital intercourse was wrong and promiscuousness in men was not accepted as a normal occurrence. If there was no demand

for females the supply would go down. It is therefore necessary to raise the moral standard of the community as well as make the laws applicable equally to men and women.

Suspected Incest Cases

Included in these figures are those of indecent assault by relatives (see Figs. 1, 2, and 3). One to three of the five cases seen each year would be true incest with penetration by the penis; and here again since the war the numbers went up to 6.5 a year for the 1945-9 period and to 8.6 a year for 1950-4. Of the total 114 cases, 37 showed penetration (see Table I). The age distribution is also given, 14 years being the most frequent time.

In the majority of cases the father had assaulted the daughter, but in some the offence had been between brother and sister. Where the girl was over 16 years, the men seemed to have taken advantage of the fact that she was a bit mentally slow and more easily intimidated.

Suspected Rape Cases

A similar kind of picture is seen here, with a steady number of 2.2 to 3.8 a year in each of the earlier periods, and a definite rise after the war to 5.6 and 7.1 a year respectively for the last two periods (Fig. 2). Police records for the city show that on only one occasion since 1927 did figures for rape reach 10, and that was in 1950. Table I gives the numbers seen in each age group.

Before the war there were fewer suspected cases, and most of them were genuine, though not always proved to the satisfaction of the court. One of my earlier cases fell through because the girl waited till the next day before complaining to her sister of the attack made on her when she answered an office advertisement. It was not considered to be "the earliest possible moment," so there was no corroboration. No account was taken of the fact that the girl was shy and lived alone and was unable at once to see her sister, who lived on the other side of the city.

Since the war there have been more of the doubtful cases, such as one where it seemed more an excuse because she had not been paid and the man had gone off with her handbag.

Cases difficult to assess included those where the woman was slow or mentally backward and did not realize what the man was up to until it was too late to resist penetration properly.

Suspected Common Assault and Miscellaneous Cases

Some of these include borderline cases between rape and assault, but there were two cases of women over 70 years attacked in their rooms, one being in bed at the time. The cases in children were mainly those of cruelty by the parents or chastisement by adults. The numbers rose after the war to between 4 and 5 a year.

The miscellaneous cases were usually odd cases of abduction, of criminal abortion, of infanticide and abandoned babies, and of neglected and ill-treated children. One condition seen only since the war was sodomy, and in each case the man stated he had learnt the practice in the Army and had continued it with his wife or family after demobilization.

The Offenders

Apart from the men in the Forces, already referred to, the offenders range in age from young boys of 8 or 9 years to men of 70. With many of the lads it often seemed to be more inquisitive and experimental behaviour rather than real badness, but of course it does mean lack of training and teaching of decent behaviour at home. Then there are the old men and wrecks of men who are apt to hang round the parks, conveniences, and cinemas, and whose poor mental faculties are apt to be associated with somewhat perverted sexual feelings.

In the middle age groups there are a large number with I.Q.s probably between 70 and 80 who lack interests and occupations (which they got in wartime) and give way to various sexual urges, normal and abnormal. The majority

of the cases of indecent assault are done by the hand only, though some are with the penis between the legs, and they chiefly involve sexually immature little girls of under 12 years (mostly only 5 or 6 years), so there is no advance or sexual response by the child. This indicates that some form of mental abnormality, defect, or perversion must be present—and these conditions are unlikely to respond to prison treatment.

Another type was the emotionally and sexually uncontrolled man who would rape the office girl or someone he had met at a dance or in the public-house as they went home. In many cases the effects of alcohol undoubtedly entered into the picture.

However much one feels that the men should be severely punished, the fact remains that prison will not cure a sexual perversion, though sometimes it may be necessary as a form of shock treatment to begin with. In a certain number, some form of psychiatric treatment may be possible, but the kind of condition likely to respond is limited. Moreover, the man must not only be willing but also mentally capable of co-operating with the doctor.

This makes it all the more necessary for the court to receive a medical and psychiatric report on the accused before sentence is passed, as was strongly advocated by the joint committee of the B.M.A. and Magistrates' Association in 1949 in their report on the criminal law and sexual offenders. Among other recommendations they suggested that, after guilt had been decided but before the sentence was passed, the courts "should be under an obligation, wherever possible, to seek the advice of a duly qualified medical practitioner with experience of this type of case, as it is only when furnished with an adequate report that it is possible to pass a suitable sentence. Possibly a team such as is found in a child-guidance clinic would give the best results." They also felt that more practitioners with the necessary qualifications and experience should be available.

Some cases could be dealt with by probation, with or without a condition of special treatment; but, again, to get good results it would need more psychiatrists and more probation officers to give adequate supervision.

There still remain the mentally and physically poor types who really need to be "cared for" rather than punished, as prison will not prevent further trouble arising. For these, as for some other types of mental defectives, I feel that the best place would be small homes within a colony where they could work and live according to their ability, protected and under supervision, and yet the public would be protected from their bad habits. Though expensive to set up and difficult to staff, in the long run it would probably prevent much damage and crime in the general community and eventually help to cut down the prison population and reduce the number of recidivists.

Points Arising

1. *Women Police and Woman Police Surgeon.*—It is clear that a large proportion of the examinations are of sexually immature girls under 12 years, of whom more than half are under 7. To take statements from these children that are accurate and full needs special qualities, and it is here that women police have shown their worth. A policewoman was always in the room with me, often before the statement was taken, as it is very important to get the examination done as soon as possible or slight corroborative signs may have gone for ever. Both of us being women, I am sure the child gave a better story, and one nearer the truth, than would have been given if either of us had been a man. Experience gained over the years by the surgeon can prove very useful in doubtful cases, and I feel very strongly that a woman doctor should be called in all cases of sexual assault. Women doctors, available now in almost all districts, could be given part-time appointments, as I was. And yet after 30 years I believe Manchester still remains the only place outside London where such an appointment

has been made, though there are a few places like the Manchester Division of Lancashire County where a woman is called in "in suitable cases." But as experience is very helpful and it is not everyone who wants to be bothered with possible court cases, a definite appointment probably gives best results.

2.—*Court Procedure.*—The aim should be to make conditions at court at least as good for the child witness as it is for the child delinquent, especially as in these cases she is often the most important witness. Everything should be done to reduce any further emotional damage. The following practices are helpful, and should be carried out in more courts than is done at present.

(a) In the cases of an adult offender where the juvenile court cannot be used, there is usually available a small room where there can be less formality, no dock, with everyone on the same level, and no great distance between the magistrates and the witness-box. Otherwise the atmosphere of a large court, the fencing round the dock, the high witness-box and magistrates' bench, and the numbers of strange folk present can be overwhelming for the child or young girl, who, in any case needs courage to give the unpleasant details of what has happened. It makes her more likely to get nervous and easily confused, and therefore more liable to appear to be an unreliable witness.

(b) A woman magistrate and policewoman should be required to be present in court in all cases of sexual assault.

(c) It should not only be possible, but compulsory, to clear the court in these cases, and publication of the names of the child witnesses should be prohibited, as with child delinquents.

(d) The cases should be brought to court as soon as possible. Delay in hearing or reference to sessions or assizes, with a wait of maybe weeks or even months, means that the child forgets the details of time and sequence and therefore gives a wrong impression, especially with a hard cross-examination. This holds good, too, where the witness is mentally slow or defective. The evidence while fresh in the mind can make such witnesses quite reliable, but the impression soon becomes hazy and then very patchy. Unfortunately the defence are not beyond taking advantage of this, as delay gives the accused a better chance of getting off. But it is bad for the injured persons, as a second appearance in court and repetition of their evidence tends to increase the psychological trauma from which they were possibly beginning to recover.

(e) An alteration in the law might be made so that a child who could not be sworn might be allowed "to affirm" the truth in suitable cases.

(f) Another alteration should make it possible to accept the unsworn evidence of a child if corroborated by one or more other children who have not been sworn.

3. *Disposal of Accused.*—As many of the accused are mentally slow or suffering from sexual perversion of some kind, it is clear that no amount of prison sentence is likely to stop them doing the same thing again on discharge. It is treatment of some sort with a view to prevention that is needed, rather than punishment, and this approach needs to be more fully realized by both the public and the courts. This means that it should be compulsory in sexual cases for the magistrates to get, before sentence, a medical and psychological report on the accused, in order that they can decide what is likely to be the best way of dealing with him.

Summary

This survey of cases seen over a period of about 27 years shows a large amount of sexual misbehaviour, particularly affecting girls of under 7 years.

Its management is helped by the presence of women in the Police Force. The necessity for the appointment of a woman police surgeon is pointed out if further trauma to the children is to be avoided.

The legal position of the child under 7 years and also the older mentally backward person needs careful consideration, and legal practice altered in some way if justice is to be done by them.

However, without further legislation much could be done to improve the way in which these cases are handled, both in and out of court.

CARBON-MONOXIDE POISONING

USE OF CARBON-DIOXIDE-OXYGEN MIXTURE

Statement by the Medical Research Council

In February, 1955, a report under the title of "Gases Administered in Artificial Respiration with Particular Reference to the Use of Carbon Dioxide" was published (*Brit. med. J.*, 1955, 1, 313) by the Medical Research Council's Committee for Research on Breathing Apparatus for Protection against Dangerous Fumes and Gases, to explain the reasons that had earlier led the Council, on the advice of the Committee, to recommend the abandonment of the practice of carrying cylinders of carbogen (oxygen containing carbon dioxide) in ambulances.

The report confined itself to consideration of the first-aid treatment of patients in respiratory failure. The possible adverse effects on such cases of even comparatively low percentages of carbon dioxide in the inspired air were stressed and the report concluded with the recommendation "... that in first-aid practice carbon dioxide should not be administered with oxygen in the resuscitation of subjects requiring and receiving artificial respiration."

While accepting that pure oxygen was preferable to oxygen and carbon dioxide in the treatment of many cases of respiratory failure, Dr. H. L. Marriott (*Brit. med. J.*, 1955, 1, 664) challenged this recommendation in so far as it related to carbon-monoxide poisoning, on the grounds that the administration of an oxygen-carbon-dioxide mixture caused increased elimination of carbon monoxide and quicker recovery.

The Medical Research Council accordingly set up a special subcommittee of Council to "review all available evidence and to prepare for Council a statement for publication in the medical press." The following were appointed to this subcommittee: Professor Robert Platt (chairman), Sir Lindor Brown, Professor R. C. Garry, Professor J. McMichael, Sir George Pickering, Professor F. J. W. Roughton, Professor G. Payling Wright, and the Secretary of the Council, Sir Harold Himsworth.

Statistical Evidence

In view of the fact that mixtures of oxygen and carbon dioxide had been withdrawn from local authority ambulances in favour of pure oxygen as a result of the advice that they had received from their Breathing Apparatus Committee, the Medical Research Council had already asked Professor A. Bradford Hill to analyse the available mortality statistics on carbon-monoxide poisoning. If one method of treatment had any considerable advantage over the other, whether in patients with respiratory failure or not, it would be expected that the difference would be revealed in the statistics. Professor Bradford Hill published his report in the *British Medical Journal* (1956, 2, 1220). After drawing attention to the limitations of the available data, and emphasizing that they were clearly not precise enough to prove the relative advantages (or disadvantages) of the oxygen-carbon-dioxide mixture compared with pure oxygen, he concluded that there was no evidence of any association between the number of registered deaths from carbon-monoxide poisoning and any change of practice in the treatment of such cases.

Respiratory Failure in Carbon-monoxide Poisoning

Members of the Council's Breathing Apparatus Committee have recently completed experiments on a number of species of laboratory animals in order to try to induce a state of respiratory failure by the administration of carbon monoxide. Although it is theoretically possible for an animal with carbon-monoxide poisoning to pass through a stage before death when respiration has failed but the circulation is still maintained, the experiments indicate by actual observation that, both in pure carbon-monoxide poisoning and in carbon-monoxide poisoning complicated by the prior administration of respiratory depressants, this stage either does not exist or is so short that it provides no opportunity for special treatment. Similarly, inquiries which the Council's subcommittee have made of those experienced in treating patients suffering from carbon-monoxide poisoning indicate that respiratory failure without circulatory

failure, as a definite clinical stage following carbon-monoxide poisoning, is very rare, if indeed it ever occurs; in the subcommittee's view, it is certainly not common enough to serve as the basis for deciding the method of treatment for all cases.

On the other hand, the results of the recent animal experiments, and of independent work on human volunteers poisoned with carbon monoxide but not to the point of respiratory failure, fully endorse the older evidence that the administration of a mixture of carbon dioxide and oxygen leads to a more rapid elimination of carbon monoxide from the blood than does the administration of oxygen alone.

Conclusions

After carefully weighing all the available evidence, the Council's subcommittee have concluded that the differences in practice between the effectiveness of the two methods of treatment are almost certainly small, but that, on balance, the evidence favours the use of a mixture of 5% carbon dioxide in oxygen for the treatment of carbon-monoxide poisoning. In the light of present knowledge the subcommittee do not consider that there is anything to be gained by the use of higher percentages of carbon dioxide in oxygen. The Medical Research Council have accepted the advice of their subcommittee and wish to issue the following statement:

Experiments have clearly shown that, with either spontaneous or artificial respiration, the administration of a mixture of 5% carbon dioxide in oxygen leads to the more rapid elimination of carbon monoxide from the blood than does the administration of oxygen alone. The use of 5% carbon dioxide in oxygen for the first-aid treatment of carbon-monoxide poisoning would therefore appear to be preferable to treatment by oxygen alone. Pure oxygen, however, would appear to be preferable, as recommended by the Breathing Apparatus Committee in their report, for the treatment of those suffering from asphyxia and anoxia due to other causes, in which the administration of carbon-dioxide mixtures is contra-indicated. The Council have been assured by those with wide responsibilities for the supervision of first-aid services that it should not in practice be difficult for first-aid workers to distinguish between these two groups of patients; the circumstances in which the case is discovered will usually suffice to reveal its nature.

Motoring News

WINTER MOTORING ABROAD

While the majority of British motorists prefer to take their holidays during the summer months, there are many parts of Europe which enjoy mild weather during our winter. January and February are perhaps the two coldest months in Britain and those in which it is most desirable to travel south and seek the sun. It is unfortunate that the winter is not the easiest time for medical men to leave their patients, but, nevertheless, it is the best time financially to travel abroad. Hotels, restaurants, and all other facilities are cheaper, resorts are less crowded, and sunshine, if you go far enough south, is obviously beneficial to health, especially if it is at a time when it is lacking in Britain.

Ski-ing, skating, and other traditional winter holiday sports are, of course, available quite near at hand, but for the motorist there is little enjoyment in visiting a country which is well and truly snow-bound. An alternative is to go south on one of the regular steamships plying between Britain, East Africa, the Far East, and South America and alight at the first port of call. Passenger liners on these routes stop at such places as Vigo, Lisbon, Gibraltar, Casablanca, Genoa, and other Mediterranean ports.

Services to Vigo and Lisbon are maintained by Royal Mail, Blue Star, and Fanu Lines en route for South America. Each of these companies has one or two sailings a month

from either London or Southampton. Passenger fares vary from £12 third class to £38 first for single rates, while there are special rates for children. The cost of taking a car amounts to approximately £23, on top of which dock dues and local taxes have to be paid. Sailings to Gibraltar may be made on Union Castle, Orient, and P. & O. ships en route for East Africa and the Far East. One or two sailings a month are made by each company and single fares are from £14. Cars can be carried at rates from £14 to £20 depending on size. Vessels of the Batavier line call at Casablanca and other ports in the vicinity. Passengers must, however, join the ship at Rotterdam, though cars are loaded at London. Passenger fares are £33 and cars £30, one way.

For sailings to Marseilles and Naples the Orient Line provide what are known as "amphibian tickets" which allow sea and land travel for passengers taking their cars. Single journeys to Marseilles and Naples with car and one passenger first-class amount to £81 and £89 respectively; four passengers on the same trip would be charged £160 and £189 for the same two ports, but in this case the car is transported free. A full car load is therefore desirable on this route, where, for under £50 a head, passengers enjoy a luxury Mediterranean cruise, travelling first-class, with the cost of transporting the car included. Naples, after all, is a long drive for motorists even after leaving the Channel ports. Incidentally, the cost of taking the car to or from France by the Lydd-Le Touquet air ferry is also included in these fares so that the holiday can begin or end with a sea cruise. Sailings are scheduled monthly to and from London.

To Genoa by the Union Castle Line first-class passenger accommodation costs £43 per person and a good tourist-class cabin £28. Cars are accepted at an approximate figure of £25 for a medium-sized model, but considerable reductions are to be made next year for passengers travelling first-class and taking a car with them. For motorists going to Spain, car freight is not so cheap. To Valencia and Barcelona a one-way passage for a car would amount to between £35 and £40, with passenger fares from £28. Sailings are made fortnightly from London and Liverpool by MacAndrews and Co. Ltd., and the ships also call at Bilbao, Lisbon, and Gibraltar.

Further information about these and other sailings is, of course, available from the national tourist offices of the countries concerned, and, while voyages of this sort seem expensive on paper at first, it is surprising what costs the motorist incurs when travelling hundreds of miles on Continental roads. A sea journey can obviate a lot of these incidental expenses, give each member of the party a five to eight day luxury cruise, and allow them to start motoring, fresh and relaxed, at some interesting southern port. Alternatively such trips can form an excellent substitute for the sometimes depressing homeward journey at the conclusion of the holiday.

IAIN GELLATLY.

Dr. William A. Horne, medical officer of health of the City of Glasgow, writes in his Annual Report for 1957 of the city-wide x-ray campaign, carried out between March 11 and April 12. During the five weeks of the campaign some 715,000 persons were x-rayed, of whom 622,349 were Glasgow residents. Among the Glasgow residents 2,369 active cases of pulmonary tuberculosis were found, giving a rate of 3.7 per 1,000 over 14 years of age. The total number of new cases of pulmonary tuberculosis notified during the year was 3,925 compared with 2,024 in 1956. The highest incidences were in young adult women and in men in the older age groups. During the five weeks of the campaign 30,506 persons were recalled for further examination on large films—a recall rate of 4.3 per 1,000. Some 58% of these presented evidence of significant radiological abnormality requiring further investigation or medical supervision. 347 sufferers from lung cancer were found, the highest incidence being in men over 60.

To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in current use.

Influenza Virus A (Asian) Vaccine (Parke, Davis and Co., Ltd.).—This is a vaccine made by growing the 1957 (Asian) strain of influenza A in fertile eggs, inactivating with formaldehyde, and making up in aluminium phosphate suspension. It is prepared at the Wright-Fleming Institute, St. Mary's Hospital.

Invirin (Glaxo Laboratories Ltd.).—This is a similar preparation containing in addition to the Asian strain a 1956 A strain and a B strain. Since it is likely that most of any serious influenza occurring in the general population in the near future will be caused by a strain related to the Asian, the usefulness of the other two viruses is doubtful.

Such vaccines are best given in 1-ml. doses, deeply subcutaneously; children require smaller doses. They should not be given to persons sensitive to egg protein. The vaccines are stable only if kept in the cold (2-10° C.—35-50° F.). They are best given in December, since, in contrast to 1957, most influenza outbreaks occur in January and February. Recent trials in several countries indicated that vaccination led to a reduction in incidence of influenza to one-third of that in controls: better results than that cannot be expected at present. Immunity is not likely to last for more than one winter. As indicated lately (*Journal*, September 20, p. 732), there are grounds for hoping that we may escape a major outbreak of influenza this winter.

N.H.S. basic price: Influenza virus A (Asian) vaccine, 1 ml., 4s. 1½d.; invirin, 1 ml., 7s. 6d.

Ilotycin Glucoheptonate I.V. (Eli Lilly & Co.).—This is a preparation of erythromycin for intravenous injection. The contents of a 250-mg. ampoule are dissolved in 10 ml. "water for injection" (not saline). This solution can be injected slowly without further dilution or added to saline or dextrose solution for continuous infusion. A dose of 250 mg. or more up to 1 g., according to the severity of the infection, is administered every six hours. Dilute solutions can be instilled into body cavities. The preparation is not suitable for intramuscular or intrathecal administration.

This form of the drug is indicated when oral administration is impracticable for the time being; it has the added advantage of producing high concentrations in blood and tissues certainly and rapidly. Erythromycin has a similar range of activity against ordinary bacteria to that of penicillin, and may be indicated for the same infections (e.g., lobar pneumonia, any haemolytic streptococcal infection) when the use of penicillin is contraindicated as, for instance, in sensitized patients, or when the causative organism is resistant to penicillin, as is now frequently the case in staphylococcal infections.

N.H.S. basic price: 250 mg., 15s.

"It was interesting to read that a doctor who is police surgeon at South Shields, and has one of the largest practices there, has been given the sub-postmastership of an area of the town. . . . Any solicitor who wishes to engage in other professions or businesses will find guidance as to what he may and may not do in a lecture on professional conduct and etiquette, delivered by the secretary of the Law Society. The broad principle is that he may carry on any honourable profession or business, for example as a stockbroker, or coal merchant, or manager of a theatre. But apparently not as a publican, or licensed moneylender or pawnbroker, or bookmaker."—*Law Notes*, November, 1958, p. 263.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Medical Charities

SIR,—The registration of the Charities Trust Fund of the Association as a charity, resolved by the Council during last session and announced at the A.R.M. at Birmingham, is complete. The most important consequence is that the Trust is enabled to receive covenanted subscriptions which when a promise of seven consecutive years' payment is made allow income tax to be recovered at standard rate. Herein lies a great opportunity to increase the receipts of the charities of the profession without extra cost to the donor.

We are deeply appreciative of the generous support of members of the profession, and we understand that many already subscribe, under covenant, to the various charities of the profession. We suggest, however, that those who do not already subscribe under covenant should consider carefully whether they could not do so, whatever the amount. Most contributions are made when the annual subscription to the Association is paid, and on the application form this year will be found a "box" for indicating that the donor will undertake a covenant. If this is filled in, the necessary forms will be sent for completion of the formal promise.

Applications for help from the aged and sick members of the profession and from widows and orphans are greater than ever, and the need in each case is increasing. We appeal to all members to support the worthy cause of medical benevolence, especially by covenant through the Charities Trust Fund. The B.M.A. Charities Committee is a collecting body which advises the Council on the best method of distributing to other charities the moneys it collects in the Charities Trust Fund.—We are, etc.,

S. WAND,
Chairman of Council.
L. DOUGAL CALLANDER,
Treasurer.
H. M. GOLDING,
Chairman of Charities Committee.

Trypanosoma rhodesiense in Bushbuck

SIR,—I have just read with great interest the paper by Dr. R. B. Heisch, Mr. J. P. MacMahon, and Dr. P. E. C. Manson-Bahr and your annotation thereon (*Journal*, November 15, pp. 1203 and 1211). As one long interested in this subject, will you allow me to submit some comments that may help in reviewing the available evidence on the nature and origin of the trypanosomes of man? On the inoculation of game trypanosomes into man you write: "This essential test was not applied by the early workers." The following facts are, I think, relevant. In 1919 Taute and Huber, in German East Africa, inoculated 129 Africans with *T. brucei*; none of these men became infected.¹ In 1930, in Tanganyika, Corson was accidentally infected with *T. rhodesiense*; a year or so later he infected himself with *T. rhodesiense*. On each occasion treatment was fully effective.² In 1932, in Uganda, I exposed three Africans and one European to cyclically infective *G. palpalis* carrying a polymorphic trypanosome obtained from a situtunga antelope on the Sesse Islands on Lake Victoria. None of the men became infected.³ In 1933 Fairburn in Tanganyika infected himself with *T. rhodesiense*; and again drugs effected a prompt cure.⁴ Both Corson and Fairburn also employed African volunteers.

Turning now to the paper, which records the first recovery from wild African game of a trypanosome pathogenic to man. That "only one serious attempt to isolate polymorphic trypanosomes from game animals has hitherto been made" is, however, an understatement. The Royal

Society's Commission early in the century, and later on the Trypanosomiasis Research Institute and the League of Nations Commission, were all engaged in this line of research in Uganda. In the present authors' successful experiment a polymorphic strain was recovered from each of two bushbuck. One of these strains proved infective to man and the other was not. The successful inoculum into man consisted of 25 ml. of rat's blood, heavily infected with parasites (over 100 per oil-immersion field). Note the mode of infection—direct blood inoculation as distinct from fly transmission. My experience of cyclical transmission strongly suggests that development in the fly may influence the host-propensities of a strain. Moreover, cyclical transmission is the natural mode of infection, and it is extremely doubtful whether anything like the concentration of parasites present in the 25 ml. used in the experiment would be introduced by a feeding tsetse. In other words, flies infected with this strain might fail to infect man and the trypanosome would then be regarded as *T. brucei*.

An experiment carried out in Uganda is of interest here. Two antelopes were infected, each with a different strain of *T. rhodesiense*, and each animal was then exposed to clean tsetse. Each fly-cage being fed on the one antelope only. These flies subsequently proved invariably infective to laboratory animals and non-infective to human volunteers. When, however, the blood of the antelope, taken at the same time as the fly-feeds, was inoculated into monkeys, clean tsetse infected from these monkeys infected the majority, but not all, of the volunteers on whom they were fed.⁵ Another experiment illustrated still further the variability of the factors involved. A strain of trypanosome taken from a man's blood was introduced into an antelope. Monkeys, and small laboratory animals and studied for some years at the Trypanosomiasis Research Institute. During that time nine different volunteers were exposed to infection with this strain by the cyclical route, many of the flies having acquired their infection from monkeys; none of these men became infected. A bushbuck was also infected with this strain, and some 2½ years later this animal's blood was injected into two volunteers and both became infected.⁶ Yet another variable factor is the susceptibility to infection of different species of antelope. Corson⁷ found one species of reedbuck more susceptible than another, and in Uganda we found bushbuck and reedbuck more liable to infection than situtunga and oribi.⁸

All these observations suggest that the balance between susceptibility and resistance to trypanosomes in man very finely adjusted and sensitive to minute physiological changes in host and parasite and possibly tsetse. In view of all these variables I submit that it is not yet possible to decide whether *T. gambiense*, *T. rhodesiense*, and *T. brucei* are one or different species. My own view still is that *T. brucei* is a potential parasite of man; that its normal hosts are game animals; but that, given adequate opportunity, it can adapt itself to man. Its supreme achievement in this direction is the form known as *T. gambiense*.—I am, etc.,

H. L. DUKE.

Cross-in-Hand Sussex.

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Pharmaceutical Houses and the Doctor

SIR,—I read Dr. Mary M. Rayner's letter (*Journal*, November 22, p. 1291) with a mixture of astonishment coupled with a sense of despair, and finally cynicism. I really wonder if, in addition to completing questionnaires and writing letters to the *Journal*, your correspondent reads it. If she does, I fail to understand how, in her letter outlining her difficulties, she can fail to refer to the *British National Formulary*, now in its fourth edition, the alternative edition of which was favourably commented upon in your columns a few weeks ago (*Journal*, September 6, p. 601). The Joint Formulary Committee of the B.M.A. and the Pharmaceutical Society, established in 1946 and on which I have served for more years than I care to remember, has

the task of compiling, reviewing, and making appropriate additions and deletions of drugs and preparations of value for use in hospitals and proved in medical practice throughout the kingdom. Of course the doctor is still left free to prescribe outside the *Formulary* if he considers it to be in the best interests of his patient.

The *British National Formulary* is a cheap, small, pocket-size book, and in it Dr. Rayner will find 9/10ths of what she so plaintively requests. The 4th edition, 1957, and the amendment, 1958, puts into the hands of practitioners a proved useful list of preparations adequate for all purposes. There is no need for Dr. Rayner to attempt to compare the "more expensive proprietary antibiotics": she can, I submit, select from the *British National Formulary* all that is required for her sick patients, and this without reference to the charming young representatives of the pharmaceutical houses whom—in her innate courtesy—she finds so difficult to resist. Nor need she refer to the postal advertising efforts, with or without samples, all of which could be consigned to the waste-paper basket and her patients none the worse. If she feels that she may be a little behind the times in her prescribing, she can be assured that any proved and worthwhile preparation will quickly find its place in the *British National Formulary*. In the alternative edition she will find the same material classified upon a pharmaceutical basis, and brief introductory monographs usefully discuss the pros and cons of the particular choice of drug within the group to be used. In both editions lists of proprietary drugs with their equivalent official names and *per contra* lists of official names with the corresponding proprietary names will be found.

Dr. Rayner should also find the *Prescribers' Notes*, issued regularly by the Ministry of Health since 1952 and sent to all doctors on the executive council lists, of considerable help. If this is not enough, reference may be made to the Ministry of Health publication *Proprietary Medicines*, compiled by the Standing Joint Committee on the classification of proprietary preparations and prescribing (Cohen Committee). Surely this is exactly the "body of men to deal with all these proprietary products" for which Dr. Rayner pines. They too have been working for many years. Their latest list was published in 1957. Of the six categories of preparations listed, Dr. Rayner should be particularly interested in: Category 1—"New drugs of proved value not yet standard," and Category 5—"Preparations not in the B.P., B.P. Codex, or B.N.F." which in the Committee's view have not been proved of therapeutic value. The *British Pharmacopoeia*, the neglect of which Dr. Rayner deplores, is essentially a book of standards, invaluable for occasional reference, but not likely to appeal to the busy general practitioner.

Finally, I can assure Dr. Rayner that a large number of final-year students now walk round the wards with the *B.N.F.* alternative edition in their pockets, are encouraged to write prescriptions from it and to use official names. Moreover, the Ministry of Health, concerned about prescribing costs, and following part of the advice given by the Hinchliffe Committee on prescribing, is about to provide every final-year student with the *B.N.F.* (alternative edition, I hope). He will then be "the proud possessor of a good (if compact) pharmacopoeia" as Dr. Rayner hopes, and able to "hold his uncovered head high in general practice," and if he so chooses to resist the blandishments of both the representatives and the advertising methods of the pharmaceutical houses if he finds them objectionable.—I am, etc.,

Department of Clinical Medicine,
University of Leeds.

S. J. HARTFALL.

** Professor Hartfall might have added "To-day's Drugs" and the series on "Drug Treatment of Disease," appearing each week in the *British Medical Journal*, to his list of up-to-date sources of information on drugs.—Ed., B.M.J.

SIR,—Dr. Mary M. Rayner (*Journal*, November 22, p. 1291) describes herself as a simple family doctor, and certainly her polemic against the pharmaceutical industry is unreal and inaccurate. She and some other critics of that industry have a blind spot for two basic facts. First, we live in a relatively free economy; and for as long as we do, for so long will the structure and mode of operation of the industry conform by and large to their present pattern. If Dr. Rayner wants a controlled economy, let her say so; but

it would be invidious and impracticable to single out the production and selling of drugs for a treatment not also to be given to, say, the motor-car or farming industries or—dare I say it?—to the medical profession. Second, this *Journal* and others often contain justified grouches from doctors that they are not paid enough by the N.H.S. A Royal Commission is sitting on the topic at the moment, and evidence is being most skilfully given to it by doctors: that is, the profession wants more money, and is using all legitimate means to ensure that it will get it. Why is it wrong for a pharmaceutical manufacturer to do the same? Dr. Rayner really cannot have it both ways. Simple business men often say to me, "You doctors do a better public relations job for yourselves than any other group in the country"; and, of course, the present Minister in charge of Government propaganda is an ex-secretary of the Association.

Dr. Rayner suggests there should be some central body to assess the value of drugs for the simple general practitioner. Well, there is "To-day's Drugs"—in my view an earnest and well-meant feature. There is the *National Formulary*; there are *Prescribers' Notes*; there are the opinions of consultants, praised by Dr. Rayner but often in my experience based on a careful study of the glossy pharmaceutical literature decried by her. (What, by the way, is wrong with its being glossy? Should it be the kind of economy paper we had during the war in a controlled economy?) Excessive centralization in the matter of assessing new drugs might have drawbacks worse than its possible advantages. Most people, and many doctors, hate innovation; so do official and authorized bodies. That is why most major advances in any field come from a single man with a single "crackpot" idea: a new and embryo penicillin would hardly survive scrutiny by a Government committee ("Think of the cost . . .", "Importance of the body's natural defence mechanisms . . .", "Current Ministerial thinking . . .", "Over-population . . ."). I experienced official therapeutics when in the Army. While appreciating the need for it in wartime, I disliked it, and so did every other doctor I met.

Let pharmaceutical firms, says Dr. Rayner, "start measuring their products against each other's scientifically." They already try to do so. Clinical trials are an essential element in scientific assessment of a drug; but every pharmaceutical manufacturer daily laments the difficulty of obtaining those clinical trials that will provide the very evidence on a drug that doctors demand from him. I am *inter alia* medical adviser to a pharmaceutical firm, and have it as a rule of thumb that, if one desires a single paper on a new and interesting drug, one must initiate at least six separate clinical trials. Five, started in good faith by both manufacturer and clinician, and at some cost to the former, fall by the wayside. Why? Not because of any lack of enthusiasm in the firm making the drug. This may be an unpalatable fact, but it is a fact.

Dr. Rayner deprecates salesmen and advertisement psychologists (whatever they may be) and free gifts. The use of all these is merely a way of bringing the attention of doctors to a new and useful drug, and of securing their good will. Only if a substantial demand develops does manufacture of a drug become economically worthwhile—with the possibility of price reduction. The best drug in the world will never be used widely unless it is advertised in the fullest sense: we hate innovation. Aspirin was discovered 30 years before any doctor began to prescribe it; and paracetamol for 40. D.D.T. lingered, unused, for as long; the discovery of penicillin went unexploited for 12 years. "Exploitation," what a dreadful word?—but it meant lives saved by penicillin as well as profits for its manufacturers. Dr. Rayner may not like the implications of these facts; but she ought to face them. And may I suggest that advertisement, perhaps of a more discreet and subtle kind than any practised by the industry, is not unknown in the profession? Have we not a thing called a bedside manner? Do doctors, having published a good paper in a good journal, disown it? Or do they very properly see that the right quarters are at the right time appraised of the paper's existence? Dr. Rayner criticized the shiny new cars of pharmaceutical representatives. Should she really prefer dirty old cars? Of course the cars cost money, and of course the good manufacturer makes the money by selling drugs; but that is what life, in the material sense, is about in this country in 1958.

I should like to end with a few more facts. The *British Pharmacopoeia* (and Dr. Rayner thinks it good for a doctor to have one, and I agree) is now largely written with the gladly given assistance of the pharmaceutical manufacturers. They have discovered the new drugs that are to be canonized by inclusion in the B.P., and they know more about those drugs than anyone else. The "rising drug bill": between 1949 and 1957 it increased from 35 to 73 million pounds; in the same period hospital costs went up from 219 to 421 millions. I leave Dr. Rayner to draw a simple conclusion. The pharmaceutical industry in this country says it can afford to spend only 4 million pounds a year on research: the figure in Switzerland [*sic*] is 7 millions. The British industry sells 45 million pounds' worth of drugs to the N.H.S. at manufacturers' prices: it exports 40 million pounds' worth. (Does Dr. Rayner favour exports? And does she think foreign countries are influenced to order drugs from the British industry when it is stigmatized by a British doctor as trying "to degrade our profession," and by practising "wiles and subtleties"?) Between 1953 and 1957 the index of prices for branded drugs fell from 100 to 82: the index of general retail prices rose in the same period from 100 to 116. A voluntary price regulation scheme for branded drugs has already been formulated by the industry and the Government. It affects 90% of the cost of all N.H.S. proprietary drugs. The estimated saving?—about £350,000 a year. Will Dr. Rayner agree that the smallness of the saving may mean that the previous prices were not in fact excessive? Or does she accuse the Treasury of a lack of financial acumen?

Dr. Rayner and Dr. Charles S. Thomson (*Journal*, November 22, p. 1291) imply that pharmaceutical manufacturers are lacking in responsibility, unlike doctors. Who do they imagine these dreadful manufacturers are? They are in fact ordinary men and women, getting considerable satisfaction from the making and selling of drugs that will save lives and shorten disability; and they have as much sense of responsibility as any other citizen. The pharmaceutical industry, for instance, is well known to give more, relative to its size, to charitable and academic good causes than any other industry in this country. Far from inciting her colleagues to "unite and fight these pharmaceutical firms," Dr. Rayner should try to realize that without them present-day medicine simply could not exist. The industry and the profession are partners in a great enterprise, not enemies. Of course the industry has some defects, as we all have. It knows it has them. But they will not be remedied by ill-informed criticisms or by suggestions of sweeping Utopian alternatives, dreamt up perhaps "on a Monday morning, during a crowded surgery."—I am, etc.,

Normandy,
Near Guildford.

S. BRADSHAW,
Medical Adviser,
Aspro-Nicholas Ltd.,
Ethical Pharmaceuticals Division.

SIR,—I would like to thank Dr. Mary M. Rayner (*Journal*, November 22, p. 1291) for a very excellent letter regarding the effect of high pressure advertising on the G.P. She is a shrewd observer and has placed a very adept finger on the main cause of the cost of the drug bill. The possession of Martindale's *Extra Pharmacopoeia* is, in my opinion, an absolute must in general practice, and if the Ministry were to supply each G.P. with one gratis it would at the very least earn its keep and at the best would save pounds per head per annum.

However, I would not like it to be felt that this means that all the drug houses are selling useless products at high prices. This of course, as all know full well, is far from the truth; indeed, a casual perusal of "Martindale" will show, if prices in the *Drug Tariff* are compared, that many of the proprietary preparations are cheaper and better, and in many cases that no equivalent is available. However, many readers will be as staggered as I have been recently to find that many of the so-called "new" pain-killers are no more than our old pals aspirin and phenacetin when the mumbo jumbo of their chemical formulae is reduced to an intelligent level. There has been in some instances a definite attempt to blind us with science in the form of chemical *noms de plume*. Reference to "Martindale" will show

at once to which particular section or type a particular substance belongs.

Pharmacology and *Materia Medica* have now grown so vast and vital that a serious attempt should be made to offer to G.P.s either refresher courses—with adequate locum coverage—or a monthly "digest" compiled and edited in an attractive way to combat "Big Brother" techniques.—I am, etc.,

Shipley, Yorkshire.

J. A. FRAIS.

SIR,—As a representative for the last 44 years with a firm of surgical instrument and equipment manufacturers, I feel that drug house representatives who visit the general practitioners have been handed out rather a raw deal in your correspondence columns during the last year, and now one of your latest correspondents, a lady doctor (Dr. Mary M. Rayner, *Journal*, November 22, p. 1291) considers them ideal companions at a dance or cocktail party, but can give them only two minutes, out of courtesy, for a discussion on new medical preparations.

My experience suggests that most of the representatives are qualified chemists and members of the Pharmaceutical Society, and rank with hospital pharmacists, from whom the doctors are glad to obtain information on new drugs, dosages, etc., when working in hospitals.—I am, etc.,

Stockport, Cheshire.

R. MERRYWEATHER SHAW,
Pharmaceutical Chemist.

Pharmaceutical Houses and the Postman

SIR,—During October I kept all the advertising matter which arrived at the surgery used by our partnership of three. Not counting the duplicates which arrived at our home addresses, I collected 235 packets which weighed in all exactly 14 lb. (6.4 kg.), and on which the total postage was £2 2s.

What an opportunity for the statistician! If we are 1/7,000th part of the N.H.S. practitioners, it works out during the course of one year that 21,000 doctors receive 19,740,000 packets weighing 525 tons (1 ton = 1,016 kg.), and on which the postage is £176,400. Or, to make it even more fantastic, let us take 63,000 registered medical practitioners receiving 59,220,000 packets weighing 1,575 tons and the postage is then £529,000. Imagine the numbers of postmen carrying this mountain of paper! Imagine the numbers of refuse collectors carrying it all back again (probably mostly unopened)! Imagine the chemists getting in supplies of the new wonder drugs, only using them once, and then keeping them on their shelves.

I wonder how much of this enormous expense goes on the national drug bill, or alternatively reduces the drug firms' taxation? And do our patients get any better treatment because of it?—I am, etc.,

Tynemouth.

J. PHILLIPS.

SIR,—May I plead that all those many firms who send us advertisements should respect the very difficult task of the postal authorities during the fortnight before Christmas, and refrain from advertising their products during this period.—I am, etc.,

London, S.W.1.

FRANCIS LESLIE.

Rational Use of Drugs

SIR,—I have followed with great interest recent comment on drug pricings and overprescribing. Contrary to a recent observation on the teaching of medical students in the use of *National Formulary* preparations, I was taught to use the N.F. whenever possible. However, on my first "sedative round" I found tab. butobarbiton. was not available. The next day the hospital pharmacist told me that "soneryl" tablets were bought by the hospital group on a bulk contract, and were thus cheaper than tab. butobarbiton.. N.F. Similarly, in another hospital my attempt to order

caps. vitaminor. was frustrated. "Multivite" was the available preparation, again on bulk contract.

It is difficult to find up to date and authoritative information on the new preparations as they become available. The *Practitioner* publishes an excellent series on new drugs, and this I find most helpful. Your new series "Drug Treatment of Disease" similarly has been very helpful, but like Dr. D. R. Laurence (*Journal*, October 11, p. 914) I was disappointed in "To-day's Drugs."

Occasionally having access to the *Journal of the American Medical Association*, I find the pronouncements of the Council on Pharmacy and Chemistry are authoritative and without bias, either commercial or political. Surely we could well do with a similar organization here? I would like to press for the formation of a Council on Pharmacy and Chemistry, under the auspices of the B.M.A., modelled on the lines of the American one, submitting regular reports on drug action and uses to the *British Medical Journal*. How else may we sort our present problems, which increase each day with the morning post?—I am, etc.,

Blandford, Dorset.

GEOFFREY F. BAINES.

Petrol-vapour Poisoning

SIR,—It would seem from the comments made by Dr. Reed Aidin in his article (*Journal*, August 9, p. 369), and Dr. B. George in his letter (*Journal*, October 18, p. 979) concerning the dearth of published accounts of petrol-vapour poisoning that this form of intoxication may be less well known in civil life than it is in the Royal Navy. During the second world war fairly frequent cases of petrol vapour poisoning were reported, but once the nature of this hazard was recognized and the methods of protecting against it were promulgated it usually ceased to be a hazard.

Typical incidents are cited in the *History of the Second World War* in His Majesty's Ships *Victorious*, *Activity*, *Glenroy*, *Empress*, and *Arbiter*, in which there were several fatalities. Attention is drawn in the *History* to the insidious danger of a steadily rising concentration of petrol vapour which, in contrast to sudden exposure to an irritant high concentration of vapour which is quickly recognized, deadens the sense of smell so greatly that the danger is not detected by the unwary; and also to the fact that complete protection is only afforded by a self-contained breathing apparatus which does not rely on the ambient air for its support, such as the Salvus, although the conventional Service respirator for protection against chemical warfare agents, which every Service man has in his possession, affords good protection for the very useful period of 10 minutes. The need is emphasized for efficient ventilation arrangements in the construction of petrol control compartments, and for ensuring that ventilation systems are cleaned and maintained efficiently.

Dr. Aidin's comment that the accident he reports happened on a warm day is of particular interest, and underlines the need for increased caution when those exposed to petrol vapour are working in a warm atmosphere indoors or in a hot climate.—I am, etc.,

Medical Department of the Navy,
London, S.W.1.

F. P. ELLIS.

REFERENCE

1. Ellis, F. P., *History of the Second World War, United Kingdom Medical Series, Medicine and Pathology*, edited by V. Z. Cope, 1952, p. 312. H.M.S.O., London.

Advising the Bronchitic

SIR,—Personal experience is of much greater value than second-hand information. Having suffered from chronic bronchitis almost all my life, I consider myself able to speak with authority on this important subject. It is indeed a very sad fact that only a small percentage of the medical profession realize that certain "chesty people" are hypersensitive to any forms of tobacco smoke (especially pipe tobacco).

During my daily work as a chest physician I often inquire from my smoking patients if they can travel on the top of

a bus or tram. The bronchitic and asthmatic invariably reply, "No. Because it makes me cough." Yet these same people admit to smoking 10 to 15 cigarettes per day. Is it any wonder they cough? They fail to see that they are producing the very same atmosphere they cannot tolerate on a bus. Patients are always ready to blame the weather or their employment but never their smoking habits. If these patients were advised to stop smoking, there would be less of them suffering from chronic bronchitis and persistent coughs. Cutting down is not enough, they must stop smoking altogether and avoid smoky atmospheres. I am also often asked, "Shall I stop smoking cigarettes and start pipe smoking?" I always reply that from the health point of view pipe smoking is worse because it produces four or five times the amount of irritating fumes.

But what of the other unfortunate victims who do not smoke and yet have to inhale these fumes? The greatest calamity which can befall them is to be admitted to a hospital ward or convalescent home in this country. Recently an emphysematous patient was admitted to a local convalescent home. She was compelled to sit half-way up the stairs during the daytime, this being the only place free from tobacco smoke. Another patient was compelled to forgo her hospital gastro-intestinal investigations—because of the smoke from the other female patients. It is high time the hospital management committees throughout the country woke up to these facts and provided side wards on every medical and surgical ward where patients who so desire may have their treatment in an atmosphere free from pollution with tobacco smoke.—I am, etc.,

Leeds, 8.

DAVID A. HERD.

Qualified Pen-names

SIR,—I was intrigued when I first read about the B.M.A. booklet on nutrition by John Clyde, M.D., etc., and when my wife obtained a copy my curiosity got the better of me. I looked him up in the *Directory*. Imagine my surprise when I found no such name. There only were the three of us. One I have met, the other I have not had the pleasure of meeting. I wondered what mysterious motive the B.M.A. could have in sponsoring work done by some nebulous nobody, and I must admit that my confidence in the integrity of the B.M.A. received a little jolt on discovering their apparent duplicity (or quadruplicity). Should the booklet not have contained the usual writer's disclaimer that all characters mentioned in this book are purely fictitious and have no reference to any person living or dead?

As Sir Stewart Duke-Elder implies in his letter (*Journal*, November 29, p. 1355), I also feel that you cannot escape some responsibility for helping to make three into four and thereby reducing each by a third, because if I remember right I first saw reference to this new member of our clan in the columns of the *British Medical Journal*. Has the B.M.A. been doing some roamin' in the gloamin' by the bonny banks?—I am, etc.,

Bordon, Hants.

N. P. R. CLYDE.

Poliomyelitis Vaccines

SIR,—Dr. Ritchie Russell (*Journal*, November 29, p. 1354) in discussing our review of the present position of live poliovirus vaccines (*Journal*, November 15, p. 1184) says that it is doubtful if we presented a balanced analysis of the present position. We did not, as he suggested, condemn live poliovirus vaccines, nor did we take a strong line against trials. We said that it was unlikely that any country with the finances available to undertake a vaccination programme using formalized vaccines would use or switch to attenuated virus vaccines until it has been shown that they are as safe as, or safer than, formalized vaccines and produce as good or better levels of immunity. We said that live virus vaccines appear suitable for trial in countries where formalized vaccines cannot be afforded, and we said that in our opinion carefully conducted trials of attenuated virus vaccines should be undertaken in such countries if there is a genuine need for vaccination.

We tried to indicate that human vaccine viruses which (a) change their characteristics after growth in the human host and (b) spread readily to contacts are a new concept and therefore may not be easy to evaluate.

Dr. Ritchie Russell apparently thinks that we place more weight on the results of monkey pathogenicity tests as an indicator of potential neurotropism in man than in fact we do. Admittedly we are worried when the laboratory characteristics of excreted virus resemble those of some wild viruses the stability of which is at least questionable. What is important is that the virus excreted by some vaccines differs from the original virus and can spread to contacts. With this knowledge, we consider that the safety of the excreted virus should be subject to the same type of preliminary clinical trial as the original vaccine virus.

Dr. Ritchie Russell discusses the effect which different vaccines may have on the natural history of the poliovirus. We, too, are interested in this problem but like him can only speculate.

Dr. Ritchie Russell asks us to clarify our hopes and fears. Our hopes as far as vaccination against poliomyelitis is concerned are the same as his—namely, that, safe, efficient cheap vaccines will be available in all countries. We cannot see that a live vaccine must necessarily fill this bill, and we think that improvements will certainly be made to the inactive virus vaccines at present in use. Our fears are that, unless trials are carefully conducted to test the safety of living virus vaccines, the future of these vaccines and perhaps public confidence in all poliovaccines may be jeopardized.

Dr. Ritchie Russell must be irritated by the many delays and alarms that have accompanied the development and trials of oral vaccines. He would like to see the oral vaccines put to the test quickly and decisively. We share his sense of urgency, but obviously disagree on methods of assessing safety and effectiveness, neither of which we take for granted.—We are, etc.,

G. W. A. DICK.
D. S. DANE.Department of Microbiology,
The Queen's University, Belfast.

Onset Enuresis

SIR,—The excellent publication by Drs. J. D. Paulett and E. Tuckman (*Journal*, November 22, p. 1266) prompts me to mention a case of enuresis which I have always considered one of those we would like to meet more frequently.

It was 1942, and we had well over 200 unbillable enuretic evacuees in various hostels in Cornwall. Onset enuresis was not a major problem, for out of that segregated number only one had failed to give a positive answer to my stock question: "And what did your mother say when you wetted your bed at home?" The last batch of children had been sorted out, and six months had passed without any further complaint from a billetee. I was therefore all the more annoyed when a 12-year-old boy was reported to have started wetting his bed.

I found a healthy and intelligent youngster waiting for me, who was obviously greatly upset over his misbehaviour. He admitted having wetted till the age of 5, but there had been no lapses after he had started school. He had an elder sister who had remained with his parents. Neither at his school nor at his billet could any cause for this sudden change be found, and he had appeared to all and sundry as happy as ever. Yet for the past six nights he had never once been dry. He was clearly eager to give me every assistance, but, after my inquiries had drawn a blank all round, his face began to assume a look of helpless resignation. It was then that I fired my last shot: "When did you get your last letter from home?" "A week ago to-day." "And what did it say?" "Mum said I had a baby sister."

—I am, etc.,

London, W.1.

W. E. R. MONS.

SIR,—In their interesting study (*Journal*, November 22, p. 1266) Drs. J. D. Paulett and E. Tuckman state that there is "no information in the literature on the prevalence of the onset type of enuresis." They are evidently unaware of the important studies of Dr. Bertil Hallgren, of Stockholm. In the first of these Hallgren reported the results of a survey of 1,992 unselected primary school children. Of these, 20% of 4 at least once a month, mostly several times a week, and of these children 86 (42%) had earlier been dry. The frequency of onset enuresis in this sample of schoolchildren

aged 7 was therefore 4.3%, as against 2.9% in Paulett and Tuckman's 677 children under the age of 21. Hallgren made a detailed inquiry into the social factors.

In his second study, Hallgren examined the clinical, social, and genetic aspects of 213 cases of nocturnal enuresis severe enough to have been referred to the psychiatric out-patient department of a paediatric hospital or as in-patients to a children's psychiatric ward. Of these, 15% were onset cases, with a significantly higher proportion of girls than of boys. Emotional stress (disturbance of the relationship between mother and child, or unsatisfactory home) seemed to be connected with the onset especially when the child also showed diurnal enuresis. This finding is in accordance with my own observations at the Mersham Reception Centre, where the high incidence of reported enuresis on admission (32% of those over 3 years of age) seemed closely related to their unsatisfactory home conditions. Whether the familiar improvement that rapidly occurs when "deprived" children are happily settled in suitable homes is restricted to onset cases has not been determined.—I am, etc.,

London, S.W.13.

HILDA LEWIS.

REFERENCES

- Hallgren, B., *Acta psychol. scand.*, 1956, 31, 379.
- Ibid.*, 1957 Suppl. 114.

Munchausen Syndrome

SIR,—I must congratulate Drs. J. C. Barker and T. G. Grygier (*Journal*, November 22, p. 1274) on their lucid description of six cases of Munchausen's syndrome. I have only one small correction: it was a horse doctor, not a house doctor, who is alleged to have operated on Elsie Packoma¹—an experience much more typical of Baron Munchausen's adventures.

It is interesting that every one of these patients has been at this hospital within the last few years, because this shows that the apparent commonness of the syndrome is an illusion caused by a very few cases visiting a very large number of hospitals. Putting it another way, in the last five years nearly every hospital doctor has met two or three cases of Munchausen's syndrome, but during that time very few people have met any other cases except those listed by Drs. Barker and Grygier. Never in the history of hospitals have so many doctors been so much annoyed by so few patients.—I am, etc.,

Central Middlesex Hospital,
London, N.W.10.

RICHARD ASHER.

REFERENCE

- Asher, R., *Lancet*, 1951, 1, 339.

Sex Education for Students

SIR,—With Dr. Edward J. R. Rossiter's excellent letter on the above subject (*Journal*, November 8, p. 1164) I am in complete agreement. But the implementing of Dr. Rossiter's suggestions poses I think a number of problems. If students are to receive sex education, what will they be taught, and by whom?

Recently, probably stimulated by the controversy over the Wolfenden Report, I read a number of books and articles on homosexuality, and I can only say that I was quite appalled by the lack of even an elementary knowledge of sexual physiology and psychopathology displayed by the writers. One of these authors cited, as a typical case of "neurosis supervening on homosexuality," a young man who felt sexually attracted to girls but who was unable to have irregular unions with them on account of an earlier warning by his mother and his subsequent "fear of making them pregnant." Was this such a very abnormal reaction? Was it in fact a neurosis at all, or merely the very normal reaction of a sensitive and morally sound young man? And, instead of this patient being told that his reaction was both normal and understandable, he was apparently dismissed as an intractable homosexual.

The treatment, too, offered to these unfortunate people was almost negligible. A minute percentage was selected for Freudian analysis, which nearly all the writers, with two exceptions, found disappointing. Very strangely, too, continence seemed to be advised only "if it did not seem likely to lead to neurosis," otherwise it was not advised. But in not one single instance did any author advise mental continence, or any attempt by the patient

to control his sexual fantasy-life, which of course must be the beginning and foundation stone of all attempts to reach sexual maturation. Nor, again, was there a single attempt by any author to teach the patient that his sex life must eventually (for any normality or stability) be linked with and dependent upon his tender emotions, which must always be his sole guide to any sex-expression, and that such a linking may require (if he really wants to reach maturity) months of abstinence, self-sacrifice, complete abolition of fantasies, and a sustained desire to allow the growth of all tender sentiments regarding the opposite sex.

Therefore, while I endorse the ideal set forth by Dr. Rossiter, I am greatly at a loss to know how it could be achieved. Sex education which is based upon utterly wrong premises is probably much worse than no education at all. It is proverbially much more difficult to teach a person who has been badly taught than one who knows nothing about the subject.—I am, etc.,

Pinner Middlesex.

ROBERT THOMPSON.

Costs of Notification

SIR,—I should like to point out to Drs. E. O. Gibson and R. M. Emrys-Roberts (*Journal*, November 15, p. 1229) that the saving from the abolition of fees for notification of diseases might not be great. For all moneys earned by G.P.s outside the Pool, a corresponding deduction is made from the Pool. So, if fees from notifying diseases ceased, a corresponding increase would take place in the Pool, and this, unlike notification fees, would count as pensionable income.—I am, etc.,

Devonport.

J. LAWRENCE HENRY.

SIR,—I feel that the letter of Dr. E. O. Gibson and Dr. R. M. Emrys-Roberts (*Journal*, November 15, p. 1229) concerning notifications has put this subject into its proper perspective. A recent experience of mine shows how farcical the whole thing can become. While working in a hospital in England, I was responsible for the medical care of the staff. My opinion was asked as to whether a cleaner whose child had scarlet fever should continue her duties. I advised that she should, provided that she had no symptoms and was not working in the children's ward. The following day the hospital secretary received a message from the M.O.H. passing on the notification. I therefore contacted the M.O.H. and stated the position. The outcome of this was that the M.O.H. insisted on the woman remaining at home during the period of infection.

Pondering on this rather drastic move, I can see only two logical conclusions. One is that sore throat should be made notifiable and treated in isolation; this is surely absurd. The alternative is to delete scarlet fever from the list of notifiable infectious diseases. I feel that this move is long overdue and would strongly support the plea that it should be done as soon as possible.—I am, etc.,

Edinburgh, 10.

BRYAN ASHWORTH.

Blood Groups in Cyprus and the Near East

SIR,—I read with great interest your leading article on blood groups in Cyprus and the Near East (*Journal*, October 18, p. 959) in which it is said: "Nothing is known of the Rh groups in this area" (Syria and Lebanon). I have studied this question in Beirut with Dr. J. Mouacdie.

We found the following incidence of Rh negatives: 4.4% for Moslem Arabs; 6.4% for Armenians; and 7.0% for Christian Arabs.—I am, etc.,

Beirut, Lebanon

FARID S. HADDAD.

REFERENCE

- Haddad, F. S., and Mouacdie, J., *Lebanese med. J.*, 1951, 4, 200.

Combined Gastric and Duodenal Ulceration

SIR,—I was most interested to read the paper by Dr. R. Mangold in your issue of November 15 (p. 1193), confirming most of my findings reported in 1955¹ and 1956,² particularly in regard to the great frequency of haemorrhage

and other complications in patients with combined ulcers. However, there is one point on which we have differed. This is the matter of the importance of gastric retention in the pathogenesis of the gastric ulcer, which, we both agree, is nearly always secondary to the duodenal ulcer.

Dr. Mangold recorded an incidence of 9.2% of cases of frank pyloric stenosis in his own series (28% when minor evidence suggesting obstruction was included). He concluded "pyloric stenosis does not appear to be a major factor in the pathogenesis of combined ulcers." But frank pyloric stenosis is only the final stage of a slowly developing lesion, and radiology is too crude a method to detect the earlier stages, many of which are surely almost certainly present as well in any series containing a number in the final stage. Dr. Mangold's own figures imply that the proportion of his own patients with some degree of pyloric obstruction was substantial, even if he does not accept the belief held by many that active duodenal ulcers always cause some degree of functional pyloric obstruction. Frank organic stenosis is quite a different matter and develops slowly over the years. Either kind of pyloric obstruction, or indeed, gastric retention from any cause, can promote a secondary gastric ulcer—I have given reasons and examples in the papers referred to. My view was further supported by the finding of often unsuspected associated gastric ulcers in a substantial proportion of patients known to have pyloric obstruction from another cause.

Royal Free Hospital,
London, W.C.1.

H. DAINTREE JOHNSON.

REFERENCES

- Johnson, H. D., *Lancet*, 1955, 1, 266.
- *Surg. Gynec. Obstet.*, 1956, 102, 287.

Marie Stopes

SIR,—By arrangement with the executors of the late Dr. Marie Stopes we have commissioned Mr. Keith Briant to write her official biography. We shall be most grateful if any of your readers who possess letters from Dr. Stopes, or who could provide personal recollections of her, would be kind enough to make them available to Mr. Briant through us. All original documents will be carefully copied and returned without delay.—I am, etc.,

40, William IV Street,
London, W.C.2.

IAN PARSONS,
Chairman,
The Hogarth Press.

SIR,—I am writing a book about the character, life, and struggles of the late Dr. Marie Stopes. Any help from your readers in the form of letters, reminiscences, press cuttings, or any other relevant information would be most gratefully received. Any items lent will be treated most carefully and returned promptly, and may be sent to me either at the address below, or care of my publishers, Messrs. Barrie Books Ltd., 3 and 4, Clement's Inn, London, W.C.2.—I am, etc.,

9, Westbourne Terrace,
London, W.2.

ELIZABETH SMART.

POINTS FROM LETTERS

Hazards of Sport

Dr. K. E. JOLLES (West Bromwich) writes: Dr. E. Brauer states (*Journal*, November 22, p. 1296) that he has seen more fatalities amongst spectators than players of football. That it is, certainly, not always the combatant who dies was forcibly brought home to me on an occasion earlier this year when I was officiating as medical officer at a "speed hill climb" competition. A driver had successfully and quite creditably completed his three practice runs as well as his two competition ones and, his task of the day done, had repaired to the paddock to watch his fellow competitors. An hour later, whilst thus engaged in "spectating" quietly, he suddenly collapsed and died almost instantaneously of coronary thrombosis. The interest of this case lay in the fact that this man had actively competed earlier that day and suffered no ill-effect, but died an hour later whilst watching others.

Obituary

A. HOWARD CUTTING, M.B., B.S.

The tragic death of Dr. A. Howard Cutting in a car accident on the evening of November 25 was a great loss to the general-practitioner service of south Cambridgeshire. The death of his wife, Margery Cutting, at the same time was a sad and bitter blow not only to the family but also to the village of Balsham, in which they lived.

Educated at King's College School, Wimbledon, Alfred Howard Cutting, who was born on December 28, 1914, proceeded to London University and King's College Hospital, graduating M.B., B.S. in 1939. He served as a house-surgeon at King's and also as clinical assistant to the department of urology and as resident medical officer at St. Luke's Hostel. At the outbreak of war in 1939 he was attached to the Emergency Medical Service and served in it until he joined the R.A.F. in 1940. Here he proved not only his medical worth but also his ability to turn his hand to other skills. He was for a long time with a squadron in Gibraltar and also served in North Africa, as well as at stations in England.

Dr. A. BROWN writes: In July, 1946, Dr. A. Howard Cutting joined a practice based on Linton in south Cambridgeshire, and was a partner there when he died. During the twelve years he helped to build up a group practice and became not only the doctor but the counsellor and friend of the patients. The technical knowledge of building which he possessed was invaluable when the group practice centre was being built. He will be greatly missed in Balsham, where he took a great interest in village affairs. The regard and esteem in which he was held not only by the patients but also by the medical profession were evidenced by the very large congregation which was present at the funeral service in Balsham Church.

Although not medically qualified, Dr. Margery Cutting was before her marriage doing work directly connected with medicine, and she obtained the degree of Ph.D. for her work on the sulphur content of food. She was awarded a Beit Memorial Fellowship at Cambridge and worked under and with Professor R. A. McCance before and after her marriage. She took a great interest and a very active part in the village life and also in the Women's Institute and the work of the Girl Guides in the district. She will be sorely missed by all with whom and for whom she worked. To both sets of parents and to the three young sons who are left we all extend our most sincere sympathy.

Mr. JOHN HESKETH writes: I first met Dr. A. Howard Cutting when he was a squadron medical officer in the R.A.F. in 1943. Being more senior and experienced, Flight-lieutenant Cutting (as he then was) became my guide, counsellor, and friend in all matters of a Service nature. My association continued for some 18 months as our respective squadrons kept fairly close together, and he was always willing to help in any way he could. He had already been on an overseas posting, and when my turn came nothing was too much trouble to him in advising or instructing me in every possible detail. I still have in my possession a "primus" stove in working order which he personally modified for my use. Although a doctor, he could, I found, turn his hand to things other than medicine, and in later years I came to realize how much of a handy-man he was, particularly in respect of houses, boats, and cars. It was not until 1948 that chance again threw our paths together, by which time he was established in general practice near Cambridge. Over the last 10 years he and his family and mine have remained friends, and at all times I have found him eager to help others and always of a cheerful disposition. He could not tolerate inefficiency, particularly when rules and regulations were involved, and

he never lost an opportunity to bring anything of this nature to light, especially if the occurrence had been to the detriment of his patients. Although somewhat dogmatic in his clinical approach, he was in every sense a conscientious general practitioner. Outside medicine, sailing was a hobby which gave endless delight both to himself and to his family. By his untimely death his colleagues, and particularly his own village of Balsham, have lost a very dear friend. The death of his wife at the same time was another bitter blow to the family. Three young sons are left, and to them and the parents of the deceased our deepest sympathy is extended.

T. C. CLARE, M.D., F.R.C.S., F.R.C.O.G.

Mr. T. C. Clare, who was honorary surgeon to the Leicester Royal Infirmary for many years, died on November 12 at the age of 77.

Thomas Charles Clare was born in Birmingham, where his father was city treasurer. From King Edward's School he went on to study medicine at Birmingham University and St. Bartholomew's Hospital, qualifying in 1905 and graduating B.S. a year later. After being house-surgeon to Mr. Jordan Lloyd at the Queen's Hospital, Birmingham, he later became resident medical officer under Sir John Bland Sutton at the Chelsea Hospital for Women. In 1909, the year he came to Leicester, he obtained the F.R.C.S. and proceeded to the M.D. (London) in gynaecology in the following year. For three or four years he was in single-handed general practice, and in 1913 he was appointed to the honorary surgical staff of the Leicester Royal Infirmary. At the outbreak of the first world war he joined the R.A.M.C. and served in the 5th Northern General Hospital at Leicester until 1916, when he was sent out to Mesopotamia. While there he contracted sandfly fever and dysentery and was transferred to Bombay to convalesce, spending the next two years in the North-West Frontier Province. It was there that he did his original work on the effect of heat on the red blood corpuscles, later publishing his paper "On the Toxic Nature of the Stroma of the Red Blood Corpuscles." It was characteristic of him that he did most of the experimental work on himself. As a result of this work he devised a method of treatment of certain bacterial infections. Some years after resuming his work at the Leicester Royal Infirmary he published a paper on "Gastromyotomy—an Operation for the Cure of Chronic Gastric Ulcer." He became president of the Leicester Medical Society in 1929 and read his address on "The Physiology of Cancer." After working for two or three years as honorary secretary of the Leicestershire and Rutland Division of the B.M.A., he was its chairman in 1932-3. In 1938, the year he was elected F.R.C.O.G., he delivered his presidential address to the Midland Obstetrical and Gynaecological Society, giving it the title "A Socratic Dialogue on Cancer." He had previously given a paper to this Society on "The Keloid Ovary," basing his hypothesis on clinical and physiological evidence. Although he was due to retire in 1941, he carried on until the end of the war, and his appointment was further extended owing to the rather long illness of a colleague, so that ultimately he gave 39 years' service to his hospital. He is remembered with great admiration and affection by a long line of house-surgeons, several of whom have achieved distinction. Among doctors' families he was in great demand as an obstetrician and gynaecologist.

In his younger days Mr. Clare was a keen cricketer and rugby player, but in later years his chief recreations were golf, fly-fishing, bridge, and reading. He possessed a very fine and extensive library. It gave him great pleasure when in 1937 he was elected captain of the Leicestershire Golf Club, a position which he held until 1941. Four years later he became president and was eventually elected a life member as a tribute to his great popularity. He was a Freemason of 40 years' standing. Unassuming modesty and charm were the outstanding characteristics of his personality which endeared him to his colleagues, nursing

staff, and patients alike. He possessed a fine original mind and had the unique faculty of expressing *multum in parvo*. Our deepest sympathy is extended to his wife and only son, the Rev. Thomas Charles Hunter Clare.

M. W. PATERSON, O.B.E., M.C., M.R.C.S., L.R.C.P.

Dr. M. W. Paterson, who was in general practice at Hyde, Cheshire, for nearly thirty years, died at Llandudno Hospital on November 15. He was 71 years of age.

Matthew Wallace Paterson was born at Tinsley, Yorkshire, on September 3, 1887, and was educated at Glasgow High School and Manchester Grammar School. He went on to St. John's College, Cambridge, where he took his B.A. in 1908. Receiving his clinical training at Manchester Royal Infirmary, he qualified M.R.C.S., L.R.C.P. in 1913, and then held the appointments of house-surgeon at Alnwick Infirmary and at Manchester Royal Infirmary and senior resident medical officer at Hope Hospital, Salford. On the outbreak of the first world war he joined the R.A.M.C. and served with distinction in France, attaining the rank of major. He was awarded the Military Cross in 1917 and was appointed O.B.E. in 1919. He was also decorated by the French Government, receiving the Médaille d'Honneur, with crossed swords. After the war he settled in Hyde, where he remained for the whole of his working life, taking an active part in local medical affairs. He was chairman of the Hyde Division of the B.M.A. in 1930-1, and had served on a number of Headquarters committees. When the Association held its Annual Meeting at Manchester in 1929 he acted as one of the honorary secretaries of the Section of Occupational Diseases, and in the following year he was honorary secretary of the Association of Certifying Factory Surgeons. Rheumatoid arthritis and overwork entailed his retirement from practice in 1947, when he moved to Drayton Parslow, Buckinghamshire, where he lived until a month or two before his death.

F. V. G. P. writes: "Pat," as Dr. M. W. Paterson was known in Hyde, had a charming personality and inspired great affection in patients and friends alike. His patients loved him, knowing that they could be sure of his interest and sympathy, and that he would do all he could to help them. As a young man he was an excellent hockey player, but his real love was for fishing and he spent many hours on the banks of the Dove, in Derbyshire. He was also a keen amateur painter. For the last 30 years of his life rheumatoid arthritis limited these pleasures to a great extent and made his work increasingly tiring and difficult. During all this time he was devotedly helped by his wife, who acted as his chauffeur for many years, and nursed him to the end. Our sympathy goes out to her, and to his son and daughter.

H. S. ROBERTS, M.D.

Dr. H. S. Roberts, formerly one of Southport's oldest practitioners, died at a nursing-home at Wilmslow, Cheshire, on November 9. He was 84 years of age.

Hubert Shearwood Roberts was born on May 23, 1872, the son of Dr. A. Morton Roberts, of Sheffield. He received his medical education in North America, graduating M.D. from New York University in 1895. After a period as house-surgeon at the Bellevue Hospital, New York, he went on to obtain the Toronto degrees of M.D., C.M. in 1896, and then returned to the United Kingdom to take the Scottish triple qualification in 1897. After working for some time as a ship surgeon he settled at Southport in 1900 and was in practice there until he retired to Wilmslow two years ago. In addition to the work of his practice he assumed a heavy list of public duties, being medical officer to several convalescent and children's holiday homes. During the first world war he served as a captain in the R.A.M.C. in Belgium and France and, later, on recruitment boards. As president of the Southport Medical Society in 1922 he gave an address

on the doctor's car, a subject on which he could speak with some authority. Chairman of the Southport Division of the B.M.A. in 1923-4, he also represented his Division at the Annual Representative Meeting from 1944 to 1947, and was often seen at other Annual Meetings. His death came after a year of ill-health, and he is survived by his wife and a son and daughter. In manner quiet and courteous; in appearance dignified (his dress perhaps a little reminiscent of Edwardian days); assiduous in the care of, and loved by, his patients; devoted to his family—surely the verdict must be "Well done."—W. A. M.

Medical Notes in Parliament

DEBATE ON WOLFENDEN REPORT

The House of Commons put aside its party lines on November 26 to give expression to its opinions on the Report of the Wolfenden Committee on Homosexual Offences and Prostitution. It was asked to do no more on this occasion than "take note" of the report.

Mr. R. A. BUTLER, Leader of the House as well as Home Secretary, in the opening speech put the debate on a serious, human, and at times troubled level. He suggested that the delay of 12 months or so since the report was presented had given a useful opportunity for reflection; and was the first of many speakers to comment that the two parts of the report had not very much to do with one another.

Homosexual Conduct

Their main concern, Mr. BUTLER told the House, would be to decide whether the committee's recommendations for changes in the law were to be accepted. The essence of Mr. Butler's argument was this: the Wolfenden Committee drew a sharp and valid distinction between sin and crime; while private homosexual conduct between consenting adults was commonly regarded as a sin, it ought not to be a crime. The argument that if conduct that was morally wrong was not injurious to society it should be left to the operation of the individual conscience was impressive; but it could be accepted as a reason for leaving homosexuality to the private conscience only if one was convinced that society would not be harmed by so doing. An impression had gained ground, unfair to the Wolfenden Committee, that they desired to legalize homosexual conduct. In fact, what they wished to do was to remove these practices, like adultery and other sins, from the realm of the law. It was clear, however, that there was at present a very large section of the population who strongly repudiated homosexual conduct and whose moral sense would be offended by an alteration of the law which would seem to imply approval or tolerance of what they regarded as a social evil. Therefore the Government were satisfied that they would not be justified, on the basis of opinions expressed so far, in proposing legislation to carry out the committee's recommendations. The committee had drawn attention to the need for research, and, with a reservation related only to heavy demands already imposed on the Home Office, he undertook to follow up the committee's desire.

Legislation on Prostitution

On prostitution, there was probably little disagreement on what was desirable; the question was—what is practicable? Here the principal recommendation was that the law should be reformulated in three ways. The first was to eliminate the requirement to establish annoyance. He thought that was right. The second was that the maximum penalty should be increased, and the system of progressively higher penalties introduced, culminating in sentences of three months' imprisonment for a third and subsequent offences. He had no doubt of the need to clean up the streets. The Wolfenden Committee had made a strong case for its recommendations, and he could now see the lines on which legislation giving effect to them would be

framed. That legislation was being prepared. He was predisposed to sympathize with the view that it was inequitable that the woman should be punished and the man should not. But practical considerations presented real difficulties: the man normally did not loiter; it was not his persistent presence, but that of the woman, that was offensive or injurious; it was almost impossible to identify the man, but it was comparatively easy to identify the woman. It was, further, most important that the law should not be framed in terms that would expose an innocent woman to any danger of arrest for alleged loitering or soliciting. Any new definition of the offences must satisfy two criteria: it must not expose an innocent woman who behaved indiscreetly to arrest; and it must not impose on the police an impossible burden of proof.

On the section of the report relating to living on immoral earnings, Mr. Butler rejected the conclusions as not firm enough and accepted the reservation of three women members that the maximum penalty should be raised to five years' imprisonment. Finally he spoke about the findings on premises used for prostitution, and confessed that on this he did not at present see a way of providing a reasonably speedy and effective remedy that would not at the same time do harm to innocent subtenants.

Dr. Broughton and Dr. Bennett

Two doctors, both with experience of psychiatric work, but as it so happened on opposite sides of the House politically, took part in the debate, and both were opposed to the Wolfenden recommendations on homosexuality.

Dr. A. D. D. BROUGHTON (Batley and Morley, Lab.), after expressing some surprise that the Wolfenden Committee had been asked to investigate two vices so very different, said that he had less knowledge of prostitution because few prostitutes went to psychiatrists. He understood that the psychiatrists who gave evidence regarded prostitution as a social problem and did not supply the committee with any helpful advice. He could see their point of view; but it must be recognized that there was something psychologically abnormal about a woman who chose that way of earning a living. Those whom he had met professionally were women who had been deprived of the love of one or both parents in childhood. He agreed with a view that had been expressed that they were incapable of giving or receiving love. Those he had come across all suffered feelings of isolation and worthlessness. But it would be wrong to generalize from so few cases. There was need for a great deal more research, including research into the mentality of men who resorted to prostitutes. The sight of prostitutes in the streets was displeasing to respectable men, offensive to respectable women, and a thoroughly bad example and temptation to the young. For those reasons he agreed with the recommendations of the committee. But they would not be effecting a cure.

Half a Million Male Homosexuals

Some authorities put the prevalence of homosexuality among males as 4%, others as low as 2%. At the lower figure it would mean that there were half a million male homosexuals in the British Isles. The causes were deeply embedded in a person's mental make-up. Undoubtedly in some cases there were constitutional factors, but it was believed that the environment and upbringing of a child were the most important factors. Normal sexuality was part of the process of growing up, but there were some people in whom the natural process of development was arrested and even reversed.

The homosexuals who took the male or active part appeared of the masculine type. He believed they had been directed along the path of homosexuality by accident: for example, they might in childhood have been made to avoid girls, and therefore have come to regard them with repulsion; or they might, as boys, have had sexual experience with an adult woman and that had filled them with some feeling of disgust. Others had a femaleness

of outlook: they probably had a bad father-image, and because of it had more interest in what the mother and sisters were doing. This type were vain and apt to indulge in exhibitionism. It was in that group that were found the really decadent types and the male prostitutes.

It was true, to a large extent, that it was possible for homosexuals to repress their desires. But the sex urge was not weakened in a man by his being a homosexual. Treatment was extremely difficult. Many homosexuals looked upon the suggestion of becoming heterosexual as quite absurd. It must be realized that it entailed changing their whole life pattern. He agreed with an intervention by Dr. DONALD JOHNSON (Carlisle, Con.) that hormone treatment merely lowered sexuality in general rather than making any change in homosexuality.

Legal Sanctions

The question to be decided was: should the law be modified in the way recommended by the Wolfenden Committee—namely, that homosexual practice among consenting adults should no longer be a criminal offence? If the recommendation was accepted, the general public would gain the impression that Parliament condoned this practice. Homosexuality was biologically wrong. If the recommendation was accepted he had a fear, based on what he knew of homosexuals, that some, not all, would repress their homosexual feelings less. They might go to the extent even of showing some signs of the affection they had for one another in public. He could envisage men walking along the street arm in arm, possibly holding hands, perhaps wishing to dance together, and even caressing in public places.

Mr. S. SILVERMAN (Nelson and Colne, Lab.) said that, supposing Dr. Broughton was right, was that a justification for sending homosexuals to prison, which would be the inevitable result of not changing the law?

Dr. BROUGHTON replied that the law was very savage. He thought the penalties too severe. It was a pity that such heavy penalties were ever imposed. But to alter them at this time, he feared, would be misunderstood and many people would think they were condoning these offences. He would not himself go as far as to send them to prison. Long-term imprisonment was too severe a penalty, and prison was quite the wrong place to send these people. But unless some punishment was imposed there was a danger of others becoming acquainted with the practice and indulging in it. It was a well-known fact that homosexuals banded themselves into groups, and if the law were changed so that they did not have the fear of punishment these groups might elevate the practice of homosexuality to a cult. He had heard of groups in which considerable trouble had been taken by some members in the seduction of others. He was not in favour of accepting the Wolfenden recommendations.

Dr. REGINALD BENNETT (Gosport and Fareham, Con.) welcomed the agreement of Dr. Broughton with his own views, because he felt that few other members of the psychiatric profession agreed. He had thought he was in a minority of one, but saw now that it was a minority of two. He agreed that, on prostitution, what they were trying to do was to take the advertisement of the wares of these people off the streets, even if the practice was historically insuppressible. He would certainly say that the penalties should be raised, but they must beware of doing so to such an extent that every case became defended, and the defence of the women became more and more an undertaking for the "monarchs" of the industry. They should certainly penalize very heavily those who exploited this industry, if they could be caught.

Adolescent Partners

He had done a good deal of practice at the request of the courts in reporting on the state of mind and indeed undertaking the treatment of homosexuals. In the light of his experience he found it difficult to understand why the

Wolfenden Committee came to the conclusions they did. On the strength of expert witnesses, to wit psychiatrists, the report stated (para. 57):

"We are authoritatively informed that a man who has had homosexual relations with an adult partner seldom turns to boys, and *vice versa*, though it is apparent from the police reports we have seen and from other evidence submitted to us that such cases do happen."

That might be true, though he doubted it. They should have much more information before accepting that. He declined to accept that the man who accepted an adult male as his partner would not seek an adolescent male above the age of puberty. He thought they all did. That was why, if indulgence in private was made not an offence, the House would be permitting the spread of an activity that would inevitably lead to a greater evil in proselytizing adolescents.

Mr. F. TOMNEY (Hammersmith, North, Lab.), interrupting, said that in 1947 the Cambridge Institute of Criminal Science made an inquiry covering 1,000 cases from 14 police districts. There were 275 indictable offences for homosexual practices involving 406 accomplices or victims. The majority of the victims were under the age of 16, and only 11% over 21, and only one case of one adult with a consenting adult.

Dr. BENNETT said he was sure that was not far from an average figure. He had seen a fairly large number of homosexuals and he had been struck by the proportion who were adolescents who had been picked up. They were late developers, slow in maturing, uncertain of their sexual direction, and they had been pushed into that direction. He had found it remarkably easy to cure these people with the aid of hormone treatment. This could so suppress sexual tension that a reorientation of ideas had time to take place, so that when sexual desires were allowed to return on the cessation of treatment they were in a more natural form. If patients were suitably selected it seemed that there was a good prospect of cure. That showed that they could not regard homosexuals as incurable, nor as hereditary, congenital, or even environmentally produced people who must have a separate way of life. In his belief a big part in the influencing and curing of these young men had been the fear of the sanction of the law. He would take issue with anyone who said the law was not a deterrent. It was a profound deterrent, especially in those of whom they had the most hope of success. It would be disastrous to abandon the law on that point. For these reasons he could not accept the Wolfenden findings on homosexuality. The evidence produced by the psychiatric profession could not necessarily be accepted as being as sound as it had been accepted as being by the Wolfenden Committee.

ANSWERS TO QUESTIONS

Change of Sex and Divorce Law

Mr. KENNETH ROBINSON (St. Pancras, North, Lab.) asked the Attorney-General if his attention had been called to the legal difficulties arising from the case of *Dolling versus Dolling*, recently before the Court of Appeal; and if he would consider amending the law of divorce to enable marriages to be dissolved on the grounds that a spouse had changed his or her sex. Sir REGINALD MANNINGHAM-BULLER said he was not aware of any legal difficulties. The Court of Appeal held, on the particular facts of that case, that the conduct of the respondent did not amount to cruelty. Sir Reginald did not think there was any need to amend the law by seeking to specify what acts constituted cruelty for the purposes of the law of divorce or by making express provision for the type of case mentioned in the question.

Disparity in Hospital Costs

Dr. DONALD JOHNSON (Carlisle, Con.) asked the Minister if he was aware of the wide disparity of in-patient hospital costs revealed by his department's recently published hospital costing returns, varying in the case of acute

hospitals from £16 0s. 1d. per patient per week for the Middlesbrough General Hospital to £36 9s. 1d. per patient per week for the Royal Northern Hospital, with all gradations of cost in between, showing wide differences even for apparently similar hospitals; and what he proposed to do to find the reason for, and eliminate if possible, such disparities. Mr. WALKER-SMITH replied that some variations were inevitable even in hospitals classified in the same broad category, because of differences in local conditions and in the services provided. It was, however, one of the objects of the new costing arrangements to provide a firmer basis of comparison of detailed hospital costs, and he had asked hospital authorities to make full use of the published information with a view to improving efficiency and securing economies.

Cancer Diagnostic Clinic at Bart's*

Mr. W. HANNAN (Maryhill, Lab.) asked the Secretary of State for Scotland if he was aware of the proposal to establish a clinic at St. Bartholomew's Hospital for free examination for early diagnosis of cancer; and if he would ask for full details of this project and consider taking similar action in Scotland. Mr. JOHN MACLAY: I have noted the proposal and will certainly watch its progress.

Vital Statistics

England and Wales in 1957

The infant mortality rate again reached a record low figure in 1957, being 23 deaths of children aged under 1 year per thousand live births, according to the Registrar-General's Statistical Review of England and Wales for the Year 1957, Part I, Tables, Medical (H.M.S.O., £1). The crude death rate was 11.5 per thousand population, and this too was a record low figure when adjustments are made for the age and sex structure of the population.

The table below contrasts crude death rates for 1947 and 1957 for certain causes of death. The large fall in the death rates for the two infectious diseases listed there is to be seen in the death rates for almost all infectious diseases, including those caused by viruses. In the composite category "Deaths attributable to viruses," for instance, the death rate was 51 in 1947 and 22 in 1957. The principal cause of death in this category in 1957 was infectious hepatitis, with a death rate of 7 per million population.

Crude Death Rate per Million Population, 1947 and 1957.
England and Wales

Cause of Death	1947	1957
Respiratory tuberculosis	473	95
Whooping-cough	22	2
Cancer of:		
Stomach	335	312
Rectum	151	120
Pancreas	61	80
Lung and bronchus, males	(1947) 485	759
females	(1947) 87	116
Breast, females	349	370
Uterus	193	169
Prostate	143	161
Leukaemia	35	53
Chronic rheumatic heart disease	240	183
Arteriosclerotic and coronary disease	895	1,700
Hypertensive disease	352	434
Acute bronchitis	165	63
Ulcer of stomach	71	58
" duodenum	45	53
Appendicitis	36	18
Chronic nephritis	154	76
Suicide	105	118

Scotland in 1957

At 11.9 per thousand population the general death rate in Scotland in 1957 was the lowest for 4 years, but higher than in 1953, when it was 11.5, according to *The Annual Report of the Registrar-General for Scotland for 1957* (H.M.S.O., £1). The infant mortality rate was 28.6 per

*A statement from St. Bartholomew's Hospital is printed at p. 1423.

thousand live births, which was the same as in 1956 and the lowest rate recorded until then.

A comparison of standardized death rates for Scotland and for England and Wales in 1957 shows that for most of the main causes of death Scotland's figures are less favourable. One of the most striking disparities is for diabetes mellitus, the death rate for which was 108 per million in Scotland and 69 in England and Wales. This disparity has increased during recent years, for in 1953 the two rates were 95 and 72. The rate for pulmonary tuberculosis was 136 per million in Scotland and 94 in England and Wales in 1957. The difference between them has remained similar since 1953, when the rates were 235 and 178 respectively.

As usual, the death rate from pneumonia (all forms) was higher in England and Wales (520) than in Scotland (445), and both these figures have increased fairly steadily since 1953, when they were 488 and 363 respectively. Hypertensive disease is also a commoner cause of death in England and Wales, the rate being 429 as compared with 392 in Scotland in 1957. In the large composite group of heart diseases, however, Scotland has the higher rate with 3,999 as against 3,378. In the other two large groups, malignant neoplasms and vascular lesions of the central nervous system, the rates for Scotland are somewhat higher than for England and Wales.

The death rate from syphilis was 20 in Scotland and 29 in England and Wales; these rates have hardly altered in the 5 years 1953-7. An increasing disparity in the death rates from rheumatic fever is notable. In 1953 the rate for Scotland was 8 and for England and Wales 7. Thereafter it did not fall below 8 for Scotland but has steadily diminished in England and Wales, so that in 1957 the two rates were 9 and 4.

18 deaths of reputed centenarians (16 verified) occurred during the year, 1 male and 17 female. The greatest number to be registered in one year is 19—in 1918 and 1950. The greatest age verified was 109 years 14 days of a person who died in 1936.

Week Ending November 22

Infectious diseases were more prevalent in England and Wales during the week ending November 22. The largest rises in the number of notifications were 333 for measles, from 5,779 to 6,112, 133 for dysentery, from 614 to 747, 113 for scarlet fever, from 975 to 1,088, 60 for acute pneumonia, from 309 to 369, and 51 for food-poisoning, from 196 to 247; the only large fall was 48 for whooping-cough, from 805 to 757.

The largest rises in the incidence of measles were 86 in Hampshire, from 81 to 167 (New Forest R.D. 58), 76 in Durham, from 86 to 162 (Stanley U.D. 62), 69 in Wiltshire, from 125 to 194 (Swindon M.B. 67), and 61 in London, from 326 to 387 (Paddington 83); the largest decreases were 56 in Worcestershire, from 96 to 40, and 55 in Buckinghamshire, from 98 to 43. The number of notifications of scarlet fever was the largest for almost 3 years; the largest rises during the week were 30 in Lancashire, from 133 to 163, and 20 in Essex, from 43 to 63. Only small variations were reported in the local returns of whooping-cough. 9 cases of diphtheria were notified, being 3 more than in the preceding week; 5 of these cases were notified in London (Finsbury 4, Hampstead 1) and 2 in Barking M.B., Essex.

4 of the 9 cases of paratyphoid fever were notified in Sussex, Brighton C.B.

The notifications of acute poliomyelitis numbered 72, and these cases were 3 fewer for paralytic and 9 more for non-paralytic cases than in the preceding week. The largest returns were Yorkshire West Riding 14 (Bradford C.B. 2), Huddersfield C.B. 2, Leeds C.B. 2, Pudsey M.B. 2, Lancashire 8 (Manchester C.B. 4), Warwickshire 8 (Birmingham C.B. 6, Rugby M.B. 2), Derbyshire 6 (Bakewell U.D. 2), London 5 (Wandsworth 2).

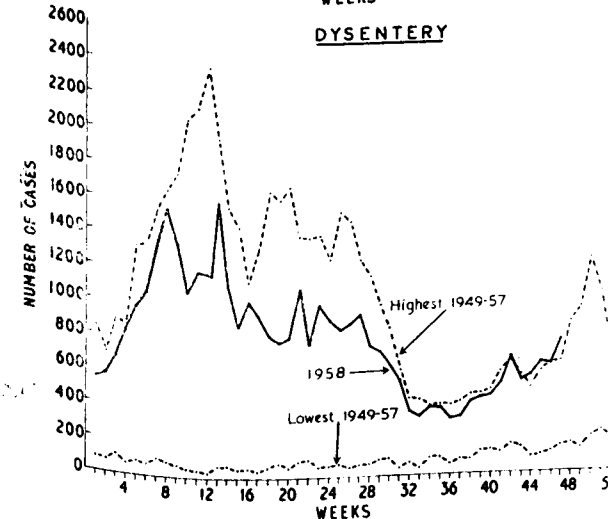
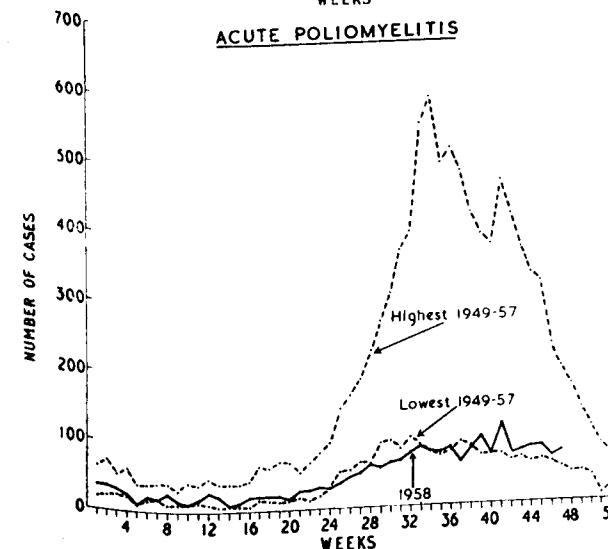
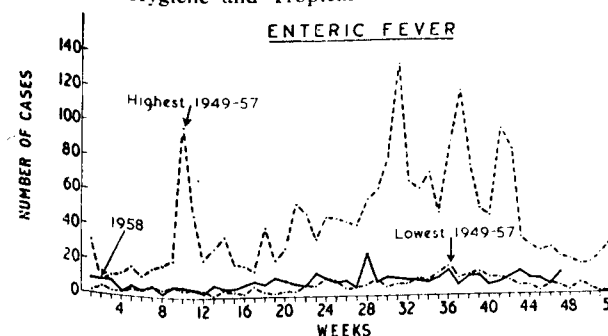
The largest outbreaks of dysentery were Yorkshire West Riding 98 (Leeds C.B. 53, Thorne R.D. 15), Lancashire 87 (Eccles M.B. 49, Liverpool C.B. 14), Warwickshire 77 (Coventry C.B. 72, Birmingham C.B. 12), London 77

(Lambeth 20, Battersea 12, Deptford 10), Glamorganshire 48 (Rhondda M.B. 14, Cardiff C.B. 12), Cumberland 41 (Carlisle C.B. 25, Millom R.D. 16), Surrey 39 (Godstone R.D. 25, Croydon C.B. 11), Essex 32 (West Ham C.B. 13), Hampshire 27 (Southampton C.B. 14), Nottinghamshire 25, and Middlesex 20 (Hendon M.B. 14).

The largest outbreak of food-poisoning was 58 cases in Crewkerne, Somersetshire.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus -----, the figures for 1958 thus ————. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending November 15 (No. 46) and corresponding week 1957.

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

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

CASES	1958					1957				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	6	1	8	0	1	5	0	2	0	2
Dysentery	614	80	141	7	4	278	29	94	11	3
Encephalitis, acute	2	0	0	0	0	3	0	0	0	0
Enteric fever: Typhoid	3	0	0	0	0	4	1	0	0	1
Paratyphoid	3	0	3 (B)	0	1 (B)	15	0	0	0	0
Food-poisoning	196	34	20	1	0	136	15	4	0	0
Infective enteritis or diarrhoea under 2 years				13	25				16	26
Measles*	5,779	326	105	26	303	1,695	36	25	11	25
Meningococcal infection	18	0	9	0	0	24	0	10	1	2
Ophthalmia neonatorum	28	4	1	0	0	28	5	5	0	0
Pneumonia†	309	31	180	0	0	623	50	293	9	53
Poliomyelitis, acute: Paralytic	50	4	14	3	6	55	6	0	2	4
Non-paralytic	16	0	0	0	0	13	0	0	0	1
Puerperal fever‡	197	17	8	0	0	220	38	7	1	1
Scarlet fever	975	83	109	21	38	550	41	60	11	28
Tuberculosis: Respiratory	478	54	96	24	1	504	77	128	16	3
Non-respiratory	82	9	16	1	0	82	12	3	0	0
Whooping-cough	805	40	78	79	104	472	26	46	0	6

DEATHS	1958					1957				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	0	0	0	0	0	0	0	0	0	0
Encephalitis, acute	0	0	0	0	0	0	0	0	0	0
Enteric fever	0	0	0	0	0	0	0	0	0	0
Infective enteritis or diarrhoea under 2 years	4	0	1	0	0	0	2	0	0	0
Influenza	16	0	1	0	0	7	13	0	14	0
Measles	0	0	0	0	0	0	0	0	0	0
Meningococcal infection	0	0	0	0	0	0	0	0	0	0
Pneumonia	404	37	18	17	3	53	20	15	14	0
Poliomyelitis, acute	3	0	0	0	0	1	0	0	0	0
Scarlet fever	0	0	0	0	0	0	0	0	0	0
Tuberculosis: Respiratory	93	8	13	1	4	8	12	1	8	0
Non-respiratory	2	0	0	0	0	1	0	0	0	0
Whooping-cough	1	0	0	1	0	0	0	0	0	0
Deaths 0-1 year	320	23	35	9	13	19	23	6	17	0
Deaths (excluding stillbirths)	9,444	768	599	129	148	826	565	128	215	0
LIVE BIRTHS	13,505	1233	968	219	311	1098	866	186	295	0
STILLBIRTHS	304	29	28	0	0	20	23	0	0	0

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

Medical News

G.M.C. Centenary Dinner.—The General Medical Council held its centenary dinner at the Mansion House, London, on November 27. The president, Sir DAVID CAMPBELL, received the many distinguished guests, who included Viscount KILMUIR, the Lord Chancellor. In proposing the toast of the G.M.C., Sir HAROLD GILLET, Lord Mayor of London, said that the Council could be described as characteristically English, for it was born in Parliamentary compromise and operated as a compromise. It was not a Government department, yet the Crown nominated eight members; nor was it a voluntary association. In reply, Sir DAVID CAMPBELL sketched the Council's achievements over the last 100 years in improving the education, ethics, and social status of the profession of medicine. "To-day I am proud to think that the attainments of the general practitioners in these islands are higher than anywhere else in the world," he said. Such was the prestige of the British Register that last year almost a thousand practitioners from all parts of the Commonwealth sought to have their names inscribed thereon. Sir David said it had been very gratifying to receive the following message from the Vice-Chancellor of an Indian University:

"The General Medical Council has played a vital role in the development of Medical Education not only in the British Isles but throughout the Commonwealth. If we have been able to achieve the present standard of medical education in India, it is largely on account of the guidance that we received from the General Medical Council and the British universities."

Lord COHEN OF BIRKENHEAD, who toasted the guests, welcomed particularly the representatives of the Medical Councils of the Commonwealth and Burma. The reciprocity and temporary registration which enabled practitioners from other countries to work in Britain, and practitioners from Britain to work in the Commonwealth, provided an abiding link of friendship. Speaking as the present head of a sister profession, the Law, Viscount KILMUIR congratulated the Council on the manner in which it dealt with its disciplinary work. "In this mad century and in the odd world in which we have lived," said the Lord Chancellor, "a body that has kept the old, tried, and valued conception of natural justice before it, and has gained respect in its application, can think worthily of itself and of its labours."

Richard Bright Centenary.—The centenary of the death of Richard Bright (1789-1858), physician to Guy's Hospital, was commemorated at Guy's Hospital Medical School on December 1. During the afternoon a number of cases were shown at a combined clinical round illustrating the theme of chronic Bright's disease, attended by many distinguished guests. Dr. W. N. MANN, director of the department of medicine at Guy's, who introduced the round, pointed out the difficulty of establishing the aetiology in many cases of chronic Bright's disease, even after necropsy. He also commented on the rarity of chronic glomerulonephritis, having been unable to find an example in Bright's own hospital for the afternoon's demonstration. After tea Professor M. L. ROSENHEIM delivered the Bright Centenary Lecture before a large audience. Professor Rosenheim discoursed on the syndrome of Bright's disease—which was what Bright had described—rather than a disease entity. He reviewed the remarkable advances made in the investigation of renal disease, and showed how aortography might occasionally uncover abnormalities of one kidney, which could lead to the syndrome of chronic Bright's disease but, if remedied early, offered hope of complete cure. In thanking Professor Rosenheim, Professor ROBERT PLATT said that not only had they heard a brilliant lecture but one by a clinician which would have pleased Richard Bright himself. During the day an exhibition arranged by Dr. C. KEITH SIMPSON was on view in the Gordon Museum. Amongst the many exhibits were the original specimens of the kidney examined by Bright, a copy of *Reports of Medical Cases*,

as well as writings by Bright outside the subject of medicine, and a copy of the original number of the *Guy's Hospital Reports*. In the evening a dinner was given by the Medical School at the Royal College of Physicians, under the chairmanship of Dr. A. C. HAMPSON.

Chair of Medicine, Manchester.—Dr. D. A. K. BLACK is to succeed Professor ROBERT PLATT, P.R.C.P., in the chair of medicine at Manchester University, according to a report in the *Manchester Guardian* (December 2). Dr. Black is the present reader in medicine at Manchester. "Professor Platt," states the report, "has asked to be relieved of his full-time chair of medicine and directorship of the department because of his duties as President of the Royal College of Physicians. Dr. Black graduated B.Sc. at St. Andrews in 1933 and M.B., Ch.B. in 1936, proceeding to the M.D. with honours and the Rutherford gold medal in 1940. He was admitted M.R.C.P. in 1939 and elected F.R.C.P. in 1952. Before going to Manchester Dr. Black was a Beit memorial research fellow at Oxford and Cambridge. In 1953 he was Goulstonian lecturer of the Royal College of Physicians."

Royal College of Obstetricians and Gynaecologists.—At a meeting of the council on November 29, with the president, Professor A. M. CLAYE, in the chair, the William Blair-Bell memorial lectures for 1959 were awarded to Dr. WINIFRED J. A. FRANCIS and Dr. M. L. PATERSON; and the Green-Armytage short-term travelling scholarship for 1959 to Dr. J. C. S. LEVERTON. Congratulations were sent to Professor J. M. MUNRO KERR for his 90th birthday anniversary on December 5.

Feversham Committee.—Mr. R. F. D. SHUFFREY, secretary of the Departmental Committee on Artificial Insemination (Home Office, Whitehall, London, S.W.1), writes: "The committee would welcome the views of any member of the medical profession who may be interested in this subject, and I should be grateful if anyone who is prepared to assist the committee in this way would get in touch with me at the above address." The committee is asked to inquire into the existing practice of human artificial insemination and its legal consequences; and to consider whether, taking account of the interests of individuals involved and of society as a whole, any change in the law is necessary or desirable.

Halliwick Hospital.—On November 27 the DUCHESS OF KENT opened Halliwick Hospital, London, N.11, said to be the first post-war hospital in the London area built specifically for psychiatric purposes. It is a 152-bed unit adjoining Friern Hospital. It cost £260,000 and took two years to build. The Ministry of Health described it as representative of the modern approach to psychiatry—"active treatment of early cases and their quick return to the community." Halliwick Hospital will take, by informal admission, short-stay neurotic patients and patients in the early stages of psychoses. The hospital will be closely linked with community services in its catchment area. Besides providing conventional in-patient facilities, it will also act as a "day hospital" for patients who return to their homes at night after treatment and will allow for evening out-patient treatment of those working during the day. The medical superintendent is Dr. I. SUTTON.

Nuffield Lecture Fund.—The council of the Royal Society of Medicine has accepted from Lord NUFFIELD a sum of £3,513 to establish a Nuffield Lecture Fund. This is the balance of contributions from doctors to an eightieth birthday tribute to Lord Nuffield (see *Journal*, December 28, 1957, p. 1558). The Fund will provide for periodical lectures on the advancement of the science and art of medicine.

Anaesthetist Registrars Prize.—The Scottish Society of Anaesthetists offers a prize of £30 to an anaesthetist not above senior registrar grade for an essay, full particulars of which may be obtained from Dr. M. SHAW, honorary secretary of the Society, at 75, Woodend Drive, Glasgow, W.3.

Mental Health Manual.—The British Red Cross Society has produced a *Mental Health Manual* written by Dr. D. STAFFORD-CLARK, of Guy's Hospital, and illustrated by Miss SYLVIA TREADGOLD. The manual aims at giving "the essentials of a first-aid and nursing approach to all types of illness in which psychological disturbance plays an important part." In part I the author discusses some aspects of normal psychology and describes mental development from infancy through adolescence to adult life. In the second part he shows how this knowledge can be put to use in the care of the sick patient. In a third short part he gives advice on psychological first aid following a major disaster, such as a railway accident, flood, or attack in war. The manual is obtainable from the Society at 14, Grosvenor Crescent, London, S.W.1, for 3s. (3d. postage).

Burden Neurological Institute.—Professor F. L. GOLLA, director of the Burden Neurological Institute, Bristol, since 1936, is retiring. He will be succeeded by Dr. W. ROSS ASHBY, at present director of research at Barnwood House, Gloucester.

Cytology Service at Bart's.—A question was asked in Parliament on November 25 about a cancer diagnostic clinic at St. Bartholomew's Hospital (see p. 1420). The hospital has issued this statement.

"The setting up of a cytology service for the early diagnosis of cancer at St. Bartholomew's Hospital is at present under discussion between the Corporation of London and the Governors of St. Bartholomew's Hospital. A statement giving details of the scheme will be issued, although it may be some time before the service can come into operation."

French Medical Film Prize.—The annual prize for 16-mm. medical films offered by *La Presse Médicale* (value 100,000 francs) will be awarded at the Nouvelle Faculté de Médecine de Paris on March 17. Entries and films should be sent to *La Presse Médicale*, 120, Boulevard Saint Germain, Paris, 6, before February 15.

Sir Walter Mercer has had conferred on him the honorary fellowship of the Royal College of Surgeons in Ireland.

COMING EVENTS

Institute of Dermatology.—Semi-permanent exhibition, December 3 to 30, on "The Skin and Friction."

B.B.C. North Home Service.—"Doctors on Trial," December 10, from 10 to 10.30 p.m.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Saturday, December 6

CAMBRIDGE UNIVERSITY MEDICAL SCHOOL.—At Addenbrooke's Hospital, 10.30 a.m. and 2.30 p.m., symposium: Blood Diseases and Reticuloses. Morning: The Malignant Reticuloses. Papers by Dr. D.A. Kok and Dr. E. M. Kingsley-Pillars and F. G. J. Hayhoe. Afternoon: The Common Anaemias. Papers by Dr. F. G. J. Hayhoe and Mr. S. J. Hopkins.

Sunday, December 7

CAMBRIDGE UNIVERSITY MEDICAL SCHOOL.—At Radiotherapeutic Centre, Addenbrooke's Hospital, 2 p.m., symposium. Papers by Dr. Janet Roscoe, Dr. B. B. Zeitlyn, Dr. C. H. Whittle, and Dr. G. V. Balmforth. **EUGENICS SOCIETY.**—At Royal Society, Burlington House, W., 5.30 p.m., Dr. J. A. Fraser Roberts: Human Genetics at Two International Conferences.

Monday, December 8

GUY'S HOSPITAL.—At Anatomy Lecture Theatre, 5.15 p.m., lecture-demonstration in endocrinology by Dr. P. M. F. Bishop: Diabetes Insipidus.

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., special university lecture in pathology by Dr. B. Josephson (Stockholm): Examination of Renal Function in Man by Renal Vein Catheterization.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Guest lecture by Professor H. Scarborough: Purpura.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—4 p.m., Harben Lecture by Sir Samuel P. Bedson, F.R.S.: Psittacosis-Lymphogranuloma Group of Infective Agents—(1) History and the Characters of these Agents.

Tuesday, December 9

ASSOCIATION OF ANAESTHETISTS OF EDINBURGH.—At Surgeons' Hall, Nicolson Street, 7.45 p.m., Dr. C. T. Barry and Dr. J. D. Robertson: Halothane.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. L. Forman: Disturbances of Pigmentation.

INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. H. Lander (Adelaide): Kuru (The Laughing Disease)—A Recently Discovered Disorder of the Central Nervous System.

MANCHESTER MEDICAL SOCIETY: SECTION OF SURGERY.—At Clinical Sciences Building, York Place, 7.30 for 8 p.m., Mr. H. M. Goldberg: Lesions of the Fundus of the Gall Bladder; Dr. J. R. Edgc: Use of Steroids in Major Surgery for Debilitated Patients with Advanced Tuberculosis.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., FitzPatrick Lecture by Dr. W. S. C. Copeman: Medical Practice in the Tudor Period—Evolution of the Profession.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Erasmus Wilson Demonstration by Dr. L. W. Proger: Aneurysms.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—4 p.m., Harben Lecture by Sir Samuel P. Bedson, F.R.S.: Psittacosis-Lymphogranuloma Group of Infective Agents—(2) Position of the Agents of Trachoma, Inclusion Conjunctivitis and Cat-scratch Disease. The Ecology of the Agents of the Psittacosis-Lymphogranuloma Group.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. Aleck Bourne: Influence of the Emotional Factor in Gynaecology.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. N. G. Hubert: neurological demonstration.

WEST OF ENGLAND CHILD HEALTH GROUP.—At Department of Child Health Lecture Theatre, Children's Hospital, Bristol, 8.30 p.m., Professor A. V. Neale: A Recent Tour Abroad.

Wednesday, December 10

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Precancerous and Cancerous Conditions of the Skin.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Mr. Donald Barlow: Surgery of Pulmonary Tuberculosis Viewed in Perspective.

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Chelsea Hospital for Women, 4.30 p.m., Guest lecture by Mr. C. M. Gwillim: Anatomy of Prolax.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Dr. A. R. Harrison: Tests of Renal Function.

MANCHESTER MEDICAL SOCIETY: SECTION OF PATHOLOGY.—At Large Anatomy Theatre, Manchester University, 4.30 for 5 p.m., Dr. B. Sandler: Testicular Biopsy: Its Interpretation and Value in Infertility.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Guest lecture by Dr. B. Josephson (Stockholm): Renal Blood Flow Determinations in Man.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—3.30 p.m., Mr. D. J. Waterston: Abnormal Development of the Heart and its Surgical Correction.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Lock Lecture by Sir Eric Riches: New Growths of the Kidney.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—4 p.m., Harben Lecture by Sir Samuel P. Bedson, F.R.S.: Psittacosis-Lymphogranuloma Group of Infective Agents—(3) Diagnosis, Treatment, and Control of Infection of Man with these Agents. The Taxonomic Position of the Group.

Thursday, December 11

HONYMAN GILLESPIE LECTURES.—At Anatomy Theatre, University New Buildings, Teviot Place, Edinburgh, 5 p.m., Mr. A. B. Wallace: Thoughts on Wound Healing and Wound Care.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., FitzPatrick Lecture by Dr. W. S. C. Copeman: Medical Practice in the Tudor Period—Growth and Status of Medical Practice.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Bradshaw Lecture by Sir Archibald McIndoe: Problem of Facial Burns.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION. PSYCHOTHERAPY AND SOCIAL PSYCHIATRY SECTION.—At 11, Chandos Street, W., 8 p.m., Dr. R. F. Hobson: Analytic Attitude in Psychiatry.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., Professor P. C. C. Garnham and Dr. D. J. Lewis: Parasites of British Honduras, with Special Reference to Leishmaniasis. A discussion will follow.

ST. ANDREWS UNIVERSITY.—At Physiology Department Lecture Theatre, 5 p.m., Professor Dugald Baird: Practical Importance of Clinical Research in Obstetrics.

Friday, December 12

BIOCHEMICAL SOCIETY.—At Department of Biochemistry and Chemistry, Medical College, St. Bartholomew's Hospital, 2 p.m., 378th meeting.

CAMBRIDGE UNIVERSITY POSTGRADUATE MEDICAL SCHOOL.—At Radiotherapeutic Centre, Addenbrooke's Hospital, 4 for 4.15 p.m., clinical and clinicopathological meeting. Discussion to be opened by Dr. A. J. Rook: Melanoma and its Precursors.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. E. H. Hudson: clinical demonstration.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—5.30 p.m., special lecture by Professor W. St. C. Symmers: Mycotic Diseases.

KEIGHLEY AND DISTRICT MEDICAL SOCIETY.—At Victoria Hospital, Keighley, 8.30 p.m., Dr. P. M. Addison: The Law as it affects the Doctor.

KENT AND CANTERBURY HOSPITAL.—8 p.m., clinical meeting.

PLYMOUTH MEDICAL SOCIETY.—At Greenbank, 8.30 p.m., clinical evening.

Sunday, December 14

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—10.15 a.m. to 12.30 p.m., Seminar for General Practitioners by Mr. C. Gill-Carey: Common Ear, Nose, and Throat Conditions.

MANCHESTER UNIVERSITY: FACULTY OF MEDICINE AND NORTH-WEST ENGLAND FACULTY, COLLEGE OF GENERAL PRACTITIONERS.—At Theatre J, Clinical Sciences Building, York Place, 11 a.m., Professor E. W. Anderson: Arteriosclerotic Encephalopathy.

BIRTHS, MARRIAGES, AND DEATHS

DEATHS

Clare.—On November 12, 1958, Thomas Charles Clare, M.D., F.R.C.S., F.R.C.O.G., of 19, Central Avenue, Leicester.

Davenport.—On November 15, 1958, Edward Charles Davenport, M.B., of 19, Kirkdale Road, Harpenden, Herts, aged 87.

Eminson.—On November 19, 1958, at 2, Burringham Road, Scunthorpe, Lincs, Ralph Franklin Eminson, D.S.O., M.B., B.S., aged 69.

Guppy.—On November 13, 1958, at The Grove House, Church Stretton, Salop, Francis Henry Guppy, M.C., M.R.C.S., L.R.C.P., D.P.M.

Miles.—On November 10, 1958, at St. Thomas's Hospital, London, S.E., Tudor Miles, M.B., B.S., D.Obst.R.C.O.G., of The Spurriers, Horsell, Woking, Surrey.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Linoleic Acid and Coronary Atheroma

Q.—Does "arcofac" (linoleic acid, pyridoxine HCl, mixed tocopherols) have any beneficial effect on existing atheroma of the coronary vessels?

A.—There is no direct evidence that the administration of linoleic acid has been beneficial to patients with atheroma of the coronary vessels. There is evidence that in animals atheroma can be produced by a diet high in saturated fatty acids and can be prevented by linoleic acid. There is also evidence that in man a diet containing unsaturated fatty acids from vegetable oils such as corn oil, peanut oil, or olive oil leads to a decrease in serum cholesterol, whereas butter, eggs, and beef fat increase it. There is, however, no direct proof that high serum cholesterol levels lead to atheroma in man. Further evidence linking coronary disease with a high consumption of animal fats comes from statistics of the incidence of coronary thrombosis in various countries and groups of people; there is strong evidence of an association, though this does not necessarily imply a causal relationship. This evidence has led some workers to urge strongly that the consumption of more unsaturated fatty acids and less saturated fats should prevent the development of coronary disease; other workers, however, contest this conclusion. The subject is fully discussed in several articles in the *British Medical Bulletin*,¹ which were the subject of an annotation in the *Journal* (October 18, p. 963).

REFERENCE

¹ *Brit. med. Bull.*, 1958, 14, 197-278.

Amphetamine Sulphate and Preludin

Q.—In view of the close similarity in chemical composition between amphetamine sulphate and preludin, why has the former been made a "scheduled" drug and not the latter?

A.—There is indeed a very close similarity in chemical composition and mode of action between amphetamine sulphate and preludin. That the former has been made a "scheduled" drug and not the latter is probably due to the fact that amphetamine has been available for some time and a considerable experience has accumulated, not only of its possible advantages, but also of its dangers and drawbacks. The undesirable effects of preludin, which probably closely approximate to those of amphetamine, have not so far been as thoroughly appreciated. There is a honeymoon period for most new drugs, and perhaps preludin has not as yet settled down into humdrum married life.

Ringworm

Q.—What are the indications for x-ray epilation of the scalp in ringworm due to *Microsporon* infection? Is exclusion from school necessary?

A.—Children with small-spore ringworm of scalp should be excluded from school because of the risk of epidemic spread. If after cultural examination the fungus is found to be *Microsporum canis*, the condition may be expected to clear spontaneously or readily following the application of fungicides. It is important that infected contacts and animals should be dealt with at the same time. Very rarely *Microsporum canis* infection does not clear with such treatment. Infection with *Microsporum audouinii* may similarly clear spontaneously, but in a large proportion of cases is resistant to fungicidal treatment, which should, however, be tried for two or three months. It is these persistent cases of *Microsporum audouinii* which call for x-ray epilation of the scalp.

NOTES AND COMMENTS

P.A.S. and Pulmonary Tuberculosis.—Dr. M. O. J. GIBSON and Dr. M. M. NAGLEY (London, S.E.12) write: We wonder if we could be granted the courtesy of your columns to protest at the answer to the question regarding the effectiveness of Ca B-P.A.S. as opposed to sodium P.A.S. ("Any Questions?" November 8, p. 1174). Your expert maintains that evidence is difficult to obtain regarding the relative values of the two substances and goes on to quote, *in extenso*, a paper in which weighty conclusions are drawn following an analysis of a mere seven cases treated with Ca B-P.A.S. The author of this paper does us the honour of extensively quoting our original paper dealing with this very matter, in which more than two hundred cases treated with Ca B-P.A.S. were analysed, in which the conclusions drawn were that Ca B-P.A.S. seemed to be no less effective than sodium P.A.S. in delaying the emergence of isoniazid-resistant strains when used in combination with isoniazid. In view of the fact that your expert quoted only the most recent paper—that is, that of Lewis—we feel that our original paper should be drawn to the attention of your readers so that the papers and the results may be compared. Briefly, Sir, we would assert that there is no evidence that in clinical use Ca B-P.A.S. is inferior to any other sort of P.A.S. from the point of view of isoniazid resistance, and our follow-up of a three-year period on this very point, proving it to our satisfaction, is in the press and about to be published in another journal. Ca B-P.A.S. is extensively used in this country, and it is therefore important to try and establish its place in the treatment of pulmonary tuberculosis, and we would respectfully suggest, Sir, that this cannot be done on the lines set out by your expert, but can only be done by perusal of the available evidence.

REFERENCES

- ¹ Lewis, D. O., *Tubercle (Lond.)*, 1958, 39, 247.
- ² Gibson, M. O. J. and Nagley, M. M., *Ibid.*, 1955, 36, 209.

OUR EXPERT replies: I was, of course, aware of the early paper by Drs. Gibson and Nagley which showed that the administration of calcium B-P.A.S. with streptomycin or isoniazid for the relatively short period of two to four months was followed by the emergence of only a few resistant organisms. However, very much longer periods of treatment are now known to be essential to the effective treatment of pulmonary tuberculosis, and so far as I know the paper by Lewis is the only one which at present gives evidence about the emergence of resistant organisms in patients treated for a more prolonged period with combinations including calcium B-P.A.S. The emergence of resistant strains in three out of seven patients who were known to have had sensitive organisms at the beginning of treatment, and in 20 out of the total of 39 who were investigated but in whom the evidence about initial sensitivity was not so good, is strong evidence of which cognizance must be taken unless it can be controverted. The publication of any further evidence dealing with the rate of emergence of resistant strains in patients treated for periods of a year or more with combinations including calcium B-P.A.S. will be awaited with great interest.

Collected Articles from the "British Medical Journal"

The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

Emergencies in General Practice (26s. 9d.).
Refresher Course for General Practitioners, Volumes 2 and 3 (26s. 9d.).

Clinical Pathology in General Practice (22s. 3d.).
Any Questions?, Volumes 2 and 3 (8s. 3d. each).

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TREATMENT OF ADVANCED CARCINOMA OF THE BREAST*

BY

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Endocrine treatment of carcinoma of the breast has gone through a number of phases from hormonal therapy with androgens, oestrogens, and corticoids to oophorectomy, adrenalectomy, and hypophysectomy, each of which has led on occasion to dramatic improvement but none of which has been shown to be outstandingly the best. It is well known that some tumours of the breast are hormone-dependent while others are not, and that tumours which are hormone-dependent initially will eventually escape from dependence and progress inexorably despite further attempts to alter the hormonal environment. The reasons for these differences are obscure, partly because the factors which are responsible for mammary development and lactation are still not completely understood and partly because hormonal balance is difficult or impossible to assess adequately.

Hormonal Factors in Breast Development

Knowledge of the hormonal factors responsible for development of the breast has accumulated gradually over the past thirty years, aided particularly by the work of Folley (1956) and his group at Reading and by Lyons (1958) and his colleagues at Berkeley, California. These hormonal factors are now becoming more clearly defined owing to the use of experimental animals whose relevant endocrine glands have all been removed, and also to the use of chemically pure hormones. The hormonal factors are grouped broadly under mammogens and lactogens, terms which are in line with the well-known terms oestrogens, progestogens, and androgens.

Mammogens may be defined as hormones which, acting singly or in synergism with other hormones, will induce any of the three main phases of mammary growth—ductal, ducto-alveolar or lobular, and lactational; and lactogens as hormones which, acting singly or in combination with other hormones, will induce milk formation. The term lactogen therefore has a narrower connotation, and it is noteworthy that lactogenic hormone is itself a mammogen (see Diagram on next page). For this reason Lyons prefers the term mammatrophic hormone (M.T.H.), which is also in line with the other trophic hormones—gonadotrophic, thyrotrophic, and adrenocorticotrophic. Likewise the California group prefer to call growth hormone somatotrophic hormone (S.T.H.). S.T.H. is the other main pituitary mammogen. Both M.T.H. and S.T.H. are available as pure proteins by current standards. Both act on the breast in synergism with steroid hormones.

It is well known that oestrogens promote ductal growth in the breast, but they are quite incapable of preventing ductal atrophy which follows hypophysectomy in the young rat. Lyons has shown conclusively that they are dependent on the presence of S.T.H. to prevent this atrophy. S.T.H. is

also incapable of preventing ductal atrophy in the rat which is deprived of its sources of steroidal hormones. The two hormones are therefore said to act in synergism. It is remarkable that substitutes have been discovered for both hormones. The adrenal mineralocorticoid deoxycortone has the same action as oestrone when given in doses five hundred times as great by weight, and smaller amounts enhance the combined action of oestrone and S.T.H. S.T.H. can be replaced by long-acting insulin, but its action is less pronounced (Ahrén and Jacobsohn, 1956; Ahrén and Etienne, 1958).

S.T.H. and oestrogen are incapable of inducing the next stage of development of the breast, but lobular growth will occur in young castrated rats treated simultaneously with the corpus luteum hormone progesterone. This does not occur in the hypophysectomized rat, however, because progesterone, like oestrogen, requires a pituitary hormone as synergist. Lyons has shown that this is M.T.H. There are therefore at least four hormones which are essential for development of the breast up to this stage—oestrogen with S.T.H. and progestogen with M.T.H.—and it is remarkable that the body has no confidence in its ability to produce enough of them for all the requirements of pregnancy. As a result high concentrations of at least three are produced in the placenta, the production of S.T.H. by this organ being still questionable. It is interesting to speculate on the influence of this factor on carcinoma of the breast. Finally, in the rat which has been deprived of its pituitary, gonads, and adrenal glands the addition of an adrenal glucocorticoid like cortisol leads to better development, but still no milk is formed. Curiously, the thyroid gland appears to be unimportant for this development.

Milk Secretion

In the experimental rat, milk secretion depends on the continuation of treatment with M.T.H. and the withdrawal or great reduction of treatment with the sex steroids oestrogen and progestogen. In an animal deprived of its adrenal glands and gonads the addition of corticotrophin or a glucocorticoid like cortisol is essential. Six hormones are therefore ultimately necessary for the production of milk. The transfer of milk from the lobules to the larger ducts is initiated by the posterior pituitary hormone oxytocin, and the suckling stimulus is necessary for its delivery. Suckling probably causes the secretion of oxytocin.

Throughout the development of the breast the ratio of these various hormones to one another is important and is variable from species to species. For instance, in the oophorectomized goat whose pituitary is left intact oestrogen alone in suitable doses can cause extensive development of the udder with lactation, so that progesterone appears to be relatively less important in this species. The ratios of the hormonal factors required for the development of the human breast have still to be established, and clearly these may be of considerable value in the study of carcinoma of the breast.

*Read to the Section of Surgery at the Annual Meeting of the British Medical Association, Birmingham, 1958.

Oestrogens in Relation to Carcinoma

The conception of hormone-dependence of a carcinoma implies that the qualitative character or absolute or relative concentration of certain hormones is important for neoplastic growth, and extensive studies have been made of the concentration of various hormones in blood and urine in an attempt to correlate them with remissions or relapses of the disease. The oestrogens have received most attention partly because the various surgical procedures have been designed primarily to remove the source of oestrogens and partly because there are well-recognized methods for their measurement. The results of a number of investigations on urinary oestrogens were described in a series of papers read at a Conference on Endocrine Aspects of Breast Cancer held at the University of Glasgow in 1957 and published in its *Proceedings*. The methods are, however, by no means simple. There are two ways of dealing with them—by biological assay and by chemical determination.

At first sight the biological method would seem to be the method of choice because it is sensitive and it measures the total biological activity of oestrogens regardless of the

Terminology	Anterior Pituitary Hormones	Ovarian Steroid Hormones	Auxiliary Hormones
Ductal growth 	Growth or somatotrophic hormone (S.T.H.)	Oestrogen (e.g., Oestrone)	Corticotrophin or mineralocorticoid (e.g., deoxycortone)
Ducto-alveolar or lobular growth 	Lactogenic or mammatrophic hormone (M.T.H.)	Progestogen (e.g., Progesterone)	Corticotrophin or glucocorticoid (e.g., cortisol)
Lactation 	Lactogenic or mammatrophic hormone (M.T.H.)	None	Corticotrophin or glucocorticoid (e.g., cortisol) (obligatory)
"Let down" 	Posterior pituitary hormone Oxytocin	Suckling	— stimulus

potency of individual chemical entities. Unfortunately it is necessary first to extract the oestrogens from urine, and the chemical procedures involved may lead to the inactivation of some oestrogenic substances, and also to the activation of some previously non-oestrogenic substances. Moreover, there are substances in urine, like androsterone, which, although not oestrogenic themselves, augment the action of oestrogens in certain assays, and sometimes there are also substances which inhibit the action of oestrogens. We spent a considerable amount of time investigating the biologically active oestrogens and their augmentors and inhibitors in the urine of patients with carcinoma of the breast both before and after operations, including oophorectomy, adrenalectomy, and hypophysectomy. We did not publish our results because we felt that a great deal more academic research was required first in order to elucidate these problems.

If we accept the limitations of the methods, however, we would agree with Scowen (1958) that there appears to be no correlation between the amount of residual oestrogen assayed biologically in urine and the progression or remission of metastatic carcinoma of the breast after endocrine surgery. Indeed, we have been impressed with one patient on whose urine we did a large series of investigations. It consistently contained biologically measurable amounts of oestrogens for nine months after completion of bilateral oophorectomy and adrenalectomy. During this time she had an excellent remission. Then simultaneously with the onset of a relapse the oestrogens disappeared from her urine and were never detectable again.

A method for the chemical determination of the three oestrogens—oestrone, oestradiol-17 β , and oestriol—has been

developed by Brown (1955) which is satisfactory for the concentrations found in the urine of women during the reproductive phase of life. Subsequently it was modified for use with urine of low oestrogenic concentration by Brown, Bulbrook, and Greenwood (1957a, 1957b). Using this procedure, Brown (1958) found that there was no significant difference in the excretion of these three oestrogens by women who had passed the menopause, whether they had carcinoma of the breast or not, and Bulbrook and Greenwood (1957) showed that oophorectomy and adrenalectomy or hypophysectomy (Greenwood and Bulbrook, 1957) in younger women caused a big reduction in excretion, but often failed to abolish it. No comprehensive analysis is available of the relationship between the amount of these oestrogens excreted and the remission or progression of the carcinoma. Perhaps such an analysis would be premature because of the shortcomings of the methods. They do not measure certain other known oestrogens which may be present in significant amounts in urine, like 16-epioestriol, 16 α -hydroxyoestrone, or 2-methoxyoestrone, and studies with radioactive oestrogens indicate that all the known oestrogens represent only a fraction of the total metabolites (Beer and Gallagher, 1955), but apparently they do measure other substances which are not biologically active oestrogens.

Diczfalussy, Birke, Franksson, Hellström, Hultberg, Plantin, and Westman (1958) attempted to characterize substances extracted from the urine of three patients with carcinoma of the breast after bilateral oophorectomy and adrenalectomy. They obtained two substances which behaved like oestrone and like oestradiol-17 β with Brown's procedure, but they behaved quite differently in studies of counter-current distribution and there was a gross discrepancy between the amount of each substance extracted and its biological activity. It is apparent, therefore, that, as in the case of the biological assay, a great deal more fundamental research is needed into the chemistry of the oestrogens and similar substances before the relationship between the production of oestrogens and carcinoma of the breast can be settled.

Progesterone ; 17-Ketosteroids

A considerable amount of attention has been devoted to other steroids. Progesterone, which plays such an important part in the development of the breast, cannot be measured in blood or urine as a routine procedure. Some 20% of circulating progesterone is converted into an inert and more readily soluble steroid, pregnanediol, and a satisfactory method has been developed for its determination in urine (Klopper, Michie, and Brown, 1955). Unfortunately other steroids, including adrenocortical steroids, are also partly converted into pregnanediol, but the amount excreted in urine is commonly regarded as a good reflection of the level of circulating progesterone. Pregnanediol disappears from urine after oophorectomy and adrenalectomy (Strong, Brown, Bruce, Douglas, Klopper, and Loraine, 1956), and its absence is probably a good indication of complete ablation of glandular tissue. No attempt has been made to use this procedure as an indication of hormone dependence in carcinoma of the breast.

The 17-ketosteroids have also received attention. They constitute a conglomeration of substances whose only common denominator is a ketone in position 17 of the steroid nucleus. Some of them are biologically inert, others are androgenic, and yet others have widely different endocrine activities. Measured as a group they are of little or no clinical value now that better and more specific procedures have been developed, especially for the measurement of adrenocortical function. Various methods have been developed for the subdivision of neutral 17-ketosteroids into smaller groups which can be measured separately or for the isolation of individual members of the groups.

A number of workers have applied these procedures to the urine of patients with carcinoma of the breast, but only one group has claimed to show significant differences in

excretion between patients who respond to glandular ablation and those who do not. In a preliminary report Allen, Hayward, and Merivale (1958) showed that the ratio of 11-deoxy-17-ketosteroids to 11-oxy-17-ketosteroids is reduced in patients who subsequently fail to respond to oophorectomy and adrenalectomy or to hypophysectomy. This work has been criticized by Kellie (1958) on the grounds that the method which they employed gives rise to artifacts and certain 11-hydroxylated 17-ketosteroids are hydrated and appear in the 11-deoxy group. Moreover, Plantin, Birke, Diczfalussy, Franksson, Hellström, Hultberg, and Westman (1958), in a similar investigation, found no such differences. If the work of the group at Guy's Hospital is eventually confirmed it would be of considerable clinical value in helping to decide which patients are most suitable for endocrine surgery, and further results are awaited with interest.

Pituitary Hormones

There remains a group of pituitary hormones which play various parts in the development of the normal breast. They comprise S.T.H., M.T.H., corticotrophin, and the gonadotrophins. Various methods have been developed for the assay of S.T.H. and corticotrophin in extracts from animal pituitary glands, but none is suitable for the routine examination of blood or urine. The assay of M.T.H. in human body fluids is little better. The response of the pigeon-crop gland to injections of urinary extracts has been employed by Coppedge and Segaloff (1951) as a measure of M.T.H. Using this method, Segaloff and his co-workers claimed to show changes in the excretion of M.T.H. by patients with cancer of the breast treated with a variety of steroid hormones (Segaloff, Horwitz, Carabasi, Murison, and Schlosser, 1953; Segaloff, Carabasi, Horwitz, Schlosser, and Murison, 1954; Segaloff, Gordon, Carabasi, Horwitz, Schlosser, and Murison, 1954), but it is doubtful if the method is sensitive or reliable enough for clinical use.

Hadfield (1958a) has used the proliferation of the mammary gland of the immature male mouse as an end-point of an assay for what he terms "pituitary mammatrophic substances." The method has been criticized on the grounds that many substances can cause breast development, and there is insufficient evidence about the specificity of this assay. He has partly overcome this difficulty by using hypophysectomized weanling male mice, but very few mice are suitable for the test. He found that only two out of 36 strains examined were satisfactory, and when these two strains were used in another laboratory they were found to have lost their responsiveness (Williams, 1958). Such variation in the sensitivity of a strain to different substances is not uncommon, and sometimes presents considerable difficulty in assay work. The onus lies with the critic to repeat the work until successful. A more serious criticism is that there is insufficient evidence about the precision of the assays performed by Hadfield, but doubtless this information will be forthcoming. Meantime, Hadfield has claimed to be able to demonstrate "mammatrophic substance" in the urine of 57% of women who had passed the menopause and of all younger women during the second half of the menstrual cycle. Recently he (Hadfield, 1958b) has applied the method to the serum of five younger women and found activity in all of them. This work is potentially of such importance in the investigation of cancer of the breast that it warrants considerable effort to repeat it elsewhere.

The assay of urinary gonadotrophins is on rather firmer foundations. The majority of workers use the increase in weight of the uterus of the immature mouse as a measure of the combined effect of follicle-stimulating hormone (F.S.H.) and of luteinizing or interstitial-cell-stimulating hormone (I.C.S.H.). Loraine (1958) used this procedure to measure total gonadotrophins excreted by women with carcinoma of the breast who had passed the menopause. He claimed that those who subsequently failed to respond to treatment with stilboestrol excreted significantly more than those who responded to it. Further studies along these lines are awaited

with interest. The excretion of urinary gonadotrophins has also been employed as an indication of complete hypophysectomy. We have used the test as a semi-quantitative procedure but our interest has been more concerned with the development of assays capable of demonstrating differences in the relative concentrations of F.S.H. and I.C.S.H. These methods have not yet been applied to the problem of cancer.

Persistence of Steroids after Gland Ablation

The discovery that various steroids continue to circulate in the blood and to be excreted in the urine after ablation of the glands which secrete them has led to a reappraisal of the methods of treatment and to a reconsideration of their sources of origin. Incomplete removal of the ovaries or adrenal glands is one possible explanation for the persistence of oestrogens and certain other steroids, and the presence of accessory cortical tissue is another. It has been suggested that stimulation with corticotrophin might demonstrate their presence by causing an increased production of steroids, but it is not generally helpful, possibly because the glandular tissue is already working to its maximum capacity. The incidence of such tissue should be known from necropsy studies, but the remnants may easily be missed unless serial sections are made of large areas. Accessory adrenocortical tissue has been estimated by various workers to occur in some 20% of all subjects. Symington, Grant, O'Donnell, Carr, and Forrest (1958) reviewed the literature on this subject and failed to demonstrate such tissue in a very careful examination of their own material at necropsy. It seems to be unlikely that accessory adrenal glands are a common source of persisting steroids after adrenalectomy, and their origin must be sought elsewhere, possibly from exogenous sources.

The failure of hypophysectomy to relieve all patients with carcinoma of the breast may be due to the presence of accessory anterior pituitary tissue in the roof of the pharynx. This subject has been reviewed by Müller (1958), who found a pharyngeal pituitary consistently in all his own material at necropsy. Its functional significance is uncertain. It contains chromophobe and eosinophil cells and is known to have been the site of an eosinophilic tumour associated with acromegaly. It contains no basophil cells, which might explain the absence of urinary gonadotrophins after hypophysectomy, while S.T.H. and M.T.H. might continue to be produced by the pharyngeal remnant. Ultimately its significance must be established by the development of methods for the assay of the hormones which it produces.

In conclusion we are faced with this challenge. Empirical surgery has established the existence of hormone-dependent carcinoma, and all the biologists, chemists, and pathologists together have so far been unable to explain it.

Summary

Growth hormone acts synergistically with oestrogen to cause ductal growth, and lactogenic hormone acts synergistically with progestogen to cause lobular growth in the breast of immature rats deprived of their pituitary and steroid-producing glands. Little is known, however, of the concentrations of these hormones required for normal breast development in the human subject, but it seems likely that they all may play some part in the development of hormone-sensitive types of breast cancer.

There are several important technical factors which detract from the value of biological and chemical estimations of the various hormone concentrations in blood and urine, and, so far, no convincing correlation has been demonstrated between the remission or progression of cancer and the residual excretion of oestrogens or other steroids. The assay of growth and lactogenic hormones in body fluids is not practicable as a routine procedure at the present time.

The remarkable clinical improvement of patients with breast cancer which sometimes follows hypophysectomy or adrenalectomy and oophorectomy is still not satisfactorily explained.

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AN ANALYSIS OF 161 CASES OF CARDIAC INFARCTION WITH ABC ELECTROCARDIOGRAPHIC STUDIES AND 36 NECROPSIES*

BY

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In the *Lancet* (1954), in a section concerning vectorcardiography and referring to the ABC display, it was stated that "satisfactory electrocardiograms have been obtained from cases of known heart disease, but confirmation from larger numbers is needed." In the present paper 161 cases of cardiac infarction observed over a period of 2-8 years by the ABC display have been studied with this end in view. Necropsies were performed on 36 cases of this series.

The standard unipolar limb and chest leads record electrical activity almost solely in the frontal (coronal) plane. The vectorcardiograph is limited with regard to the study of temporal relationships and the acceptance of a standard frame. This simple three-dimensional display, allowing a three-dimensional analysis, is not deficient in these respects. As will be seen from this survey, it detects all changes detected by the present normal leads, and in addition detects changes not demonstrated by the normal leads.

*Technical assistance for this work was aided by a grant from the National Health and Medical Research Council of Australia.

The series of patients is classified into the following groups.

A. (i) Clinically diagnostic, standard E.C.G. diagnostic, ABC leads diagnostic: 127 cases; 32 traced deaths, 25 necropsies. (ii) Clinically diagnostic, standard E.C.G. not diagnostic, ABC leads diagnostic: 24 cases; 5 traced deaths, 5 necropsies.

B. Clinically not obvious, standard E.C.G. not diagnostic, ABC leads diagnostic: (i) fatal cases 4, 2 necropsies. (ii) survivors 2.

C. Infarct totally unexpected, ABC leads diagnostic: 1 case (necropsy positive).

D. Clinical diagnosis infarction, ABC leads negative: 1 case (necropsy negative).

E. Special instances: (i) Minor infarct patterns: 4 cases; 1 traced death, 1 necropsy. (ii) Abnormal T-wave form (also included in A): 1 case. (iii) heart block (also included in A): 17 cases; 12 traced deaths, 9 necropsies.

Method

The majority of the patients were examined personally by me, and the condition of all patients was discussed with at least one physician concerned with the management of each patient.

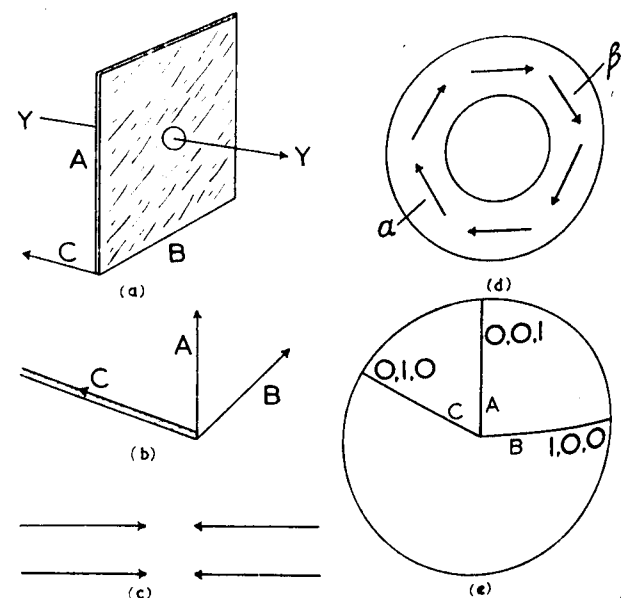


FIG. 1.—(a) Planar sheet (diagrammatic) of infarction AB at right-angles to YOY. Further details in text. (b) Linear infarction, C, at right-angles to A and B axis. Further details in text. (c) Four dipoles paired and orientated at 180 degrees. Further details in text. (d) Clockwise dipoles. Further details in text. (e) Direction cosines (0,0,1; 1,0,0; 0,1,0) to ABC axis. Further details in text.

E.C.G. recording was usually performed with a Both direct writing electrocardiograph and in some instances with a "cardio-scribe" direct writing machine. A continuous check was made to ensure that the recording apparatus was kept in good condition.

When patients died every endeavour was made to have a necropsy performed, though this was not always possible owing to conditions beyond our control. In some instances the freshly removed intact heart was perfused through the coronary vessels with a gelatin-barium suspension at 37° C. and 120 mm. Hg pressure and then x-rayed as described by Blumgart *et al.* (1940).

ABC electrocardiographic recording was made from the right-angled system: xiphisternum (X), manubrium

sterni (M), left axilla (L), and right chest at the base (R), as described previously (Trethewie, 1953). Lead A is taken from the manubrium and xiphisternum (MX), lead B from the left mid-axilla at the level of the xiphisternum and the xiphisternum (LX), lead C from the right chest at the base at the level of the xiphisternum and the xiphisternum (RX). LX, MX, and RX are all mutually at right angles. The electrode connected to X is positive for upward deflection and thus corresponds to the left leg lead in lead II Einthoven. Thus the right arm lead corresponds to the varying electrode placed successively on the manubrium, left axilla, and right chest at the base. This should define electrical fields in a three-dimensional conductor when these fields emanate from a dipole within the volume, and probably also would analyse whatever combinations of dipoles are present or whatever the characteristic electrical events arising in the conductor. Certain modifications occur owing to the fact that the medium is not homogeneous, though nearly so, and the conductor is not infinite, but bounded by the body surface. The former modification is regarded as minor by most observers. Schmitt (1955) has shown there is a modification, and actually recorded it, with a homogeneous medium containing a dipole inside a model in the shape of the human torso.

Influence of Infarction on the E.C.G.

Let us consider a planar sheet of heart muscle which is infarcted (Fig. 1,a). Such a sheet produces a "current of injury," the injured portion of muscle being at the surface electrically negative compared with the surface of the adjacent healthy muscle. The QRST complex then shows elevation of the RT segment, provided the leads chosen are in the plane of the affected muscle (AB). In the line YOY, at right angles to this plane for all practical purposes, the heart contains only healthy muscle, and segment elevation will not be observed in a lead chosen along this direction—for example, lead C (Fig. 1,a). Depending on the angle formed by the planar sheet to the directions A, B, and C, so we will obtain more or less "weighting" or segment elevation in specific leads.

Let us next consider a linear distribution of infarction (Fig. 1,b). In this instance no effects will be detected in leads A, B, but considerable change will be detected in lead C. If C were only slightly askew to the plane AB there would be relatively little observable effects of the infarction in C. This is the case with V_1 - V_3 with small septal infarcts. Such infarcts do, however, show gross changes in lead C of the ABC display.

Since the posterior aspect of the heart forms a considerable vertical sheet of muscle, infarcts in this area classically produce maximal effects in lead A. The antero-lateral aspect of the left ventricle which recedes posteriorly and cranially is parallel to lead B, and thus infarcts

in this region produce maximal changes in that lead. The septum is almost parallel to lead C, and infarcts in this portion in the heart produce maximal effects in lead C. Likewise the AC pattern indicates posterior septal infarction and the BC pattern indicates anterior septal infarction. This aspect is amplified later with necropsy studies (cf. Fig. 2).

To produce a null effect as referred to above, dipoles would be required to be orientated in opposite directions (Fig. 1,c). However, cardiac infarction simply produces a steady state of "injury" current which gradually subsides over two to three weeks with the development of fibrosis followed by contraction. This latter phenomenon alters the axis of adjacent healthy muscle fibres and may result in a permanent inversion of the T wave in a particular lead. Ischaemia may also affect the T wave. Two areas of infarction would summate this "negativity," not cancel each other out. Similarly a null effect could be produced by a ring of muscle with a clockwise (or anti-clockwise) orientation of dipoles, and dipole α and dipole β (Fig. 1,d) might then cancel out one another; but again the effect of infarction, as before, is to produce



FIG. 2.—Infarct sites, as detected at necropsy. Continuous line, recent infarction; broken line, discrete fibrosis; dotted line, degeneration only. Top left-hand corner, Patient number, E.C.G. infarct pattern designated centrally.

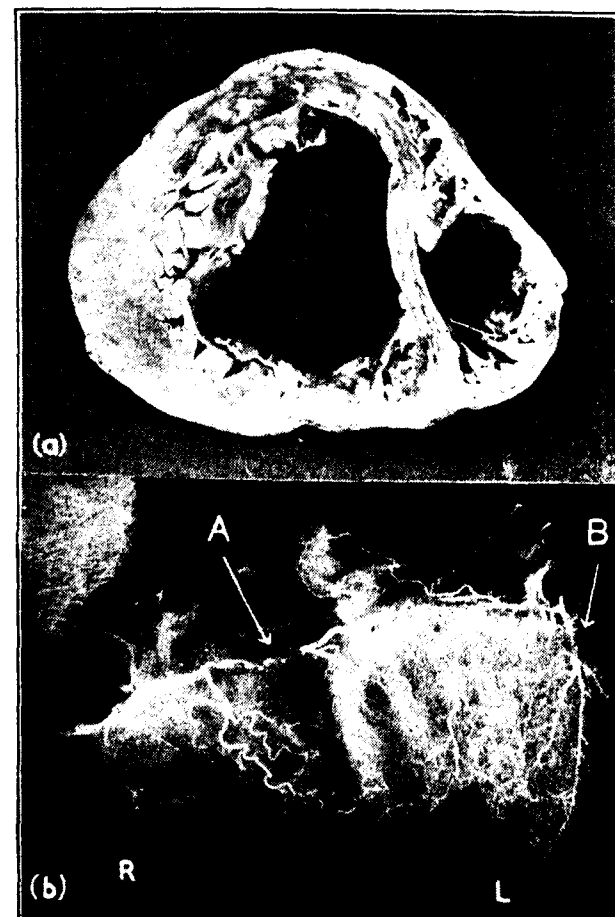


FIG. 3.—(a) Patient 93: Septal infarction extending anteriorly over the left ventricle with fibrotic lamina from older infarction parallel to the right. Further details in text. (b) Roentgenogram of perfused heart from Patient 128. Right coronary block at A and left coronary at B. Further details in text.

a steady "state" of negativity. Contraction of infarcted muscle does not occur with heart beats. In the presumed circus movement of flutter, now not acceptable in its original form, the repetitive firing of the P wave is the diagnostic feature, not injured muscle. Further, the nearer bipolar leads are to the heart the less likely is it that clockwise dipoles would cancel one another out. The ABC leads are close to the heart.

For changing potentials—that is, when currents are produced as distinct from static charge—the field patterns will not be arrived at immediately because there is a degree of impedance in the conductor (that is, the body). However, Kaufman and Johnston (1943) consider these variations in resistance as minor, and that they do not influence potentials greatly. Further preliminary tests on a human torso with a dipole source at the heart position show that the potentials as recorded for leads A, B, and C, while not being at the precise level expected, are nevertheless at 60%, 75%, and 90% of the theoretical value, and, so long as an abnormal contour appears even in part, this should be large enough to have practical significance. Again the particular problem concerning us here is the evaluation of infarcts, and these produce a steady current of injury, so that estimates based on static laws probably do apply here. The problem is best answered by the practical results obtained: namely, do the leads used record significant changes in accord with pathological findings?

It would appear axiomatic that a right-angled distribution of the ABC type is the logical display to choose for electrocardiography because no electrical axis is then unrepresented and more obvious segment elevation must be produced in one lead than is the case with any other display owing to that distribution. In the representation shown in Fig. 1, e, the direction cosines become 0,0,1; 0,1,0; and 1,0,0, when the ABC leads correspond to the axes chosen in the original figure, because $\cos 90^\circ = 0$ and $\cos 0^\circ = 1$. The approximate size of the infarct can then be indicated. In point of fact point X (xiphisternum) is close to 0 (Fig. 1, e), since the heart occupies the anterior part of the mediastinum, and this distribution applies as nearly as is possible practically. Further, this distribution, being located on skeletal points—namely, manubrium and xiphisternum—ensures regularity of repetition of the display from patient to patient.

E.C.G. Pattern and Infarct Site as Revealed at Necropsy

The sites of the infarct in 36 instances where necropsy studies were available are shown in Fig. 2. In these the heart has been cut across horizontally below the level of the atria and observed from above, so that the left ventricular cavity appears on the left and the right cavity on the right. The photographic findings of the heart from Patient 93 are shown in Fig. 3, a, where two parallel septal infarcts of different age are well shown. Leads ABC showed a "Cb" type cardiac infarction, indicating recent septal involvement extending on to the antero-lateral surface. Also, R_A was absent and without segment elevation in A—that is, Q_A form—indicating older infarction in the posterior portion, and in fact there was older septal infarction extending posteriorly to involve both ventricles at a lower level than that shown in Fig. 3, a. It will be observed that, as expected from theory (Trethewie, 1953), "C" type infarcts are largely septal (Fig. 2), "B" type infarcts more commonly involve the antero-lateral aspect (Fig. 2), and "A" type infarcts more commonly involve the posterior aspect of the heart (Fig. 2). Occasionally BC type infarcts involve the posterior and medial aspect of the left ventricle rather than being antero-septal, especially if block is present. Thick black lines indicate recent cardiac infarction, interrupted lines old infarction (with fibrosis), and dotted lines degeneration only (Fig. 2).

X-ray Studies: Radio-opaque Perfusion

In five instances the heart was perfused with radio-opaque material, laid open by incision along the anterior border between the two ventricles, the septum excised, and the whole x-rayed. Fig. 3b was obtained from Patient 128, and a block is shown in the right coronary artery (A) after giving off the inferior interventricular branch and also in the anterior descending branch of the left coronary artery (B). The E.C.G. (Fig. 4) indicated old posterior infarction (Q_A) and recent antero-lateral infarction involving the septum (STBC). At necropsy there was an old posterior infarct, and in the postero-medial aspect of the left ventricle (including the septum) there was recent infarction—that is, parallel, but posterior to the region suggested.

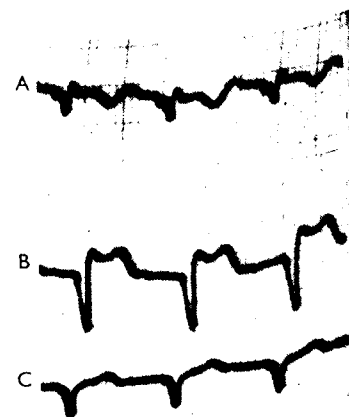


FIG. 4.—E.C.G. of Patient 128, heart depicted in Fig. 3: "Bc" type infarct pattern with old Q_A .

Classified Groups

A. Cardiac Infarction Obvious Clinically

(i) Patients with histories indicative of cardiac infarction associated with typical electrocardiographic tracings.—This aspect need only be discussed quite briefly, and it is sufficient to point out that in 127 patients there was no doubt whatever that the E.C.G. standard display (E_1, E_2, E_3 ; aVR, aVL, aVF; V_1-6) yielded conclusive evidence of infarction. Leads ABC also yielded conclusive evidence of infarction in all 127. One impressive feature has been the magnitude of the segment elevation in the ABC display, which is frequently greater than that of the standard display, and the fact that changes are so commonly seen in a greater proportion of leads with the former. Definite pattern changes are observed

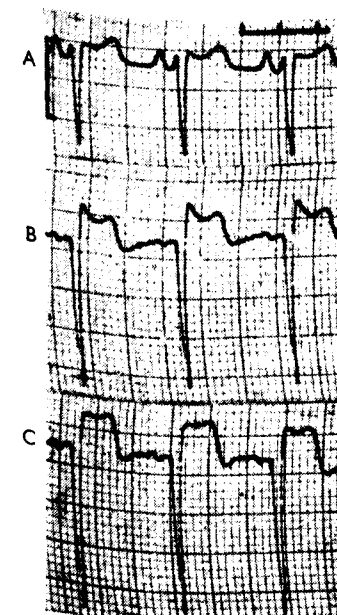


FIG. 5.—E.C.G. of Patient 26: "CBa" type infarct pattern.

surface. This patient developed a second infarction two months later ("Abc" type)—that is, posterior infarction—and he died on the fifth day of the attack. Necropsy was not permitted.

(ii) Patients with histories indicative of cardiac infarction associated with standard display tracings not regarded as indicating evidence of infarction, ABC tracings diagnostic.—Twenty-four patients (15% of cases) came under this heading. In each case leads ABC yielded unequivocal evidence of infarction. Such an instance is recorded with Patient 106. Three days before admission this patient, a male, complained of the sudden onset of severe pain under the sternum, with collapse. He was sweating, and his colour for a time was somewhat greyish. Twelve days after the onset his B.S.R. was 118 mm. in one hour and 128 mm. in two hours. His standard E.C.G. eight days after the onset is recorded in Fig. 6. The ST segment in V_1-3 is not quite normal, but this was not regarded as pathognomonic of infarction. The T-wave in V_5 and V_6 is of low potential and inverted. Leads ABC (Fig. 6), taken at that time, show conclusive evidence of infarction of the Bc type with maximum segment elevation in lead B—that is, antero-lateral cardiac infarction.

The tracing shown in Fig. 7 was obtained from Patient 80, who had attacks of substernal pain on the two days before and on the day of admission to hospital. Four hours before admission the pain was severe, prolonged, and associated with collapse. The standard E.C.G. throughout the course of his illness was recorded as not signifying infarction, but a confident diagnosis of infarction was made on clinical grounds. On the nineteenth day the tracing of leads ABC

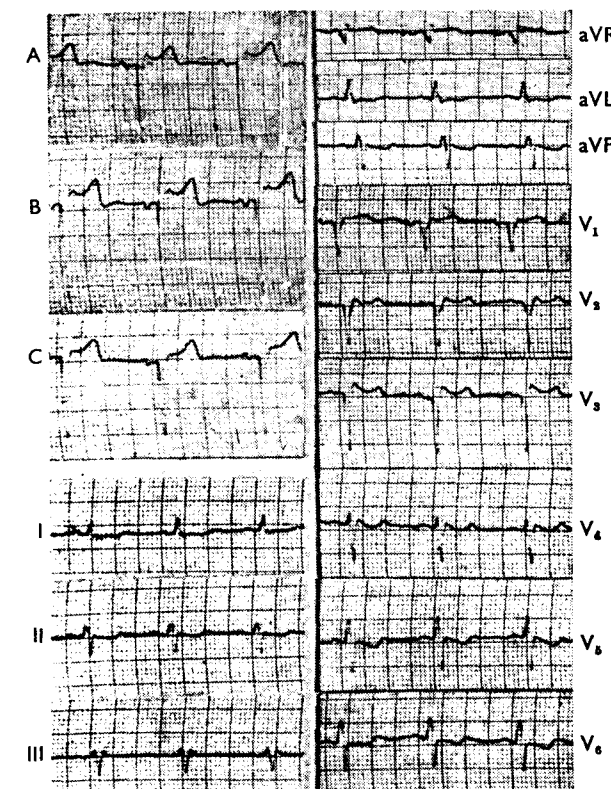


FIG. 6.—ABC-E.C.G. and standard E.C.G. of Patient 106. Tracing taken eight days after onset. Note the considerable segment elevation in B not apparent in standard leads.

was taken (Fig. 7). This shows segment elevation in all leads, maximal in lead B with obvious elevation in lead C with "round-shouldering." Elevation is also present in minor form in lead A. This is the distinctive feature confirming the diagnosis of cardiac infarction in contradistinction to left-heart-strain pattern. In this instance, of course, a confident clinical diagnosis was possible, but the value of electrocardiography, especially if it can be shown to be correct regularly in the absence of a clinical history suggesting infarction, is self-evident, and is discussed in the next section. A similar finding is shown in Fig. 8 (Patient 20), where the tracing was obtained 30 hours after the onset of infarction and segment elevation is considerable, while the standard leads E.C.G. did not indicate infarction.

The infarct pattern in the 24 cases coming under the above heading showed the distribution recorded in Table I.

For clarity, a "BC" infarct pattern—that is, marked change in B and C, though greater in B—includes CB (changes greater in C); likewise with BA and CA, and in 12 instances where some change was observed in the third lead also, the notation was recorded as the two leads in which the changes were greater. It is noteworthy that in only one instance in the 161 patients did lead A (indicative of posterior infarction) yield conclusive evidence of infarction when the standard leads did not. In this case block was present which obscured the diagnosis in the standard leads. This

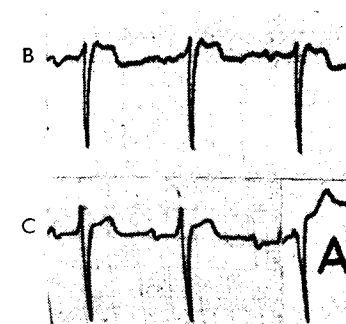


FIG. 7.—E.C.G. of Patient 80, showing typical infarct pattern on the nineteenth day; standard tracing not indicative of infarction throughout course of illness.

TABLE I

Infarct type	BC	BA	B	CA	A
No. of tracings	12	5	4	2	1

aspect will be discussed later. On the contrary, in 14 instances (BC and CA type pattern) where the septum or that portion of the left ventricle parallel to it was involved, conclusive evidence of infarction was manifest in leads ABC, while the standard leads did not yield conclusive evidence of infarction. Of ten patients who died and on whom a

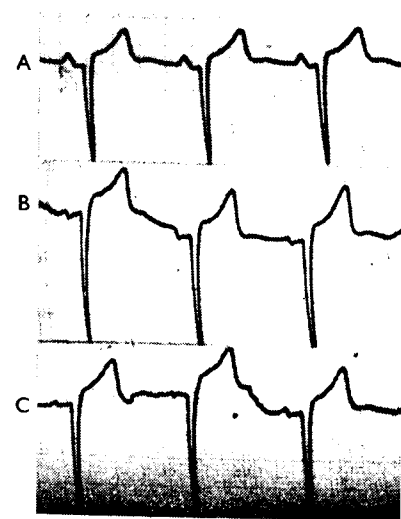


FIG. 8.—E.C.G. of Patient 20; typical infarction 30 hours after onset. Standard leads did not indicate infarction.

necropsy was performed where the pattern was of this type—that is, with major involvement in lead C—the septum was found to be involved in seven, and in three instances the postero-lateral part of the left ventricle (parallel to the septum) was involved. Nine other patients were found to have an associated BA or B type infarct pattern (Table I). Since lead B is inclined at about 40 degrees to the frontal plane, this finding could be expected. Standard lead tracings, where minor changes were observed, which were not regarded as presenting evidence of infarction but were nevertheless not normal, involved leads V₁, V₂, or V₃ in four instances, lead 3 in one, and lead V₄ in one. In the remainder changes were quite trivial.

Changes found in lead V₃ of the type referred to above are probably due to the infarct, but since this lead is only slightly askew to the frontal plane, as referred to earlier, infarct pattern changes are not likely to be marked if the frontal plane leads (Einthoven and lateral V leads) show indefinite infarct patterns.

Five of these 24 patients died. Necropsy was performed on all five subjects, and the infarct was found in the site expected for the ABC finding in each instance.

In 5 of these 24 instances (3% of cases) the initial diagnosis made was of cardiac infarction, but considered opinion at a later date was opposed to this diagnosis. In each instance, in the opinion of at least one other physician and in my own, these patients were still regarded as suffering from myocardial infarction. Such a state of affairs is to be expected, especially as it is recognized that some 15% of patients do not show conclusive evidence of infarction in standard lead electrocardiography. Emphasis in such cases must therefore be placed largely on clinical findings.

It is pointed out below that one patient who was not regarded as suffering from myocardial infarction on clinical grounds, and who was not considered to have a myocardial infarct after necropsy (macroscopic) examination, was recorded as clearly associated with myocardial infarct pattern in the lead ABC findings. Subsequent histological examination of the heart, carried out because of the latter findings, revealed the presence of a laminar infarct in the posterior part of the heart. Again in Section D, below, an infarct was diagnosed clinically without support in the E.C.G. findings with leads ABC; and subsequent necropsy, including microscopical examination, did not reveal the

presence of infarction four days later nor was coronary atheroma present. There was also adequate evidence at necropsy for another cause of death. Such findings naturally strengthen one's confidence in the value of leads ABC, and the absence of standard lead confirmation may have played a part in the different clinical opinion expressed in relation to the five patients referred to here. Nevertheless, at the initial examination the clinical picture was regarded by all as being that of cardiac infarction.

The case history of one of these patients is presented as an example.

Patient 53 complained of the sudden onset of tearing pain at the lower end of the sternum and in the epigastrium one week previously. The pain radiated up to the back of the neck. On admission his B.P. was 180/90 mm. Hg. The standard lead E.C.G. was regarded as normal throughout his stay in hospital. Lead 3, obtained on the eighth day after the onset of the pain, showed a minor anomaly considered to be sufficiently like a normal RSR'. The B.S.R. at this time was 35 mm. in one hour and 64 mm. in two hours (Westergren). X-ray examination of the lungs was normal. Leads ABC revealed a classical Pardee curve in leads A and C, indicating a postero-septal infarct.

B. Infarction not Obvious Clinically

(i) Patients who died where leads ABC showed unequivocal infarction but in whom infarction was not certainly diagnosed on clinical grounds, and the standard leads did not yield definite evidence of infarction.—Four patients in whom leads ABC showed unequivocal infarction died, while infarction was not certainly diagnosed on other grounds. In each of these patients standard lead E.C.G.s did not

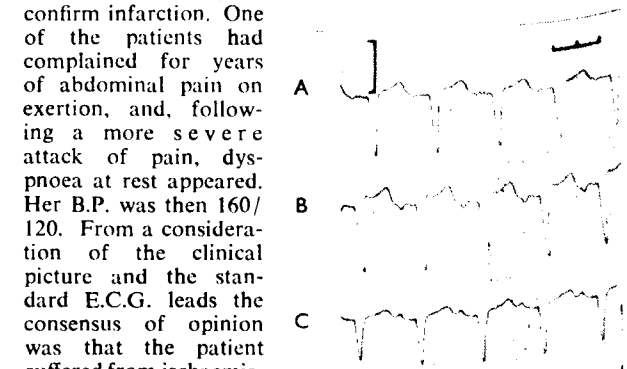


FIG. 9.—Typical "Bac" type infarct. Clinical history thought to indicate ischaemia only. Standard leads, ischaemia; necropsy, antero-lateral infarct (left ventricle).

confirm infarction. One of the patients had complained for years of abdominal pain on exertion, and, following a more severe attack of pain, dyspnoea at rest appeared. Her B.P. was then 160/120. From a consideration of the clinical picture and the standard E.C.G. leads the consensus of opinion was that the patient suffered from ischaemia. Slight segment elevation was shown in V₄, and this was thought not to be indicative of infarction. In leads ABC, however, a classical Bac type infarct pattern was observed—that is, an antero-lateral infarct (Fig. 9). At necropsy an antero-lateral laminar infarct was found in the left ventricle. This infarct encroached neither on the endocardial nor on the pericardial surface. A histological section is shown in Fig. 10, which shows the infarct clearly.

The second of these patients developed cardiac failure fairly suddenly and was critically ill; it was thought that cardiac infarction could not be excluded. The standard E.C.G. (I, 2, 3, aVL, aVF, V₂, V₃, V₆) did not suggest cardiac infarction, but lead C showed gross segment elevation and also a W-shaped contour, including a well-marked Q wave. At necropsy a recent and an old infarct were found in the septum as expected (lead C lies in the septal axis).

Necropsies were not performed on the other two subjects. (ii) Patients who survived where leads ABC showed unequivocal infarction, but in whom infarction was not certainly diagnosed before electrocardiography and the standard leads did not yield definite evidence of infarction.—There were two patients in this group. One patient, a

woman aged 51, had complained for 15 years of sharp pain near the lower sternum in the evening on walking. She did not stop walking on experiencing the pain. This pain was regarded as not indicative of organic cardiac disease. A standard lead E.C.G. and leads ABC at that time were normal. Her B.P. was 148/80 mm. Hg. Following examination I expressed the opinion that the patient might be suffering from cholelithiasis and advised cholecystography, but that I was not certain whether the patient suffered from angina of effort in addition. Cholecystography revealed the presence of numerous biliary calculi.



FIG. 10.—Microscopical section of heart from patient whose E.C.G. is recorded in Fig. 9. (x543.)

Cholecystectomy was performed. Two years later the patient stated that the pain had become worse. Then six months later, at a second examination, she said that one week previously she experienced a sudden onset of lower sternal pain and sweated, the pain lasting four hours. A standard lead E.C.G. was normal, but lead A in the ABC display revealed the presence of a classical Pardee curve, indicating posterior cardiac infarction.

C. Cardiac Infarction quite Unsuspected on Clinical Grounds but Evident from Leads ABC

This patient was admitted to hospital with hypertension and developed a hemiplegia. He did not complain of cardiac or chest pain. A standard E.C.G. was not done. Leads ABC (Fig. 11a) show segment elevation with round-shouldering in lead A, conclusive evidence of posterior infarction. There is also segment elevation in leads B and C, but in B the elevation is angulated very much as it is in hypertensive strain. With such a degree of elevation in leads B and C in hypertension ordinarily the S waves are

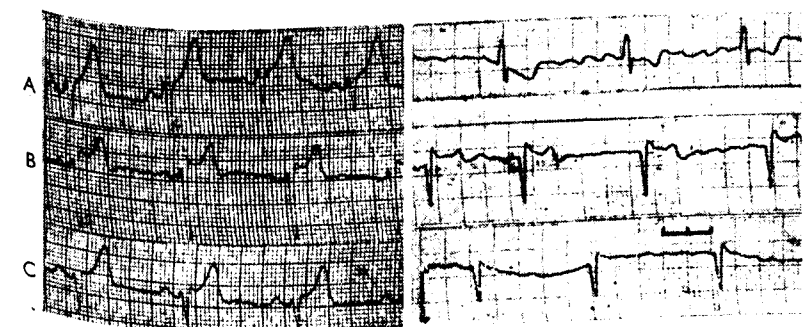


FIG. 11.—(a) Typical posterior infarct pattern in patient with coarctation. (b) Typical tracing of coarctation of the aorta without infarction.

much larger. Here they are normal to reduced in potential. The T waves are unduly large and abnormal. The patient was 38 years of age. At necropsy the heart, other than showing considerable hypertrophy, appeared normal macroscopically. However, more careful examination of the posterior part of the heart, carried out because of the ABC-E.C.G. finding, revealed the presence of a recent laminar infarct. The patient was also found to have coarctation of the aorta, and for interest a tracing obtained from another patient who had coarctation of the aorta (without infarction) is shown in Fig. 11b. Interestingly enough the S waves again are not prominent and there is flutter-fibrillation (lead A). Segment elevation with angulation is seen in leads B and C, but, more significantly, the S-T segment is depressed in lead A. This is the distinctive feature of left-heart-strain pattern. With cardiac infarction the S-T segment in lead A is not depressed or concave upwards at the isoelectric line. Infarct patterns with leads ABC always show elevation, not depression, of the S-T segment when this is abnormal. Further, the round-shouldering of the contour is significant of infarction. In the absence of segment elevation, as with other leads, infarction is of course indicated by a cove-shaped usually inverted T wave and a biphasic R-T interval. Segment elevation pattern may conform to the monophasic type or the high take-off of the Pardee type.

D. Cardiac Infarction Diagnosed Clinically Without Changes in Leads ABC Suggestive of Infarction

This patient complained of shortness of breath and cough for some months and chest pains one week before admission. Retrosternal pain with cyanosis developed on the previous day, and the patient was treated with anticoagulant therapy for cardiac infarction and also treated for cardiac failure, pneumonia, and shock. The prothrombin level fell to 12%.

The standard E.C.G. was recorded as indicating ischaemia only. Leads ABC did not support the clinical diagnosis of cardiac infarction. The ABC-E.C.G. is presented in Fig. 12. Potentials are very low, as is seen sometimes in pericarditis or in approaching death; the T waves are flat. This patient died 72 hours later. The recording made against the ABC leads before death was: "Very low potential, ischaemia apparent in A; I would think the muscle would show degenerative changes microscopically, but the tracing is not of the Pardee type." It was concluded there was no infarction. At necropsy three small foci of old pericarditis were found. The coronary vessels were free of atheroma, as was the proximal aorta. The ventricular muscle was dark brown in colour, but no infarct was found. Microscopical examination at a later date revealed the presence of brown degeneration in the cardiac muscle. Other significant findings at necropsy were gastro-intestinal haemorrhage (gross), pulmonary emphysema, acute bronchiolitis, cholelithiasis, and diverticulitis coli. The gall-bladder was distended with bile and there was impaction of small pigment calculi. If one

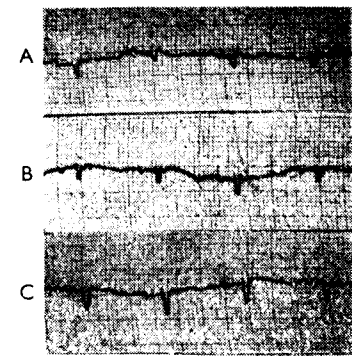


FIG. 12.—E.C.G. of patient with old pericarditis and ischaemia. Further details in text.

can apply an electrocardiographic technique which is so complete that infarction can be excluded if the E.C.G. is negative, obviously one has a most valuable tool to aid diagnosis.

E. Special Instances

(i) *Minor E.C.G. "infarct" patterns.*—It is regarded as likely that, since leads ABC record three leads mutually at right angles with a common origin, the grossness of the infarct can be deduced approximately from the degree of segment elevation all three leads. On the contrary, if only the frontal and slightly skew frontal planes are recorded, gross infarcts may sometimes produce little segment elevation in the electrocardiogram.

A tracing may be observed, in the case of a patient considered to be suffering from cardiac infarction on clinical grounds, where the E.C.G. tracing forms a very small though definite "Pardee" complex or other slight segment elevation. If this tracing is magnified, the evidence of infarction electrocardiographically becomes more obvious. It is suggested such patients developing pain at rest show recent degenerative cardiac changes short of infarction. This feature was observed in four patients in the present series, and is seen more often in private practice. For accuracy of recording, an ink writer forming a fine line, or a cathode-ray oscillograph, is required to demonstrate this feature. Multiple T inversions approaching a cove shape also occur in severe acute ischaemia. All of these patients were diagnosed clinically as suffering from cardiac infarction without any doubt. Three survived. The other patient died. The ABC findings in one of the former showed a Pardee curve in lead B, passing to a cove-shaped inverted T wave and a Pardee curve in lead C. The standard E.C.G. appeared normal, showing an RSR' of apparently normal type in lead V₂. In the remaining two, minor monophasic segment elevation was evident in leads ABC. The ABC findings in the fourth patient showed a curve of Pardee type in lead C, leading to an inverted abnormally shaped T wave. This was less evident in lead B, while there was no segment elevation in lead A (Fig. 13). Magnification of the tracing demonstrated the feature more readily. Similar though less obvious findings were observed in V₂ and V₃. This patient died seven days after admission on August 22, 1955. The ABC-E.C.G. diagnosis before death was "Pardee type tracing: septal infarct, very small." At necropsy broad zones of pallor were observed in the left side of the interventricular septum and in the papillary muscles of the anterior wall. Both coronary arteries were almost completely occluded at their origins, and elsewhere were grossly atheromatous. Microscopically, cloudy swelling and some vacuolation were seen in the muscle fibres in the pale zone, but no massive infarction was observed (Fig. 14).

It is considered worth while to follow such cases through with necropsy findings wherever possible, so as to determine if such minor changes as illustrated in these four examples are indicative of degenerative changes in the muscle as distinct from discrete infarct formation. Continued reduced blood supply and oxygen lack can be expected to produce degenerative changes. This has been shown for the liver (Trethewie and Gaffney, 1951). Undoubtedly post-mortem changes

require exclusion, and the interval after death before necropsy examination needs to be kept at a minimum even though the body is placed in the refrigerator. In view of the facts that the second subject died during cold weather (in Melbourne), was placed in the refrigerator on arrival at the necropsy department, that bands of pallor were seen in the heart in the area suggested to be involved previously by the ABC findings, that the

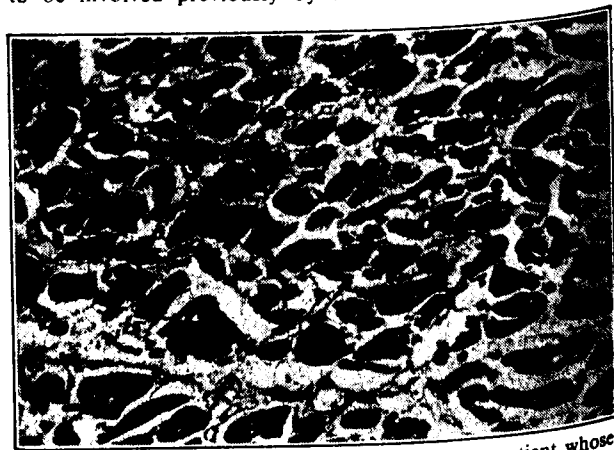


FIG. 14.—Microscopical examination of heart from patient whose E.C.G. is shown in Fig. 13. (×554.)

coronary arteries were almost completely occluded at their origins, and that actual vacuole formation was observed in cells in pyriform areas of degeneration, it is considered very likely that the microscopical changes observed in the heart were of ante-mortem origin.

The incidence of this condition in patients admitted to public hospitals with a diagnosis of cardiac infarction is lower than that found in the general population. For instance, apart from the series of 161 cases reported here, of 139 cases of heart attacks seen privately and thought clinically to be possibly or probably due to cardiac infarction, 115 showed frank evidence of cardiac infarction electrocardiographically with leads ABC, and 24 showed these minor changes of "ischaemia at rest." This feature, recognized at the necropsy referred to above performed in August, 1955, has been re-emphasized recently for the standard leads in relation to S-T depression. The polarity of the ABC leads, since point X is close to zero potential (Nahum, Mauro, Chernoff, and Sikand, 1951), probably accounts for the fact that the current of injury in the degenerated muscle, as with frank infarction, also produces segment elevation in the tracing. Frey (1938) and Oettel (1941) describe elevation of RST during acute coronary insufficiency without infarction at necropsy.

(ii) *Abnormal T-wave forms in cardiac infarction.*—The cove-shaped inverted T wave is commonly seen in cardiac infarction with ABC leads as with standard leads. In addition the cove-shaped upright T wave may also indicate cardiac infarction with leads ABC as with standard leads. Such a case is illustrated in the following. Patient 109 was admitted to hospital with a history of eight hours' duration of sudden severe chest pain passing to the neck and down both arms; he lost consciousness, and on recovery of consciousness was cold and clammy. The ascent of the T wave (Fig. 15) is faster than the descent, it is peaked, and the T wave reaches its maximum after about 50–55% only of the interval from the Q wave to the extreme end of the T wave. Also, it is noticed that the "take-off" is slightly elevated and round-shouldered. This E.C.G. was taken eight hours after the onset.

This type of tracing may be replaced by a more usual pattern later, and in fact five days later this patient's E.C.G. revealed an inverted T wave with well-marked Q wave formation.

(iii) *Electrocardiographic diagnosis of cardiac infarction associated with heart block.*—The diagnosis of cardiac

infarction in the presence of heart block is regarded as a difficult one electrocardiographically. If an earlier tracing free of heart block is available and the E.C.G., taken immediately after symptoms and signs of cardiac infarction appear, shows heart block, this development is generally regarded as due to infarction. Such a case has already been reported with leads ABC (Trethewie, 1953). Right bundle block does not present such difficulty usually, though

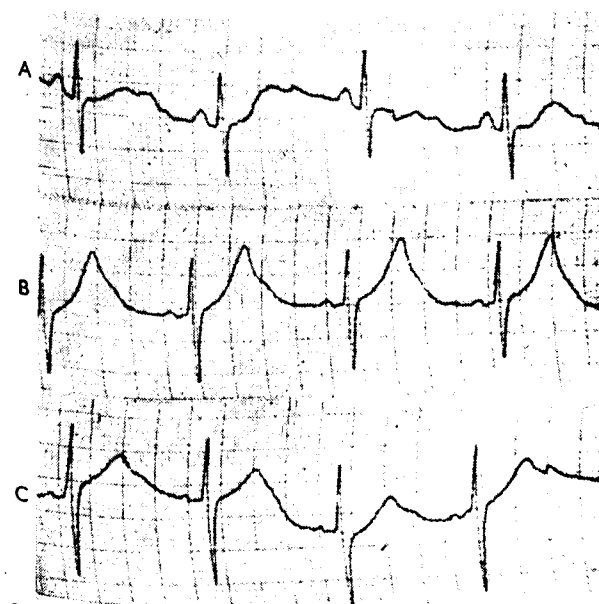


FIG. 15.—Cove-shaped upright T wave of cardiac infarction eight hours after onset.

it may be congenital. It was pointed out (Trethewie, 1953) that segment elevation is also evident in such tracings, while in block due to old fibrosis and electrolyte imbalance such segment elevation presents different features. Recently vector-cardiographic work has indicated a feature suggesting infarction associated with block, and this probably depends on the same feature fundamentally. In the present series 17 patients showed varying degrees of block.

There were five cases of left branch bundle block in this series. Three conformed to the pattern seen in hypertension with the gradual production of block following a left strain pattern. In one of these there was no notching of the S wave (first downward complex), but some slurring in leads A and B. In one, notching was present in this complex in A and C, and in one notching in A, B, and C. The B.P. in the first patient was 170/110 on admission. The sedimentation rose and there was a leucocytosis. The history was clinically significant of infarction, and the patient survived.

For comparison the findings in a patient who had no history suggestive of cardiac infarction, but who developed left bundle block associated with aortic regurgitation, are described. The tracing showed slurring only in lead A and not in lead B or C. This patient died two years later, and was shown at necropsy to have aortic incompetence, left ventricular hypertrophy, and some slight general fibrosis without evidence of infarction. Intensive microscopical examination of sections of the heart muscle failed to reveal any evidence of infarction or of sufficiently discrete fibrosis that might have suggested old infarction.

In the other two cases gross notching was present in A. In one the block pattern was also manifest in B and C with gross notching; but in the other leads B and C did not show such a broad biphasic swing pattern. These two, by their elevated segments, clearly indicated infarction. Segment elevation was of the CBa type in one (Patient 36), and the pre-necropsy diagnosis was "infarction: septal, antero-lateral, and slightly on the posterior surface." The standard E.C.G. showed left branch bundle block, which was thought, in view of the history, to be due to infarction but

not conclusive of itself. The patient died 13 days after admission, and the infarct was found to be extensive and in the zones described. In the other (Patient 52) the left branch bundle block was described as atypical, leads B and C not showing the big biphasic swing, and the E.C.G. diagnosis was "antero-lateral infarction: B type, with old posterior infarction." At necropsy, six days later, a yellow gelatinous lamina of infarction was present in the anterior wall of the left ventricle towards the apex. A thrombus was present in the anterior descending branch of the left coronary artery a little below its origin, and there was also another complete occlusion of a small branch of the anterior descending branch. Further details of the distinction between block due to infarction and block due to other causes will form the substance of a separate paper.

Right bundle block patterns were seen in eight instances. Five conformed to a classical infarct pattern (Fig. 16) (Patient 29). This report read: "Old infarct (B) and recent infarct (C): recent septal infarction extending posteriorly with old infarction." At necropsy, 11 days later, "the left ventricle showed extensive recent infarction from the apex into the posterior wall of the left ventricle and anteriorly into the interventricular septum. Between the upper limits of this infarct and the AV junction there was evidence of older infarction." Fig. 17 shows the standard lead findings for this subject. The remaining three patients showed a more marked biphasic swing in the tracings, but segment elevation was present in lead A suggestive of infarction.

Two of the latter patients died, and a necropsy was carried out on one. This showed the presence of septal infarction encroaching on the posterior and also slightly on the anterior surface of the heart. Of the former five, four died within a fortnight of the attack. The other patient was discharged on September 14, 1955, and has not returned to hospital. In one, necropsy was not performed; in the other three, infarcts were found—respectively, in the apex of the left ventricle and septum (Patient 22) in the whole of the apex of the left ventricle extending to the base of the septum (Patient 19); and extensively in the posterior wall of the left ventricle and extending anteriorly into the interventricular septum (Patient 29).

Two further patients showed intermittent right bundle block with classical signs of infarction in leads A and C.

FIG. 16.—ABC-E.C.G. showing right bundle block due to cardiac infarction. Necropsy confirmation.

FIG. 17.—Standard E.C.G. of patient whose ABC-E.C.G. is shown in Fig. 16.

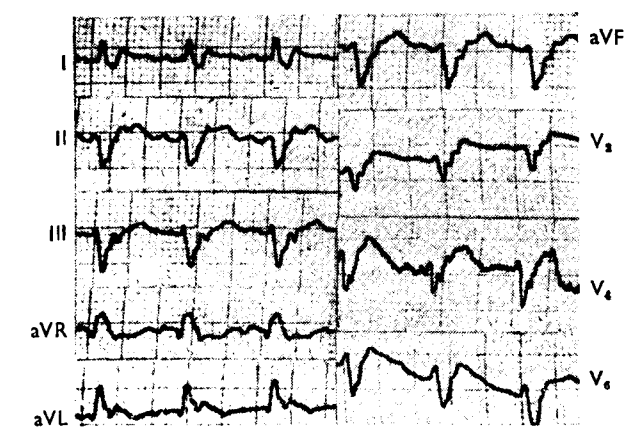


FIG. 17.—Standard E.C.G. of patient whose ABC-E.C.G. is shown in Fig. 16.

Since we know ϕ_1, ϕ_2 , see (p) above, and the denominator of the fraction contains terms we know, $\therefore Q$ is known. Thus the moment (strength) of the dipole is known. Thus leads ABC define the dipole completely.

1. *Modification owing to the fact that the emanation is not precisely that of a dipole.*—Craib (1927) has presented strong evidence that we may regard the field as being produced by a dipole, and, since in the final analysis related ionic migration through muscle membrane is associated with the action current produced, this would appear to be a sound hypothesis. Let us first assume it is a point source at the centre producing an emanation of the type $f(t)$. The above treatment still holds, since we can select any particular instant in the cycle of $f(t)$ which will correspond to a selected dipole as treated above.

2. *The thorax is (a) not a sphere, (b) not a perfect conductor and impedance varies throughout its volume, and (c) the heart is not a point source at the centre.*—(a) If points M, L, and R (ϕ_1, ϕ_2, ϕ_3) are not at equidistance from the centre and the thorax forms an ellipsoid since these variations are known, then the treatment is more complicated; but the actual conclusion—namely, that neither the strength (Q) nor the direction of the dipole (l, m, n) can be changed without producing a reflected change in lead A, B, or C—is a reasonable deduction. (b) This factor is difficult to evaluate. Kaufman and Johnston (1943) consider that variations of this nature, since they are not major, do not affect the recorded potentials greatly. (c) Though the heart is not a point source it is still theoretically possible to treat all the emanating points individually and summate algebraically, and therefore we should still obtain an equation related to the known findings appearing from leads A, B, and C. The final difficulty will arise if and when fields produced can annul one another as in precisely accurate phase difference of 180 degrees. This could not be expected to occur with infarction owing to the type of firing off of the heart muscle, and this has already been discussed.

Summary

A series of 161 cases of cardiac infarction on whom ABC electrocardiograms were performed has been presented. Necropsies were done on 36 of these subjects.

The ABC display detected all cases of infarction detected by the present standard leads, and in addition detected infarction not demonstrated by them.

The correlation of infarct site with pattern changes in the ABC leads was determined theoretically and confirmed by necropsy studies.

E.C.G. patterns indicating cardiac degeneration short of discrete infarct formation, with one necropsy study, are described.

Abnormal T-wave form associated with infarction is illustrated.

Heart-block patterns associated with infarct formation are described and presented.

A theoretical analysis of the significance of the Einthoven, Goldberger, Wilson, and ABC leads is presented.

I thank the honorary staffs of the Royal Melbourne and St. Vincent's Hospitals for access to patients and Dr. Gerard Crook for the radio-opaque heart perfusions. I am indebted to Dr. J. D. Hicks, of the Royal Melbourne Hospital, and Dr. Tate Smith, of St. Vincent's Hospital, for access to and help in their departments of pathology.

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INCIDENCE OF CORONARY ISCHAEMIA AFTER PARTIAL GASTRECTOMY

BY

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There are many studies relating coronary artery disease to various aspects of lipid metabolism. It has been shown that the incidence is high where the diet contains a large quantity of animal and saturated fat, and low where fat intake is poor (Keys, 1956). Following partial gastrectomy of the Polya type many patients lose weight and most are below their expected weight (Anderson *et al.*, 1955). This is probably due to a low calorie intake and post-gastrectomy symptoms, but impaired digestion and absorption of fat may be a contributory factor. Recent work in gastrectomy patients with labelled fats has shown increased fat excretion and diminished absorption after fatty meals and that fat loss is greater after the Polya operation than after the Billroth I (Everson, 1954; Shingleton *et al.*, 1957). This impaired fat absorption could be reflected in a lower incidence of coronary artery disease in gastrectomy patients.

Material

Of 53 patients who had undergone the Polya type of partial gastrectomy 40 were traced and examined. All were males between 45 and 65 years who had been operated on for severe duodenal ulcer symptoms. The mean lapse of time from operation to interview was 9 years 10 months (range: 7 years 1 month to 13 years 4 months). At the same time, 40 men in the same age group with long-standing symptoms of duodenal ulcer (mean duration 17 years) were studied; 15 of these patients had suffered major complications such as perforation and haemorrhage. As a further control group we examined 40 "normal" males without ulcer or cardiac symptoms admitted for operative treatment of minor surgical and orthopaedic conditions (hernia, varicose veins, haemorrhoids, etc.). In the latter two groups the last five or six patients were selected on an age basis to ensure that the mean ages of each group were closely related (Table I).

Methods

A clinical history and an examination of each patient were undertaken; height, weight, pulse rate, and blood pressure were recorded and a sample of venous blood was withdrawn for haemoglobin and lipoprotein estimations. Electrocardiography was performed, using a direct writer ("mingograph") before and after Master's (1950) double two-step test. The amount of exercise in this test is graduated according to the patient's weight and age. One man

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with a previous myocardial infarction was not exercised, and in two others the exercise was discontinued because of angina; all others completed the test. To facilitate rapid recording after exercise only nine leads were used—the three standard leads and aVR, aVL, aVF, V₁, V₂, V₄, and V₆. The records were studied independently by two of us without reference to the patient's group, and the findings compared. A further independent opinion was obtained where a difference in interpretation occurred.

It is difficult to apply rigid standards to the interpretation of electrocardiograms, but the following criteria of ischaemia were adopted as a guide: ST depression of 1 mm. or more where the increase in pulse rate did not exceed 20 a minute and of 1.5 mm. or more where it did; flat or inverted T waves in appropriate leads; and multiple extrasystoles. All other abnormalities were noted and care was taken to distinguish changes due to tachycardia alone—namely a low RS-T junction with upward-sloping ST segment. The distinction between the lateral ischaemia of coronary artery disease

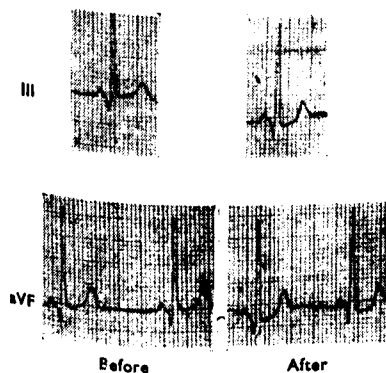


FIG. 1.—Posterior ischaemia after exercise.

and that of left ventricular strain is taken into account in the analysis of the results. A typical abnormal record is shown in Fig. 1. Fig. 2 shows alternate ventricular extrasystoles occurring after exercise. This, the only example of its kind, was accepted as evidence of ischaemia. The β : α lipoprotein ratio was estimated by standard methods of electrophoresis, Sudan-black staining, densitometry, and planimetry (Swahn, 1952). Pre- β lipoprotein was noted when present (Besterman, 1957).

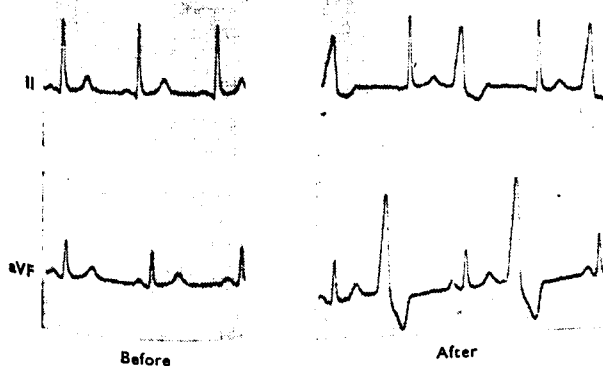


FIG. 2.—Alternate ventricular extrasystoles after exercise.

Results

A summary of the principal findings is presented in Table I, and the abnormal electrocardiograms are classified in Table II.

The incidence of myocardial ischaemia in the gastrectomy group (six positive E.C.G.s) is less than in the control group (15 positives), and this difference is significant ($\chi^2 = 5.23$; $0.02 > P > 0.01$). The difference is even more significant when the gastrectomy group is compared with the ulcer group (21 positives) ($\chi^2 = 12.6$ and $P < 0.01$). The difference between the control and ulcer groups is not significant ($\chi^2 = 2.49$). If the electrocardiograms showing left ventricular (L.V.) strain are included in the analysis (Table II) the significance of the data is altered and the difference

between the control and ulcer groups becomes less marked. The number of abnormal in each group becomes gastrectomy 7, control 18, and ulcer 21, so that for gastrectomy and control groups $\chi^2 = 7.05$ ($P < 0.01$) and for the gastrectomy and ulcer groups $\chi^2 = 10.80$ ($P < 0.01$).

TABLE I.—Summary of the Principal Findings. Each Group Contains 40 Patients

Group	Mean Age (Yrs.)	Mean Hb %	Mean Weight		No. of Ischaemic E.C.G.s	Mean β : α Ratio (Lipo-proteins)	No. with pre- β Lipo-protein
			lb.	kg.			
Polya gastrectomy	53.2	88.2	132	59.9	6	2.17	16
Range	45-65	59-103	103-183	46.7-83		1.12-4.00	
Control	53.6	96.7	154	69.9	15	2.42	17
Range	46-64	77-118	114-208	51.7-94.3		1.17-4.24	
Ulcer	53.5	97.7	147	66.7	21	2.49	16
Range	47-64	80-112	110-202	49.9-91.6		1.00-7.20	

TABLE II.—Classification of the Diagnoses of the Abnormal E.C.G.s

	Post. Ischaemia	Post-Lat. Ischaemia	Lat. Ischaemia	Ant-Lat. Ischaemia	Ant. Ischaemia	Infarction	Extrasyst.	Total	L.V. Strain	Misc.
Polya gastrectomy	4	1	—	—	—	—	1	6	1	1 Low voltage with emphysema
Control	7	7	—	—	1	—	—	15	3	1 R.V. strain
Ulcer	11	3	3	2	1	1 Healed post. infarct.	—	21	—	—

These figures suggest that the cardiac status of the gastrectomy patient is better than that of his fellows. Because the gastrectomy group is much lighter than the other two (Table I) and the mean weight of the six ischaemic gastrectomy patients (154 lb.; 69.9 kg.) is greater than the group mean, it seems possible that ischaemia is related to weight. However, no correlation between absolute weight and ischaemia was found in the ulcer and control groups.

Each patient's expected weight, depending on height and age, was calculated from British tables (Levine, 1923), and Fig. 3 shows the deviation from expected weight in each group, with the corresponding distribution of ischaemic E.C.G.s. This demonstrates clearly that the occurrence of myocardial ischaemia is not prevented by being underweight, and that

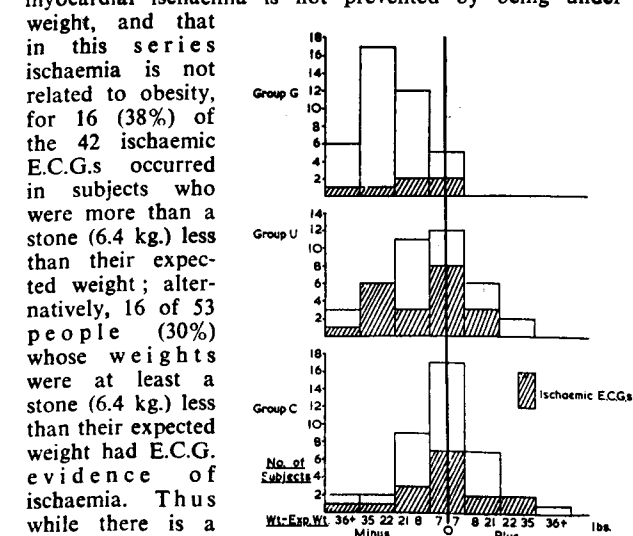


FIG. 3.—Distribution of ischaemic E.C.G.s and subjects' weights related to expected weights.

this corresponds to the incidence of myocardial ischaemia, weight by itself does not seem to be a specific factor.

There is a difference between the mean $\beta : \alpha$ lipoprotein ratios of each group (Table I). The ratio of the gastrectomy group is 89.5% of the mean control ratio and 87.0% of the mean ulcer ratio, but these differences are not significant ($P > 0.1$ in both cases). There is no difference between the mean ratios of the 42 ischaemic and 78 non-

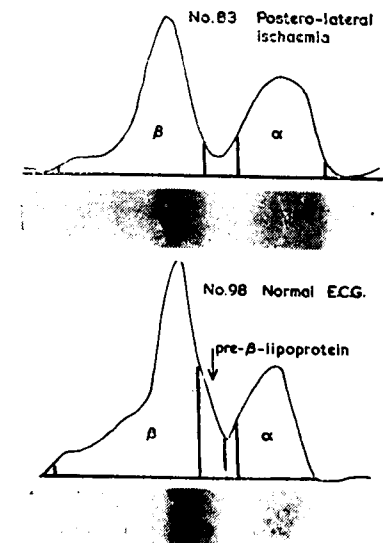


FIG. 4.—Normal lipoprotein pattern with abnormal E.C.G. (No. 83) and normal E.C.G. with pre- β lipoprotein (No. 98).

the groups, apart from the low mean haemoglobin level of the gastrectomy patients (88.2%). This is actually an adverse factor which would tend to increase the number of positive electrocardiograms in this group.

Discussion

There is inevitably some selection of patients for gastrectomy. Nevertheless only one of the present ulcer group would be refused gastrectomy on a normal assessment of fitness, and all were fit 10 years ago. We consider that there is insufficient evidence of selection in favour of the gastrectomy group to invalidate the findings.

It may be argued that the incidence of abnormal electrocardiograms in this study is suspiciously high. Certainly Master *et al.* (1942) found no significant changes in the electrocardiogram following the double two-step test in 34 normal subjects of unspecified age. Against this, Riseman *et al.* (1940), employing criteria of abnormality more severe than Master's and comparable to our own, found significant changes in 10 of 15 normal patients whose ages ranged from 25 to 73 years. In a review of the literature they drew attention to the divergent findings of a number of authors. We cannot reconcile such differences. Here we are reporting results obtained from a standard test consistently applied to each of the clinical groups.

We believe that the cardiac status of the long-term gastrectomy patients is better than that of his "normal" or "ulcer" counterpart. Electrocardiographic evidence of myocardial ischaemia in the absence of anaemia is usually regarded as indicating coronary artery disease, and presumably the gastrectomy patients show less ischaemia because their coronary arteries are healthier. This suggests that in the time since operation their coronary vessels have either remained healthy and undergone minimal atheromatous change, or have even recovered from such change if initially present. In a pathological study Wilens (1947) concluded that regression of established atherosclerosis occurred in clinical states associated with severe short-term malnutrition and weight loss. This clinical study may support his view.

Weight loss by itself does not seem to be the main factor, and it is tempting to relate the lower incidence of ischaemia in gastrectomy patients to the diminished fat intake and impaired absorption which frequently occurs after a Polya gastrectomy. This, however, has not been reflected in a significantly lowered $\beta : \alpha$ lipoprotein ratio, nor can we demonstrate a relationship between pre- β lipoprotein and myocardial ischaemia. It is true, however, that by the nature of Master's double two-step test we are dealing with coronary artery disease of less severity than that recently studied by Besterman (1957, 1958), and this may explain our inability to demonstrate the lipoprotein changes which he describes.

This study confirms the opinion of Douglas and Melrose (1955) that there is no increase in the incidence of coronary artery disease in ulcer patients compared with the normal individual.

Summary

Evidence is presented which demonstrates a significantly lower incidence of coronary ischaemia in long-term gastrectomy patients compared with "ulcer" and "normal" controls.

This cannot definitely be related to lowering of the $\beta : \alpha$ lipoprotein ratio nor to changes in the pre- β lipoprotein.

Although the gastrectomy patients are much lighter as a group there is no direct relationship between weight and ischaemia.

We thank Professor C. F. W. Illingworth for access to records and for the facilities so readily granted; Miss McCann for assistance with the electrocardiography; Miss Murray for secretarial help; and Mr. Kelly for preparation of the illustrations.

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"In these days it is not uncommon to hear in some quarters debates on the relative merits of science and the arts in education. In my own University College of North Staffordshire a regard for both these two branches of learning is considered essential in every undergraduate's studies, and we have, I think, achieved a very happy marriage between them. But it was long ago that Cambridge realized that both are equally important to a true university, and it emphasized its view by creating, in 1702, the Chair of Chemistry as one of the first dozen Chairs in the University. Since that time it has continuously expanded its activities and has established a tradition in natural science which is outstanding among the universities, not of this country alone, but of the world. What other university can match the names of Newton, Darwin, Clerk Maxwell, Thomson, Rutherford, and Hopkins—to mention but a few of its famous men?—H.R.H. PRINCESS MARGARET on the occasion of the opening of the new Chemical Laboratories at Cambridge on November 6 (*Cambridge University Reporter*, November 12).

TEETH OF 5-YEAR-OLD LONDON SCHOOLCHILDREN (1957)

WITH A COMPARISON OF THE RESULTS OBTAINED FROM 1929 TO 1957

BY

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The first of a series of detailed surveys of the deciduous teeth of 5-year-old children was undertaken by one of us (M.M.) in 1929 at the request of the Board of Education. The children attended London County Council schools representative of the different parts of the Metropolitan area. Inspections at the same, or similar, schools have been made with colleagues at two-yearly intervals from 1943 to 1957, with the exception of 1953. In addition, children living in residential homes (institutions) and those attending private schools were visited in 1945 and 1950 for comparison with the London County Council children. (References to all these are given at the end of this report.)

The probe-and-mirror method of examination has been used throughout, and the criteria for structure and caries employed were those developed by Mellanby (1934). Both the method and the criteria have been described in detail in previous reports of this series.

When the surface of a tooth is smooth and shiny it is said to be hypoplasia-free—that is, the structure is good (Hy). Any roughness is graded according to type and degree, differentiation being made between the comparatively rare gloss hypoplasia (G-Hy) and the common M-hypoplasia (M-Hy) (King, 1940). The surface structure of the teeth is expressed both as the percentage incidence of the different grades of hypoplasia and as the average M-hypoplasia figure (A.H.F.). The latter gives a rough computation of the extent of this type of defect and is obtained by allotting a number to each tooth (1 for M-Hy₁, 2 for

M-Hy₂, and 3 for M-Hy₃) and dividing the sum of these by the number of teeth. Those showing gross hypoplasia and those so carious that assessment is impossible are excluded.

A tooth is regarded as caries-free when no disease can be diagnosed by the method of examination employed. Caries is expressed as a percentage incidence—that is, d.e.f. per 100 teeth—and as the average caries figure (A.C.F.), which is estimated in a similar way to the A.H.F. The numbers 1, 2, and 3, are allotted to carious teeth according to the amount of tooth involved. Missing molars and canines are presumed to have been extracted for severe caries and are included in the C₃ group, while missing incisors (mainly lower centrals) are counted as having been naturally shed and are omitted from the analysis. The maximum value for both A.H.F. and A.C.F. is 3.

The Board of Education (1931) analysed the data obtained in the 1929 investigation, but published only the figures relating to children and not to individual teeth. A child was said to be caries-free who had no recorded decayed teeth, or only one, two, or three teeth with grade 1 caries, the second group being included because such a small proportion of the children were "caries-free." For the purpose of comparison the same classification has been perpetuated throughout these surveys, but, in addition, the results have been analysed for the incidence and extent of hypoplasia and caries in each type of tooth.

Results

Teeth Present.—In 1957 the dental condition of 1,241 children were recorded. All of them had had their fifth but not their sixth birthday. At the time of the inspection there were 22,587 deciduous teeth *in situ* out of a possible 24,820 (91%). The percentage distribution of the individual types was similar to that in 1955 and in the earlier surveys (*Brit. med. J.*, 1957, 2, 318)—namely:

	Upper Jaw	Lower Jaw
Central incisors	90.5	77.6
Lateral incisors	96.4	96.7
Canines	99.4	99.6
1st molars	91.6	82.9
2nd molars	93.6	81.9

Surface Structure.—An examination was made of the surface structure of 98% of the teeth present in the mouth (see above) and the results for individual teeth compared with 1955 figures are given in Table I. All the teeth except the lower molars had a better structure in 1957 than in 1955. In both years the lower teeth had fewer defects than the upper. The best structure of all occurred in the lower incisors, in which 80.3% of the centrals and 64.1% of the laterals were non-hypoplastic, and the worst in the molars,

TABLE I.—Surface Structure of Different Types of Teeth (1957 compared with 1955)

TABLE 1.—Surface Structure																
Type of Tooth	Total No. of Teeth Examined for Structure		Percentage of Teeth								Total Percentage of Teeth with M-Hypoplasia		Percentage of Teeth with Gross Hypoplasia		A.H.F.*	
			Hy ₁		M-Hy ₁		M-Hy ₂		M-Hy ₃							
	1955	1957	1955	1957	1955	1957	1955	1957	1955	1957	1955	1957	1955	1957	1955	1957
Upper jaw:																
Central incisors	2,118	2,166	26.4	51.7	33.2	36.6	27.3	8.8	7.3	0.1	67.9	45.5	5.7	2.8	1.17	0.56
Lateral " "	2,282	2,284	34.9	45.2	39.4	44.4	17.6	8.3	3.2	0.1	60.3	52.8	4.8	2.0	0.89	0.62
Canines " "	2,392	2,432	37.5	41.1	43.4	51.6	14.0	5.9	2.4	0.1	59.9	57.6	2.6	1.3	0.81	0.64
1st molars	2,157	2,196	9.9	14.6	34.2	46.9	42.7	36.8	8.2	0.9	85.1	84.6	5.1	0.8	1.52	1.24
2nd " "	2,263	2,293	8.9	13.7	32.3	45.7	47.6	37.6	9.5	2.4	89.7	85.6	1.5	0.7	1.59	1.29
Total upper jaw	11,212	11,371	23.8	33.3	36.7	45.2	29.6	19.3	6.0	0.7	72.3	65.2	3.9	1.5	1.19	0.87
Lower jaw:																
Central incisors	1,883	1,917	83.6	80.3	14.8	18.8	0.8	0.6	0.0	0.1	15.6	19.5	0.8	0.2	0.17	0.20
Lateral " "	2,336	2,389	77.4	64.1	20.7	35.0	1.2	0.8	0.1	0.0	22.0	35.7	0.6	0.2	0.23	0.37
Canines " "	2,399	2,460	61.7	56.6	30.1	38.9	3.7	2.3	0.3	0.0	34.1	41.3	4.2	2.1	0.40	0.45
1st molars	1,893	2,001	22.1	27.8	35.4	46.5	32.7	24.3	6.2	0.4	74.3	71.3	3.6	0.9	1.24	0.97
2nd " "	1,904	1,970	11.7	26.3	34.3	43.3	40.7	28.2	11.4	1.4	86.4	72.9	1.9	0.8	1.53	1.04
Total lower jaw	10,415	10,737	52.8	51.6	27.0	36.7	14.7	10.5	3.3	0.4	44.9	47.5	2.2	0.9	0.68	0.59
Grand Total	21,627	22,108	37.8	42.2	32.0	41.0	22.4	15.0	4.7	0.6	59.1	56.6	3.1	1.2	0.94	0.74

* Total M-hypoplasia figure

* A.H.F.—Total number of teeth examined for structure (excluding those with gross hypoplasia)

TABLE II.—Incidence and Extent of Caries in Different Types of Teeth (1957 compared with 1955)

Type of Tooth	Total No. of Teeth Assessed for Caries (inc. Extractions)		Percentage of Teeth								Total Percentage of Carious Teeth (d.e.f. per 100 Teeth)		A.C.F.*	
			C ₀		C ₁		C ₂		C ₃					
	1955	1957	1955	1957	1955	1957	1955	1957	1955	1957	1955	1957		
Upper jaw:														
Central incisors ..	2,179	2,245	72.2	74.4	6.8	6.2	12.3	12.3	8.7	7.0	27.8	25.6	0.57	0.52
Lateral ..	2,342	2,392	82.3	82.6	4.9	4.0	8.2	7.2	4.6	6.2	17.7	17.4	0.35	0.37
Canines ..	2,410	2,482	88.9	90.5	3.2	2.2	5.3	4.6	2.6	2.7	11.1	9.5	0.22	0.20
1st molars ..	2,410	2,482	58.3	58.5	10.2	8.3	15.6	16.6	15.9	16.6	41.7	41.5	0.85	0.91
2nd ..	2,410	2,482	41.9	37.7	18.4	25.0	22.4	22.4	17.3	14.9	58.1	62.3	1.15	1.14
Total upper jaw ..	11,751	12,083	68.6	68.5	8.8	9.2	12.8	12.7	9.9	9.6	31.4	31.5	0.64	0.63
Lower jaw:														
Central incisors ..	1,887	1,926	94.8	94.6	2.3	2.9	2.5	2.0	0.5	0.4	5.2	5.2	0.09	0.08
Lateral ..	2,340	2,399	94.7	96.3	2.1	1.3	2.6	1.9	0.6	0.5	5.3	3.7	0.09	0.07
Canines ..	2,410	2,482	91.2	92.2	2.4	2.1	4.5	4.2	1.9	1.5	8.8	7.8	0.17	0.15
1st molars ..	2,410	2,482	37.5	37.8	7.3	6.8	24.5	26.5	30.7	28.9	62.5	62.2	1.48	1.47
2nd ..	2,410	2,482	29.8	28.2	16.3	19.9	19.3	20.1	34.5	31.7	70.2	71.8	1.59	1.55
Total lower jaw ..	11,457	11,771	68.3	68.5	6.3	6.8	11.1	11.4	14.3	13.3	31.7	31.5	0.71	0.69
Grand Total ..	23,208	23,854	68.4	68.5	7.5	8.0	12.0	12.1	12.1	11.4	31.6	31.5	0.68	0.66

* A.C.F. = $\frac{\text{Total caries figure}}{\text{Total number of teeth (including extractions)}}$

particularly the uppers, where only 14.6% of the first and 13.7% of the second were free from hypoplasia.

Very few teeth had any mottling, and when present it was very mild. Such teeth were graded for M- and G-hypoplasia in the usual way.

Incidence and Extent of Caries.—Table II compares the incidence and extent of caries for each type of tooth and for all types together in 1957 and 1955. The two series were in close agreement. The proportion of carious teeth and the average caries figures in both upper and lower jaws, separately and combined, was approximately 31% and 0.6%. The lower incisors had the least caries (5.2% in the centrals in both years and 3.7% in the laterals in 1957, as against 5.3% in 1955) and the lower second molars the most (71.8% and 70.2% respectively). The upper first molars had less caries than the other molars (20–30% less in 1957 as compared with 16–29% less in 1955).

TABLE III.—Treatment of Caries (1943 to 1957)

Year	Total No. of Carious Teeth (including Extractions)	Treatment			Total Percentage of Carious Teeth Treated
		% Extracted	% Silver Nitrate	% Filled	
1943	10,886	15.7	6.7	2.7	25.0
1945	3,545	9.6	2.8	2.4	14.8
1947	6,245	15.6	2.4	4.4	22.4
1949	3,553	15.3	0.6	3.9	19.8
1951	7,412	13.0	0.1	6.1	19.2
1955	7,326	16.7	2.3	11.1	30.1
1957	7,510	17.0	0.6	10.7	28.3

The average number of carious teeth per child was 6.1% in both years, but if the "caries-free" children were excluded the figure dropped from 7.2% in 1955 to 6.9% in 1957. The percentage of children caries-free or nearly so was also similar—20.7 in 1957 and 21.2 in 1955—but the percentage of "caries-free" children was less in the last survey—namely, 11.9 compared with 15.5.

Treatment of Caries.—Table III shows that in 1957, as in 1955, rather less than one-third of the carious teeth had been

treated, approximately 17% had been filled, and 11% extracted. Only 0.6% appeared to have been painted with silver nitrate in 1957 compared with 2.3% in 1955, which accounts for the slight difference in the total treated.

TABLE IV.—Caries Related to Superficial Staining of Teeth (1943 to 1957)

Year	Percentage of Carious Teeth in Children with:		
	No Stain	Black or Dark-brown Stain	Green Stain
1943	30.1	19.3	33.4
1945	23.1	15.4	33.0
1947	19.8	12.4	26.0
1949	25.8	16.9	30.0
1951	25.5	14.4	33.6
1955	29.1	20.2	39.2
1957	32.0	22.0	31.2

Caries and Superficial Staining of Teeth.—In the recent examination as in 1955 (Table IV), the children with black or dark-brown stain on any tooth had a smaller percentage of caries (22%) than either the children with no stain (32.0%) or those with green stain (31.2%).

Comments and Conclusions

It may be said, after reviewing these results, that the caries picture of the 5-year-old children in the London County Council schools has shown little or no change since 1955, whether considered per child or per tooth. But, as mentioned in previous reports, there have been many variations both in structure and in caries experience of this age group since the original 1929 investigation.

The proportion of teeth present at examination was, on the whole, similar in the seven inquiries from 1943 to 1957.

The structure of the individual teeth has varied from year to year. There was in general an improvement up to 1947, but, later, variations occurred for which we cannot

TABLE V.—Structure—Caries Relationship (1957)

Grade of Structure	Incisors			Canines			Molars			All Teeth		
	Total Examined	% Carious	A.C.F.	Total Examined	% Carious	A.C.F.	Total Examined	% Carious	A.C.F.	Total Examined	% Carious	A.C.F.
Hy	5,223	6.9	0.12	2,392	4.1	0.08	1,712	39.3	0.71	9,327	12.1	0.22
M-Hy ₁	3,003	14.5	0.27	2,212	9.7	0.18	3,860	50.9	0.92	9,075	28.8	0.52
M-Hy ₂	408	37.5	0.72	200	16.5	0.30	2,711	61.5	1.17	3,319	55.8	1.06
M-Hy ₃	7	71.4	2.00	4	25.0	0.50	111	78.4	1.75	122	76.2	1.72
G-Hy	115	37.4	0.63	84	17.9	0.25	66	69.7	1.33	265	39.2	0.68

TABLE VI.—Comparison of Caries in Upper and Lower Teeth (1943 to 1957)

Year	Percentage of Carious Teeth		A.C.F.	
	Upper Jaw	Lower Jaw	Upper Jaw	Lower Jaw
1943	33.2	26.9	0.69	0.62
1945	28.5	24.5	0.57	0.54
1947	21.0	19.5	0.41	0.44
1949	26.7	26.6	0.52	0.57
1951	26.9	28.2	0.51	0.60
1955	31.4	31.7	0.64	0.71
1957	31.5	31.5	0.63	0.66

account. The present position is similar to that of 1951 for all teeth combined, but there are differences between the types of teeth. As already mentioned, the structure is better in 1957 than in 1955.

The relationship between the external structure of a tooth and caries experience (Table V) was in general the same as in the comparable surveys made since 1943. For all types of teeth grouped together caries was present in only 12.1% of those with no recorded enamel defects (Hy₀), a higher figure than previously found, but with severe defects the disease was much more prevalent. For instance, caries was found in 76.2% of teeth with grade three M-hypoplasia (M-Hy₃) and in 39.2% of those with the gross forms of defect (G-Hy). These figures nevertheless support the con-

Some of the factors which contributed to the marked improvement of the caries picture between 1929 and 1947 and the subsequent deterioration in later years, have been discussed at length in the previous reports. No further evidence has been forthcoming to modify the tentative conclusions given there—namely, that the reduction in the disease was partly the result of more scientifically controlled nutrition of pregnant women and infants during the war and post-war period of rationing, when among other things the calcifying properties of the diet were increased. The subsequent freer choice of diet when cheaper foods, including cereals, were more easily obtainable, together with the reduction in the consumption of milk and cod-liver oil, could account for some of the deterioration from 1947 to 1955. The work of Holloway *et al.* (1958) suggests that some of the increase in the incidence of caries in recent years may be due to the rapid growth in popularity of iced lollies and similar confections. The fluorine in the water could not have been concerned in the changes noted in these reports, as it has remained low and constant throughout.

Our thanks are extended to many who have helped directly or indirectly with the investigations. We are particularly indebted to the London County Council and Dr. J. A. Scott for permission to carry out the survey, to the head teachers and their assistants for the trouble they took to make our visits to the schools such a pleasure, and to the Medical Research Council for

TABLE VII.—Distribution of Caries (1953 to 1957)

Year	Percentage of Carious Teeth									
	Central Incisors		Lateral Incisors		Canines		1st Molars		2nd Molars	
	Upper Jaw	Lower Jaw	Upper Jaw	Lower Jaw	Upper Jaw	Lower Jaw	Upper Jaw	Lower Jaw	Upper Jaw	Lower Jaw
1943	37.6	4.9	20.3	3.7	9.5	6.9	42.0	54.0	56.5	61.0
1945	29.5	1.7	14.9	2.1	7.5	5.9	38.9	48.6	51.4	58.8
1947	22.2	1.7	10.6	1.7	6.9	4.1	30.6	43.3	34.4	43.0
1949	30.1	3.3	14.5	2.6	9.1	5.5	35.7	54.0	44.2	61.3
1951	30.0	3.8	15.4	2.6	7.2	5.6	34.2	56.9	47.7	65.1
1955	27.8	5.2	17.7	3.3	11.1	8.8	41.7	62.5	58.1	70.2
1957	25.6	5.2	17.4	3.7	9.5	7.8	41.5	62.2	62.3	71.8

clusion drawn from earlier work that the better the structure of a tooth, as diagnosed by the method previously described, the less likely is it to become carious.

The incidence and extent of caries declined from 1943 to 1947 but rose after that date until 1955, since when there has been little or no change. A comparison of the carious teeth in the upper and lower jaws from 1943 to 1957 (Table VI) is of interest. In 1943 the upper jaw had 6.3% more carious teeth than the lower. The decrease in the incidence of the disease noted up to 1947 was less in the lower than in the upper jaws, and the difference between the two fell to 1.5%. The rise in the proportion of carious teeth subsequent to 1947 was greater in the lower jaw, and in 1951 the percentage of such teeth in the lower was 1.3% greater than those in the upper jaw. By 1955, and also in 1957, the percentage in the two jaws was the same—namely, 31. This change in distribution of the disease between the two jaws is analysed in Table VII, which shows that the trend is mainly due to a decrease in caries in the upper incisors associated with a larger increase in the lower molars compared with the upper.

The proportion of carious teeth filled has increased from approximately 2.5 to 11.0% since 1943, the rise being most marked in the last two examinations (Table III). Although the percentage of teeth extracted has varied to some extent from year to year, it was also greater in 1955 and 1957 than at any of the previous inspections.

In 1957 the children with black or dark-brown stain had a smaller percentage of carious teeth than the children with no stain or green stain, as in previous surveys. The children with green stain in 1957, however, had approximately the same percentage of diseased teeth as the children with no stain, while in the preceding surveys they had a larger percentage.

financing the work. We would also like to acknowledge gratefully the assistance given by Misses I. Allen and B. Hafner in the tabulation of the data and to Dr. P. J. Holloway for his help and criticism during the preparation of the report.

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"It seems to me certain that there should be no strife between science and religion, for the great Creator of living beings was also the Creator of the harsh and ruthless natural laws we call Darwinian evolution. . . . The question arises, does the Creator now content himself with allowing human beings to follow their own dictates as a self-governing colony provided they keep themselves within the natural laws which have been arranged for them; or does He occasionally intervene in an "unnatural" or "supernatural" way? That question I think cannot scientifically be answered. Hardly anything happens which cannot be explained by natural causes, but revelations occur which are sudden and surprising enough to suggest an "unnatural" or "supernatural" origin as if the Creator had Himself directly intervened in the course of a human life. Who would be bold enough absolutely to deny the possibility of such an intervention?"—F. Parkes Weber, *The Advent of Life: an Agnostic's Dream About the Creation* (H. K. Lewis, 1958).

RADIOIODINE TRACER TESTS IN THE DIAGNOSIS OF HYPERTHYROIDISM

BY

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The use of radioiodine, ^{131}I , has now an established place as an aid in the diagnosis of hyperthyroidism, but there is no agreement on which radioiodine test is best for this purpose. Many indices of thyroid function have been proposed which variously involve the measurement, either serial or at fixed times after the administration of the radioisotope, of its accumulation by the thyroid, excretion by the kidneys, and concentration in whole blood, blood plasma, and saliva.

Indices dependent on measurements of the radioiodine content in the thyroid or in blood are considered preferable to those dependent on urinary excretion because of the problems involved, particularly for out-patients, in urine collection over set periods of time.

Almost all of the radioiodine tests advanced in the literature will distinguish between the frankly thyrotoxic patient and the normal subject, but the real usefulness of a test must lie in its ability to aid the diagnosis in clinically borderline cases, and in its simplicity.

It is often difficult to assess the relative merits of particular proposed indices of thyroid function, as the clinical material varies so widely from one group of workers to another. However, most of the more promising radioiodine indices have been compared with each other, the B.M.R., and the biochemical determination of protein-bound iodine (P.B.I.) by the Royal Melbourne Hospital group (Clarke and Aujard, 1954; Madigan and King, 1954; Winikoff, 1954; Clarke, Sherriff, and Winikoff, 1955) and by others (Goodwin, Macgregor, Miller, and Wayne, 1951; Fryers, 1956; McConahey, Owen, and Keating, 1956).

From the studies in Melbourne it has been concluded that the best single index of thyroid function is the biochemical determination of P.B.I., which separates both the hyperthyroid and hypothyroid groups from the normal or euthyroid group with a high degree of accuracy. Between 90% and 95% of the patients in each group, including a large number of clinically borderline cases, have been correctly classified by this index.

The determination of P.B.I., however, is technically difficult on account of the very low levels of iodine to be measured, and demands the utmost care in keeping the laboratory and apparatus completely free from iodine contamination. For this reason it has been hoped that the use of radioiodine, which is readily detected by its beta and gamma emanations, would provide a simpler index of thyroid activity.

The best radioiodine indices in the Royal Melbourne Hospital studies referred to above have been shown to be

the measurement of plasma protein-bound radioiodine 48 hours after administration of the tracer dose (48-hour P.B. ^{131}I) and a measurement dependent on the early uptake of radioiodine by the thyroid.

The 48-hour P.B. ^{131}I index is the one proposed by Goodwin *et al.* (1951), who have shown that the rapid removal of the radioiodine as iodide from the plasma, and its early reappearance in hormonal form in hyperthyroid patients, can best be distinguished from the much slower process in euthyroid patients 48 hours after the administration of the tracer dose. It is a convenient index in that it does not require intravenous administration of the isotope, but it does necessitate the patient's attendance a second time, and, furthermore, since the measurement of the 24-hour percentage retention of radioiodine by the gland is considered useful in assessing the size of the therapeutic dose in those cases subsequently treated with radioiodine (Fairley, Holman, and King, 1956), patients often have to attend the hospital three days in succession, the first day for the administration of the tracer dose and early thyroid uptake measurements, the second day for a 24-hour percentage thyroidal retention measurement in case subsequent radioiodine therapy is prescribed, and the third day for a blood sample for the 48-hour P.B. ^{131}I determination.

Several early uptake tests have been suggested, and all appear reasonably reliable. The thyroid clearance test of Myant, Pochin, and Goldie (1949), however, is laborious in that it involves serial measurements over the gland and the measurement of radioiodine in the blood plasma; the uptake rate factor of Oddie, Meschan, and Wortham (1955) involves measurements of thyroidal radioiodine at 1, 4, and 24 hours; while the thigh/neck clearance test of Foote and MacLagan (1951) and the uptake rate factors of the earlier studies at the Royal Melbourne Hospital also depend on serial measurements.

Pochin (1950) was the first to observe that a simple but efficient test would be an early comparison of the counting rate over the neck with that over the thigh following the administration of a tracer dose of radioiodine, and Rundle, Seldon, and Indyk (1956) have also found such an index to be useful. In thyrotoxicosis the thyroid rapidly takes up radioiodine from the circulating plasma, so the early neck counts will become higher than normal and the thigh counts will become lower than normal, resulting in the neck/thigh ratio being greatly increased.

In the series of cases reported here the thyroidal uptake and the neck/thigh ratio have been determined two hours after oral administration of the tracer dose, the patient having had nothing to eat for the three hours before the test. The time interval of two hours was chosen because it was considered that by that time the amount of radioiodine secreted from the thyroid and the effect of variations in the absorption rates of radioiodine from the intestinal tract would be small.

The percentage content of radioiodine in the thyroid at 24 hours, which is used in many centres as an index of thyroid function, has not been found to have diagnostic significance in the Royal Melbourne Hospital Unit. In some patients the radioiodine content of the thyroid falls greatly between 2 hours and 24 hours, and the 24-hour measurement is considered useful as a measure of the degree of retention of radioiodine by the gland, which is taken into account when assessing

the size of the therapeutic dose of radioiodine required. This measurement is here referred to as the 24-hour percentage thyroidal retention.

Technique

Certain dietary factors, medications, and special radiographic procedures involving substances containing iodine are known to influence the thyroidal uptake and turnover of radioiodine. In order that the dietary influence shall be minimal a diet which avoids foods with a high iodine content, such as fish foods, is prescribed for one week before the test. With regard to medication, thiourylene derivatives and carbimazole are discontinued for a minimum period of two weeks, and iodine preparations and thyroid for at least four weeks prior to the tracer test.

A tracer dose of 20 μC of radioiodine (^{131}I), carrier-free, is administered orally, the patient having had nothing to eat for the previous three hours. Two hours after administration measurements are made of the radioiodine content of the neck and thigh, using paired G10Pb geiger counters as previously described (Clarke and Aujard, 1954).

Since the accumulation of iodine by tissues other than the thyroid and kidneys is relatively small, it has been assumed that the ^{131}I content of the tissue of the neck, excluding the thyroid, is approximately equal to the ^{131}I content of a similar volume of tissue of the thigh. The geometrical arrangements of the counters in the neck and thigh units are such that the response of the thigh counters to a distributed source of ^{131}I (as in the thigh) is three times the response of the neck counters to a similar source, hence thyroid counting rate = neck counting rate $\times \frac{1}{3}$ thigh counting rate and the neck/thigh ratio, which is here taken to mean

$\frac{^{131}\text{I} \text{ content of the tissue of the neck including thyroid}}{^{131}\text{I} \text{ content of a similar volume of tissue of the thigh}}$
will be equal to $\frac{\text{Neck counting rate}}{\frac{1}{3} \text{ thigh counting rate}}$

In those cases where radioiodine therapy is a considered possibility similar measurements are made at 24 hours.

At 48 hours a blood sample is taken for the determination of P.B. ^{131}I , which is expressed as a percentage of the dose per litre of plasma. The details of the method are given below. The limits for the two-hour uptake, the two-hour neck/thigh ratio, and the 48-hour P.B. ^{131}I determined in this study are given in Table I. The same criteria have been adopted in the clinical assessment of thyrotoxicosis as have been previously described from this unit (Madigan and King, 1954).

Determination of 48-hour P.B. ^{131}I

Two-millilitre samples of plasma are used. The plasma proteins are precipitated by adding 6 ml. of 10% trichloroacetic acid, after which the suspension is centrifuged

and the supernatant liquid poured off. The precipitate is washed twice with 6 ml. of trichloroacetic acid, centrifuged, and the supernatant poured off. To the precipitate is now added 0.5 ml. of 2N sodium carbonate and 0.1 ml. of "teepol" (a commercial wetting agent) and the mixture is agitated with a glass rod until all has dissolved. It is then transferred quantitatively to an aluminium pan, dried gently by means of an infra-red lamp, counted by means of an EHM2 mica-window geiger counter, and compared with a standard radioiodine source.

Results

This study covers all the patients who were referred to the radioiodine unit of the Royal Melbourne Hospital for investigation, and who were given subsequent radioiodine tracer tests during the 15-months period August, 1956, to November, 1957. Some of these were frankly thyrotoxic patients for whom tracer tests were required for the determination of the 24-hour percentage thyroidal retention of radioiodine used in the assessment of the radioiodine therapy dose, but these results are not considered in the final analysis.

Altogether, 156 consecutive tracer tests were carried out on 139 patients. Twelve tests on 12 patients have been excluded from the analysis, as it has not been possible to assign a final diagnosis in these cases. A further 44 tests have been excluded either because medication had not been discontinued for a sufficiently long period, or because the patient was considered to be frankly toxic.

The results of the remaining 100 tracer tests on 96 clinically borderline patients considered free from influencing medication are given in Table II. These 100 tests include 61 in which no known influencing medication had been given at all, 3 post-operative, 17 post- ^{131}I therapy (minimum time interval since therapy being three months), and 19 others in which medication had been discontinued for longer than the prescribed period. In 52 tests the final classification was hyperthyroid and in 48 tests it was euthyroid. The final classification was decided after further observation and in some cases after a trial period of medication.

For various reasons not all the three radioiodine indices—that is, the two-hour uptake, the two-hour neck/thigh ratio,

TABLE I.—Limits for the Three ^{131}I Indices Presented

Classification	Two-Hour Thyroidal Uptake %	Two-Hour Neck/Thigh Ratio	48-Hour P.B. ^{131}I % Dose/Litre of Plasma
Hyperthyroid	> 55	> 50	> 0.5
Indeterminate	$> 50 - < 55$	$> 35 - < 50$	$> 0.45 - < 0.5$
Euthyroid	≤ 50 (lower limit uncertain)	≤ 35 (lower limit uncertain)	$0 - < 0.45$

TABLE II.—Results of 100 ^{131}I Tracer Tests on 96 Clinically Borderline Cases Considered Free from Influencing Medication

Final Diagnosis	No. of Tests	Two-Hour Thyroidal Uptake			2-Hour Neck/Thigh Ratio			48-Hour P.B. ^{131}I		
		Correctly Classified	Indeter- minate	Incorrectly Classified	Correctly Classified	Indeter- minate	Incorrectly Classified	Correctly Classified	Indeter- minate	Incorrectly Classified
Hyperthyroid	34	30	—	4	32	1	1	31	1	2
Post ^{131}I therapy	10	9	—	1	9	—	1	10	—	—
Euthyroid	33	27	—	6	27	—	6	26	—	7
Post ^{131}I therapy	2	1	—	1	1	—	1	—	—	2
Hyperthyroid	3	2	—	1	2	—	1	—	—	—
Post ^{131}I therapy	3	3	—	—	3	—	—	—	—	—
Euthyroid	8	7	—	1	7	—	1	—	—	—
Post ^{131}I therapy	1	—	—	—	—	—	—	—	—	—
Hyperthyroid	2	2	—	—	—	—	—	2	—	—
Euthyroid	3	2	—	1	—	—	—	—	—	1
Post ^{131}I therapy	1	1	—	—	—	—	—	—	—	—
Totals	—	—	—	5	34	1	2	33	1	2
Hyperthyroid	39	34	—	5	34	—	1	33	—	—
Post ^{131}I therapy	13	12	—	1	12	—	1	10	—	—
Euthyroid	44	36	—	8	34	—	2	29	—	—
Post ^{131}I therapy	4	2	—	2	1	—	—	—	—	3

*At the Peter MacCallum Clinic, Melbourne.

body water and extracellular water determinations were repeated when the gain in body weight appeared to have ceased.

RESULTS

Body Weight

As can be seen from Figs. 1 and 2, in all four cases there was a marked rise in body weight within a few days of the beginning of treatment. This increase in weight continued for a varying period of time—three days for H. F., nine days for J. R., and about 14 days for both H. C. and

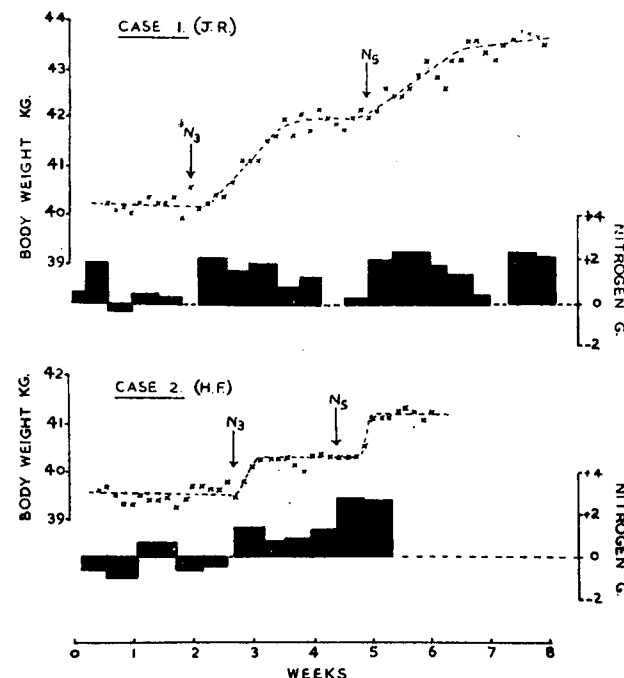


FIG. 1.—Diagram showing the relationship between body weight and nitrogen balance. Both cases began treatment with 30 mg. of norethandrolone daily (N3), but this was later increased to 50 mg. daily (N5).

J. McK. After this period of pronounced gain the body weight remained more or less constant. At this stage the daily dose of the drug was increased in patients J. R. and H. F. from 30 mg. to 50 mg. Within several days both patients showed a further increase in body weight, then again the body weight became more or less constant. The two patients (H. C. and J. McK.) who had 50 mg. of norethandrolone daily from the commencement of the treatment period appeared to gain weight more rapidly than did those who started with 30 mg. daily. In these patients, too, the body weight eventually reached a relatively steady state. Unfortunately, in the case of J. McK., measurements had to be interrupted owing to diarrhoea as a result of Sonne dysentery, and, although administration of the drug was continued, no body weights were recorded or urine collected until the infection was controlled.

The increases in weight, expressed as percentages of the body-weight levels during the control period, were 9% (J. R.), 4% (H. F.), 5% (H. C.), and 7% (J. McK.).

Nitrogen Balance

The state of nitrogen balance is shown in Figs. 1 and 2. Nitrogen retention is depicted by the shaded area above the balance line and nitrogen loss by shading below the line. No urines were collected where the balance line is represented by a broken line.

During the control periods all four patients were considered to be in nitrogen balance, within the limits ± 0.5 g. of nitrogen daily, but during treatment there was marked nitrogen retention in three of the cases. The fourth case

(J. McK.) shows marked nitrogen retention until the onset of his diarrhoea, and finally a second nitrogen retention as he gained weight. As expected, in all cases the strongest nitrogen retention occurred where the body weight was increasing most rapidly.

Total Body Water and Extracellular Water Measurements

Total Body Water.—As can be seen from the Table, all four cases showed an absolute increase in the total body water, although in the case of J. McK. this increase was not a significant one. The relative total body water—that is, total body water percentage of body weight—was increased in two cases (H. F. and H. C.); it was unchanged in the case of J. R. and decreased in J. McK.

The Extracellular Water.—The absolute extracellular water increased significantly in three of the four cases but was less for J. McK. The extracellular water percentage of body weight was increased slightly in two cases (J. R. and H. P.), unchanged in one (H. C.), and decreased in one (J. McK.).

Side-Effects

The drug, which was administered orally three times a day in a total dosage of 30–50 mg., was well tolerated. No patients suffered from nausea or vomiting, nor were there any noticeable androgenic effects. An increase in appetite occurred during the treatment period, and the non-protein portion of the diet was increased slightly to cater for it. At the time of maximum gain in weight on the 50-mg. dose all patients were fully satisfied by the amount of food, and it was noted that occasionally some was refused, though all denied having nausea and none vomited. On this evidence it is doubtful whether a further increase in dose would have been well tolerated or desirable.

In the liver-function tests repeated after treatment there was no impairment of function.

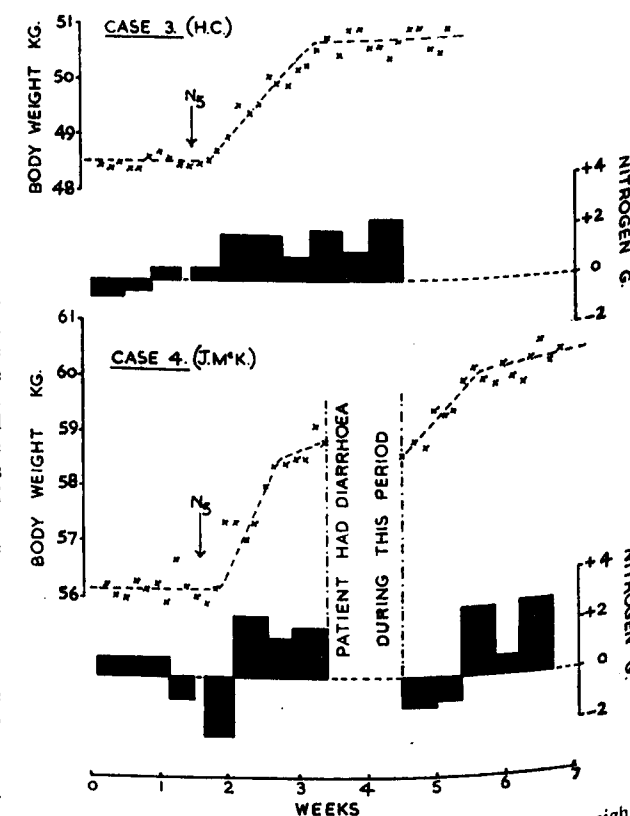


FIG. 2.—Diagram showing the relationship between body weight and nitrogen balance. Both cases had 50 mg. of norethandrolone (N5) throughout the treatment period.

Comparison of Total Body Water, Extracellular Water, and Derived Intracellular Water Values Before and After Treatment with the Steroid Norethandrolone

Patient	Age	Surface Area (Sq. m.)	Time of Measurement	Body Weight (Kg.)	Total Body Water		Extracellular Water		Intracellular Water*	
					Litres	% Body Wt.	Litres	% Body Wt.	Litres	% Body Wt.
J.R.	68	1.43	At end of control period	40.2	28.9	72	9.4	23	19.5	48
			After 42 days' treatment	43.7	31.4	72	11.0	25	20.4	47
			Difference	+3.5	+2.5	0	+1.6	+2	+0.9	-1
H.F.	56	1.35	At end of control period	39.5	26.4	67	8.1	21	18.3	46
			After 22 days' treatment	41.2	28.5	69	8.9	22	19.6	48
			Difference	+1.7	+2.1	+2	+0.8	+1	+1.3	+2
H.C.	80	1.60	At end of control period	48.4	32.8	68	11.1	23	21.7	45
			After 25 days' treatment	50.6	35.2	70	11.6	23	23.6	47
			Difference	+2.2	+2.4	+2	+0.5	0	+1.9	+2
J. McK.	77	1.56	At end of control period	56.0	29.9	53	13.5	24	16.4	29
			After 28 days' treatment	60.0	30.6	51	12.8	21	17.8	30
			Difference	+4.0	+0.7	-2	-0.7	-3	+1.4	+1

* Intracellular water volume obtained from the difference of the total body water and the extracellular water volumes (i.e., T.B.W. - E.C.W. = I.C.W.).

Discussion

The object of this study was to investigate the anabolic properties of the steroid norethandrolone in elderly underweight patients who consistently failed to gain weight on an adequate diet. From the results it would appear that this substance has definite anabolic properties. The four patients studied showed significant weight gain accompanied by marked nitrogen retention—two necessary requisites for the laying down of new lean body tissue. That this weight gain was in fact due to an increase in the lean body mass and not merely due to fluid retention should be more obvious after consideration of the total body water and extracellular water volumes before and after treatment.

Lean tissue gain is associated with an increase in both the absolute and the relative total body water values, and our results appear to follow this course. In all four cases there is an increase in the absolute total body water; there is an increase in the relative total body water in two of the cases (H. F. and H. C.), one is unchanged (J. R.), and the other (J. McK.) shows a slight decrease. The extracellular water values also support the view that the gain in body weight was lean body tissue and not merely fluid retention, since if the latter were the case we would expect large increases in the extracellular water. The increases which occurred, however, were not large, and in fact are compatible with the weight gain being totally accounted for as lean body tissue. The extracellular water percentage of body weight was increased slightly in two of the cases (J. R. and H. F.); it remained unchanged in one case (H. C.), and was slightly decreased in one (J. McK.). If the weight gain had been due to fluid retention we should have expected the extracellular water percentage of body weight to have increased by as much as 5 or 6% and not only 1 or 2% as we have found.

Fluid retention unaccompanied by an increase in the lean body mass would have had little effect, if any, on the absolute intracellular water volume. Our evaluation of the intracellular water volume—the difference between the total body water and extracellular water volumes—shows an absolute increase in the four cases studied. The intracellular water percentage of body weight is increased in three of the cases and decreased in one case (J. R.). It was unfortunate that J. McK. had acute diarrhoea during part of his treatment period, and this undoubtedly accounts for the decrease in the absolute and relative extracellular water values observed and also for the decrease in the relative total body water. Nevertheless, the increase in the intracellular water volume, together with the marked increase in body weight, shows that in this patient too an increase in the lean body mass occurred.

These results, together with the marked nitrogen retention, indicate that the gain in weight results from an increase in lean tissue and is not due to simple fluid retention. It appears, therefore, that the steroid norethandrolone is an

effective protein tissue-building substance which is well tolerated and has little or no androgenic effects in these aged patients at a dosage of up to 50 mg. daily. According to McSwiney and Prunty (1957), 50 mg. of norethandrolone daily is as effective as 100 mg. Our investigation shows that 30 mg. does not produce the maximum anabolic response (Fig. 2), since a higher level of weight resulted from the administration of 50 mg. daily. The tendency to anorexia observed towards the end of the course suggests that a larger dose might cause nausea and vomiting in patients of the age group and sex investigated in this study.

We were not able to measure the body weight in the immediate post-treatment period, since the subjects were anxious to leave hospital after their prolonged stay, but the two we were able to follow (J. R. and H. C.) have maintained and subsequently increased their weight after seven months. McSwiney and Prunty (1957) reported that after cessation of treatment they have observed immediate nitrogen loss and quote a case in which nitrogen loss after withdrawal of the drug approximated to that previously gained. Kory *et al.* (1957), however, found that in a group of chronically underweight individuals 19 out of 25 subjects, followed for six months after the drug was discontinued, either maintained their weight or continued to gain. Our subjects and those of Kory were chronically underweight individuals, while those of McSwiney and Prunty were well nourished. This may explain the difference in findings. Where there is definite underweight or wasting the nitrogen retention due to treatment is perhaps permanent, but in a well-nourished subject the nitrogen retained may well be lost on withdrawing the drug.

Summary

The anabolic effects of the steroid norethandrolone have been investigated in four elderly underweight patients.

In each case there was a significant gain in body weight associated with marked nitrogen retention.

Total body water and extracellular water measurements were made before and after treatment, and the results supported the view that the weight gain was due to an increase in the lean body mass and not merely due to a simple fluid retention.

No androgenic or other unpleasant effects were observed from use of the drug.

In our opinion norethandrolone has definite anabolic properties and should prove to be of considerable value for increasing the lean body mass in individuals who consistently fail to gain weight on an adequate diet.

Grants in aid of this study have been made to one of us (D.W.) by the Nuffield Foundation and by the Scientific and Research Subcommittee of the Newcastle Regional Hospital Board.

We wish to acknowledge the supply of norethandrolone ("nilevar") from Messrs. G. D. Searle and Co. Ltd.

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ACTION OF METHALLENOESTRIL ON THE POST-MENOPAUSAL ENDOMETRIUM AND VAGINAL EPITHELIUM

A COMPARATIVE STUDY

BY

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Methallenoestril ("vallestril") is a phenolic acid derived from naphthalene that has been shown to be more strongly oestrogenic than oestradiol when administered parenterally in oily solution to castrated female rats (Courrier, Horeau, and Jacques, 1947). It has the descriptive formula 3-(6-methoxy-2-naphthyl)-2,2-dimethylpentanoic acid. It is relatively insoluble in water and gastric contents, but soluble in alcohol, in oil, and in dilute bases such as occur in the intestinal secretions. Sturnick and Gargill (1952) have found methallenoestril to be effective in the control of "menopausal symptoms" and of the pain of post-menopausal osteoporosis, without causing uterine bleeding during treatment or after withdrawal.

Potency studies in the laboratories of the manufacturers have shown that, while the oestrogenic effect of methallenoestril on the vaginal epithelium of spayed mature rats is twice that of oestrone, its influence on uterine growth in immature mice is only one-tenth as potent as that of oestrone. The present investigation was undertaken to determine whether this selective oestrogenic action of methallenoestril was demonstrable in women, and this was done by comparing its action on the endometrium and vaginal epithelium with that of stilboestrol.

The subjects of the investigation were patients awaiting vaginal repair operations for genital prolapse in whom the menopause had occurred five or more years previously. Each of these was given a course of tablets labelled A, B, or C, the nature of which was unknown to the investigators until the study was complete. The course of tablets, one a day, was given for a period of between 40 and 84 days, and the interval between completion of the course and endometrial curettage at the time of the vaginal repair operation was between 4 and 15 days.

The tablets labelled A contained 5 mg. of methallenoestril, those labelled B were inert, and those labelled C contained 0.5 mg. of stilboestrol.

Results

It may be seen from the Table that of the seven patients who received methallenoestril only one experienced withdrawal bleeding. This patient and one other were found to have hyperplastic endometrium. Of the 10 patients in the control group not one had withdrawal bleeding, although in three cases endometrial polypi were found, and in two of these the endometrium was relatively hyperplastic for a post-menopausal woman. Of the eight patients who received stilboestrol, four experienced withdrawal bleeding only, one induced bleeding, and one both induced and withdrawal bleeding. All of these, together with a seventh who did not bleed, were found to have hyperplastic endometrium. One patient had an endometrial polyp.

The diagnosis of "hyperplastic endometrium" was made on the basis of a naked-eye judgment of the amount and thickness of the endometrium confirmed by microscopical evidence of active proliferation or frank cystic hyperplasia. The four endometrial polypi (of which three occurred in the control group) were discrete adenomata arising by slender pedicles within the uterine cavity. They were considered to be innocent neoplasms rather than manifestations of hyperplasia.

The condition of the vagina was compared by noting the presence or otherwise of obvious atrophic changes in the epithelium. This was present in one of the seven methallenoestril cases, five of the 10 controls, and none of the eight stilboestrol cases.

Five patients volunteered the information that they felt better in general health and that their symptoms of prolapse were moderated after taking the tablets. Of these, three received methallenoestril and two the inert tablets.

Tabulated Results

	Age	Years since Menopause	Days of Treatment	Interval before Curettage (Days)	Induced Bleeding	Withdrawal Bleeding	Atrophic Vaginitis	Endometrium		
								None or Scanty	Hyperplastic	Polyp
A. Methallenoestrii										
2117/56	68	16	49	10	—	—	—	—	—	—
30661/54	65	15	63	15	—	—	—	—	—	—
46285/54	62	12	42	10	—	—	—	—	—	—
11174/56	62	10	42	10	—	—	—	—	—	—
13164/54	61	10	46	4	—	—	—	—	—	—
25128/55	58	10	62	10	—	—	—	—	—	—
10982/56	57	5	42	10	—	—	—	—	—	—
B. Control										
26697/54	59	18	44	10	—	—	—	—	—	—
27838/52	56	14	41	10	—	—	—	—	—	—
11349/50	63	11	42	10	—	—	—	—	—	—
2800/49	57	8	43	10	—	—	—	—	—	—
21632/55	57	7	42	10	—	—	—	—	—	—
10316/55	59	5	44	8	—	—	—	—	—	—
392/57	55	7	63	10	—	—	—	—	—	—
5072/57	46	5	73	10	—	—	—	—	—	—
40193/56	59	10	84	10	—	—	—	—	—	—
27136/52	57	5	84	10	—	—	—	—	—	—
C. Stilboestrol										
35248/53	59	19	40	10	—	—	—	—	—	—
925/49	57	9	44	8	—	—	—	—	—	—
373/56	57	7	41	10	—	—	—	—	—	—
4351/56	57	7	41	10	—	—	—	—	—	—
38570/56	66	14	69	10	—	—	—	—	—	—
23902/56	61	11	68	10	—	—	—	—	—	—
44359/49	61	8	63	13	—	—	—	—	—	—
18427/56	66	16	82	10	—	—	—	—	—	—

Summary

A "double blind" trial of methallenoestril (vallestril) and stilboestrol has been carried out on 25 post-menopausal women awaiting vaginal repair operations.

Abnormal bleeding occurred in six out of eight patients who received stilboestrol and in only one of

the seven patients who received methallenoestril. Both macroscopic and microscopical examination of the endometrium has shown a lesser degree of oestrogenic stimulation in those who were given methallenoestril. The results may be largely explained by the fact that methallenoestril is a weaker oestrogen than stilboestrol, but there is some evidence of a selective action by the former which would make it a more suitable preparation for the treatment of post-menopausal vaginitis, post-menopausal osteoporosis, and the symptoms of the climacteric. A healthy vaginal epithelium was observed in all eight of the patients treated with stilboestrol, and all except one of the seven who were given methallenoestril. Five of the 10 controls had obvious atrophic changes.

We wish to thank Mr. Victor Lack, Mr. Alan Brews, and Mr. Robert Percival for permission to treat their patients and for their encouragement. The tablets for the investigation were prepared by G. D. Searle and Co.

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A UNIQUE CASE OF AUTO-IMMUNE ERYTHROCYTE SENSITIZATION

BY

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Occasionally the red blood cells of an apparently normal person will be found to have a positive reaction when a direct anti-globulin test is carried out. Usually this can be demonstrated to be a "false positive" due to *in vitro* sensitization with the normal cold incomplete antibody. Very rarely is a true positive reaction found in healthy people (Dacie, 1950, 1954). Little has been written on this aspect of the antiglobulin test, and the occurrence in a blood donor of a true positive direct antiglobulin reaction must be very unusual.

Mr. X, group A₁, Rh genotype cde/cde, has given 26 donations of blood since 1941, and since 1948 has attended donor sessions regularly twice or three times each year. No trouble was experienced until his 25th donation in October, 1957. The hospital laboratory, selecting blood for one of their "dangerous" recipients, included an indirect antiglobulin test as well as saline and albumin techniques in the compatibility tests. Mr. X's blood was found to be "incompatible" by the indirect antiglobulin test, but compatible in saline and albumin media. As is the custom, this bottle of blood and the patient's serum were sent to us for investigation, when the donor's blood was found to give a moderately strong positive direct antiglobulin reaction, agglutinates appearing in about one minute. The patient's serum contained no antibodies. The apparent incompatibility on cross-matching was thus explained.

A direct antiglobulin test using serial dilutions of the reagent gave the results shown in Tables I and II. This gave the first surprise. The optimum reactions with Mr. X's cells were in the same range as the optimum for Rh (anti-D) sensitized cells suggesting a "warm" antibody was coating the cells. Inhibition of the reactions with γ -globulin showed the coating antibody was of the γ -globulin type—further confirmation that a "warm" type sensitizing antibody was involved. The second surprise came when a red-cell eluate prepared by Weiner's (1957) method was tested against a

panel of cells of known phenotype and was found to contain the specific auto-antibody anti-c. This was demonstrable by the indirect anti-globulin technique, but not in saline or albumin.

No abnormal antibodies were found in the serum. Tested against a panel of R.B.C.s, no abnormal agglutinins were present apart from a very weak auto- and pan-agglutinin demonstrable at 4° C. only. Neither cold nor warm haemolysins were detected. The Donath-Landsteiner reaction was negative.

The serological findings were those usually associated with a moderately severe haemolytic anaemia.

The haematological findings on January 25, 1958, were as follows: Hb, 92% (13.6 g./100 ml.); R.B.C., 4,510,000 c.mm.; reticulocytes, less than 1%; W.B.C., 4,000 (polymorphs 52%, eosinophils 2%, lymphocytes 40%, monocytes, 6%). R.B.C.s and W.B.C.s apparently normal; platelets, 275,000. Hess test negative. Bleeding- and clotting-times normal. Prothrombin time normal. Red-cell saline fragility—within normal limits. No abnormalities were present, nor were any found on physical examination.

Past medical history included a hernia repair in 1939 and removal of a cartilage from a knee-joint in 1956. No history of any significant illness was given. Particular inquiry into any possible virus infection was made. He has never had a blood transfusion.

In March, 1958, a further donation was taken and the extensive serological tests were repeated. The direct antiglobulin reaction was still positive, and the pattern of the reaction was identical with that previously found. An eluate prepared from the red-cell stroma no longer had an anti-c specificity, having broadened its activity and now being, so-called, non-specific.

Dr. W. Weiner has completely confirmed the later serological findings and had some additional investigations done on the serum. Ultracentrifugal analysis gave perfectly normal results. A haptoglobulin estimation showed these to be definitely deficient, having a level only 50% of normal.

The fate of the man's blood donations since 1952 was investigated by inquiry of the hospitals using them. A particular point was made of asking whether any difficulty had been experienced in performing compatibility tests, particularly when the indirect anti-globulin technique had been used. The most recent occasion when the indirect antiglobulin test was used in a compatibility test was in November, 1955, and this was negative. Knowing that, using a single-dilution antiglobulin test, a positive reaction would have been obtained if present, there is no reason to doubt that in 1955 this donor's erythrocytes were normal. An antiglobulin test was not done on these cells again until the start of this investigation in November, 1957; the present state of autosensitization has therefore developed within the last two years.

TABLE I.—Direct Antiglobulin Test

Final Dilutions of A.H.G.	4	8	16	32	64	128	256	512	1,000	2,000
Mr. X's Rh-positive cells, sensitized with anti-D	w	w	w	(+)	+	++	++	++	+	+
Rh-positive cells, unsensitized	+	+	+	+	+	+	+	+	+	+

TABLE II.—Direct Antiglobulin Test after Adding an Equal Volume of 1/400 γ -globulin to each Dilution of A.H.G.

Final Dilutions of A.H.G.	4	8	16	32	64	128	256	512	1,000	2,000
Mr. X's Rh-positive cells, sensitized with anti-D	—	—	—	—	—	—	—	—	—	—
Rh-positive cells, sensitized with anti-D	(+)	(+)	?	—	—	—	—	—	—	—
Rh-positive cells, unsensitized	(+)	?	—	—	—	—	—	—	—	—

Mr. X is 44 years old and is a coal-miner working at the coal face. He has no complaints whatsoever. He has two abnormalities—a positive direct antiglobulin reaction and a low haptoglobulin level. An apparently healthy man with this type of true positive direct antiglobulin reaction and no significant previous illness seems to be unique.

This case obviously needs following before a final answer to the present finding can be given. The most likely explanation is that he has an acquired haemolytic "anaemia" which has been detected in a very early stage, and which is at present fully compensated, although one might have expected a higher reticulocyte count. The low haptoglobulins suggest that haemolysis may be active. Nosslin and Nyman (1958) found these levels to be low in haemolytic diseases. The serological findings are those of a haemolytic anaemia; the haematological findings are normal. The picture is very similar to that sometimes seen in known cases of acquired haemolytic anaemia, either during natural remission or after treatment with steroids or by splenectomy. It remains to be seen whether in the course of months or years the present findings will change and show the full picture of an acquired haemolytic anaemia.

A further examination of specimens taken in October, 1958, showed no change. The haemoglobin level was normal and the red cells still showed the same degree of sensitization.

Acknowledgments are due to Dr. W. Weiner for the great interest he has shown in this case, and to Dr. E. K. Blackburn for carrying out the haematological tests.

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BILATERAL THROMBOPHLEBITIS AFTER A SINGLE DOSE OF ERGOTAMINE TARTRATE FOR MIGRAINE

BY

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Although ergotamine tartrate has such a well-established place in the treatment of the acute attack of migraine and the toxic effects of ergot and its alkaloids are so often quoted, the incidence of thrombophlebitis occurring after ergotamine tartrate has not often been recorded; in fact, only one reference has been found—that of Sir Russell Brain (1947), who, writing on the treatment of migraine, states: "Ergotamine tartrate has a highly specific effect on the headache . . . there seems no risk of ergotism, but pregnancy and arteriosclerosis are contraindications, and, rarely, a single dose may cause thrombophlebitis."

Below are given the case histories of three patients who in one practice in the course of two years have developed bilateral thrombophlebitis following a single dose of ergotamine tartrate.

Case 1

A married woman aged 42, with two children, was diagnosed by an ophthalmic surgeon in 1954 as suffering from migraine, precipitated by strong sunlight. The wearing of dark glasses seemed to prevent the recurrence of any severe attacks, but ergotamine tartrate ("femergin") was prescribed in case of need.

On May 11, 1955, she developed an acute attack of migraine and took her first dose of ergotamine (two 1-mg. tablets) at 11 a.m. About 2 p.m. the headache disappeared quite suddenly, but she experienced a cramp-like pain in her right calf. This pain persisted and grew in severity throughout the afternoon and evening. In the night she was very restless with the pain and began to have sharp pains in the left leg. In the early hours of the following morning she was unable to stand up.

Examination later that morning showed that she was afebrile and had no gross varicose veins; but a dull red line, which was very tender, was present over the course of the long saphenous veins in the right leg, extending about a quarter of the way up the right thigh. A similar red line, also very tender, was present in the left leg, but this did not extend above the knee.

Both legs were strapped with "elastoplast," sorbo-rubber strips covering the affected veins, and she was encouraged to be ambulant. Within 24 hours she was much easier, all symptoms had gone within four days, and when the strapping was removed after 12 days there was no evidence of any residual thrombosis. She did show some varicosity of the long saphenous veins, more marked in the right leg.

Case 2

The patient, a married man aged 44, had a history of marked varicose veins in both legs, for which he had had injections in 1942, which had been followed by a troublesome phlebitis. This had dissuaded him from any surgical procedure, and he had resigned himself to a below-knee elastic support. He had also managed to change from a manual occupation to a sedentary job in May, 1956—a change which had relieved his leg symptoms but aggravated his migraine.

On July 19, 1956, he received his first prescription for ergotamine tartrate, and on July 23 he had a typical migraine attack on rising. He took two 1-mg. tablets sublingually about 9 a.m. (it was Sunday) and then had a little breakfast. His headache began to ease and he decided to seek some fresh air in the garden. About 10.30 a.m. he was compelled to return indoors with severe pains in both legs. The pains increased, and by lunch-time he was only capable of lying on his bed. After a restless day and night he found numerous red lines on both legs.

Examination then revealed an intensive network of very tender red lines over both legs and extending half-way up each thigh. He was admitted to hospital, and the following day both long saphenous veins were ligated at the saphenous opening to obviate the danger of pulmonary emboli. He made a steady recovery.

Case 3

A married man, a shop-proprietor aged 44, whose mother had suffered from asthma, was first diagnosed as suffering from migraine in 1952. Codeine tablets usually relieved the attacks, but in February, 1957, they became more frequent and he was subsequently kept on a modified Gowers mixture as a preventive. On March 23 he had his first prescription for ergotamine in the form of "cafergot."

On April 5 he felt a typical attack starting on rising. He returned to bed and swallowed his first dose of ergotamine tartrate (two tablets) at 10.30 a.m. He fell asleep, and awoke at 2 p.m. with his headache gone but having severe pains in the varicose veins in both calves. He remained in bed, and slept through the early part of the night, but found himself unable to stand the next morning owing to severe pains in both legs, the left being the worse.

Examination revealed a tender red line over a vein in his left leg, extending for about 4 in. (10 cm.). He had a small area of tenderness over a vein in the right calf but no redness. Both legs were strapped with elastoplast; he was much better in 48 hours, and when the strapping was removed after one week no signs of thrombosis or phlebitis were present.

Discussion

Von Storch (1938), in a review of an early trial of ergotamine tartrate for migraine, mentions perivascular pains and pains in varicose veins as a rare complication. Spasm of the saphenous vein is referred to by Clarke (1957). The observation of Russell Brain quoted above is, however, the only reference to thrombophlebitis occurring after ergotamine; he mentions it as happening after a single dose, which is confirmed by the above three cases.

The third case is particularly interesting, for the difference between this patient's two legs tends to suggest that the pain which occurs in varicose veins following ergotamine may be the first stage of a thrombophlebitis.

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SALT INTAKE AND HYPERTENSION

BY

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Hypertension was found by Dahl and Love (1957) to be associated with a high dietary intake of salt. In a group of 1,346 adults, habits of salt intake were classified as follows: (1) low intake—never add salt to the food at table; (2) average intake—add salt to food after tasting if insufficiently salty; and (3) high intake—routinely add salt to foods customarily salted before tasting.

TABLE I.—Correlation of Salt Intake and Hypertension in 1,346 Adults

	No. in Group	No. with Hypertension
Low intake	135	1
Average intake	630	43
High intake	581	61

Hypertension was significantly more frequent among those with a high intake than among the average group (Table I, $p < 0.01$).

Dahl (1957) also studied the sodium excretion in hypertension, assuming that sodium is the important ion and that sodium excretion normally reflects intake with reasonable accuracy. The average sodium excretion of nine hypertensive men was 204.3 ± 27.3 mEq/24 hours, while the average excretion of 19 men with normal blood pressure was 165.7 ± 32.0 mEq/24 hours. The difference is significant ($p < 0.01$). In the present work sodium excretion has been measured in a larger group of men with hypertension.

Method and Results

The 24-hour urinary excretion of sodium has been measured in 20 men with hypertension and in 20 men with normal blood pressures. Blood-pressure levels over 140/90 mm. Hg have been regarded as abnormal. The mean age of the group with hypertension was 49.8 years, and their mean blood-pressure level 218.9/127.3 mm. Hg. The mean age of the normotensive group was 56.3 years. All were out-patients, taking their normal home diet and unaware that their salt intake was being investigated. The work has been confined to men because of the greater difficulty of

collecting samples in women and because of premenstrual sodium retention. Sodium was estimated by flame photometry.

The mean sodium excretion of the 20 men with hypertension was 156.3 mEq/day (S.D.=54.6). The mean excretion in the 20 with normal pressures was 154.1 mEq/day (S.D.=46.2). The difference is not significant.

In this small group little reliance can be placed on differences in the subjects' accounts of their dietary habits. It is of interest, however, that high salt intake was commoner among the men with normal blood pressures (Table II).

TABLE II.—Salt Intake in 20 Men with Hypertension and 20 Men with Normal Blood Pressures

	Salt Intake		
	High	Moderate	Low
Normal blood pressure	9	10	1
Hypertension	4	15	1

Discussion

The present results do not confirm the findings of Dahl and Love (1957) that hypertension is associated with a high sodium intake and excretion.

There is other evidence suggesting that sodium plays an important part in the pathogenesis of hypertension. Hypertension is extremely rare among the Australian aborigines (Hicks and Matterns, 1933), the Cuna Indians of Panama (Kean, 1944), and the tribes from the Szechwan mountains of West China (Morse and Beh, 1937). A factor common to all these peoples is a low sodium intake of 1–2 g. or less a day, but many other factors, nutritional or genetic, may be responsible.

With restriction of dietary salt to less than 250 mg. a day, the blood pressure falls in most hypertensive patients and rises again if more salt is added (Kempner, 1948). Moreover, Perera and Blood (1947) found that the rise in blood pressure of hypertensive subjects resulting from deoxycortone could be prevented by restriction of sodium intake. They showed also that an increase of dietary sodium chloride from 4 to 15 g. daily produced a slight but definite rise in blood pressure in six patients with hypertension.

In rats the use of 2% sodium chloride as drinking-fluid for six weeks produces hypertension and renal hypertrophy (Sapirstein *et al.*, 1950). The feeding of salt also enhances the hypertension resulting from experimental renal ischaemia (Verney and Vogt, 1938), and salt restriction prevents production of hypertension in rats by deoxycortone injection (Braun-Menendez, 1951).

Summary and Conclusions

The sodium excretions of 20 men with hypertension and 20 men with normal blood pressures did not differ significantly. Other evidence suggests that sodium is necessary for the production of hypertension. In our society, however, hypertension cannot be related simply to dietary sodium intake.

I thank Dr. George Discombe for the sodium estimations. This investigation formed part of work awarded the Central Middlesex Hospital Research Prize for 1958.

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Medical Memorandum

A Simple Procedure for Early Detection of Hypofibrinogenaemia

For the diagnosis of hypofibrinogenaemia or afibrinogenaemia the Kjeldahl or simpler "fibrindex" (Ortho) method is most frequently used. Weiner *et al.* (1953) suggested a "bedside" method, the so-called "clot-observation test." In cases suspected of afibrinogenaemia blood is withdrawn into a test-tube. If clotting has not occurred in 10 minutes, disturbance of the fibrinogen level can be assumed. One of us (G. L. B.) suggested the incorporation of this method in the admission routine, dispensing with the use of a test-tube. The following procedure has been used in our department for the past year:

In all cases of ante-partum haemorrhage the admitting house-surgeon takes off blood for cross-matching—a routine followed in most maternity units. He notes the time when taken and proceeds with the admission routine. Ten minutes later he observes the sample. If it has not clotted he considers the patient to be suffering from hypofibrinogenaemia. In cases where resuscitative action must be taken immediately—and it is in just such cases that a rapid diagnosis is needed—he can at once proceed and return to the sample later.

We believe hypofibrinogenaemia is not as rare as is usually suggested. Of the 2,176 cases admitted to the maternity unit of the North Middlesex Hospital during 1957, four had proved hypofibrinogenaemia or afibrinogenaemia (an incidence of 1 in 544), and two of these were diagnosed on admission by employing this simple test.

The first case was one of severe post-partum haemorrhage after a spontaneous unexplained stillbirth, where it was noted that the sample taken for cross-matching at the onset of the haemorrhage had not clotted. The patient later developed anuria, from which she subsequently recovered.

In the second case the afibrinogenaemia was associated with a ruptured uterus after external version under anaesthesia (Riedel, 1958). This patient died, and the diagnosis of both ruptured uterus and afibrinogenaemia was made in retrospect.

The third case was one of intrauterine death where the admitting house-surgeon noted poor clot formation, and a low fibrinogen level was subsequently confirmed biochemically. The level rectified itself spontaneously, in keeping with the findings of Hodgkinson *et al.* (1955) of fluctuating fibrinogen levels in those cases.

The fourth case is described in some detail, as it illustrates the efficacy of this method.

ILLUSTRATIVE CASE

An emergency admission was arranged for the patient by her own doctor. He stated that she was a para-1 aged 25, booked for home confinement, who had had a severe ante-partum haemorrhage at 38 weeks' maturity and who was in poor condition. She arrived at 7.30 a.m. in the maternity receiving-room. She was pale and shocked, with a tense, tender uterus, and was losing moderately heavily per vaginam. Her blood pressure was 90/70 mm. Hg and the pulse was feeble and rapid. No foetal heart could be heard. A catheter specimen showed the urine to be solid with albumin. Blood was taken immediately, an intravenous drip of "dextraven" begun, and morphine sulphate, $\frac{1}{4}$ gr. (16 mg.), given subcutaneously. At 7.45 a.m. one of us (J. A. R.) noted that the sample of blood had not clotted. (Subsequently absence of fibrinogen was confirmed.) The following measures were taken: (1) the dextraven was changed to group O, Rh negative blood; (2) 6 pints (3.4 litres) of blood was ordered from the pathological labora-

tory; (3) a solution of fibrinogen was prepared; and (4) two bottles of triple-strength plasma were prepared.

At 8 a.m. infusion of triple-strength plasma was begun after the patient had had 1 pint (570 ml.) of blood. Her pulse was still feeble and rapid. Vaginal bleeding continued, and it was noted that this blood showed no signs of clotting. As she reacted with a rigor to the plasma, given at speed, blood was given immediately afterwards.

At 9 a.m. the second bottle of triple-strength plasma was started. Her blood pressure remained low (105/75 mm. Hg), but the pulse had improved in volume and was 90. The blood then showed signs of clotting. A vaginal examination was carried out; the cervix was four fingerbreadths dilated, and the membranes, which were intact, were artificially ruptured. A second 400 ml. of plasma had been given by 9.15 a.m., and spontaneous delivery of a stillborn infant occurred at this time. Ergometrine maleate, 0.5 mg., was given intravenously with the birth of the anterior shoulder; the placenta, which followed immediately, was covered by a large, dark clot of 30 oz. (850 ml.) (supporting the theory that afibrinogenaemia occurs after placental separation). Five units of "pitocin" were added to the next pint (570 ml.) of blood, as there was a steady loss and the uterus tended to relax.

At 10 a.m. the fibrinogen was dissolved and ready for administration. By this time the patient had received 4 pints (2.2 litres) of blood and two bottles of triple-strength plasma, and 2.3 g. of fibrinogen in 200 ml. of water was given slowly.

At 11 a.m. the blood clotted normally. The patient's condition was fair, her blood pressure being 100/60 mm. Hg, and there was a slight trickle of blood per vaginam. The pulse was 90 and of good volume. Two more pints (1,140 ml.) of blood were given.

At 5 p.m. her condition was satisfactory; blood pressure 120/80 mm. Hg, pulse 86. The total loss was estimated at 120 oz. (3.4 litres), which had been replaced by 120 oz. (3.4 litres) of blood, and two bottles of triple-strength plasma. That the loss was underestimated was proved two days later, when the haemoglobin (which had been 73% on admission) had fallen to 57%.

The fibrinogen content of the blood was normal 26 hours after delivery, when the clotting-time was $4\frac{1}{2}$ minutes.

COMMENT

In this case the diagnosis of hypofibrinogenaemia was made within 15 minutes of admission. Fibrinogen replacement had begun 15 minutes later. Within 90 minutes the patient had received 6 g. of fibrinogen (in the form of concentrated plasma) and the blood showed signs of clotting. That, and the measures taken to prevent post-partum haemorrhage, made it possible for the patient to be discharged on the eleventh day, with a normal blood pressure, a trace of albumin in the urine, and a haemoglobin of 67%.

The reasons why we think this method, which is only a slight improvement on the clot-observation test, is worth reporting are: because it is simple and does not need help from a laboratory, because it is applied routinely, and because the diagnosis can be made by an inexperienced house-surgeon soon after admission. Early diagnosis is of prime importance in the treatment of hypofibrinogenaemia.

We thank Mr. K. A. K. Hudson and Mr. A. W. Purdie for permission to report cases under their care.

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Reviews

MEDICINE AND THE NAVY

Medicine and the Navy, 1200-1900. By J. J. Keevil. Volume II—1649-1714. (Pp. 331+ix; illustrated. 40s.) Edinburgh and London: E. and S. Livingstone, Ltd. 1958.

It is indeed fortunate that Surgeon Commander Keevil lived long enough to complete the essentials of his second volume of *Medicine and the Navy*. This volume follows the pattern of the first, presenting a most entertaining and readable account of the development of medicine in England with a naturally naval bias. The theme running through this collection of historical facts might well be founded on the dictum of Lowell that "Tis man's worst deed to let things that have been run to waste and in the unmeaning present sink the past," for it is a somewhat pathetic story of the obscurantism of the age which could not or would not profit by lessons learnt. The prevention of scurvy among sailors, admittedly empirical, had been found, but 200 years later the medical profession was still unable to connect cause and effect. It may also be salutary for those who decry the National Health Service to realize that it took high on 200 years to produce the money to build a naval hospital. History as recounted in this volume undoubtedly repeats itself, for there is a strange, if somewhat ominous, similarity between the frequent "Commissions for Sick and Wounded" of the seventeenth and eighteenth centuries and our modern Commission on the Medical Services of the Crown. The basic reason for these commissions—an attempt to produce the effect of a financial quart out of the Treasury pint pot—is always the same, and it would appear that the results are equally alike.

This volume brings the story up to 1714. It is tragic to realize that Surgeon Commander Keevil, a historian of such outstanding capacity, cannot himself bring the history up to date. We can only trust that the Naval Medical Service will find another "Keevil" to carry on the work of this very gifted and painstaking biographer of the naval surgeons of the past, so that their persistence and perseverance in moulding the evolution of the Naval Medical Service into the highly efficient service of the present day may receive the credit they so richly deserve.

J. C. DOWSE.

ADVANCED PAEDIATRIC SURGERY

Pediatric Surgery. By Orvar Swenson. (Pp. 740; illustrated. \$20.) New York: Appleton-Century-Crofts, Inc. 1958.

This book is the work of one who worthily carries on the great traditions of the Boston school of paediatric surgery. His solving of the problem of Hirschsprung's disease is the most important work to come from it since Ladd's classical study of the congenital malrotations of the intestine.

It is significant that in the last few years three detailed, highly instructive, beautifully produced, and very expensive textbooks have appeared on the subject of the advanced surgery of the infant and young child—those of Gross, of Boston; Grob, of Zurich; and now this one of Swenson's. The demand responsible for the appearance of these books springs from a growing realization that many babies and young children are being allowed to die unnecessarily because of the remarkable lack of teaching on this subject in medical education. (Though the Scottish schools, in particular Glasgow, treat it far better than the English.) The whole subject has changed vastly in quite recent times: it is not so long ago that a work on paediatric surgery (Brenner, 1938) began with the words, "The immature organism is predominantly unstable, and this incompetence forbids heroic surgery."

Taking the adjective heroic to mean extensive, we see in all these books that this timidity is entirely unjustified: given the necessary technique, the most drastic and extensive operations can be successfully performed on the youngest and frailest of infants. And it is with technique

that Dr. Swenson is particularly concerned; in this respect his book is the most instructive of the three. Because of his own efficiency in this regard he favours immediate end-to-end anastomosis when bowel has to be resected for atresia, or for necrosis in such conditions as intussusception; and it is probably for the same reason that, like other great American surgeons, he dislikes paying the price of added risk for the ease of operating given by muscle relaxants.

He makes the stimulating suggestion that congenital dilatations of the ureters and bladder are caused by defects of the parasympathetic system. Whether or not this is accepted, his method of replacing an inefficient ureter by a segment of surgically narrowed bowel illustrates his technical ingenuity and powers. I am personally flattered by his recommendation of my technique for hypospadias; not surprised by his flat statement that hormone therapy has no place in the treatment of the undescended testicle; and hope that on experiment and reflection he will give up the belief that the cremaster can pull this organ into the inguinal canal.

Like all human works the book has gaps and inequalities of treatment. There is no mention of tonsils and adenoids, nor of spina bifida; the section on hare-lip and cleft palate is poor; and paediatric surgeons in the States have so far been unable to break into the tightly closed shop of the orthopaedists, where it is possible that new advances might result from the approach that has been so successful elsewhere. But the book is a most valuable one for the magnificent treatment of the infant's abdomen and chest, in particular for the section in which the author describes his unequalled experience of Hirschsprung's disease.

DENIS BROWNE.

METABOLISM OF BONE

The Chemical Dynamics of Bone Mineral. By William F. Neuman and Margaret W. Neuman. (Pp. 209+xi; illustrated. 37s. 6d.) Chicago: University of Chicago Press. London: Cambridge University Press. 1958.

There can be fewer subjects in medicine which leave teachers and taught in such an uneasy frame of mind as that of bone metabolism. The original fertile ideas as to calcification processes—such as the calcium and phosphorus product of the plasma, phosphatase and the local factor—have been barely extended since they were originated, and they have subsequently been accepted and developed so glibly by clinicians as to reach the realm of fantasy. This book aims to correct this situation. Its first chapters deal in physico-chemical terms with the modern views of solution chemistry, solubility of bone mineral, crystal structures, and surface chemistry. Heavy going, but an essential corrective in the circumstances. From here on things become more easily digestible by doctors, and the chapters on skeletal dynamics and on physiological regulatory mechanisms are thrilling from the way the authors have developed the basic arguments along more clinical directions. The key factor here is the local citrate concentration and its influence on the product of the ionic activities of Ca^{++} and HPO_4^{--} . Both parathyroid hormone and vitamin D can now be plausibly linked with different stages in citrate metabolism, and thus act independently but in the long run synergistically. The final chapter deals critically with the authors' current concept of the calcification mechanism. They firmly reject the generally held view that the local stimulus is due to an increase in calcium and phosphorus product mediated by phosphatase, and prefer to suggest the existence of a local crystal seeding mechanism (epitaxy) probably induced by the organic constituents.

It may appear unfortunate that I cannot withhold a protest against the frequent misspelling in the figures of the standard abbreviations for common terms such as gram and milligram. This slovenliness appears to be increasing in the medical literature of the English-speaking countries, which seems a pity when our spelling conventions have

been internationally agreed to by the entire scientific world, Russia and China included.

The book fills a long-felt gap in the medical literature. Its clear and forthright style makes it easy to read and remarkably stimulating to one's thought processes.

C. E. DENT.

ADVANCES IN VIRUS RESEARCH

Advances in Virus Research. Volume V. Edited by Kenneth M. Smith and Max A. Lauffer. (Pp. 376+x; illustrated. \$9.50.) London: Academic Books, Ltd. New York: Academic Press, Inc. 1958.

This is the fifth in a series of annual reviews of advances in virus research. The striking feature of this book is the apt choice of a fundamental subject from each field of virology and the completeness with which each subject is discussed. The first essay, by J. B. Brooksby, on "The Virus of Foot and Mouth Disease," is an up-to-date and full account of the virology of this infection. Mention is made of the geographical distribution of the virus types, but little is said about its epidemiology. Herbert Werner's contribution, "Psittacosis-Lymphogranuloma Group of Viruses," gives a comprehensive account from both the epidemiological and laboratory aspects. Most usefully he emphasizes the large numbers of animal diseases caused by this group and the relation of these animal viruses to human disease. There are two contributions on bacterial viruses. The first, by G. S. Stent, entitled "Mating in the Reproduction of Bacterial Viruses," is a well-studied and extremely interesting theoretical essay based on work on the action of ultra-violet light, radioactive phosphorus, and x rays on phages and their host bacteria. The interpretation of Watson and Crick's classical work on the molecular structure of deoxyribose nucleic acid is modified to explain his observations. Using four phages as models, G. Bertani gives a lucid and factual account of lysogeny. A lengthy discourse is given by Ph. L'Heritier on the "Hereditary Virus of *Drosophila*," with special emphasis on the action of CO₂ on the infected insects and the transmission of this virus. There has been an outstanding requirement for a review on the measurement of complement-fixation by viruses. This has been amply fulfilled by Forrest Fulton's article. Each component of the test has been fully dealt with, and their application in three dimensions as antigen, antiserum, and complement contours described. The author has tackled a difficult subject and has attempted to clarify it by a mathematical approach. The last contribution, "The Mechanism of Hemagglutination by Influenza Virus," is by A. Buzzell and M. Hanig. This is a detailed review of the subject; nothing important has been omitted, and it is written so concisely and clearly that all who work with influenza will find it invaluable.

P. S. GARDNER.

THE DISCOVERER OF STREPTOMYCIN

My Life with the Microbes. By Selman A. Waksman. (Pp. 320. 21s.) London: Robert Hale Ltd. 1958.

Although it is true that the great discovery comes to the mind prepared, it is also true that there are many different ways of preparing the mind. Fleming's mind was trained to appreciate the value of the chance observation, but Dr. Waksman had prepared himself for the discovery of streptomycin by knowing more about soil bacteriology, and particularly the influence of the members of this teeming microbiological population upon each other, than anyone else in the world. His researches conducted for 20 years had shown, as early as 1936, that actinomycetes were able to exert a considerable influence on the growth and activities of fungi and bacteria in the soil. The discovery of streptomycin in 1943, therefore, following the discovery of penicillin by Fleming, was no more than the climax of these researches, for it was prepared from an organism, *Actinomyces griseus*, first isolated by himself and a collaborator in 1915.

Dr. Waksman emigrated from Russia to the United States in 1910, and has been since 1918 on the staff of the College of Agriculture at Rutgers University in New Jersey. The

University had made an agreement with Merck and Co. in 1939 that all patentable processes should be assigned to this firm in exchange for a royalty of 2½% and for considerable scientific help provided by Merck's. After the discovery of streptomycin Merck's agreed that other interested organizations should be allowed to manufacture it under arrangement similar to that made with themselves.

Some of the interest of Dr. Waksman's excellent autobiography is to be found in his story of the complicated relationships that crowd upon the discoverer in the modern world—relations not only with his employing university and with manufacturers, but also with the press and the public, with patients both gratified and disappointed, and even with his assistants. A former student instituted a legal suit for a share of the large profits; he was paid 125,000 dollars for the assignment of all foreign patent rights and 3% of the royalties. Whereupon Dr. Waksman, whose judgment and good will were not submerged by these legal complications, decided that half his share in the royalties—namely, the 10% which he had returned to the Rutgers Research and Endowment Foundation—should be distributed among the 26 of his former students and assistants who had helped in the development of the antibiotics programme. The law is now prepared, not only to assess the financial value of an erring wife, but also to judge the contribution made to a great discovery by the laboratory assistant who prepares the culture media. A friend of mine when receiving an award for his researches said, "The prestige I gladly share with my assistants; the money I will keep for myself"—a simple and old-fashioned solution of a problem which has now acquired a new look.

D. V. HUBBLE.

PERIPHERAL CIRCULATORY DISTURBANCES

Begutachtung Peripherer Durchblutungsstörungen. By H. W. Passler and H. Berghaus. (Pp. 272+xi; illustrated. DM.45.) Stuttgart: Georg Thieme Verlag. 1958.

This book on the examination of peripheral disturbances of the circulation is based on 100 well-documented cases. Investigation by serial angiography is found to be very important. There are a number of excellent photographs of the vessels of the legs obtained in this way. The author claims that it is absolutely safe. The campaign in Russia provided an enormous amount of material for the study of the effect of cold on the vascular system. The author had special opportunity to investigate these cases. The effect of cold is considered in both healthy and diseased arterial systems. Deficiency states are dealt with, and the effects of trauma. In another section the effects of peripheral disturbance of the venous circulation are considered. The numerous cases are well described and shortly presented. The illustrations are excellent. There is a full list of references. The print and index are clear and adequate. Altogether an up-to-date and efficient presentation of an important subject. The book can be heartily recommended. As the title implies, there is nothing about therapeutics.

TERENCE EAST.

Centenary of the General Medical Council, 1858-1958 (pp. 31 +2 plates, published by the Council, 3s. 6d.) gives an account of the history and present functions of the G.M.C. compiled by Mr. Walter Pyke-Lees, its present Registrar. After a brief note on the events leading up to the Medical Act of 1858, which brought the Council into being, Mr. Pyke-Lees describes the difficulties encountered in the preparation of the first *Medical Register* and *British Pharmacopoeia*. He also discusses the Council's efforts from time to time to promote legislation for the better discharge of its functions. The Council's duties in the field of medical education—not always appreciated—are shown to be one of its major concerns; it has devoted much time to examination and revision of the curriculum. Its disciplinary powers, it is pointed out, are not intended to be retributive, but are for the protection of the general public. In the words of Sir Donald MacAlister, an outstanding past-president, the Council's two great functions are "to prevent the unfit from gaining access to the Register, and . . . to remove the unworthy from it."

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B.M.A. CLINICAL MEETING

The candid, and usually caustic, critic of the B.M.A. is never tired of saying that an organization which costs over a quarter of a million pounds a year to run spends too much of its energy on getting more money for doctors. Those who report the A.R.M. in the press sometimes accuse our spokesmen of talking money instead of medicine, of what they can get out of the country instead of what they can give it. Since 1948 the B.M.A., the critic says, has taken on too much of the colouring of a trade union—too much, at least, for the liking of many of its members. The worst consequence of the N.H.S. is that it has made doctors too self-conscious about money. And small wonder! The gay promise of the Spens Reports has not been fulfilled. What seemed a decent enough charter has been turned by politicians and the quibblings of civil servants into a dirty piece of paper. Not insensitive to all this, those responsible for the conduct of B.M.A. affairs have this year, and last week, instituted the first Annual Clinical Meeting. It was held in Southampton from December 4 to December 7. It was an annual meeting of the B.M.A. in which the words Spens, Danckwerts, capitation fee were neither uttered nor published. It was, refreshingly and hopefully, a meeting at which men and women spoke and thought solely of their work, of clinical medicine and scientific investigation. It was a meeting of doctors.

Panel discussions, general sessions, colour television, medical films, clinical demonstrations in the hospitals of Southampton, filled out the day, with short respites for lunch and tea. There was a big attendance of doctors from the neighbourhood and from further afield, and many distinguished physicians and surgeons came from as far north as Edinburgh to join in this feast of reason and good fellowship. A large audience saw a magnificent demonstration of a "live operation" for atrial septal defect colour-televised from Southampton General Hospital. The other *coup de théâtre* was the Transatlantic Clinical Conference between a British group in the Guildhall of Southampton and a team from the U.S.A., at the American Medical Association's Clinical Meeting in Minneapolis. There were

two cases for diagnosis, and only one member of each team knew the answer for his own side. It was, certainly, at least for the British, a dramatic occasion. Two to three hundred British doctors in Southampton Guildhall participated in a clinical conference between four British and three American doctors separated by four thousand miles. Medicine certainly is not dull, and no one who listened in will ever again see a case in which there is an excess of gammaglobulins in the blood without thinking of myxoma of the atrium.

The Southampton meeting was a success, and any fears its sponsors may have had on this score were soon laid to rest. Drs. R. S. Russell-Smith, J. G. McDowell, and R. P. W. Shackleton, who laboured so mightily in their home town to make the meeting what it was, must now feel justifiably content. And so must be the chairman of the Committee of Management, Dr. Ronald Gibson, untiring in his efforts to weld the B.M.A. into a unity of like-minded men and women whose common meeting-ground must always be the art and craft and science of a great and inspiring vocation. As Professor A. P. Thomson, the B.M.A.'s President said last week, the Southampton Clinical Meeting has set a standard and example for the future. The next meeting will be in Norwich a year from now. Maybe less time should be given to the set lecture in the general session and more to panel discussions and clinical demonstrations. What is surely needed is active participation, and it was curious how this was felt at the Transatlantic Clinical Conference. Everyone present was silently taking part and making his own diagnosis. The lecture, however, puts the listener too far back into the passive receptivity of the student furiously scribbling notes on a hard bench. But the pattern set at Southampton, if not perfect, was little short of excellent, so excellent that some hope that a spring and an autumn clinical meeting on the Southampton model might be separated from the Annual Representative Meeting, which itself could be held regularly in the summer in the Parliament of the B.M.A.—B.M.A. House, Tavistock Square.

PERIPHERAL NEUROPATHY AND THE LUNGS

Over the years a formidable list of causes of peripheral neuropathy has grown up. It includes chemical agents, metabolic disorders, and infective states. In many diseases the neuropathy is a well-established component or complication—for example, poisoning by heavy metals, diabetes mellitus, vitamin-B deficiency, and diphtheria. In others it occurs infrequently and is usually ascribed, for want of a better

explanation, to a "toxic" cause. Occasionally it develops in conjunction with respiratory disorders, and many attempts have been made to discover a specific relationship between the lungs and the peripheral nerves. These have not been entirely unsuccessful. For example, peripheral neuropathy and carcinoma of the bronchus would seem at first sight to make uneasy bedfellows, but their association has been proved to be real beyond doubt.¹ Of the infections, perhaps advanced tuberculosis is the best known, but transient neuropathies may complicate pneumonia and influenza, and two instances of rather severe chronic peripheral neuropathy have recently been recorded in bronchiectatics, the neurological features being relieved in each by effective treatment of pulmonary suppuration.²

In trying to relate the pulmonary condition to the neuropathy, the problems posed by carcinoma and the infections are different. The mechanism of the association with carcinoma remains a complete mystery, whereas the main issue with the infections is to decide whether neuropathy occurs more frequently with inflammation of the lungs than it does with inflammation elsewhere in the body. A consideration of the clinical aspects strongly suggests that such mechanisms as may be involved are dissimilar in the two pulmonary conditions.

The first manifestation of carcinoma may precede, coincide with, or follow the neurological signs. The tumour is often situated peripherally and its size bears no relation to the degree of neuropathy. The neuropathy runs a variable course, sometimes becoming arrested or remitting spontaneously and usually being unaffected by surgical removal of the growth. Hence any causative link seems to act in a haphazard way. In seeking an explanation, many suggestions have been made. Intoxication by arsenic springs to mind as an obvious common factor, but no evidence of excessive exposure to arsenic has ever been found in these cases. The possibility of a virus being responsible for both seems improbable, since it would be likely to act upon the nerves within a matter of weeks, whereas a carcinoma would take much longer to develop. Metabolic disorders are very difficult to assess because of their complexity, but vitamin therapy rarely if ever relieves the neuropathy; disturbances of pantothenic-acid metabolism or even the production of an anti-vitamin substance by the carcinoma cells have been mentioned.³ Nervous reflexes from the lungs might conceivably play a part.⁴ In other

words, we do not know, even to the extent of which system may provide the link.

Many acute infections are known sometimes to be associated with peripheral neuropathy—for example, septicaemia, puerperal sepsis, mumps, measles, smallpox, scarlet fever, gonorrhoea, syphilis, meningitis, typhoid, paratyphoid, dysentery, typhus, malaria, influenza, and pneumonia. The neurological features ordinarily develop during or shortly after the febrile phase, and no evidence exists suggesting that pulmonary involvement *per se* predisposes to peripheral neuropathy. The question whether chronic infections are more likely to do so if situated in the lungs rather than elsewhere is less certain. Peripheral neuropathy has been observed in advanced phthisis, chronic suppurative of the extremities,⁵ osteomyelitis,⁶ and bronchiectasis.² These are toxic and debilitating diseases which may easily disorganize metabolism to the extent of interfering with the nutrition of the peripheral nerves, possibly with amyloidosis in addition, but again no specific pulmonary mechanism seems to be acting. However, the recent publication of two cases of bronchiectasis with peripheral neuropathy and no evidence of cachexia or metabolic upset² is perhaps a straw in the wind; the publication of further similar cases must be awaited before a firm conclusion can be drawn.

INSULIN ANTIBODIES

Insulin resistance is a well-known phenomenon in diabetes mellitus. It may occur temporarily during infections or ketosis, and is a common finding in the obese diabetic and in the patient who has diabetes in association with acromegaly or Cushing's syndrome. Occasionally patients need enormous doses of insulin to control the disease. Several mechanisms have been suggested to explain this resistance. Antagonism of insulin by growth hormone, and particularly by adrenal steroids, might well be expected, but except in the endocrinopathies has not been proved. It is known that the liver contains an enzyme insulinase which destroys insulin, and that this enzyme in its turn is acted upon by insulinase inhibitors.¹ It is not yet clear, however, what part this complex plays in the diabetic syndrome. A third possibility is that certain patients develop antibodies to insulin. This has been suspected for some years.²

¹ Mirsky, I. A., *Metabolism*, 1956, 5, 138.

² Lowell, F. C., *J. clin. Invest.*, 1944, 23, 233.

³ Pressland, J. R., and Todd, C. M., *Quart. J. Med.*, 1956, 25, 275.

⁴ Berson, S. A., Yalow, R. S., Bauman, A., Rothschild, M. A., and Newerly, K., *J. clin. Invest.*, 1956, 35, 170.

⁵ Berson, S. A., and Yalow, R. S., *Diabetes*, 1957, 6, 402.

⁶ Burrows, B. A., Peters, T., and Lowell, F. C., *J. clin. Invest.*, 1957, 36, 393.

⁷ Skom, J. H., and Talmage, D. W., *ibid.*, 1958, 37, 787.

⁸ Kalant, N., Gomberg, C., and Schuchter, R., *Lancet*, 1958, 2, 614.

⁹ Yalow, R. S., and Berson, S. A., *J. clin. Invest.*, 1957, 36, 648.

¹⁰ Randle, P. J., and Taylor, K. W., *Lancet*, 1958, 2, 996.

though their presence cannot always be detected by the usual immunological techniques. Nevertheless the presence of insulin antagonists in the serum of resistant patients can be shown by various indirect means, such as the protection afforded to animals receiving lethal doses of insulin and the effect on the uptake of glucose by the rat diaphragm.³

Renewed interest in the role of antibodies has been stimulated by recent studies of the fate of insulin labelled with radioactive iodine.⁴ It has been found that treated diabetics retain insulin-¹²⁵I in the circulation longer than those who have never received insulin, and that the radioactivity is concentrated in the globulin fraction of the plasma proteins. Such insulin binding, presumably in the form of an antigen-antibody complex, is an invariable response to repeated insulin injection, but its relation to the development of resistance is not at all clear. Thus, while some workers^{5, 6} have found much greater binding in insulin-resistant patients, others⁷ have been unable to show any connexion between the degree of insulin binding and the dosage and duration of treatment. N. Kalant and colleagues⁸ have concluded that neither retention of radioactive insulin in the serum nor the degree of binding affect the response to a given dose of insulin. Moreover, the serum of animals actively immunized to the hormone does not exhibit insulin-neutralizing activity, nor do such animals show any great diminution in responsiveness to insulin. They suggest that repeated injection of insulin leads first to a decrease in its rate of degradation, followed later by the appearance of circulating antibodies in the form of a loose complex which does not necessarily interfere with the action of insulin. A further factor which may partially explain why the presence of antibodies is not clearly linked to insulin resistance is the ability of serum from treated diabetics to inhibit insulinase.⁹

A full interpretation of the phenomenon of insulin binding must await further work on the metabolism of insulin, both in normal subjects and in diabetics. It is possible, for example, that a similar mechanism occurs in the serum of healthy people,¹⁰ and that the insulin-globulin complex is not an immunological response in the strict sense. The fact that it always appears in the treated diabetic suggests that it has little to do with insulin resistance. Similarly it seems unlikely that such a mechanism would influence the long-term insulin requirements of the average patient. Yet it is possible that the development of antibody would tend to increase the dose required for a given effect,⁷ and this would explain the resistance that occurs in patients receiving insulin-shock treatment.

MORBIDITY IN GENERAL PRACTICE

During the twelve months from May, 1955, to April, 1956, 171 general practitioners in more than 100 practices in England and Wales kept clinical records of all their Health Service consultations. This survey of the morbidity encountered in general practice was conducted jointly by the General Register Office and the College of General Practitioners, and the first volume of results has now been published.¹ Two more are promised. There are few comparable studies, though the rich rewards that can be won from careful observation in general practice have been brilliantly shown by Budd, Mackenzie, Pickles, and others. There was an obvious need for more information of this sort; an earlier pilot study from the General Register Office showed that it was well worth collecting^{2, 3}; and epidemiologists, public health officers, and general practitioners have been awaiting the results of this large study with the keenest expectation.

The survey is based on two items of information—the consultation between doctor and patient, and the diagnosis of the patient's complaint. More than half the book consists of tables presenting this basic information differentially by sex, age group, and geographical area. Two different types of rate have to be distinguished: the "consultation rate" measures the numbers of times a patient was seen by his doctor for a particular disease; the "patient-consulting rate" is the number of patients suffering from a disease, regardless of the number of consultations. It is unfortunate that the two names are so similar and are not self-explanatory so that it requires a little mental effort to hold them in mind while studying the tables. The patient-consulting rate is held to give a truer picture of the amount of sickness in the community because doctors will differ widely in the number of consultations which they give to a patient for a particular illness. Nearly 400,000 patients were seen by the doctors and the number of consultations reached nearly 1½ million.

The early chapters give details of the methods adopted to ensure completeness and uniformity in the data. Sometimes arbitrary decisions had to be made on how to deal with recurrent diseases; for example, whether each attack of asthma should be considered separately or as a continuation of a single disease. The devices for recording several diseases at a single consultation and for linking subsequent consultations with previous ones for the same disease are ingenious.

The book is so arranged that it will be invaluable to anyone planning similar investigations, and it is so complete that it would not be difficult to repeat the survey in every respect. The later volumes will show in more detail what inferences can be drawn from these tables, but the present volume gives certain interesting statistics. For example, only 30% of female patients did not consult their doctor during the year, whereas 37% of males kept away. One would have expected a larger discrepancy. The proportion of patients seen was

¹ *Morbidity Statistics from General Practice*, Vol. 1 (General), 1958, H.M.S.O., 15s. 6d.

² *General Practitioners' Records*, 1953, H.M.S.O.

³ *Brit. med. J.*, 1953, 2, 1038.

¹ Lennox, B., and Prichard, S., *Quart. J. Med.*, 1950, 19, 97.

² Caughey, J. E., Wilson, R. F., and Borrie, J., *Thorax*, 1958, 13, 59.

³ Denny-Brown, D., *J. Neurol. Psychiat.*, 1948, 11, 73.

⁴ Wyburn-Mason, R., *Lancet*, 1948, 1, 203.

⁵ Schmidt, C. F., *Nervenarzt.*, 1948, 19, 81.

⁶ Lebedev, A. P., *Vestnik Khir.*, 1953, 73, 55.

higher in the age group under 15 years, but the elderly patient tended to be seen twice as often as the average child or young adult. The number of patients consulting for malignant disease was 5.2 per thousand, suggesting a total of approximately 230,000 cases of cancer under treatment in the whole country. Those interested in psychoneurotic disorders will find that the patient-consulting rate for these was 45.7 per thousand, indicating a national total of 2,000,000 patients under the care of their doctor during that year, or one in twenty of the population. The common cold gave the highest patient-consulting rate for individual diseases, 81.1 per thousand, though it entailed fewer consultations than this rate would suggest, and it was bronchitis that most often required medical attention. With a consultation rate of 261.1 per thousand and a patient-consulting rate of 62.3 per thousand, bronchitis had the third highest patient-consulting rate, coming after arthritis-and-rheumatism with 64.9 per thousand. Surprisingly, influenza came fifth on this list, both for patient-consulting rate and for consultation rate, though there was no great influenza epidemic in that year.

High praise must go to Dr. W. P. D. Logan and his team at the General Register Office, to the general practitioners, their secretarial staffs and probably their wives, for the fine work which has produced this volume, and the care and skill with which it has been written. Still higher praise must go to those general practitioners who were able to offer an account of the occupation of all their patients. It requires much work to obtain the full statistics of sex and age for a general practice, and to add to this the occupation of the patient is a formidable undertaking. A sufficient number of general practitioners, nevertheless, did so to make possible an analysis of sickness in relation to occupation which is promised for a subsequent volume. The present work whets the appetite for what is to follow, and everybody interested in epidemiology and morbidity figures will want to collect the series.

IMAGE INTENSIFICATION AIDED BY TELEVISION

In diagnostic radiology an x-ray image is usually rendered visible by allowing it to fall on some material which converts x rays into light (a fluorescent screen) or on to a photographic film which, on processing, reveals the latent image; or a combination of these two methods may be used. Image intensification refers to any electronic method which enables the film or fluorescent image to be obtained with a reduced quantity of x rays. There are many reasons for wishing to reduce the dose of radiation, the potential hazards being in themselves a cogent one. The present methods of image intensification are first to convert the x-ray image into a light image with the use of a fluorescent screen and then to convert the light image into an electron

image. The energy of the electrons is then increased and the image may be focused with electron lenses and allowed to fall on another fluorescent screen yielding a considerably brighter image than the first one. Alternatively, the initial image may be scanned as in television, the resultant electric current being then amplified and viewed on a conventional television screen as an image with increased brightness. In either case the image may be photographed, but the television system has the advantage that contrast can be varied at will. The use of equipment of this type, which is available commercially in the U.S.A., has been described by R. H. Morgan and R. E. Sturm¹ and by R. Janker.² For medical purposes, however, the radiologist is primarily concerned with obtaining a brighter image with less radiation and without significant reduction of definition rather than with achieving merely increased brightness with the same doses of radiation as are used with conventional methods. Unfortunately, when the quantity of x rays required to give a fluoroscopic image is significantly reduced, the definition of the image falls because of statistical fluctuation of the x-ray quanta on these low levels.³ This means that, though it may be possible to intensify the image without increasing the dose of radiation, so far it has not been possible to maintain definition in the intensified image with doses of radiation much less than those used at present. It seems unlikely that further advances of major importance can be made in this field unless a more efficient means than the fluorescent screen is found for converting the primary x-ray image, for, though image intensifiers may have an intensification factor of hundreds, the radiologist can reduce the dose of radiation only by units. However, improvements sufficient to make the method useful in practice may result from comparatively small refinements in any of the components of the system. These problems are being investigated in several centres, including the department of instrument technology of the Imperial College of Science and Technology, London, and their solution will be eagerly awaited by radiologists.

QUALITY OF DRINKING-WATER

In this age of standardization it is not surprising that the quality of water for domestic consumption has been under consideration. Both in Great Britain¹ and in the U.S.A.² there have been standards for many years, but the first attempts to obtain international agreement were at the Congresses of the International Water Supply Association in Amsterdam in 1949 and in Paris in 1952. Little progress was made, and so the matter was taken up by the World Health Organization, which had long appreciated the need for some form of international agreement on the requirements for safe and potable water supplies. This problem has become more acute with the great increase in travel, especially air travel. "where common carriers must be watered at many points in the world, and the traveller must be furnished with acceptable drinking-water that will not produce unfavourable effects on his health."³ Groups of experts

each one representing a member state of the World Health Organization, studied these questions at a regional level between 1953 and 1956. The unanimity attained exceeded expectations, and a final study group therefore met in Geneva in the summer of 1956. It has put forward detailed recommendations applicable the world over.³ This report is intended primarily to refer to water as it is supplied to the public.

The introduction to this important publication states that "supplies of drinking-water should not only be safe and free from dangers to health, but should also be as aesthetically attractive as possible. Absence of turbidity, colour, and disagreeable or detectable tastes and odours is important in water supplies intended for domestic use." The requirements for providing water of this quality are set out in successive chapters discussing bacteriological, chemical, physical, biological, and radiological requirements. The standards of bacteriological quality recommended are not as strict as might be, but there are many areas in the world where the regular attainment of a standard of coliform organisms absent in 100-ml. volumes is not economically or technically practicable. Different standards are set down for treated and untreated supplies for present use throughout the world, with the hope that improvement in economic and technical resources will permit of stricter standards being adopted at a later date. Limits for toxic substances such as lead, arsenic, and cyanide in the water are given, and also for specific substances, such as fluoride and nitrate, which may affect health. Many other chemical substances affect the potability of water, but, owing to the wide variation in chemical composition of water in different parts of the world, rigid standards cannot be laid down. What has been done is to designate limits for such substances as iron, copper, zinc, sulphate, chloride, and so on which are "permissible"—that is, would be generally acceptable by consumer—and "excessive," values greater than which would eventually impair the potability of the water.

But this publication is not a mere list of standards. Many aspects of water quality are fully discussed and details of sampling procedure are set out in the appendices, together with approved methods of analysis. Moreover, since standards and analytical methods are not static, but must change with advances in knowledge, a list of subjects for future research is included. Finally, the frequency of sampling, particularly bacteriological, is worth mentioning. The report rightly attaches importance to this procedure and gives a sound guide for sampling before and after the water has entered the distribution system. To get water to the consumer without any deterioration in quality, a close watch has to be kept on the network of mains, pipes, and reservoirs—the "Achilles heel" of a water undertaking. Regular sampling and analysis is one way of checking the distri-

bution system, and the W.H.O. experts have proposed a practical programme of routine control to this end.

TREATMENT OF ASTHMA WITH HYDROCORTISONE POWDER

The success of steroid therapy in carefully chosen cases of chronic asthma, coupled with its undoubted and serious risks, has led investigators to try the effect of these drugs in smaller dosage when applied locally to the bronchial mucosa by means of some form of oral inhalation. W. S. Foulds¹ and his colleagues reported an uncontrolled trial of hydrocortisone snuff on 15 patients, of whom 12 improved. H. Herxheimer and M. McAllen² found that in 4 out of 10 patients with pollen asthma the symptoms disappeared after nasal insufflation of hydrocortisone snuff. R. M. Morris-Owen and S. C. Truelove³ made a similar observation. W. Brockbank and C. D. R. Pengelly,⁴ using a very small dosage, reported improvement in 17 out of 24 asthmatics with inhalations of hydrocortisone acetate powder, but when prednisolone was used there was no effect in 6 out of 7. W. H. Helm and F. Heyworth⁵ have recently conducted a short-term blind-controlled trial of inhalations of hydrocortisone acetate in 26 patients, prescribing up to 45 mg. a day. 14 out of 17 improved, but only 3 out of 9 showed benefit when an inert powder was given. They concluded that these inhalations were an effective form of short-term treatment in some cases of bronchial asthma. In a second paper⁶ they described the effect of treating 53 patients in a similar way, 81% showing improvement. But there was a strong tendency to relapse if treatment had to be maintained. Prolonged benefit was more likely to occur if the inhalations were given intermittently for recurring asthmatic attacks. They also determined that there was a wastage into the stomach of about 20% of the powder.

Herxheimer⁷ and his colleagues have described three trials of similar treatment in London, Cardiff, and Berlin, but do not state what salt of hydrocortisone was used. The dosage was one 15-mg. capsule administered daily, half in the morning and half in the evening. Although more than two-thirds of the patients benefited, the results need interpreting with caution. Some of them were a selected group and seemed likely to respond before treatment began, and did so. In contrast, the Cardiff study was of unselected cases, and there the number of failures (19) exceeded the number of successes (15). This treatment cannot therefore be expected to relieve the average chronic asthmatic, but only certain types. Herxheimer and his colleagues endeavoured to analyse the types that seemed to derive most benefit from the treatment. It is not surprising to find that those with excessive secretion failed to respond. The improvement occurred in patients with evidence of

¹ Foulds, W. S., Greaves, D. P., Herxheimer, H., and Kingdom, L. G., *Lancet*, 1955, 1, 234.

² Herxheimer, H., and McAllen, M., *ibid.*, 1956, 1, 537.

³ Morris-Owen, R. M., and Truelove, S. C., *Brit. med. J.*, 1958, 1, 969.

⁴ Brockbank, W., and Pengelly, C. D. R., *Lancet*, 1958, 1, 187.

⁵ Helm, W. H., and Heyworth, F., *Brit. med. J.*, 1958, 2, 768.

⁶ ——— *ibid.*, 1958, 2, 765.

⁷ Herxheimer, H., McAllen, M., and Williams, D. A., *ibid.*, 1958, 2, 762.

¹ Morgan, R. H., and Sturm, R. E., *Radiology*, 1951, 57, 556.

² Janker, R., *Fortschr. Röntgenstr.*, 1958, 88, 377.

³ Sturm, R. E., and Morgan, R. H., *Amer. J. Roentgenol.*, 1949, 62, 617.

¹ Ministry of Health and Ministry of Housing and Local Government, England and Wales, *The Bacteriological Examination of Water Supplies*, 1956, 3rd ed. London, H.M.S.O. (Reports on Public Health and Medical Subjects No. 71.)

² American Public Health Association, *Standard Methods for the Examination of Water, Sewage and Industrial Wastes*, 1955, 10th ed. New York.

³ World Health Organization, *International Standards for Drinking Water*, 1958, Geneva.

allergic aetiology and those without hypersecretion. Cases of dry asthma responded dramatically. In Helm and Heyworth's⁶ study cases of recurrent acute asthma without significant bronchial infection responded best, while cases of wheezy bronchitis with significant infection and more than ¼ oz. (7 ml.) of sputum daily responded least. This important work is worth following up. It is an ideal piece of research for the busy general practitioner.

SEBORRHOEA

In the last two decades there has been much study of the structure and function of the skin, particularly of the epidermis and its appendages and the surface film, or "mantle of the skin." Much of this work has been done in the United States and has been summarized in the two important textbooks of S. Rothman¹ and W. Montagna.² The great importance of the skin in relation to general metabolism and the reflection of systemic disease in the skin steadily assume greater importance in medicine; it is, moreover, an organ that should be susceptible of more exact study than those hidden beneath the surface. The integrity of the skin is important as a barrier against injury from without, mechanical, chemical, climatic, or infective, and this integrity is in part dependent on humoral and endocrine influences. Emphasis is now placed on the equipotentiality of epidermal cells—the ability of any epidermal cell to produce any element of the surface epithelium or of its appendages.

Much has yet to be discovered about the process of cornification or keratinization, but much is known about the surface film. Marchionini long since stressed the variation in hydrogen-ion concentration of the surface film at different sites on the skin surface and under different conditions, and Rothman has shown that the character of skin fats in the film may vary with different diseases and may bear upon the causation of those diseases.

The surface film is dependent for its effectiveness not only on sebaceous and apocrine secretion but on the fats and waxes provided by the desquamating horn cells, and the whole is emulsified by the contribution of the sweat glands, which, for instance, carry sebum readily over the palms and soles where no sebaceous glands exist. The contribution of the sebaceous glands is enhanced by the advent of puberty when apocrine glands also begin to function, and throughout adult life endocrine influence is paramount. It is at puberty that the surface film spontaneously destroys the *Microsporum audouini* fungus on the scalp as a consequence of the increased secretion of the long-chain saturated fatty acids. But this is only one aspect of the seborrhoeic diathesis, itself a reflection of a physiological state dependent on genetic, emotional, and other factors besides the endocrine.

J. M. Beare and colleagues³ have recently studied the pH of the skin surface in infants suffering from seborrhoeic dermatitis, and believe that the difference from that of normal control subjects is sufficient to be of value in differential diagnosis in difficult cases. Their investigations have been carefully controlled statistically and show that in seborrhoeic dermatitis in infants the surface film is more alkaline than in the normal. The incidence of seborrhoeic dermatitis in infants varies considerably with geographical location and nutritional state, but it is a mild affection that clears readily with treatment, or spontaneously, unless it triggers off a constitutional eczema. The seborrhoeic state is not, in fact, natural to the human until puberty, and its occurrence in infancy—sometimes with a phase of acne vulgaris—is probably dependent on hormonal influences carried over from the mother which disappear in the course of the first few months of life.⁴ The findings are of interest because the active state of seborrhoea at puberty and the seborrhoeic diathesis in the adult are generally regarded as being associated with an abnormally acid secretion. These features are related to the bacterial and fungal activity on the skin surface, and further investigations on these lines would be welcome.

THE EDINBURGH MEETING

Next year's Annual Meeting of the British Medical Association looks like being an invigorating affair. For one thing it is to be a Joint Meeting with the Canadian Medical Association, and those who went to Toronto in 1955 know what a stimulating experience it is to forgather with our Canadian colleagues.⁵ For another thing the meeting is to be in Edinburgh, one of the few big cities in the world where history, culture, and learning still hold out against industry and commerce. The arrangements for the meeting are well in hand, and this week's *Supplement* contains the provisional programme. As can be seen, the scientific meetings cover a very extensive field, and the opportunity to hear the views of so many experts from both sides of the Atlantic is one that will seldom recur. Edinburgh being what it is, the social occasions are also likely to be memorable, and the wives and families of members will all be made welcome—in fact, special arrangements are being made for the entertainment of young people.

Both the British and Canadian Medical Associations will have Prince Philip, Duke of Edinburgh, as their President next year, and, though he will be in Canada with the Queen at the time when the Annual Meeting is taking place in Edinburgh, his acceptance of both Presidencies brings the two Associations into even closer harmony than before. The Joint Meeting will certainly attract great numbers of doctors and their families to Edinburgh next July. Therefore, since the holiday season will be well under way, members who are in a position to do so would be well advised to book their accommodation in Edinburgh now, and also to make their train reservations.

¹ Rothman, S., *Physiology and Biochemistry of the Skin*, Chicago, 1954.

² Montagna, W., *The Structure and Function of the Skin*, New York, 1956.

³ Beare, J. M., Cheeseman, E. A., Galley, A. A. H., and Neill, D. W., *Brit. J. Derm.*, 1958, 70, 233.

⁴ Ingram, J. T., *A.M.A. Arch. Derm. Syph.*, 1957, 76, 157.

Drug Treatment of Disease

DISSEMINATED SCLEROSIS

BY

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It is still unfortunately true that there is no specific remedy in disseminated sclerosis, but it would be very wrong indeed for this reason to abandon these patients without treatment of any kind, for much can be done to give symptomatic relief. As important as anything else in the treatment of this condition is the attitude of the doctor. There is still some ignorance in the profession of the natural history of the disorder, and once the diagnosis is made a feeling of pessimism may overwhelm the practitioner, who feels he is faced with a hopeless patient soon to be reduced to a life of chronic incapacity and needing almost full-time care. That this is not the case is by no means sufficiently widely known.

The frequency of the disease in Great Britain is about one in 2,000 of the population; it varies in different counties. There are therefore a large number of sufferers, and it is clear at once that there are not that number of severely incapacitated patients in this country suffering from disseminated sclerosis. Many of these patients have long periods of remission often lasting many years. There are others whose disorder is mild, and, while they may have many abnormal signs in the nervous system, yet disorder of function and impairment of useful life are slight.

An explanation to the intelligent patient along these lines may be very helpful; it may prevent him from feeling that the doctors are abandoning him and stop him and his relations from wandering round seeking help which is not available.

Lines of Attack

Many treatments of the disease have been tried, but assessment of results is impossible except on a very long-term basis, as any therapy may coincide with a natural remission. The major lines of attack are as follows.

Vaccines.—The latest of these is the Shubladze-Margulis vaccine from the U.S.S.R. There is no evidence yet available that this has any effect on the disease and it is able that this has any effect on the disease and it is possible that the substance is dangerous. Bacterial vaccines, usually autogenous, have been tried, and these too have not been accepted as producing any relief.

Pyrexia.—Before the second world war there was a great vogue for pyrexial treatment. The pyrexia was induced by the use of killed organisms, such as T.A.B. vaccine, intravenously, and the patient was allowed to have up to six or even more bouts of fever. But in recent years this method of treatment has been used less and less. There is no doubt that it could initiate a remission for a time.

Vasodilators.—This is a useful method of treatment and may be of considerable help in bringing a relapse to an end rather sooner than would otherwise happen. Probably any vasodilator would be effective, but many have unpleasant side-effects. The least unpleasant is nicotinic acid given in flushing doses. This may be 50–100 mg. given three times daily before meals. The patient must be warned that in 15–30 minutes a feeling of flushing, paraesthesiae, unpleasant fullness in the head, and an odd taste will be produced. These symptoms rarely last more than 15–20 minutes. If no great flush is produced when the nicotinic acid is taken by mouth, it may be given in doses of 50–100

mg. either intravenously or intramuscularly once daily. It is useful to continue this treatment for four to six weeks and then to discontinue it for about the same period before starting again. Nicotinic-acid derivatives which do not produce vasodilatation are not so beneficial.

Histamine in rising dosage has also been given, but it causes headache and perhaps is not so easy to control. If it is used, then a starting dose such as 0.1 mg. intravenously begins the course, and it can be increased by 0.1 mg. daily or even twice daily.

Steroids.—Like vasodilators, steroids may be very helpful in initiating a remission, but if no obvious effect is being produced within two or three weeks then they should be tailed off fairly quickly; but, if benefit is obtained, the steroids may be continued for two or three months. The usual careful watch for toxic results must be maintained. A good starting dose is 10 mg. of prednisone three times a day, and it may usefully be combined with nicotinic acid. A.C.T.H. in doses of 50 units daily by injection has also been prescribed for three or four weeks and then gradually reduced to a maintenance dose of 10 units daily for several months. The good effects are unfortunately transient.

Arsenic.—The vogue of arsenic therapy seems to have diminished recently, though there are many neurologists who still use it quite extensively. The usual mode of administration is to combine both organic and inorganic arsenic. In each course neoarsphenamine is given intravenously once a week in doses of 0.15 g., 0.3 g., 0.45 g., and 0.45 g. This four-weeks course can be repeated every three to four months. If the veins are difficult to enter, then intramuscular sulpharsphenamine in corresponding doses is given. Between injections liq. arsenicalis, 3–5 minims (0.2–0.3 ml.), is given for three weeks each month. Careful watch must be kept for intolerance to arsenic.

Intrathecal Treatment.—It has been suggested at Oxford that P.P.D. (purified protein derivative of tuberculin) given intrathecally produces a specific response in the cerebrospinal fluid of Mantoux-positive patients and that there may also be a helpful therapeutic effect. It is too early to assess the merits of this procedure, which can be carried out only in hospital.

Whichever of these means of treatment is used, if the patient's mobility is affected, whether owing to disturbance of power, tone, co-ordination, or sensation, then re-education with the help of trained physiotherapists is an essential part of treatment. It is probable that at present this may well be the most important part of treatment, and it is clear that this calls for special training of physiotherapists and for their being part of a team engaged specially in helping such disorders of mobility and equilibrium. Unless the therapists know what they are trying to achieve and have adequate leadership, they may well share the hopelessness that is so frequently seen in those faced with these patients. It is remarkable how much an enthusiastic doctor or department can achieve in restoring really useful function, quite apart from the help that can be given by introducing mechanical aids in the kitchen, bathroom, and elsewhere in the house.

Symptomatic Treatment

In addition to treating the patient as a whole, some symptomatic treatment can give help.

Hypertonus and Spasms.—Occasionally hypertonicity is so great, especially in the hip adductors and plantar flexors,

that even with reasonable power walking is difficult. Some patients gain relief from meprobamate or mephenesin. The former can be started in 200-mg. doses three times a day after meals and the latter as mephenesin carbamate in 0.5-g. doses three times a day. Each can be pushed up to double or even treble these doses, provided the patient does not become too drowsy and there is no gastric irritation.

Extensor and flexor spasms may be very troublesome—disturbing rest and posture, and often being associated with a good deal of pain. Both meprobamate and mephenesin may help to diminish these contractions, but often so large a dose is necessary that the patient may be asleep the greater part of the day. In such a case it is probably better to give smaller doses such as 400 mg. of meprobamate three or four times a day and add small quantities of barbiturate such as phenobarbitone $\frac{1}{2}$ gr. (32 mg.) or amylo-barbitone $\frac{1}{2}$ gr. (32 mg.) to each dose.

Unfortunately there are many advanced cases in which no drug treatment has any effect on the spasms, and life is rendered almost intolerable by the continuous violent and painful contractions. In such patients the only reasonable treatment is selective surgical section of peripheral nerves or fractional knock-out of spinal anterior nerve roots by means of phenol. Both these techniques require expert performance by someone familiar with the hazards of the procedures, but offer the possibility of turning an impossible existence into a more comfortable though paraplegic life.

Vertigo.—This symptom, with associated disequilibrium and vomiting, is usually due to a brain-stem plaque damaging the central connexion from the vestibular labyrinths. The treatment is the same as that of any acute vertigo. While vomiting is going on the intramuscular injection of 50 mg. of promethazine, chlorpromazine, or promazine will often ease the acute disturbance. If the attack is very severe the injection may have to be repeated some six hours later. The drowsiness which results is welcomed by the patient. Once the acute vomiting has ceased, then the same substances can be given by mouth in 25-mg. doses two or three times a day, or prochlorperazine ("stemetil") in doses of 5–10 mg. twice a day can be substituted. This drug produces less drowsiness.

Sphincter Disturbances.—The function of the bladder is commonly disturbed and the patient suffers from frequency, urgency, and precipitancy of micturition. Later incontinence may occur, but this is often due to a combination of precipitancy with diminished mobility. Retention is unusual except in the acute paraplegias due to a transverse plaque.

It is difficult to control the rapidly emptying spastic bladder except by sedation, but occasionally the use of a pill containing ergot 1 gr. (65 mg.) and ext. belladonnae sicc. $\frac{1}{4}$ gr. (16 mg.) may be helpful. Frequently, however, and especially in women, the urinary disturbance is accentuated by infection. If there is any real risk of this it may be helpful to keep the patient on small doses of sulphonamide such as sulphathiazole 0.5 g. twice a day, or sulphamethizole ("urolocosil") 0.2 g. twice a day for some months. If an obvious acute infection supervenes, then treatment with the specific substance to which the organism is sensitive is clearly indicated. Several courses may have to be given before the urine becomes sterile. Occasionally the long-continued use of sulphonamides may be interrupted with a course of hexamine mandelate, 0.5 g. three times a day for two or three weeks.

Retention of urine is treated by administering the stable esters of acetylcholine, of which there are many preparations available, in doses of 0.25 mg. intramuscularly or 1 mg. by mouth, repeated if need be. When this fails catheterization will be necessary.

The bowel difficulty is usually constipation, and diarrhoea and rectal urgency are most often the result of incautious aperients. It is safer to give only mild laxatives and supplement these by glycerin suppositories or "dulcolax" (2-(4:4'-diacetoxydiphenylmethyl) pyridine) suppositories.

Enemas may be necessary, but it is essential to avoid irritating the bowel either from above or from below.

Pain.—This is a fairly frequent symptom in this disease. The pain may be associated with muscle spasms as already described, but other forms are as follows:

- (a) Lightning pains.
- (b) Root pain indistinguishable from a brachial neuralgia or sciatica or a trigeminal neuralgia.
- (c) Headache due to plaques causing narrowing of the aqueduct of Sylvius and oedema, or interfering with the root entry zones of sensory nerves.
- (d) Central pains due to involvement of the spinothalamic tract or the thalamus. Here the pain is of an intense burning and gnawing character, often with a profound affective reaction.
- (e) Painful paraesthesiae.

The treatment of all forms of pain in this condition is to use the analgesics such as compounds of aspirin, phenacetin, and codeine in full doses unless gastric irritation and constipation are troublesome. Their efficiency is often greatly enhanced by adding small quantities of sedative such as amylobarbitone in doses of $\frac{1}{2}$ –1 gr. (32–65 mg.), and during the earlier part of the day by adding also an analeptic such as dexamphetamine 5 mg. This is particularly helpful for central pain and painful paraesthesiae.

Pressure Sores.—Once the patient is confined to a chair or bed the risk of pressure sores is great. This is particularly so if there is sensory impairment and urinary overflow.

They can be avoided only by scrupulous attention to the nursing care of the skin at the points of pressure, by changes of posture, and by the use of smooth bed linen or special seats. There is no drug which will help more than the efficient use of soap, spirit, and occasionally a silicone skin cream. The healing of pressure sores is so slow and the risk of spread in the paraplegic so great that treatment must be preventive. Once pressure sores are present, the only really effective treatment is prevention of weight bearing by the sore area. Necrotic tissue must be removed, and antiseptic creams may help to some extent.

Morale

It must be clear now that a great deal can be done for these patients to provide some symptomatic relief, but it is equally clear that the essential part of treatment is the maintenance of morale in the patient and the relatives at as high a level as is possible. Patients can be helped by using all the benefits provided by the Health Service, in particular the provision of wheel-chairs, perhaps even motorized chairs, commodes, gadgets, and other appliances, but the most essential contribution to keeping up morale is the attitude of the medical staff of every kind who come into contact with the patient.

Reporting on legal proceedings taken in 1957, the City Analyst for Birmingham writes in his Annual Report: "Only twice was it necessary to use the 'big stick' of prosecution, and on both occasions farmers were the culprits; the use of this weapon against food and drug retailers has to all intents and purposes been abandoned. A very different picture is presented in the first annual report made by me as city analyst in 1929; in that year 12 farmers were prosecuted in respect of 49 samples, and fines were imposed in 45 cases. Two of these farmers were each fined £100 for adulteration on the grand scale, which it was calculated resulted in both cases in the sale of 100 gallons of water per week as milk. In addition, summonses were issued in respect of four other foods and drugs. The total fines paid by offenders amounted to £328: this figure is practically ten times as great as the corresponding one for 1957, and this reduction of 90% is an indication both of a greater sense of responsibility on the part of manufacturers and of a changed attitude on the part of local authorities."

FIRST B.M.A. ANNUAL CLINICAL MEETING SOUTHAMPTON, DECEMBER 4-7

When Professor A. P. THOMSON, President of the British Medical Association, formally declared open the Association's First Annual Clinical Meeting, in the Guildhall at Southampton at 10.30 a.m. on Friday, December 5, the meeting was in fact already well under way. Some two hundred doctors, many from far beyond the Southampton region, had attended with their wives and guests a civic reception the previous evening; and two panel discussions—on "Hand Injuries" and on "The Treatment and Prevention of Deafness"—had already taken place.

A Change of Emphasis

The President, after expressing the meeting's gratitude to the Mayor and Corporation of Southampton for putting their fine Guildhall at the Association's disposal, referred to a remark made by the chairman of the Southampton Division the night before. Dr. R. S. Russell-Smith had said that they in Southampton had spent a great deal of time in preparing for this first Annual Clinical Meeting of the B.M.A. with but one hope in mind: that the meeting might prove a serious contribution to a change of emphasis in the Association's work. It had been feared in Southampton, said the President, that in the meetings organized by the B.M.A. the cultivation of professional excellence had been neglected in the press of political events. With Southampton's hope that the emphasis on professional work would be restored Professor Thomson said he wished to identify himself completely. He hoped that this first Clinical Meeting would be the first of many.

At the reception the previous evening in the Guildhall, given by the Mayor and Corporation, the Mayor, Alderman R. R. H. HAMMOND, in his welcome to the delegates said that Southampton was proud to have been chosen for the first B.M.A. Annual Clinical Meeting. Dr. R. S. RUSSELL-SMITH likened the occasion to the birth of a baby—always an exciting event. The B.M.A. was not just a medico-political organization, he said. The meeting showed that the Association had a real interest in clinical medicine. He thanked particularly Dr. J. G. McDowell and Dr. R. P. W. Shackleton, respectively honorary general secretary and honorary science secretary, for their untiring work in preparing for the meeting.

PANEL DISCUSSIONS

Friday, December 5, 9.30 a.m.

Hand Injuries

Between 50 and 70 people attended each of the two simultaneous panel discussions held at 9.30 a.m. on Friday morning. In the one on "Hand Injuries," with Mr. J. N. BARRON (Salisbury) in the chair, Mr. L. W. PLEWES, of Luton, and Mr. R. G. PULVERTAFT, of Derby, answered questions on many aspects of this subject—which, as the chairman stressed, is of such great importance to the general practitioner. The panel first considered the organization of a hospital department for dealing with hand infections. Mr. PLEWES said only one thing counted: "to have a person who is interested in hand infection and to let him have his head—one permanent member of the staff, not a bird of passage."

Treatment of Infections

The whole treatment of hand infections had changed with the advent of antibiotics, said Mr. PULVERTAFT. "We don't see the pulp infection that we did; it is more often the minor hand infections we see now; the major ones are scotched very rapidly." Dr. N. B. EASTWOOD (Oulton Broad, Suffolk) said treatment was made more difficult by patients going on working until it was too late. Mr. PLEWES, however, took up Mr. Pulvertaft's remark about

antibiotics. He believed that we used them too much. There were only two indications for antibiotics in hand infections, he said—cellulitis or a spreading lymphangitis. Penicillin should not be given for pulp infections, paronychia, and so on. Challenged by Dr. W. R. S. CAMPBELL (Oxford) for his reasons for saying this, Mr. PLEWES said, first, there was the presence of increasing numbers of insensitive staphylococci; in some hospitals the incidence was now in the region of 80%. There was no logic in giving these patients penicillin—"after all, it is the only safe antibiotic we have got, isn't it?" Secondly, one should rely on the most effective treatment, which in his view was not antibiotics. 98% of infections in the hand were due to *Staph. aureus*, which caused its damage by its exotoxins producing tissue necrosis. "Operate on these patients and remove the necrotic tissue; that is the only thing that is important." The incision should be made directly over the pus, not by the standard incisions, under either general or local anaesthesia. The main thing was to have a tourniquet and an assistant. Dr. J. A. SADLER (Cambridge) objected that in general practice patients expected penicillin as a routine. The treatment was by immobilization of the hand and antibiotics. "We don't find so many resistant staphylococci as you talk about in hospital." The patients did very well indeed. Mr. PLEWES endorsed the importance of immobilization and mentioned that in his view any form of heat was harmful. Dressings for hand injuries could be minimal if the slough had been removed at operation: not a lot of gauze and wool which crippled the patient, but just a small strip dressing to keep the skin edges together. "We do a lot of damage to our patients by wrapping them up in cotton-wool. We ought to aim at getting our pulp infections back to work within one and a half days, acute paronychia back to work in 24 hours, acute suppurative tenosynovitis within three days." There was no place for operative treatment in acute suppurative tenosynovitis, where there was a lovely closed space capable of holding a hundred times enough penicillin to kill any organism. All that was needed was to put a needle into the space, aspirate the few drops of pus which were there, inject 500 units of penicillin, the patient was cured.

Cut Tendons and Mallet Finger

The problem of severed tendons was discussed by Mr. PULVERTAFT. Dealing first with the extensor tendons, he described the treatment of lesions at various levels. Lesions over the proximal phalanx would recover if the finger was splinted in full extension. At the back of the hand primary suture was necessary. Division of the flexor profundus beyond the level of the sublimis attachment at wrist and palm level might be treated by primary suture; but if the tendons were divided between the distal palm-creases and the insertion of sublimis, where there was a rigid fibrous sheath, primary suture was unwise. The correct treatment then was suture of the skin only, so that later the tendons could be replaced by a free tendon graft taken from some other part of the body. Mr. J. S. ELLIS (Southampton) asked if there was any place for secondary suture in the no-man's-land of fibrous tissue. As a general policy, Mr. PULVERTAFT thought there was not. Replying to Dr. M. B. CARSON (Southampton), he said that a finger would work almost as well with a profundus tendon alone as with both profundus and sublimis tendons.

Mr. PLEWES expressed definite views on mallet fingers. Instead of the disabling plasters with the finger held in the flexed position, he used a tiny splint of "perspex" over the distal two-thirds of the finger, leaving the proximal joint free. The patient could return to work wearing the splint, which he kept on for six weeks, thereafter wearing it only

at night. There was no place for surgery in this condition. Mr. PULVERTAFT used a "pin" beneath the skin, but confessed to less than 90% cure. Sometimes he performed open surgery on these cases. Mr. J. B. SHIELD (Fordingbridge, Hants) found that patients often came for advice three or four weeks after injury, and he felt that it was asking too much to expect a response to splinting alone in such cases, but Mr. PLEWES claimed 45% cures in patients seen after six weeks.

Fractures and Crush Injuries

Mr. PULVERTAFT felt that there should be a complete reorientation of our ideas on hand fractures. Many of these would do better by mobilization and pinning at an open operation. He admitted that this required most careful and time-consuming surgery, but, if this was the best way of treating them, it should be done. Mr. PLEWES agreed that some fractures must be operated upon. He did not agree with the statement in two recent textbooks that there was no reason for splinting fractures of the hand. One fracture—the impacted neck of the fifth metacarpal—could be left without splinting. "If we don't do something to our patients to relieve the pain they are not going to use the hand." In answer to Mr. ELLIS, who put in a plea for the functional treatment of fractures of the metacarpals, Mr. PLEWES thought that these were often over-treated. He thought 14 days was usually long enough in plaster.

Mr. BARRON remarked that all injuries except burns were caused by cuts or crushes. In severe crush injuries, Mr. PLEWES said, only one thing mattered, and that was the prevention of further injury by oedema to the structures that had already been damaged. He recommended delayed treatment with refrigeration and elevation. Mr. PULVERTAFT agreed that the prevention of oedema was most important, but believed that elevation was the best method of treatment. In reply to a question from the floor, he said that the correct first aid for a dirty crush-injury was to do nothing to the hand: "Put a dressing on, but don't clean it, don't put on antiseptics; let the hospital deal with the cleaning under anaesthesia." The best cleaning of a wound was by washing, washing, and washing.

Treatment and Prevention of Deafness

The importance of careful clinical observation in the diagnosis of deafness, both in the very young and in the elderly, was emphasized by the panel, consisting of Miss EDITH WHETNALL (London) and Mr. F. MCGUCKIN (Newcastle upon Tyne), which discussed "The Treatment and Prevention of Deafness," under the chairmanship of Mr. N. W. MACKEITH (Southampton). Replying to a question from Dr. R. S. RUSSELL-SMITH (Southampton), Miss WHETNALL stressed the importance of diagnosing deafness in children very early. Usually by three months a child could suppress undesirable noises and would react appropriately to meaningful sounds, and by six months he should begin to imitate his mother's voice. Deafness might be detected by observing the failure of a child to react like this, although other causes such as prematurity, mental deficiency, or simple neglect must be considered. To test the diagnosis sound must be brought to the baby by means of a hearing-aid—even very small babies could wear an aid. A deaf baby must wear its aid continuously so that he could learn to appreciate sounds in the same way as would a normal baby. The longer he was deprived of sounds, the more difficult would it be for him to learn to hear and later to talk. Thus early diagnosis was the keystone of successful treatment. The management of these children must of course be carried out through the mother, and it was important to explain to her that dramatic and immediate results could not be expected. Mr. MCGUCKIN made the point that surgical treatment was available only for middle-ear types of deafness, which were uncommon in the very young.

Dr. D. M. T. GAIRDNER (Cambridge) asked the panel what the lesion was in deafness following purulent meningitis and what was known of the pathology of congenital deafness.

Mr. MCGUCKIN pointed out that the perilymph was continuous with the subarachnoid fluid, and that, unless it became sealed off early in the disease, infection from the meninges might spread to the inner ear, causing deafness and vestibular symptoms. If only one inner ear was damaged the deafness was unlikely to be detected in early childhood. Miss WHETNALL divided cases of congenital deafness into those arising from hereditary factors, those associated with maternal illness in pregnancy, and those resulting from disorders during or immediately after birth. There might be any degree of involvement, from the complete absence of the cochlea to the loss of only a few of the organs of Corti. In those cases due to maternal rubella it was only the organs of Corti that were affected. These children were often extremely intolerant of noise, and this fact might render the wearing of an unsuitable aid most uncomfortable.

Dr. MARY CAPES (Southampton) asked the panel whether they thought that cases of partial deafness in children were being missed, thus giving rise to educational difficulties when the child arrived at school, where the true reason might not be appreciated. How far was screening advisable? Mr. MCGUCKIN replied that an audiogram was no more valuable than an x-ray; it was merely part of the clinical investigation. The patient's performance on testing would depend on many factors, including the speed of onset of the deafness. "Machines can go wrong," he said, and the shrewd clinician should be able to predict the audiogram result. Miss WHETNALL agreed, and thought that we were becoming too reliant on machines. Careful clinical assessment was every bit as scientific as audiology. The CHAIRMAN summed up by saying that it seemed that the audiogram was a good servant but a bad master.

Deafness in the Elderly

Dr. JOHN L. STRUTHERS (Southampton) asked the panel what the indications were for referring older patients with increasing deafness to a specialist. Mr. MCGUCKIN said that they came to a doctor because they or their relatives felt they were losing contact with others. The common cause of deafness over the age of 55 or 60 was cochlear degeneration. These patients had difficulty in hearing consonants. As well as the straightforward difficulty in hearing sounds, the normal damping effect on undesirable noise was lost and the patient tended to get words jumbled up, particularly if speech was fast. The provision of a hearing-aid of limited output, combined with instructions to the household to speak slowly and distinctly, was all that was required. The CHAIRMAN, while agreeing, thought that without a trial it was very difficult to tell how much a hearing-aid would help. The old-fashioned speaking-tube was often very useful, he added.

In reply to a question from Dr. W. H. N. ANGUS (Southampton) on modern surgical techniques for the relief of deafness, Mr. MCGUCKIN said that only middle-ear deafness was amenable. There were two main problems—otosclerosis and the late effects of otitis media. In the former condition the underlying lesion was the ossification of the elastic membrane around the oval window. In a few cases it was possible to fracture this new bony tissue during the inactive stage, thus mobilizing the stapes with excellent results. In the fenestration operation the oval window and the ossicles were abandoned and a new hole was made into the external semicircular canal. This would give the patient an adequate degree of hearing. In chronic otitis media the contents of the middle ear except for the stapes had been lost. Various operations had been devised to re-form the middle-ear chamber by skin-grafting, the essential requirement being the presence of some healthy mucous membrane in the region of the round window. The results of these operations could be very satisfactory, with a hearing loss of only ten to fifteen decibels. In answer to a question about their percentage success, Mr. MCGUCKIN stated that he preferred to regard them as salvage operations. In his opinion about half the patients could be so salvaged.

Dr. RUSSELL-SMITH (Southampton) asked the panel for their opinion on the dangers of treating acute otitis media with penicillin or sulphonamides. The CHAIRMAN felt that this was a matter of fine clinical judgment. If there was an appreciable amount of pus in the middle ear, then the drum should be incised, but early cases could be safely treated by medical means alone. Both the other members of the panel agreed.

FIRST GENERAL SESSION

Friday, December 5, 10.45 a.m.

Operative Treatment of Duodenal Ulcer

Dr. H. C. MAURICE WILLIAMS (Southampton) was chairman for the first general session, which he introduced. Professor JOHN BRUCE (Edinburgh), P.R.C.S.Ed., spoke on the choice of operation for duodenal ulcer. He emphasized that the surgeon could now approach his patient with a view to providing the most suitable type of operation, and this should be assessed beforehand by a maximal histamine test meal (Kay's), in order that the hazards of further ulceration could be avoided. Professor Bruce described the two forms of operation in vogue as being those attacking the gastric secretion by interruption of the nervous pathway accompanied by some form of "drainage operation," and those that reduced the degree of acidity by removal of secreting gastric tissue. He demonstrated that the reduction might be measured by Kay's test and also from an academic point of view by counting the acid-secreting cells. He showed that there was a correlation between their number and the concentration of acid as measured.

He divided the cases into three groups as determined by their capacity to produce various concentrations of acid. One-third would show less than 30 mEq, and these should therefore respond to gastro-enterostomy with vagotomy. The second group was those with medium secretion of acid, and these should be treated by partial gastrectomy of standard type. There remained some 17% who were high acid-secretors, above 50 mEq, and these would need a radical gastrectomy with vagotomy.

The results of these operations could be predicted, especially if the maximal histamine test meal was repeated. Only those showing a high acidity at the post-operative test would be liable to further ulceration, either of the suture line or of the jejunum. He concluded by answering many questions.

Prevention of Reactions to Antibiotics

Professor L. P. GARROD (London) discussed reactions to antibiotics, dividing these into three types—those causing sensitivity reactions or direct toxicity to various organs and those associated with superinfection. He pointed out that direct toxicity usually was related only to a few specialized tissues such as the kidneys, marrow, and the eighth nerve.

Chloramphenicol was a drug which should be reserved for serious indications—namely, whooping-cough in infancy, typhoid fever, and certain virus infections. Penicillin was apt to cause sensitivity reactions, and these might be severe and of the anaphylactic type, or more akin to serum sickness. He pointed out the doubtful value of skin tests, especially as a precaution against the more serious forms of reaction. The occurrence and significance of antibodies to penicillin in the blood needed further study.

The tetracycline group, or combinations of antibiotics with a similar "broad" effect, were apt to result in superinfection of the mouth, gastro-intestinal tract, or bronchi with yeasts or the overgrowth of resistant coliform, *Proteus*, and *Pseudomonas* species. He also stressed the more serious invasion by antibiotic-resistant staphylococci, especially after gastro-intestinal surgery. He thought the use of tetracycline preparations unwise after partial gastrectomy in cases where the gastro-intestinal flora might previously have been disturbed by long-acting sulphonamides, with suppression of the normal flora.

Sudden Death in Infancy

Dr. D. M. T. GAIRDNER (Cambridge) concluded the session with a discussion on sudden death in infancy, his figures being based on the first 81 cases from an inquiry by a combined team in Cambridge and London. If their figures were applied to England and Wales some 1,600 such deaths might be occurring annually. Sudden and unexpected death accounted for one-quarter of all deaths in the age group 2 weeks to 2 years. Most babies died in the colder months, and this ratio was similar in Australia. There was also a differential between the sexes, and infections, however trivial, appeared to be involved. Dr. Gairdner showed histological sections demonstrating that infections of the respiratory tract were especially important. Although full post-mortem examinations had been made on all their cases, there was a large number where no satisfactory medical cause for death was found. Post-mortem evidence did, however, show that many of these cases were not due to asphyxia.

SECOND GENERAL SESSION

Friday, December 5, 2.15 p.m.

The chairman at the afternoon general session was Dr. S. WAND (Birmingham), and the three invited speakers were Dr. A. RAE GILCHRIST, P.R.C.P.Ed., Professor A. M. CLAYE, P.R.C.O.G., and Dr. NEVILLE OSWALD.

Diagnosis of Acute Myocardial Infarction

Dr. A. RAE GILCHRIST (Edinburgh) said that the typical classical picture of acute myocardial infarction was often over-emphasized. Clinically the condition might present in various ways. There were (a) the painful syndromes which were associated with shock and collapse; (b) the cases in which the sudden onset of dyspnoea predominated; (c) those in which weakness, collapse, or even coma was the presenting symptom, or in which a sudden unexplained cerebrovascular incident occurred, or where the patient failed to improve as expected after surgery or an acute haematemesis; (d) sudden embolic phenomena which should suggest the possibility of an infarction; (e) changes of rhythm, notably auricular fibrillation and heart block in the middle-aged and elderly; and, lastly, (f) restlessness in an elderly patient without obvious cause.

In making the clinical diagnosis, more weight should be put on the abruptness of the onset rather than the duration or the severity of the illness. The diagnosis was established by the rapid development of signs of tissue destruction—leucocytosis, fever, elevated serum transaminase—and subsequently by an increased sedimentation rate. An E.C.G. was 95% accurate, given good interpretation, and was also valuable in assessing healing.

Comparing the accuracy of clinical as against post-mortem diagnosis, Dr. Gilchrist said that in a hospital series the diagnosis was almost as often wrong (37%) as right (43%), while in 20% the diagnosis was overlooked and only revealed post mortem. The errors of diagnosis included gross coronary atheroma with occasional local occlusions without infarction, pulmonary embolism, pneumonia, and post-operative collapse. The last occurring within three or four days of operation should always suggest acute myocardial infarction. Correct diagnosis was important, as it might make it possible to prevent embolic phenomena, the increase of shock, or congestive failure.

After his address Dr. Gilchrist answered questions. In reply to one on the value of the serum transaminase estimation, he said it could be of considerable use in the first three or four days. It reached a maximum within 48 hours, immediately preceding the rise in E.S.R. Though not as good as skilled reading of an E.C.G., it could be helpful. Asked about the indications for anticoagulant therapy, he said it was indicated in virtually all cases except those with advanced liver disease, renal insufficiency, a recent history of peptic ulcer, or severe anaemia. Were anticoagulants going out of fashion? They should be out

of fashion, said Dr. Gilchrist, if there was no reliable laboratory control. Anticoagulant therapy protected patients against embolic phenomena, particularly pulmonary emboli; any patient who had a pulmonary embolism within two or three weeks of coronary infarction was in very grave danger.

Asked if the E.C.G. was sometimes negative soon after infarction and positive a few days later, Dr. Gilchrist said the time when it became positive varied. In most people it became positive in 12-24 hours, in others it might take 10-72 days. In doubtful cases a series of E.C.G.s should be taken at two- to three-day intervals. Replying to a question about the value of corn-oil emulsion, he pointed out that it was a vegetable oil which in fact did reduce the blood cholesterol. The blood cholesterol was high in the younger age groups, but no one had shown that its reduction reduced the degree of atheroma.

Prevention of Severe Pregnancy Toxaemia

In the last 25 years, said Professor A. M. CLAYE (Leeds), the causes of maternal mortality had altered greatly in their order of frequency. "Eclampsia and other toxaemias" had now replaced puerperal sepsis as the commonest cause. He quoted mortality figures for 1955 in which 112 deaths had been due to toxaemia, 68 to abortion, and 41 to post-partum haemorrhage. In about half the deaths from toxaemia the antenatal supervision had been inadequate, the responsibility for this being divided between patients and their attendants. Patients who frequently defaulted from antenatal clinics had an increased incidence of toxaemia.

Dixon Hughes, of Sydney, had said that, if the mother did not gain more than 8 lb. (3.6 kg.) between the 20th and 30th weeks, she was unlikely to get toxaemia; if more than 8 lb. then it was much more possible. Toxaemia was commonest in first pregnancies. In those who had previously had toxaemia the chances were fifty-fifty, but once a woman had had toxaemia she should attend hospital for her subsequent pregnancies. The patients who were prone to develop toxaemia were those with twins, diabetics, and those in whom the blood pressure was more than 140/90 at least twice before the 20th week. Where there was no previous essential hypertension, 1.8% developed toxaemia, but in those with a previous history 35.5% developed it. In about half the women with essential hypertension the blood pressure fell to normal in the second trimester, and therefore the condition might be missed if they first attended during that time. Professor Claye described how to get a clean specimen of urine uncontaminated by vaginal discharge, and reminded his hearers that albuminuria might be due to urinary infection or chronic nephritis. When albumin was found in pre-eclamptic toxaemia it was a late sign, while headache, vomiting, and epigastric pain were very late signs.

The patient with toxaemia might lose her baby, develop eclampsia, or have an accidental haemorrhage. Describing the routine hospital treatment of toxaemia, Professor Claye said that the use of diuretics and hypotensive drugs was not yet established. Once albuminuria had appeared it rarely cleared up until after parturition, and even then it might continue for up to two years. The response of the blood pressure varied considerably. Regarding termination of pregnancy, there was little hesitation after 36 weeks; between 32 and 36 weeks he tried to tide the patient over unless her condition was deteriorating. If severe toxaemia developed before the 32nd week, the baby had little chance of survival either way. Caesarean section might have to be performed in a fulminating case.

Professor Claye then answered some questions.

Management of the Pulmonary Complications of Influenza

Dr. NEVILLE OSWALD (London) described the pulmonary complications seen during the Asian influenza epidemic in October, 1957. He said that reports showed that 5% of the cases developed pneumonia or other complications. He deprecated the routine use of antibiotics for influenza; most of the pneumonias had been straightforward. The influenzal

virus was apt to pave the way for bacterial infection of the respiratory tract which might lead to tracheobronchitis, oedema, pneumonia, or toxæmia. The tracheobronchitis might lead to severe obstruction with stridor and indrawing of the soft tissues of the neck during inspiration. If antibiotics failed to overcome the obstruction rapidly, intrabronchial intubation might be life-saving. Tracheotomy with suction was the method of choice, but bronchoscopy was permissible in extreme cases. In the lungs, oedema might be widespread before pneumonia developed; it could be relieved to some extent by aspiration through a tracheotomy tube.

The bacteriology of pneumonia complicating influenza did not differ materially from that of ordinary pneumonia, except that perhaps staphylococcal superinfection might be rather commoner. The great majority of pneumonias responded to adequate doses of penicillin or one of the tetracycline group. About half the staphylococcal cases responded equally well to these drugs, but the remainder were caused by resistant strains. Hence sensitivity tests, which took 24 hours to perform, were most important in staphylococcal pneumonia. If the results of the tests could not be awaited, intravenous erythromycin was most likely to be effective, given in doses of up to 1 g. four-hourly for the first day or so. The severe toxæmia might lead to peripheral circulatory failure, which might be fatal in a few hours. Intravenous hydrocortisone, 100 mg. six-hourly, in a drip, together with antibiotics, might prevent the fatal collapse. Lung abscess was seen as a late complication, and it responded well to antibiotics.

Asked if staphylococcal and convalescent sera were of any use in these overwhelming cases, Dr. Oswald replied that, though they were used, it was difficult to assess their value, as so many drugs were employed with them. "If you have it, use it," he said. If oxygen was needed, a tent was best for a young child and a mask or spectacles for adults. He advised a rate of 5-6 litres a minute.

TELEVISION AND FILMS

For many, one of the major attractions of the meeting, because unrealizable with the resources at the disposal of most local medical societies, were the two "live" colour television programmes of operations from the Southampton General Hospital and the "Transatlantic Clinical Conference." These admirable contributions were sponsored by Smith Kline & French Laboratories, who for the colour television were using their own experimental mobile van and equipment.

Voices Across the Atlantic

The British and the American Medical Associations joined together for an hour's clinico-pathological conference on Friday afternoon, at which two cardio-pulmonary cases were discussed blind by picked teams on either side of the Atlantic. The link was by transatlantic cable, and the voices of the speakers were transmitted by loudspeakers to each audience. This medical brains trust—which certainly enthralled the large audience in Southampton Guildhall—went as follows: Each side had beforehand been given a written case history summarizing the clinical findings, investigations, and course of the case to be diagnosed, together with slides of relevant x-ray films, E.C.G.s, etc. The highlights of the case were then recapitulated over the transatlantic telephone by the physician presenting it, after which he answered questions from the opposing panel, whose task it was to make a diagnosis. Finally, he gave the answer, as found at necropsy, over the telephone cable for all to hear.

The British team in the Guildhall at Southampton were Dr. W. D. BRINTON (Winchester), the moderator and organizer of the programme, Professor JOHN McMICAL (London), Dr. J. G. SCADDING (London), and Mr. T. HOLMES SELLORS (London). Opposing, at the A.M.A. Clinical Meeting in Minneapolis, were Dr. JAMES R. FOX (Minneapolis), as moderator, with Dr. JOHN BRIGGS (Saint Paul) and Colonel JAMES A. WEIR (FitzSimmons Army Hospital). For the

benefit of the two audiences watching the programme enormous photographs of the members of the opposing team were mounted on the stage, and when one of them spoke a red light went on over his picture.

The British team bowled first, and the ball they sent the Americans most certainly was a "fizzer." Professor McMICAL described the case of a man in his fifties with a progressive and eventually fatal pulmonary hypertension who had first presented some three years earlier with a mild febrile illness, loss of energy, a normochromic anaemia, and an E.S.R. of 85 mm. After a remittent but progressive course during which there developed a transient attack of blindness, dizziness, and an idiopathic hyperglobulinaemia, the patient died in right heart failure. The answer, which not surprisingly floored both the teams, was a myxoma of the left atrium obstructing the blood flow. The American case, ably presented by Dr. Fox, though involving a triple diagnosis, was by comparison straightforward. The correct diagnosis of silicosis, pulmonary tuberculosis, and as the final event a bronchial carcinoma with widespread pulmonary metastases was successfully made for the British team by Dr. SCADDING.

There was no doubt that the British audience found this first transatlantic clinico-pathological conference between B.M.A. and A.M.A. teams very good fun and highly instructive. The American team's voices reached the Guildhall perfectly clearly.

Colour Television

Those who have attended recent B.M.A. Annual Meetings will be familiar with the pattern of the Smith Kline & French Laboratories' colour television demonstrations of surgical operations. The cameras divide their attention between the operation itself, which is telecast as it proceeds, and a panel of experts in a temporary studio at the hospital who demonstrate charts, x-ray pictures, etc., and answer questions relayed from the audience in the meeting hall. On both Friday and Saturday, operations from the Southampton General Hospital were televised during the lunch hour to the audience in the Guildhall. The moderator on both days was Mr. H. H. LANGSTON (Winchester).

On Friday two operations were shown. The first was the repair of an atrial septal defect under hypothermia, in which the surgeon was Mr. E. F. CHIN and the anaesthetist Dr. E. S. MACHELL. The studio panel who answered questions on the case were Dr. R. V. GIBSON (London), Dr. D. J. PEARCE (Southampton), and Mr. I. K. R. McMILLAN (Southampton). The second was an operation for lymphoedema, where the surgeon was Mr. J. E. LAING and the anaesthetist Dr. P. J. HORSEY. Mr. J. N. BARRON (Salisbury) answered questions in the studio. On Saturday the first operation was a partial thyroidectomy for a "cold" nodule by Mr. G. ST. J. HALLETT (anaesthetist, Dr. H. C. J. BALL), and in the studio were Mr. T. ROWNTREE and Dr. H. K. MELLER (both of Southampton). Next was shown an arthrodesis of the knee for advanced osteoarthritis by Mr. D. E. MACRAE (anaesthetist, Dr. C. B. PICKEN), with Mr. J. S. ELLIS and Dr. J. PRESTON, of Southampton, answering questions. Finally Mr. L. A. RICHARDSON performed a stripping operation for varicose veins (anaesthetist, Dr. W. L. M. BIGBY), with Mr. ROWNTREE in the studio.

Medical Films

Dr. R. P. LISTON, chairman of the B.M.A. Film Committee, compered the showing of three films from the B.M.A. Film Library, for an hour on Friday evening. All were in colour and sound. The first on "The Jugular Venous Pulse," made by the Wellcome Film Unit, had as its commentator Dr. PAUL WOOD. It illustrated modern instrumental techniques for analysing the jugular pulse. In the second film, "The Management of Twins in Pregnancy and Labour," produced by the Wellcome Foundation Ltd., the medical authority was Professor W. C. W. NIXON. The last film was on "The Treatment of Cardiac Arrest." It had been made by the Department of Medical Illustration, Guy's Hospital Medical School, under Sir RUSSELL BROCK'S

direction. The film showed emergency exposure of the heart and cardiac massage in a case of cardiac arrest, and also demonstrated the use of the defibrillator.

DINNER AND RECEPTION

On the Saturday evening a dinner, attended by nearly 200, was held in the Royal Pier Pavilion. Speeches were made by the BISHOP OF SOUTHAMPTON, who proposed the toast of the British Medical Association, to which the President, Professor A. P. THOMSON, replied. "The Guests" was proposed by Dr. D. P. STEVENSON, Secretary of the Association, and the Vice-Chancellor of Southampton, Dr. D. G. JAMES, replied. Professor THOMSON said that since becoming President of the B.M.A. he had put to himself anxiously the question, What were the Association's purposes? Medicine had passed through three revolutions and it was still in process of adjusting itself to the last of them, which, stemming from the philosophies of men such as Herbert Spencer, held that the doctor had a duty not only to the individual but to society as a whole. That accounted for the perhaps undue concern over politics in the recent past, and he therefore welcomed a meeting devoted entirely to clinical medicine. It was a return to the original idea that what really mattered in medicine was the quality of the people practising it. The other two revolutions medicine had experienced in the past, and only slowly digested, had been the Hippocratic revolution through which medicine became rational and the ethical concept was introduced, and the scientific revolution beginning in the sixteenth century which had established experiment as the test of truth—and the implications of this latter revolution had taken over 300 years to be fully absorbed.

The night before, the Southampton Division of the B.M.A. gave a most successful informal reception at the Palm Court Restaurant, at which Dr. and Mrs. R. S. RUSSELL-SMITH received the guests.

In all, 325 doctors registered for this first B.M.A. Annual Clinical Meeting. On all sides it was accounted to have been a great success. Reports of the panel discussions, the final general session, and the visits to local hospitals for clinical demonstrations on the Saturday, and of the Sunday morning outings, will be given next week.

Nova et Vetera

RICHARD BRIGHT

Reference was made in the *Journal* last week (pp. 1402, 1422) to the commemoration of the centenary of Richard Bright's death, which occurred on December 16, 1858. Today he is remembered chiefly for his description of the disease to which his name has been given, and through the passage of time his many contributions on other subjects and his wide interests and accomplishments have been largely forgotten.

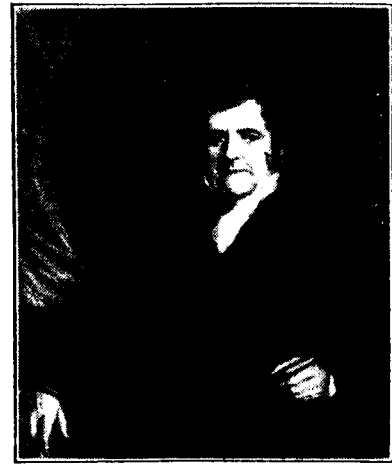
Bright was born in Bristol on September 28, 1789, and in 1808 began the study of medicine at Edinburgh. Two years later, while still a student, he accompanied Sir George Steuart Mackenzie and (Sir) Henry Holland on a two months' tour of Iceland, and contributed chapters on botany and zoology to Mackenzie's account of the expedition (*Travels in Iceland*, 1811).

On his return, Bright studied for a time at the united hospitals of Guy's and St. Thomas's, and graduated M.D. Edinburgh in 1813. In the summer of 1814 he embarked on a lengthy Continental tour, which included Belgium, Holland, Germany (where he spent some time at the Charité in Berlin), and Austria. In the spring of 1815 he travelled through lower Hungary and published an excellent description of the social and economic life of that country (*Travels from Vienna through Lower Hungary*, 1818). Some account of this little-known volume of over 700 pages was given in this *Journal* by R. T. Williamson over thirty years

ago. It exemplified "Bright's wonderful power of observation and description, his wide reading, his accuracy, as is shown by the tables, maps and appendices, and his artistic ability, for it is illustrated by beautiful engravings from sketches by himself."²

Returning to London, Bright was appointed assistant physician to Guy's Hospital in 1820, and full physician in

1824, resigning in 1843. He was elected F.R.C.P. in 1832, and, on the accession of Queen Victoria in 1837, was appointed her Physician Extraordinary. His first description of chronic nephritis was given in vol. 1 of his *Reports of Medical Cases*, 1827, and a more extensive account appeared in *Guy's Hospital Reports* in 1836. Sir William Hale-White³ has published a description



of these writings, including a condensed version of the 1836 paper; they have also been reprinted under the editorship of A. A. Osman.⁴ Vol. 2 of the *Reports of Medical Cases* appeared in two parts in 1831. It is devoted to diseases of the brain and nervous system.

Hale-White³ has also reminded us of Bright's important writings on subjects other than renal disease. These include spastic paraplegia, epilepsy, localization of cerebral function, aphasia, glycosuria and pancreatic disease, cirrhosis of the liver, acute yellow atrophy, diaphragmatic hernia, chronic peritonitis, Addison's disease, appendicitis, the administration of oxygen, heart block, and the lungs in whooping-cough. His description of unilateral (Jacksonian) epilepsy preceded the more important account given by Hughlings Jackson in 1863. He was the first to describe Addison's disease, but he did not connect the symptoms with disease of the adrenals. In 1836-9 he collaborated with Thomas Addison in writing *Elements of the Practice of Medicine*, vol. 1. No second volume appeared, and the first, now a rarity, contains what is probably the first accurate account of appendicitis.

Bright's death, which occurred at his house in Savile Row, was due to aortic disease. He was twice married. His first wife was the daughter of William Babington, M.D., another illustrious physician of Guy's Hospital.

The portrait of Bright was supplied by the Wellcome Historical Medical Library.

REFERENCES

- ¹ Williamson, R. T., *Brit. med. J.*, 1927, 2, 67.
- ² Hale-White, W., *Guy's Hosp. Rep.*, 1921, 71, 1.
- ³ *Original Papers of Richard Bright on Renal Disease*. Edited by A. A. Osman, 1937. Humphrey Milford, London.
- ⁴ Hale-White, W., *Guy's Hosp. Rep.*, 1921, 71, 143.

The 43rd Annual Report of St. Dunstan's for the year ended March 31, 1958, is entitled "Wars end—but blindness remains. . . ." The report is divided into three sections, "Learning to be blind," "Out into the world," and "Their future is bright." The oldest member of St. Dunstan's is now 90 years old; he lost his sight during an incendiary bomb raid in the second world war. "Since the last shot was fired in World War II," says the report, "we have received no less than a further 500 young men. Some were certainly casualties in Korea, Kenya, and Malaya, but the majority have been men whose sight for one reason or another failed from old wounds, the results of privation and hardship suffered in P.O.W. camps, jungle fever and tuberculosis, or from illnesses contracted on war service."

Reports of Societies

RESULTS OF LEUCOTOMY

[FROM A SPECIAL CORRESPONDENT]

The Section of Neurology of the Royal Society of Medicine took a look, on November 6, at the results of leucotomy in the light of recent long-term follow-up studies. In addition two neurosurgeons described, respectively, their experience of a modified rostral leucotomy and of orbital undercutting.

In Depression

Dr. ALICK ELITHORN said he had followed up, by clinical assessment and questionnaire to patient and relative, some 105 patients under Dr. Eliot Slater's care who underwent leucotomy at Queen Square before 1954. He had paid particular attention to the effects of the operation in depressive illness, and his findings supported the thesis, recently rejected by Garmany,^{*} that there are two distinctive types of depressive illness, one a reactive depression determined by environmental factors and the other the so-called endogenous depression which is determined at least partly by one or two genes of large effect. Using the customary criteria, Dr. Elithorn had separated the possible "endogenous depressions" from the other types and compared them in terms of response to leucotomy. It was clear that the results were very much better with the endogenous patients and that these patients were much more enthusiastic about the operation than were those with reactive depression: of the endogenous depressives, 84% were glad to have had the operation and only 1 out of 32 regretted it; while, of the reactive depressives, 51% were glad to have had the operation and 8 out of 35 regretted it. These results were not attributable to the type of operation carried out: in the series 50 had the standard and 55 the modified procedure.

Within the group of reactive depressions the outcome varied according to the kind of environmental determinant. Thus the results were very much worse where the illness was a reaction to some definite physical factor—e.g., severe and prolonged pain—rather than to purely psychological events. This effect was evident no matter what type of operation was employed, although it was slightly more marked with the modified technique. It followed, therefore, that, if "endogenous depression" was simply a type of reactive depression in which there was minimal environmental cause for distress, then the results of leucotomy should be best in those cases where there was least evidence of an external cause—that is, in the truly cyclical or manic depressive cases. This had not been the experience in this series. Leucotomy appeared not to affect the enduring physical basis of cyclical depressive illnesses; the periodicity of the attacks was unaltered, although the intensity or elaboration of the depressive spell was diminished. Dr. Elithorn concluded that some endogenous depressions were prognostically and aetiologically distinct from most reactive depressions, and that leucotomy had a specific but only transient effect on the mechanisms underlying endogenous depression.

Ten-year Follow-up of Standard Prefrontal Operation

Dr. MAURICE PARTRIDGE presented the long-term results in 96 patients upon whom Mr. Wylie McKissock had performed a standard prefrontal leucotomy some 10 to 12 years earlier and who had recently been followed up again. (They were the first 96 of the 300 reported on by the speaker in 1950†.) The incidence of epilepsy in these cases had increased in the intervening years from the 10% originally reported to 15%. Of the schizophrenics, those with affective colouring or who had had remissions prior to the operation

^{*}Garmany, G., *Brit. med. J.*, 1958, 2, 341.

†Partridge, M., *Prefrontal Leucotomy: A Survey of 300 Cases Personally Followed Over 1½-3 Years*, 1950. Blackwell, Oxford.

To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in current use.

Marcoumar (Roche Products Ltd.).

Marevan (Evans Medical Supplies Ltd.).

These are preparations of warfarin sodium, which is the sodium salt of 3-(α -acetylbenzyl)-4-hydroxycoumarin, and is chemically closely related to dicoumarol. Like dicoumarol, warfarin in an anticoagulant which exerts its effect by interfering with the hepatic synthesis of prothrombin.

There are now a number of anticoagulants, most of them closely related chemically, that are available for clinical use. These include the earlier preparations, dicoumarol and ethyl biscoumacetate, and the more recent one, phenindione. Warfarin exerts its full therapeutic effect earlier and more constantly than dicoumarol and ethyl biscoumacetate. Fremont and Jagendorf¹ have claimed that marevan is superior also to phenindione in this respect, producing an initial effect within 18 hours and exerting its full therapeutic effect by 36 hours. Warfarin also appears to be a stable and predictable form of maintenance therapy, and frequent alteration of the dosage has been found unnecessary.

Toxic reactions are similar to those produced by other anticoagulants, but so far complications from haemorrhage have not been serious and respond quickly to vitamin K₁. The indications and contraindications are the same as for other anticoagulants.

The initial dose is commonly between 35 and 50 mg., depending on the weight of the patient. Maintenance dosage depends on the results of prothrombin estimations, which are necessary for satisfactory control of the therapeutic effect and prevention of complications.

N.H.S. basic price: marcoumar, 25 3-mg. tabs., 5s.; marevan, 100 3-mg. tabs., 32s. 6d.

REFERENCE

- ¹ Fremont, R. E., and Jagendorf, B., *J. Amer. med. Ass.*, 1957, 165, 1381.

Actal (Bayer Products Ltd.).—Each tablet contains sodium polyhydroxyaluminium monocarbonate-hexitol complex in tablets of 360 mg. This is an elegant preparation of aluminium hydroxide. The tablet has a pleasant taste, dissolves readily in the mouth, and, being an antacid rather than an alkali, will not cause alkalosis. Like all preparations of aluminium hydroxide it is somewhat constipating. There is no published work on this preparation; it is therefore impossible to say whether any advantage it may possess over the ordinary B.P. tablet of aluminium hydroxide is sufficient to justify the disparity in price between them.

N.H.S. basic price: 48 tabs., 4s. 3d.

(Continued from preceding column)

constant psychiatric help) 35 fully recovered and a further 14 improved enough to carry on without psychiatric help, in spite of slight symptoms; of 44 "socially incapacitated" (out of hospital but not working) 31 fully recovered and 8 improved; and of the remaining 70 cases who were "totally disabled" (in mental hospitals) 43 fully recovered and 19 improved. In the whole group there were two deaths, both hypertensive cases, and six patients developed epilepsy. The highest recovery rate (75%) was obtained in the group with anxiety and tension states, followed by those with depression (66%), obsessional states (61%), and lastly schizophrenia (44%). The operation relieved cases of agitation and depression in which all other forms of treatment had failed and where the illness had been present for 10 years or more. This suggested that there might be a case for its earlier employment in some of these cases.

did best and those with a progressive course before the operation least well. About one-third of these schizophrenic patients remained out of hospital, although some lived in sheltered circumstances. Cases of affective disorder did better, but continued to have recurrences, though these were milder. Seven previously incapacitated obsessional had been able to live an approximately normal life without relapse. Seven of the 96 had died from causes unconnected with the operation; of the 89 survivors, 46 had been able to remain continuously out of hospital for 10 to 12 years.

Rostral Leucotomy

Mr. WYLIE MCKISOCK then described his more recent experience with rostral leucotomies. When it was recognized that the earlier types of prefrontal leucotomy often produced undesirable personality changes, modifications of technique had aimed at producing a smaller and more accurately localized lesion, he said. Since 1948 he had carried out rostral leucotomy in increasing numbers. In 1957, for instance, of 144 leucotomies he had performed 125 were rostral and only 19 a standard Freeman Watts. After Pippard's report of some personality changes of undesirable kind in the rostral (G) operation he had modified his technique, taking a more forward line of section, now directed towards the midpoint of the orbital plate. He called this operation rostral (P).

There had been a distinct change in the type of case referred for operation—fewer old schizophrenics and more cases of tension, agitation, or depression. In his series of 490 rostral leucotomies, the mortality of less than 1% emphasized the safety of the procedure. Nor did the operation require any specialized apparatus or equipment. In a series of 60 rostral leucotomies he had performed at one hospital there was a recovery rate of 60%, while a further 30% had been discharged from hospital although not working. These figures could be compared with recovery and discharge rates of 39.6% and 13.5%, respectively, in a series of 111 prefrontal leucotomies performed in the same institution. When the cases submitted to rostral leucotomy were separated into those with depressive and those with other psychotic illness it appeared that the best results were obtained with the depressives. Thus 25 of 38 depressed patients were discharged and working and a further 11 were discharged but not working. For the other psychotic states, the corresponding figures were 6 out of 17 discharged and working, and a further 7 discharged and not working. These differences were also seen in the prefrontal series. Of 5 cases of obsessive compulsive states, all were discharged and working. Rostral leucotomy had proved itself to be a form of treatment with a very low risk to life and to have remarkably few side-effects. If used in properly selected cases, it offered a high rate of recovery.

Orbital Undercutting

Mr. GEOFFREY KNIGHT said that, influenced by the results of animal experiments and Rylander's observation that lesions in the orbital aspects of the brain would produce tranquillity and loss of fear, he had followed in a modified way since 1949 Scoville's method of orbital undercutting. He used a more limited incision so as to disturb as little as possible the more lateral fibres subserving emotional appreciation and intellectual processes. The operation, although a long one taking up to two hours, was worth while because it resulted in the absence of all undesirable side-effects such as grossly increased appetite, adiposity, and incontinence. There was no intellectual blunting, the patients felt relaxed, and remained warm individuals with normal emotional reactions. In three cases a second operation at the same site, by extending the lesion, resulted in success.

Mr. Knight then analysed the results in the first 167 cases he had followed up out of a total of 250 treated in this way. Of 53 cases classified as "psychiatrically disabled" (in the sense that although out of hospital they were in need of

(Continued at foot of next column)

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Medicine on Television

SIR,—A change of role to that of patient prevented me from hearing Mrs. Mary Adams and Mr. Dickson Wright discussing "Medicine on Television" (*Journal*, November 29, p. 1351), but Professor Roger Warwick's letter (p. 1354) has brought some of the flavour of it to me. My long interest in non-medical sound broadcasting and television, sadly and unprofitably restricted by the fact that these are not the most suitable spare-time occupations even for full-time doctors, has provided me with enough experience of several of the B.B.C.'s services to realize that a revolution is taking place in adult education. The desire of what we choose to call "backward peoples" to know about the world in which they live and how it works, and to hear what others have thought about it, makes most of our programmes seem extremely frivolous. Some small countries demand continual talks of a kind which would only be tolerated here by the few and would have to be put on at the most inconvenient times.

Television is an even more astonishingly influential means to adult education which has burst upon us all unprepared. There is a particular demand for public education in medicine. It is not clear why we should call a growing desire to understand what goes on in nuclear physics as enlightenment and the same inquiry in medicine as morbid curiosity. Since we are going to have medical television programmes whether we like them or not, we do well to consider the principles which might govern their presentation. For my part I think that first and foremost they should be entertaining. I consider that the B.B.C. started well long ago at Alexandra Palace when Mrs. Mary Adams and Andrew Miller Jones had a policy. Then they presented an account of how things worked, some simple demonstrations in physics or physiology, and related this to a simple human story. In later programmes the influence of advisers has been seen, results have been presented without previous explanation, and some have even sunk to exhortation and propaganda. The old programmes were entertaining and educational, the newer (with a few fine exceptions) have too often been peeps behind the scenes with the nasty bits glossed over or inexcusably dull.

To finish on a controversial note, my pet aversion on the television screen is the anonymous doctor. To me he appears as a superior expert whose credentials I cannot check, who sets himself apart from ordinary folk by a secrecy which enhances that personal mystique which is at the heart of most of what is phony in medicine.—I am, etc.,

Knockholt, Kent.

D. W. SMITHERS.

Cause of Post-vagotomy Diarrhoea

SIR,—In an earlier paper this year Burge and Pick¹ stated that the cause of diarrhoea following vagotomy and gastro-enterostomy for chronic duodenal ulcer was not known. It was mentioned in this paper that this problem was being investigated in the Medical School of the West London Hospital. This symptom has been generally thought to arise from intestinal infection due either to reduction in gastric acid or to post-operative gastric stasis.

As a result of our work we have evidence that this symptom is caused by pancreatic insufficiency resulting from vagal denervation which must follow division of the main posterior vagal trunk. This work will be reported in detail in the near future. Meanwhile, surgeons who use this operation are urged to preserve the coeliac division of the posterior vagus while dividing all its gastric branches. This is easily done by dividing the small omentum completely

from the pyloric antrum. The left gastric artery and vein are divided close to the stomach. In this region the main gastric division of the nerve is easily seen and divided, leaving the coeliac division passing posteriorly to the coeliac plexus.—We are, etc.,

HAROLD BURGE.
PETER CLARK.
LESLIE CHAPMAN.

West London Hospital Medical School,
London, W.6.

REFERENCE

¹ Burge, H., and Pick, E. J., *Brit. med. J.*, 1958, 1, 613.

The Art of Consultation

SIR,—May I send you a brief note to express my appreciation of Dr. G. F. Abercrombie's excellent James Mackenzie lecture on "The Art of Consultation" (*Journal*, November 29, p. 1349)? In a way I find myself fortunate, for I was for some years a general practitioner before taking up surgery as a specialty. I am thus able to see from both sides the problem which he presents. In my later years as a consultant I cannot tell how much I owed to the many excellent general practitioners of Northern Ireland. Especially would I like to pay tribute to the late Dr. John Taggart, who strangely enough was an assistant to Dr. James Mackenzie when he was a general practitioner in Burnley before going to London, and the latter never forgot what he owed to the years he spent in general practice.

Dr. Abercrombie draws a clear distinction between a consultation and a second opinion. This is, I think, a vital problem to-day. Surely the failure of consultants to meet G.P.s, and vice versa, is one of the tragic defects in the present N.H.S. (at least in Northern Ireland). In former times those meetings were the very bread-and-butter of consultants. To-day I understand many part-time consultants and all those on full time never want to see a general practitioner. Why is this? Do they foolishly think that the G.P. has nothing to contribute to the average consultation?—I am, etc.,

Belfast.

S. I. IRWIN.

Poliomyelitis Vaccine

SIR,—Your leading article and the articles on live poliomyelitis vaccine (*Journal*, November 15) are valuable contributions on this important but controversial subject. However, it would appear that some clarification of the technical policy of the World Health Organization in this connexion is necessary in order to avoid possible misunderstanding. All Expert Committee Reports carry on their cover the statement that "this report contains the collective views of an international group of experts and does not necessarily represent the decisions or stated policy of the World Health Organization." In this instance the policy of the Organization is in substantial agreement with the recommendations of the Committee, although it may be that there are differences in the interpretation of certain recommendations.

The statement quoted in the leading article (p. 1210) to the effect that "tests on hundreds of thousands of people will be necessary to establish whether the theoretical expectations of safety can be confirmed in actual practice" is, in its context, a statement of fact and not a recommendation that such tests be carried out now. Since it is not known what the currently used tests on monkeys mean in terms of safety for man, it is obvious that only actual tests on man on a sufficiently large scale will finally prove the innocuity of a strain. These large-scale tests should not be carried out until there is good presumptive evidence of safety and stability, based both on laboratory and on small-scale human studies. The Expert Committee insisted most strongly on the need for a cautious extension of strictly controlled human trials under the most careful supervision. The criteria which should be fulfilled were specified in some detail. So far W.H.O. has not given direct support to any trial of live poliovirus vaccine, and, contrary to some reports, the "test" in the Belgian Congo was not supported by W.H.O. The Organization has of course

followed closely the scientifically conducted studies which are in progress in several countries, and it is clear that a great deal of new information will become available in the coming months on which future policy may be based.

The Director-General made the present position of W.H.O. clear in a statement to the Eleventh World Health Assembly in May, 1958, in which he said that W.H.O. was not satisfied with the evidence for the stability of the available strains and did not support large-scale trials of this vaccine at the present time. He emphasized the need for caution, pointing out that the availability of a safe and effective inactivated vaccine greatly reduced the urgency of developing the live virus vaccine.

With respect to the statement by Professor G. W. A. Dick and Dr. D. S. Dane (p. 1184) that the Expert Committee virtually ignored the problem of spread of the vaccine virus, I can assure them that the problem was carefully discussed and that it was one of the important reasons behind the strong recommendation for the most careful supervision of field trials by someone experienced in investigations involving poliovirus, who would therefore be fully aware of the danger of spread. I have myself repeatedly called attention to this problem, both in publications and in communications to those proposing to use the vaccine. Some carefully designed trials to throw light on this important problem are in progress and the results may be expected in a few months.—I am, etc.,

World Health Organization,
Geneva.

A. M.-M. PAYNE,
Secretary to the Expert Committee
on Poliomyelitis.

Pharmaceutical Houses and the Doctor

SIR,—It would be a great pity if Dr. Mary Rayner's letter (*Journal*, November 22, p. 1291), or any replies to it, were allowed to imperil the good relations which exist between the pharmaceutical industry and the profession.

We in the industry are aware that some members of the profession are at times critical of us, but I can assure you, Sir, that we take note of such criticisms, taking care to put it into perspective, to determine the validity, and to take whatever action is necessary. Our job is to provide the tools of clinical medicine. To do so we must bring the results of our efforts to the clinician as quickly as possible.

The alternatives to co-operation and understanding are acrimony and prejudice; as we are indispensable to one another let us pursue the first course.—I am, etc.,

London, W.C.1.

T. H. M. KERFOOT,
President,
The Association of British Pharmaceutical Industry.

SIR,—I agree entirely with Dr. Mary M. Rayner and Dr. Charles S. Thompson (*Journal*, November 22, p. 1291). Neither of them, however, mentioned a new form of advertising which appears to have crept in. I refer to the discussion in the doctors' columns of newspapers and women's magazines of drugs, mentioned by name, and in certain cases with the maker's name and cost, and the implication that the reader may well ask his doctor for these drugs.

I do not suggest that the drug houses are responsible for this. Nevertheless, I feel that drugs so mentioned have moved into the class of the publicly advertised aspirin derivatives, and I wonder whether one should continue to prescribe them, good though some of them may be. To whom are those who write these articles responsible, and is there no way of restraining them?—I am, etc.,

Salford, 6.

R. HEWITT.

SIR,—I was most interested in the letter of Dr. Mary M. Rayner (*Journal*, November 22, p. 1291) and find myself in agreement with many of her views.

I wonder how many of my colleagues recently received a sample of antacid tablets in a wedding cake presentation box. At my home it was opened with pleasurable anticipation, and we were well and truly "taken in." My first impulse was to return a similar package containing

senna pods to the managing director of the firm responsible, but second thoughts prevailed. Instead I wrote to him saying that this kind of salesmanship was not appreciated and to cross us off the mailing list. I should have known better. In reply I received a long letter which, using military language, may be divided into three parts. Firstly, the retreat; with the expression of sorrow that their efforts to present their products in a humorous and rather different style, etc., had not been appreciated. Secondly, the marshalling of the forces; with an exposition of the merits of the firm. Finally, the attack; with a final paragraph turning the knife in the wound by describing in detail the efficacy of the first-mentioned antacid tablets.

"What kind of a people do they think we are?"—I am, etc.,

Bearwood, Smethwick.

H. S. SPILLER.

SIR,—Reading through the correspondence columns in the *British Medical Journal* recently, I have been struck by the attack on the pharmaceutical houses. It appears to me that much of this is unwarranted and that insufficient credit is given where credit is due. It is common knowledge that, as a result of money invested by them in research, they have given to the medical profession a number of very valuable drugs which have provided the doctor with powerful weapons in his fight against disease. Of course the pharmaceutical houses are profit-making concerns which must advertise and sell their products, but the criticism often levelled against them, that their prices are excessive, has not been substantiated. Indeed, on looking through a recent official publication giving the cost of proprietary and official equivalents,¹ I was impressed by the large number of cases in which the cost of the proprietary preparation was no greater than that of the official, and in a few cases was even less. Moreover, there were a large number of drugs which were considered to be of such value as to be included in the *British National Formulary*, but which are available only in proprietary form. These are evidently the result of original research on the part of the pharmaceutical houses.

But the chief concern of correspondents seems to be the manner in which the pharmaceutical houses keep us informed of their products and their efforts to urge us to prescribe them. This is done by advertisements in the journals, by mailed literature, and by visits from representatives. Personally, I peruse the advertisements, sort the mailed literature, discarding the more sensational and filing the more informative, and enjoy a short discussion with representatives. But surely those who are not so inclined can deal appropriately with the postal advertising; and, after all, we who are accustomed to handling all manner of patients can surely deal with representatives in, I hope, a courteous manner.

As a former practising pharmacist, I was interested to read Dr. Mary M. Rayner's comment (*Journal*, November 22, p. 1291) on extemporaneous oral penicillin preparations, and I would very much like to see her prescription for a stable, elegant, and palatable preparation of oral penicillin, comparable to the proprietary products. Finally, if we are unable critically to appraise the literature sent to us and evaluate the pharmaceutical preparations for ourselves, then we have no right to be prescribing for our patients. And if, as Dr. Rayner suggests, we are treated as a band of immoral morons, then we have only ourselves to blame.—I am, etc.,

London, S.E.4.

JOHN E. PEARSON.

REFERENCE

¹ N.H.S. Pharmaceutical Services, Costs of British National Formulary and Proprietary Preparations, July, 1958.

SIR,—Dr. Mary M. Rayner (*Journal*, November 22, p. 1291) and other correspondents are concerned about the propaganda methods of the drug houses. I would like to make a few comments.

The practice of consigning advertising matter to the waste-paper basket seems to me deplorable. We all use a proportion of proprietary drugs, and it is surely our duty

SIR,—I was interested to read Dr. A. H. Luscombe's letter (*Journal*, November 15, p. 1226), referring to the use of continuous antibiotic therapy for adult chronic bronchitis. Dr. Luscombe's letter exposes the unfairness of the present method of criticizing a doctor's prescribing costs without taking into consideration the possible savings which these effect by shortening the duration of the patient's illness. Dr. Luscombe is quite right when he says that the Ministry of Health is not interested in these savings, nor in the fact that a patient continues working throughout the winter. However, at a time when productivity in industry is of paramount importance, is it not time that the Ministry of Health did take these factors into account?

Dr. Luscombe asks for guidance in his problem; I would suggest he might utilize the method described by Elmes *et al.*¹ This method consists in giving bronchitic patients a supply of antibiotic tablets and an instruction to commence using these at the first sign of an onset of an exacerbation. In their paper Elmes *et al.* stated that between June, 1953, and June, 1954, male insured workers in Great Britain lost nearly 15 million days' work owing to sickness diagnosed as "bronchitis," and estimated that the cost to the community that year was about £30m. They stated that the simple measures they adopted would greatly reduce this figure, but advised that the method should be used only with patients intelligent enough to understand the instructions.

Using the latest figures available from the Ministry of Health the total cost of such a treatment (including chemist's profit, dispensing fee, etc.) is less than £3 10s., so that with, say, four exacerbations per year the total annual cost would be £14. The cost of keeping a patient in hospital for one week is over £23 in the provinces and £29 in London.

This factor, added to the benefits the patient and nation receive, is, I consider, a valuable argument if the Government is interested in the overall cost of bronchitis to the nation.—I am, etc.,

Folkestone.

W. J. KEATING.

REFERENCE

- ¹ Elmes, P. C., Fletcher, C. M., and Dutton, A. A. C., *Brit. med. J.*, 1957, 2, 1272.

Medical Education

SIR,—Having been educated in the United Kingdom, having lived in the United States, and now living and practising in Canada, I found your annotation on medical examinations (*Journal*, October 4, p. 842) most disturbing. There is a remarkable tendency these days for apparently thoughtful people in the United Kingdom to accept American methods uncritically, while at the same time they are prepared to jettison methods which have been well tried and proved in their own country for many generations. This is not to plead for the maintenance of the *status quo*. There is always room for progress, and medical education can be improved in many ways. But please think twice before accepting an American system of education, which succeeds in producing "well-adjusted morons" (an American criticism) from the schools by virtue of just some of the principles advocated in your columns: I mean "credit" advances from grade to grade, multiple choice examinations, and not permitting the poor student to fail, in case he should suffer some psychological shock. Heaven knows the Americans themselves are undergoing agonizing reappraisals of these matters since the days of Sputnik, and it is the more difficult for them as "democratic education" is deeply ingrained in the national thought, even though it leads to proceeding at the pace of the least intelligent and to a deep suspicion of all truly educated men (egg-heads).

I recall a conversation struck up with the representative of a large business organization, who had been visiting one of the largest and best-known U.S. Mid-Western Universities to interview recent graduates from the commerce faculty. These men were all wanted by industry, and had the pick of many openings at that time. "Of course," added my acquaintance, "after we get them we have to teach them to read and write." These skilled university graduates, with good technical education, had progressed through multiple-choice examinations and were virtually incapable of expressing themselves either verbally or on paper, because they had never been taught to do so. Multiple-answer examinations do have the virtue of being easy to mark. They are easy for the examiner. They do test the student's knowledge of the books. But they are not a test of a man's true calibre. Ask a man to write for three hours on one subject, and you will have a much better idea.

The credit system has defects too, and these have been discovered. For example, the percentage of passes may be seen as a reflection on the teacher's ability. You men of integrity may doubt the importance of this. We who have seen the system in action have become more cynical in this respect.

All tests of skill and knowledge are open to objections. Some able men do not do themselves justice under any system you choose to adopt. This should not obscure the broad pattern.

Men of initiative and brain are on the whole stimulated by a challenge, and all of us are the more tempted to work if idleness is penalized. "When a man knows he is to be hanged in a fortnight," said Johnson, "it concentrates his mind wonderfully."

Those who decry British education may derive consolation from the fact that British speakers are renowned throughout the New World because they are so much more polished, regardless of the scientific content of their talks, and it is a fact that the standard of discussion at any medical meeting in the United Kingdom is far higher for exactly the same reason. We can certainly learn from America in many ways. Their postgraduate training is often greatly in advance of what is offered in the United Kingdom. We can learn, in fact, from their successes and their failures.—I am, etc.,

Victoria, British Columbia.

KEMBLE GREENWOOD.

Munchausen Syndrome

SIR,—I was interested in the medical memorandum on the Munchausen syndrome by Dr. J. C. Barker and Dr. T. G. Grygier (*Journal*, November 22, p. 1274).

When I was a general practitioner in London, some years ago, a lady consulted me complaining of abdominal pains, for which she requested a prescription for pethidine. She had innumerable laparotomy scars all over the abdomen; their very number, and varied sites, aroused my suspicions; also she demanded a phenomenal quantity of pethidine tablets. Discreet inquiries revealed that she was a known pethidine addict. At that time I was unfamiliar with the syndrome, although I had met the "chronic hospital patient." Unfortunately, she was more interested in seeking pethidine *ad lib.* than in obtaining treatment for her addiction, so she never consulted me again.

I was left wondering whether the addiction was the result of innumerable surgical operations, or whether the laparotomies were sought merely in order to obtain pethidine.—I am, etc.,

Hale, Cheshire.

AUDREY ROBERTS.

Charges of Indecency

SIR,—In his article on the Disciplinary Committee of the G.M.C. (*Journal*, November 22, p. 1257) Mr. C. P. Harvey, Q.C., gives an instance of how a doctor may be charged by the police with "committing acts of indecency." He appears to imply that, merely because this doctor walked home from a party through a London park at night, he was seized upon and had this charge made against him. I gather Mr. Harvey to mean that he is not suggesting that the doctor committed any indecent act in reality.

I know such things have happened—a friend of mine was charged more or less in this way and was found not guilty by the court—but is Mr. Harvey really trying to tell us that one person in every so many will be charged with indecent acts merely because he walks home through a London park at night? He does definitely make the point that the story is staged in London, and I am happy to be able to share with him the view that this would be rather unlikely to happen anywhere else.—I am, etc.,

Birmingham, 31.

DAVID T. MACLAY.

Premonition of Death

SIR,—I should like to support Dr. A. A. Lewis (*Journal*, November 8, p. 1165) in his view that we are more apt to remember those occasions when a premonition of death has proved accurate, and to forget the "false alarm." Shortly after I qualified, I was staying with my grandmother, who was then 85, and was called to her at 5 a.m. one morning as she thought she was about to die. She was thanking her two faithful maids for all their care of her, and had literally turned her face to the wall. To my inexpert eye she did not appear to be dying, and in fact she lived for another ten years, and might have completed her century if it had not been for a fracture of the neck of the femur.—I am, etc.,

Cambridge.

JANET BOTTOMLEY.

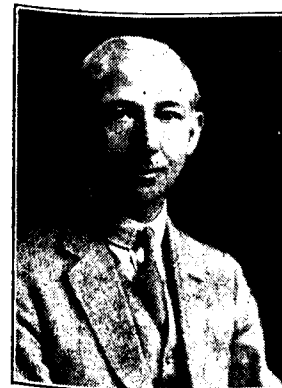
* * This correspondence is now closed.—ED., *B.M.J.*

Obituary

J. A. CRAIG, M.D., F.R.C.S.

Mr. James Craig, well known as an ophthalmic surgeon, died in Belfast after a short illness in his 87th year. He was consulting ophthalmic surgeon to the Royal Victoria Hospital, Belfast.

James Andrew Craig was born on March 20, 1872, in Ballymoney, Co. Antrim, which was also the birthplace a year or two later of another eminent doctor who has recently died—namely, Sir John Megaw. Educated at the Coleraine Academical Institution and at the former Queen's College, Belfast, he obtained first-class honours in the final examinations for the M.B., B.Ch., B.A.O. of the Royal University of Ireland in 1895. For the next three years he held resident appointments at the Royal Southern Hospital, Liverpool, and then went to Vienna to study eye and ear diseases. Returning to Belfast, he was appointed demonstrator of anatomy at Queen's in 1899. Two years later he was elected honorary assistant in the eye, ear, and throat department of the Royal Victoria Hospital, and in 1902 he



obtained the F.R.C.S. of England. One of his first publications appeared in this *Journal* in 1906: it was on the subject of the operative treatment of detachment of the retina. Mr. Craig served the Royal Victoria Hospital faithfully until his retirement in 1937 at the age of 65. But in 1939 he returned to his old hospital post in order to release his junior colleagues for war service. He finally ceased to practise only a few years ago when he went to live in Cultra, in Co. Down.

Mr. Craig also gave unstinted service to Queen's University from the time he was appointed lecturer in ophthalmology and otology in 1913. In 1951 his distinguished work was recognized by the award of the M.D., *honoris causa*. In presenting him for this degree Professor Biggart said that Mr. Craig had been a generous benefactor to the university, and, stimulated by his gifts, Queen's would promote research in his own subject of ophthalmology. In his own specialty Mr. Craig quickly made a name for himself. He acted as one of the honorary secretaries of the Section of Ophthalmology when the B.M.A. held its Annual Meeting in Belfast in 1909, and when the B.M.A. met again in Belfast, in 1937, he was president of the same section. At one time a member of the council of the Ophthalmological Society of the United Kingdom and of the editorial committee of the *British Journal of Ophthalmology*, he was a past-president of the Irish Ophthalmological Society and of the Ulster Medical Society.

Mr. Craig was one of the early enthusiasts for skiing, and he was also a keen golfer, being a past captain of the Royal Co. Down Golf Club. His wife, formerly Miss Blanche Waldron, died in 1952, and he is survived by two sons, one of whom is on the staff of the ancient monuments inspectorate of the Ministry of Works and is also a writer and poet. Two of his nephews have been active in B.M.A. affairs—Dr. J. A. Moody, of Ilford, a member of Council, and Mr. J. C. McMaster, of Yeovil.

R. M. writes: In his early days, and for long afterwards, the specialties of ophthalmology and oto-rhino-laryngology were not divided, and James Craig quickly made himself a master of both of them. As the years passed his reputation

and his practice grew in gratifying symbiosis. His diagnostic acumen was such that his opinion was accepted without question, and his skill as an operator reflected his passion for perfection. This was, in turn, easily seen in his love of beautiful things and his appreciation of "good fare, good fellowship, and good company." Of him it may be said that he became "a legend in his lifetime." His former students all over the world will long recall the clarity of his teaching, his devotion to his hospital, and his quick wit, always lively but never wounding. He did not always suffer fools gladly, but those who sought his aid will remember his patience, his skill, and his kindness.

Sir ALDINGTON CURPHEY, C.B.E., M.C., M.D.

The Hon. Sir Aldington Curphey, president of the Legislative Council of Jamaica, and for many years a general medical practitioner in the island, died in Liverpool last month while on holiday. He was 78 years of age.

Aldington George Curphey was born in Jamaica on August 24, 1880, the son of Mr. T. J. Curphey, who came from the Isle of Man. From Wolmer's School, Jamaica, he entered Queen's University, Kingston, Ontario, as a medical student, and graduated M.D., C.M. in 1907. From then on until 1912 he held various appointments in Ontario, including those of assistant physician, assistant surgeon, and full surgeon at St. Joseph's Hospital, Hamilton, and coroner for Wentworth County. During this period he obtained, in 1909, the Scottish triple qualification. In 1912 he returned to Jamaica and became government medical officer and medical officer of health at St. Ann. From 1915 to 1919, during the first world war, he served with the 2nd British West Indies regiment as captain in the R.A.M.C. in Egypt, Palestine, and Syria. He was awarded the Military Cross in 1919 for distinguished services in connexion with the military operations in Egypt, and was also mentioned in dispatches. After the war he returned to St. Ann and settled in private practice. From 1936 to 1944 he was a member of the St. Ann parish council, eventually becoming its chairman. Nominated a member of the Legislative Council in 1945, he was appointed president of the council in 1952. For his services as major in the Jamaica Medical Corps he was appointed M.B.E. (Military Division) in 1944, and in 1952 C.B.E. (Civil Division) for public services in Jamaica. He was created a knight in this year's Birthday Honours. A member of the British Medical Association for 37 years, he was president of the Jamaica Branch in 1937–8. He became Scout Commissioner for Jamaica in 1939, and was welfare officer to the Caribbean Forces and chairman of the Jamaica Legion. During the second world war he served as surgeon-major to the Jamaica local forces, and later as honorary colonel of the Jamaica regiment. His death has deprived Jamaica of a kindly and experienced doctor and of a public-spirited citizen.

P. N. B. ODGERS, D.M., M.Ch., F.R.C.S.

Mr. P. N. Blake Odgers, consultant surgeon to the Northampton General Hospital and formerly reader in human anatomy in the University of Oxford, died in London on November 30. He was 81 years of age.

Paul Norman Blake Odgers was born on July 3, 1877, and was brought up in Oxford. He took first-class honours in the school of natural science at Oxford and went on to Guy's Hospital with a senior scholarship in science. Qualifying in 1902, he took the F.R.C.S. in the following year, graduated B.M., B.Ch., and proceeded to the M.Ch. in 1904. At Guy's he was a demonstrator of anatomy, and he held numerous house appointments and then went down to Plymouth to be senior house-surgeon at the South Devon and East Cornwall Hospital. Interested in children's diseases, he held clinical assistantships at the Evelina Hospital and at Great Ormond Street. In 1913 he served as vice-president of the Section of Diseases of Children, including Orthopaedics, at the Annual Meeting of the

B.M.A. in Brighton. A few years before this he had been elected to the staff of the Northampton General Hospital as an assistant surgeon, and he remained in that town until 1925, when he gave up clinical practice for an academic career in Oxford. During the first world war he had served in the R.A.M.C. as a temporary major. Among his clinical papers he contributed two to this *Journal*, one on retropharyngeal fibroma (1906) and another on a case of vegetable gastrolith (1912).

Mr. Blake Odgers retired from his readership in the department of human anatomy at Oxford in 1945 and came to live in London. He leaves a widow, two sons, and a daughter.

Professor W. E. LE GROS CLARK, F.R.S., writes: Blake Odgers will best be remembered by past students and others for his long period of devoted service to the department of human anatomy at Oxford. He was appointed a senior demonstrator in 1925, and in 1931 he was promoted to the readership in human anatomy. This latter post he occupied till his retirement in 1945. As a teacher, Odgers was particularly effective because his previous surgical experience gave him the appropriate orientation for the instruction of medical students. But his success in teaching was perhaps even more the result of the scrupulous care and patience with which he dealt with the individual problems of his pupils, and the conscientious manner in which he sought to cover the whole field of topographical anatomy in his lectures and demonstrations. His earlier research work was concerned with problems of anatomical topography and applied anatomy—for example, his careful analysis of certain markings on the neck of the femur (1931), his study of the lumbo-sacral joints (1933), and his report on a case of non-rotation of the gut (1933). But his interest became more and more focused on embryological problems, and no doubt his best work was represented by his patient studies (by means of reconstruction models) of the development of the venous valves of the human heart (1935), of the pars membranacea septi (1938), and of the atrio-ventricular valves (1939), as well as by his systematic descriptions of an early human ovum *in situ* (1937) and of a presumptive human embryo (1941). In 1944 he published a small *Class Book of Embryology*, which has proved of great use for routine practical classes. But, apart from his academic career, Odgers will be remembered for the kindness and the delightful courtesy with which he maintained such affectionate relations with his colleagues and his students. The department of human anatomy at Oxford owes a great debt of gratitude for his contributions to organization, teaching, and research over a period of 20 years.

H. I. MARRINER, F.R.C.S.Ed., D.L.O.

Mr. H. I. Marriner, surgeon to the ear, nose, and throat department of the Royal Victoria and West Hants Hospital, Bournemouth, and formerly chief assistant in the ear department at St. Thomas's Hospital, died suddenly at his home in Bournemouth on November 26. He was 66.

Humphrey Ingilby Marriner was born on August 12, 1892, the son of a Bournemouth doctor who specialized in ear, nose, and throat work. Educated at Cheltenham College and St. Thomas's Hospital, he qualified in 1919. After holding the posts of casualty officer and house-surgeon at St. Thomas's he worked for two years as house-surgeon in the E.N.T. department there, taking the F.R.C.S. of Edinburgh in 1922 and the D.L.O. two years later. He followed his father into ear, nose, and throat practice in Bournemouth, but he by no means severed his connexion with his teaching hospital, for, having been appointed chief assistant in the ear department in 1924, he came regularly to London to work in the out-patient department at St. Thomas's for a good many years. He was also at one time throat and nose surgeon to the North-eastern Fever Hospital in London. He joined the staff of the Royal Victoria and West Hants Hospital in 1923, and in later years

he was ear, nose, and throat surgeon at Blandford Cottage Hospital and laryngologist to the Royal National Sanatorium at Bournemouth.

Humphrey Marriner was one of those quiet and reserved doctors who nevertheless cannot help making the pleasantest of impressions on patients and colleagues. The reverse of pushing, he had a large private and hospital practice which kept him busy for many years. Those who got to know him well, including his theatre staff, regarded him with the greatest of affection. So far as public life went he kept in the background, though he once served as honorary secretary of the Section of Oto-rhino-laryngology at an Annual Meeting of the B.M.A. But his work for young people was outstanding, for he had a deep sympathy for children who had to face life without the advantage of a normal home background. An Officer of the Order of St. John, he was county cadet officer of the St. John Ambulance Brigade.

C. E. G.-S. writes: As a surgeon Humphrey Marriner was conscientious, careful, and rather conservative. He never followed the various surgical fashions which appeared and disappeared so constantly during the 40 years he was in practice. On the contrary, he followed throughout his professional life certain surgical principles which he had learnt in his parent hospital and which, from his experience, he considered sound. So long as his results were satisfactory he saw no reason to change his ways.

As a man he was the kindest person imaginable, retiring to a fault, and devoid of all personal ambition. He had, however, strong views and strong convictions which he preferred to keep to himself or share only with his intimate friends. It is certain that he never realized how great was his influence both on his professional colleagues and on all those with whom he came into close contact. His sound common sense and obvious integrity commanded universal respect and affection.

He had a profound understanding of the needs of young people and was able to put this to practical use in his work for the cadets of the St. John Ambulance Brigade and even more so in his magnificent work in connexion with the Talbot Homes for Boys. Throughout the years he was in the habit of taking a succession of boys from this institution into his home and giving them guidance and training to fit them for taking a useful place in the community. There are many men to-day both at home and in the Commonwealth who owe a great debt to Humphrey Marriner.

After the death of his beloved sister and his retirement from the active staff of the hospital, he must have felt rather lonely, but he found company and pleasure in his church community and among his friends at the E.N.T. and Eye Hospitals, where he was always assured of a welcome.

Marriner was a bachelor and the last of his line.

DOROTHY M. JAMES, M.D., D.P.H., T.D.D.

Dr. Dorothy M. James, an assistant county medical officer of health in Lancashire, died at Liverpool on October 15, aged 54.

Dorothy Mary James was born on July 1, 1904, the elder daughter of the late Mr. Arthur James and Mrs. James, of Penarth, Glamorgan. A distinguished student at the Welsh National School of Medicine, she graduated M.B., B.Ch. from the University of Wales in 1928, gaining a gold medal in both medicine and surgery. After holding house appointments at the Cardiff Royal Infirmary, Booth Hall Children's Hospital, Manchester, and Alder Hey Children's Hospital, Liverpool, she returned to Cardiff to take up a Cecil Prosser research scholarship in the tuberculosis department of the medical school, where she carried out some valuable original work on tuberculin. She took the D.P.H. in 1932, the Tuberculous Diseases Diploma in 1935, and proceeded M.D. in 1937.

Dr. ENID M. ROGERS writes: Most of us who were Dorothy James's contemporaries at the Cardiff medical school or were her colleagues in her later professional life are sad at her passing. She set up in practice in her home

town of Penarth for a period of three years until 1942, and was a very much loved, conscientious, and competent general practitioner. In spite of her great happiness in general practice, circumstances forced her in 1942 to make a career for herself in public health, and she became an assistant medical officer to the Lancashire health authority, with which she served until the time of her death. No account of Dorothy James's life would be adequate without a note on her personal qualities. Her integrity and quiet sense of humour were outstanding. She was a practising Roman Catholic, and in her fatal illness the spiritual strength derived from her religion stood her in good stead. To her mother and sister, all who knew Dorothy will wish to extend their sympathy.

W. V. CRUDEN, M.B., B.S.

Dr. W. V. Cruden, who was in general practice at Brighton, died at his home at Hove on October 31 after a long illness. He was 55 years of age.

William Victor Cruden was born at Muswell Hill, London, on February 5, 1903. From Tollington School he went on to St. Bartholomew's Hospital, qualifying M.R.C.S. L.R.C.P. in 1927, later graduating M.B., B.S. at London University. After holding several resident appointments, including that of house-physician to the late Lord Horder at St. Bartholomew's Hospital, he eventually settled in a partnership at Brighton, where he became a much respected family doctor. During the second world war he served in the R.A.M.C. in the Middle East and Italy, attaining the rank of lieutenant-colonel. In 1956 his health became seriously affected and in the following year he had to give up general practice. During his long illness he displayed an extraordinary fortitude and found it possible to contribute to *St. Bartholomew's Hospital Journal* articles on cough, smell, and even on the subjective effects of a treatment he was receiving. He was a loyal colleague whose quiet manner and clinical acumen gave to his patients that confidence and friendliness which endeared him to them. To his widow and to his brother, also a doctor, we offer our sincere sympathy.

—J. V. B.

J. A. GUNN, C.B.E., M.D., D.Sc., F.R.C.P.

The obituary of Professor J. A. Gunn was printed in the *Journal* of November 1 (p. 1107).

Dr. R. E. M. COKE HARVEY writes: I think Professor J. A. Gunn's own account of how his *Introduction to Pharmacology and Therapeutics* came to be written may be of interest. Some 20 years ago Professor Gunn told me (his own words are reproduced as closely as my memory allows): "I was in Edinburgh turning over books in a second-hand bookshop when I came upon a bound copy of a student's notes on my lectures on pharmacology, priced 10s. 6d. Being a Scotsman, it at once struck me that if a student's notes were worth half-a-guinea, how much more profitable should a book prove to the author himself." I remember he laughed happily as he told me the story.

T. N. WILTHEW, L.R.C.P.&S.Ed.

Dr. T. N. Wilthew, who was in general practice in the county of Durham for many years, died suddenly on November 10 at the age of 83.

Thomas Nicholson Wilthew was born at Hexham, Northumberland, on July 31, 1875. He took the Scottish triple qualification in 1912, and then set up in general practice at Sunnyside, Co. Durham. During the first world war he served first in the R.A.M.C., and then went out to the Middle East as a medical officer in the R.A.F. In 1921 he returned home to build up another practice at Dunston, near Gateshead. He was proud of the fact that he started both his practices by "putting up his plate," and his patients always came first with him. He ceased to practise in 1942, but found complete retirement too quiet, so became medical referee to several insurance companies—work which he con-

tinued until 1955. A member of the British Medical Association for 40 years, he was chairman of the Gateshead Division in 1930-1. In his younger days Dr. Wilthew was a keen games player and athlete, with a particular interest in running. Later he developed a fondness for tennis, playing the game until he was almost 60 years of age. He had the misfortune to lose his wife in 1914, and is survived by his son, who is in medical practice at Low Fell, Gateshead.

R. F. EMINSON, D.S.O., M.B., B.S., L.M.S.S.A.

Dr. R. F. Eminson, who practised in Scunthorpe, died at his home there on November 19, aged 69.

Ralph Franklin Eminson was born at Scotter in Lincolnshire on May 10, 1889, the son of Dr. T. B. F. Eminson. Educated at the Leys School, Cambridge, and Epsom College, he went on to study medicine at Charing Cross Hospital, graduating M.B., B.S. in 1911 and winning the gold medal in surgery. After holding resident posts at his teaching hospital, he joined his father in the large country practice in which he was brought up. Later he practised with his son in the steel town of Scunthorpe.

J. R. B. writes: With the death of Dr. Ralph Franklin Eminson the people of this corner of North Lincolnshire lose a good doctor and a very fine man. It must be rare to find in one locality grandfather, father, three brothers, then one son and two nephews, all of whom have been or now are medical men. Dr. Ralph was of the line of Eminson, well known round these parts for their high tradition of sound doctoring. The gentle, kind, thoughtful practitioner did not in his later years readily suggest the rugged enthusiast of hospital days, the R.A.M.C. officer whose D.S.O. and mentions in dispatches in the first world war were awarded for devotion to duty and rescue work in Flanders. His somewhat hesitant speech tended to obscure, to those who knew him little, the real value of his contributions to committee work and of his questions and comments at scientific meetings. He was a member of the local panel committee, the local medical committee, and the executive council for the County of Lindsey. A staunch supporter of the B.M.A., he was a wise and helpful member of the Scunthorpe Division and was its chairman in 1937-8. He played his part too in other local affairs and in his church, and the esteem in which he was held was shown by the mourners from all walks of life. His fortitude and calm acceptance of his long illness, which he knew must bring his life to a too early close, was an example to all associated with him. His fellow practitioners showed by their numbers at the funeral service the respect and affection they had for the doyen of the local medical profession. His wife, who died while still in early middle age, was a dearly loved and respected member of the local community, playing her part on the bench and in her church and other social spheres. To their two daughters and son, and indeed to all his close relations and to his patients, to whom Dr. Ralph Eminson was such a friend, we offer our sympathy.

FRANK KING, M.B., Ch.B.

Dr. Frank King, general practitioner, author, and playwright, died at the Royal Halifax Infirmary on December 3 at the age of 66.

Frank King was born at Causeway Foot, near Halifax, on February 12, 1892, and was educated at Rishworth and Bradford. A medical student at Leeds University, he graduated M.B., Ch.B. in 1914, and then practised in Leeds for a time, in partnership with Dr. J. J. Anning, before entering the R.A.M.C. for service in the first world war. Soon after his return to civilian life he settled in practice at Halifax, where he remained for the rest of his life. He gave up medical practice in 1936 and thenceforward devoted his whole time to writing. Before retiring he had already written a number of successful crime stories and thrillers. His favourite creation, "The Dormouse," came later, and appeared in several of his books, the latest of which was published only last month, while another is due out early

next year. Alone, and with the Rev. L. J. Hines, Dr. King also wrote a number of plays for stage and radio, and he was closely associated with the Halifax Thespians. When the Crime Writers' Association was formed in 1953 he became a member. The authorship of over thirty books gave him great satisfaction, for he regarded writing as a recreation. He leaves a widow.

H. M. WILSON, O.B.E., M.B., B.Chir., F.R.A.C.S.

Mr. ALAN SMALL writes: When I read Dr. Harry Wilson's obituary in the *Journal* of November 29 (p. 1360) I felt quite sad to think that the miniature of such a grand life should be so chronologically accurate and yet so unrevealing. For Harry Wilson was an interesting man both in himself and as an outstanding example of a disappearing Colonial type—a man of very great capacity, integrity, and a gift for leadership who chose quite deliberately to exert his influence and live his life in a small community in which he had his roots and for which he retained his love. His natural capacity was broadened by his training at Cambridge and St. Mary's (of whose XV he was an inspiring captain). His service to his community was fortified by the balance and integrity of his character, and by his very great skill as a doctor/surgeon. In these days of specialization we are apt to forget and even belittle the services rendered by those superior men who had added exceptional technical skill and knowledge to a basic desire to serve among people they knew. Harry Wilson was such a man. He made few mistakes and none from lack of thoroughness and care. New methods and new learning will help his successors to better his results, but there will be few to make better use of the knowledge which it is their privilege to use.

Sir JOHN MEGAW, K.C.I.E., D.Sc., M.B., B.Ch.

The obituary of Sir John Megaw was printed in the *Journal* of November 8 (p. 1166).

Major-General HUGH STOTT, I.M.S. (ret.), writes: The death of our old friend, Sir John Megaw, leaves a lasting memory of a great gentleman of distinguished and youthful appearance and a kindly gentleness combined with a penetrating scientific mind which was so essentially practical. I first met Megaw close on half a century ago, shortly after he, Leonard Rogers, and others in Calcutta had become engrossed in the relationship between epidemic dropsy and beriberi. The Mohammedan recruits of the regiment in Southern India to which I was attached became heavily affected with symptoms indistinguishable from epidemic dropsy, which in some cases cleared leaving a residue of dry paretic beriberi. The Hindu recruits remained entirely healthy. The complete records were sent to Captain Megaw, who, with characteristic enthusiasm, asked me to stay with him, arranging for unforgettable discussions with the Calcutta Medical College physicians and with Major (as he then was) Leonard Rogers, professor of pathology. This, in 1911, was the beginning of a long friendship.

The then recently established King George V Medical College at Lucknow was indeed fortunate in having Megaw posted as its professor of pathology and principal and one of its three clinical physicians in succession to Colonel Selby, D.S.O., I.M.S. During the long war years, with his calm manner, winning smile, and devoted efficiency, Megaw built up that fine spirit which became a characteristic of the Indian staff and students of the college, and so prepared the way for the handing over of its control from the local government to that of the Indian administration of the Lucknow University. This was the first experiment of such a medical transfer in All-India. After the first world war it became my lot to succeed Megaw at the Lucknow Medical College. Manifold evidence of the fruition of his work during six years there existed on every hand, and of the extension of that harmony which already existed in the college to his colleagues in the other faculties and to the Indian administrative officials of the University. His bungalow and garden were bequeathed to me, together

with his love of plants and flowers, which were, perhaps, mainly the offspring of the labours of his charming wife, who was so happy a support to him in all his social and professional work. At this time Megaw continually stressed the advantages of modern air-conditioning, then almost unknown in India, for better work-output in hot climates. Nor was he satisfied until I had personally adopted it and realized the advance it was. At frequent intervals Megaw returned as external examiner in pathology to the medical college for which he had done so much. At those visits the post-war progress of the college in all its diverse ways and the welfare of its students were always a first concern to him.

Apart from his wide clinical, scientific, and administrative abilities, it is surely for his generous humanitarianism that Megaw will be remembered. And it is certain that in present-day India his numerous old students and friends will read his obituary with affectionate remembrances and with appreciation of one of the very greatest of those officers of the Indian Medical Service who served the land of their adoption so faithfully and so well.

F. F. STROTHER SMITH, M.D.

Colonel F. F. Strother Smith, who served in the Indian Medical Service for most of his professional life, died at Bromley, Kent, on June 21. He was 74 years of age.

Fleet Floyd Strother Smith was born on July 30, 1883. From Campbell College, Belfast, he entered Edinburgh University as a medical student, and graduated M.B., Ch.B. in 1907. He proceeded to the M.D. in 1912. Passing into the Indian Medical Service in 1908, he served at Gallipoli and in Salonika in the first world war, and was decorated with the Order of St. Sava by the Serbians. Between the two world wars he served in India in many capacities, and was appointed Honorary Surgeon to the King and also to the Viceroy. He retired from the I.M.S. in 1940, but was re-employed, and served in the second world war as a surgical and as an ophthalmic specialist in several military hospitals. Colonel Strother Smith was a nephew of the famous "Jullundur" Smith, and, using his uncle's technique for the intracapsular extraction of cataract, performed during his service very many operations, probably hundreds. He was a great lover and judge of dogs, and was at one time president of the Bull Terrier Club of India, and, latterly, chairman of the Indian Kennel Club, and a constant attendant at gun-dog trials. To his widow and family we extend our sympathy.—A. R.-G.

Medico-Legal

INDECENT ASSAULT UNDER PRETENCE OF MEDICAL EXAMINATION

[FROM OUR LEGAL CORRESPONDENT]

A curious but classic expedient of those whose foible is indecent assault on women is the pretence of being a medical man conducting a clinical examination requiring removal of the clothing. An example of this was recently before the courts.

A man, aged 52, pleaded guilty at Blackburn Quarter Sessions recently to two charges of indecent assault on girls, and asked for a third similar offence to be taken into consideration. His technique was to advertise in a newspaper for a magician's assistant. When a girl went for interview in answer to the advertisement he would explain that as the job entailed going abroad a physical check-up would be necessary, and he said that he was a medical man as well as a magician and was prepared to do the examination. When the girl, believing an examination to be necessary to get the job, agreed to be examined by him, he improperly assaulted her in the course of the examination.

The man, who was married to a good wife and had a family and a well-kept home, was sentenced to nine months' imprisonment.

Medical Notes in Parliament

Booster Doses of Polio Vaccine

Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked for what proportion of children under 15 years of age, who had had two injections of poliomyelitis vaccine, the parents had agreed to a third some months later; what proportion of children had already had a third injection; and what steps were being taken to urge parents to agree to this boosting dose. Mr. WALKER-SMITH replied on December 1 that third injections started only this autumn, and by the end of October nearly 250,000 had been carried out. This represented about a tenth of the children who had had their second injection seven months or more before that date. He had so far had no evidence of parents refusing to allow their children to have third injections when their turn came. Appropriate references to the value of the boosting dose would, however, continue to be made in the publicity about the vaccination scheme.

Medical Care Abroad

Miss ALICE BACON (Leeds, South-east, Lab.) asked with which countries the Ministry of Health had reciprocal arrangements for hospital treatment. Mr. WALKER-SMITH stated on December 1 that the Government had reciprocal social security agreements containing health service provisions which were open to all British residents in Sweden, Norway, and Yugoslavia, including tourists, and to limited classes of British nationals in Belgium, France, Luxembourg, and the Netherlands. In all cases hospital treatment was available for the persons covered. He added that discussions were in progress for a social security agreement with Federal Germany, but it was unlikely to provide medical benefit for British nationals other than pensioners resident there, and British workers.

Milk Consumption.—Consumption of liquid milk in the United Kingdom in the first ten months of this year amounted to 1,264 million gallons—about 12½ million gallons more than in the corresponding period in 1957.

Marriage Guidance.—The Home Secretary attaches great importance to the work of the National Marriage Guidance Council and the other organizations engaged in marriage guidance, and intends to propose to Parliament in due course that the grants shall be increased by 50% in the financial year 1959-60.

Chiropodists.—The registration of chiropodists is provided for in the draft scheme for the statutory registration of professions supplementary to medicine, which is under consideration.

Hearing-aids.—If there are no unexpected production difficulties, it is hoped to begin issues to adults towards the end of 1959 of transistor hearing-aids.

Universities and Colleges

UNIVERSITY OF EDINBURGH

At a meeting of the University Court on October 20 the title of honorary senior lecturer in the department of radiodiagnosis was conferred on Dr. Eric Samuel, and that of honorary assistant in the department of medicine on Dr. Jerome Rotstein, of the New York College of Medicine. Dr. Katherine M. Levy was appointed assistant in the department of public health and social medicine. The resignations of Mr. H. A. F. Dudley (lecturer in clinical surgery) and Dr. J. W. Galloway (lecturer in dentistry) were received.

UNIVERSITY OF LONDON

The following degrees were awarded during September:

M.D.—L. S. Sackler, E. Parry-Jones.
M.S.—M. A. Birnstingh.

The following candidates have been approved at the examinations indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN CLINICAL PATHOLOGY.—Fatima S. Ahmed, M. Y. Ali, E. F. Bowers, R. Carroll, Betty M. Clark, C. H. Coetzee.

Vital Statistics

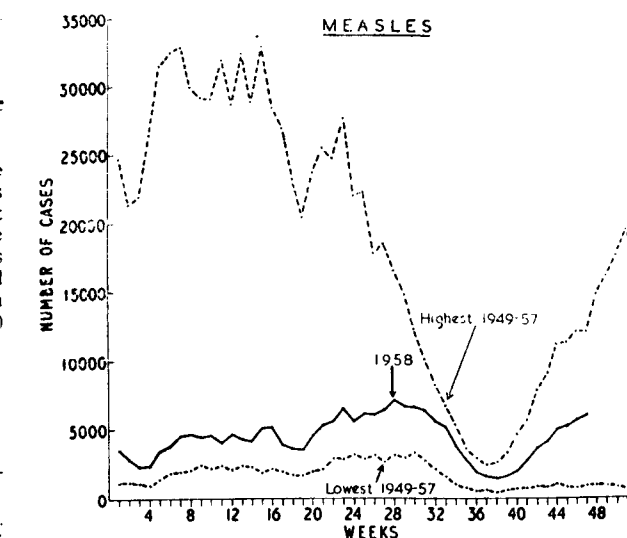
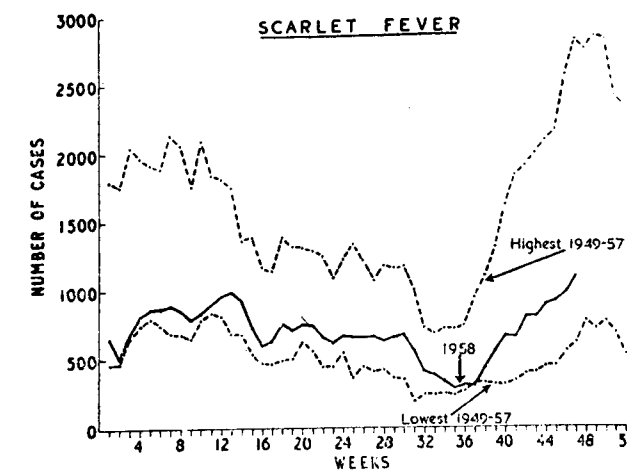
Industrial Accidents and Diseases

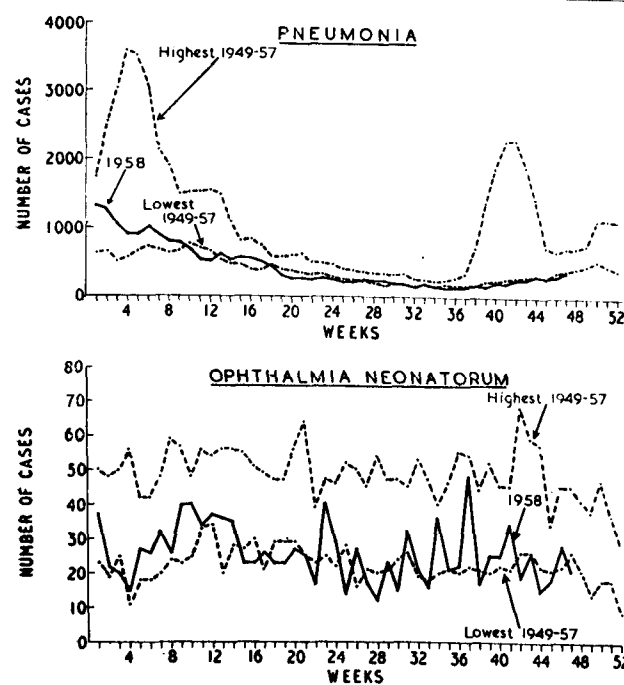
The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in October was 73, compared with 102 in the previous month and 107 in October, 1957.

The numbers of cases of industrial diseases in the United Kingdom reported during October, 1958, were as follows: lead poisoning 10, phosphorus poisoning 2, epitheliomatous ulceration 16, chrome ulceration 14; total 42. There were 2 deaths from epitheliomatous ulceration due to mineral oil.—*Ministry of Labour Gazette*, November, 1958.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus - - - - -, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Week Ending November 29

The largest fluctuations in the number of notifications of infectious diseases in England and Wales during the week ending November 29 were increases of 798 for measles, from 6,112 to 6,910, 351 for dysentery, from 747 to 1,098, 76 for scarlet fever, from 1,088 to 1,164, 38 for acute pneumonia, from 369 to 407, and the only decrease of any size was 33 for whooping-cough, from 757 to 724.

The largest rises in the notifications of measles were 189 in Middlesex, from 250 to 439 (Brentford and Chiswick U.D. 65); 154 in Cheshire, from 349 to 503 (Stockport C.B. 87); 68 in Lincolnshire, from 246 to 314 (Scunthorpe M.B. 158); 65 in Glamorganshire, from 77 to 142 (Cardiff C.B. 100); 62 in Hertfordshire, from 79 to 141 (Elstree R.D. 85); 52 in Derbyshire, from 111 to 163 (Shardlow R.D. 66); and the only large exception to an increasing incidence was a fall of 65 in Essex, from 252 to 187. The largest fall in the number of notifications of whooping-cough was 23 in Staffordshire, from 32 to 9. No large changes were recorded in the local returns for scarlet fever. 7 cases of diphtheria were notified, being 2 fewer than in the preceding week. 3 of these cases were notified in Birmingham C.B., and a further 2 cases occurred in the outbreak in Finsbury, London.

The notifications of acute poliomyelitis numbered 69—3 more for paralytic and 6 fewer for non-paralytic cases than in the preceding week. The largest returns were Lancashire 14 (Manchester C.B. 6, Liverpool C.B. 3, Chadderton U.D. 2); Yorkshire West Riding 13 (Leeds C.B. 10); Hampshire 11 (Southampton C.B. 10); Derbyshire 5 (Shardlow R.D. 3); Durham 5 (Darlington C.B. 2).

The largest rises in the number of notifications of dysentery were 78 in Yorkshire West Riding, 76 in Glamorganshire, and 43 in Essex. The largest centres of infection during the week were Yorkshire West Riding 176 (Leeds C.B. 90, Thorne R.D. 28), Lancashire 130 (Liverpool C.B. 38, Eccles M.B. 25, Fleetwood M.B. 25, Manchester C.B. 11), Glamorganshire 124 (Cardiff C.B. 93, Rhondda M.B. 16), Warwickshire 116 (Coventry C.B. 88, Bedworth U.D. 15, Birmingham C.B. 10); London 95 (Wandsworth U.D. 15, Lambeth 15), Essex 75 (East Ham C.B. 42, Epping and Ongar R.D. 16), Middlesex 51 (Hendon M.B. 33), Kent 43 (Royal Tunbridge Wells M.B. 33), Northumberland (Ashington U.D. 17), Nottinghamshire 31, Bedfordshire 26 (Amphill R.D. 25); Cumberland 22 (Carlisle C.B. 15), and Lincolnshire 20 (Grimsby C.B. 12).

INFECTIOUS DISEASES AND VITAL STATISTICS
Summary for British Isles for week ending November 22 (No. 47) and corresponding week 1957

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

A blank space denotes disease not notifiable or no return available.

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

CASES	1958					1957				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria	9	5	9	1	2	4	1	1	0	1
Dysentery	747	77	171	7	6	433	60	112	10	1
Encephalitis, acute	4	0	0	0	0	5	2	0	0	0
Enteric fever: Typhoid	3	1	0	0	1	2	0	0	0	1
Paratyphoid	9	0	1 (B)	0	0	4	0	1 (B)	0	0
Food-poisoning	247	33	17	1	0	243	18	12	0	0
Infective enteritis or diarrhoea under 2 years										20
Measles*	6,112	387	129	30	420	1,960	31	22	113	11
Meningococcal infection	18	1	11	0	1	19	3	6	2	1
Ophthalmia neonatorum	21	0	3	0	0	26	2	3	0	61
Pneumonia†	369	18	202	6	0	499	28	280	7	0
Poliomyelitis, acute: Paralytic	47	2	3	1	8	44	0	5	7	3
Non-paralytic	25	3	11	1	8	23	1	0	0	0
Puerperal fever	189	32	10	2	0	217	33	7	0	0
Scarlet fever	1,088	75	120	24	36	610	44	51	19	20
Tuberculosis: Respiratory	457	49	96	23	0	580	59	95	8	0
Non-respiratory	68	6	16	4	0	63	6	9	2	0
Whooping-cough	757	32	71	83	76	615	28	26	1	10

DEATHS	1958					1957				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria	1	1	0	0	0	0	0	0	0	0
Dysentery	0	0	0	0	0	0	0	0	0	0
Encephalitis, acute	0	0	0	0	0	0	0	0	0	0
Enteric fever	0	0	0	0	0	0	0	0	0	0
Infective enteritis or diarrhoea under 2 years	7	0	0	1	1	0	1	0	0	0
Influenza	17	1	0	0	1	6	11	3	16	0
Measles	0	0	0	0	0	0	0	0	0	0
Meningococcal infection	0	0	0	0	0	1	0	0	0	0
Pneumonia	510	53	21	13	5	46	33	13	19	0
Poliomyelitis, acute	9	0	0	0	0	0	0	0	0	0
Scarlet fever	0	0	0	0	0	1	0	0	0	0
Tuberculosis: Respiratory	93	10	13	0	3	2	15	3	3	1
Non-respiratory	0	1	0	1	0	0	0	0	0	0
Whooping-cough	0	0	0	0	0	0	0	0	0	0
Deaths 0-1 year	300	39	38	6	16	31	24	7	18	0
Deaths (excluding stillbirths)	10,153	920	602	136	180	846	680	133	251	0
LIVE BIRTHS	13,722	1183	984	239	460	1152	878	218	367	0
STILLBIRTHS	271	21	29	0	0	18	24	0	0	0

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

Medical News

Nuffield Committee for the Advancement of Medicine.—A decree reconstituting the Nuffield Committee for the Advancement of Medicine was approved last week by the Congregation of Oxford University. The object of the change is to meet Lord Nuffield's wishes that the income (about £110,000 per annum) from the trust fund given by Lord Nuffield in 1936 to finance medical research at Oxford University shall be restricted to expenditure on research, including expenditure on the training of postgraduate students in methods of research. The new committee for the advancement of medicine will be composed as before, but its duties will be to formulate policy and to prepare an annual report and accounts for submission to the trustees. The decree adds: "In making such annual reports the committee shall be required to satisfy the trustees that the time spent by the Nuffield professors of clinical medicine, surgery, obstetrics and gynaecology, anaesthetics, and orthopaedic surgery, and by the director of the Nuffield Institute for Medical Research in the instruction for students reading for the degree of B.M., shall not be such as to impair their prosecution of research and of the training of postgraduate students in methods of research." Explaining the new decree in Congregation, Mr. J. C. MASTERMAN said that a smaller special committee would be set up which would have the single function of administering the funds of the benefaction (*Daily Telegraph*, December 3). The proposals have been accepted by the United Oxford Hospitals and by the board of the faculty of medicine at Oxford.

Travelling Scholarship for G.P.s.—Details of a travelling scholarship offered by the trustees of the Claire Wand Fund are printed in the Association Notices this week (*Supplement*, p. 254). The purpose of the scholarship is to enable a general practitioner to study what is done for the further education of general practitioners in Canada and the U.S.A. The last date for the submission of applications is January 31.

Iron in the Home.—The danger of iron preparations to children in the home is again evident from figures published by the *Pharmaceutical Journal* (November 29, 1958). They refer to England and Wales in 1956 and were specially extracted by the General Register Office. Out of 15 children aged under 5 who died of accidental poisoning, 7 were poisoned by preparations containing iron. By contrast, among the remaining 341 cases of poisoning of persons aged 5 and over none was caused by an iron preparation.

Mr. H. J. Seddon, director of studies at the Institute of Orthopaedics, has been elected an honorary member of the Société Française d'Orthopédie and of the Société de Chirurgie de Lyon, having been a corresponding member of both societies for some years.

NEW ISSUES

The journals listed below are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Journal of Neurology, Neurosurgery and Psychiatry.—Issued four times a year (£3 annually). The new issue, Vol. 21, No. 4, includes:

FURTHER OBSERVATIONS ON SUBARACHNOID HAEMORRHAGE. Wylie McKissock, Kenneth Paine, and Lawrence Walsh.
LEUCOTOMY FOR PAIN. Alick Elithorn, Eric Gliether, and Eliot Slater.
A CONTROLLED STUDY OF THE EFFECTS OF LEUCOTOMY. A. A. Robin.
THYROTOXIC MYOPATHY. Ragnar Hed, Lennart Kirslein, and Curt Lundmark.
INDIVIDUAL VARIATION IN THE SIZE OF THE TENTORIAL OPENING. J. A. N. Corbelli.
ARTERIES OF THE SPINAL CORD IN THE CAT. Peter Bradshaw.
ACCOMMODATION IN THE HOLMES-ADIE SYNDROME. G. F. M. Russell.
THE EFFECT OF RESERPINE ON THE DURATION OF MANIC ATTACKS. David C. Watt.
A CONTROLLED TRIAL OF MEPROBAMATE IN ANXIOUS OUT-PATIENTS. John M. Hinton.
MYELOID CELLS IN CEREBROSPINAL FLUID. A. I. Spierres.
TWO HUNDRED AND ONE CASES OF INTRACRANIAL TUBERCULOMA TREATED SURGICALLY. C. Afsari.

Journal of Clinical Pathology.—Issued six times a year (£4 4s. annually). The new issue, Vol. 11, No. 6, includes:

SYMPOSIUM IN HONOUR OF THE CENTENARY OF VIRCHOW'S "CELLULAR PATHOLOGY" (1858-1958):
1858. Sir Roy Cameron.
DIAGNOSIS FROM CELLS. J. Bamforth and G. R. Osborn.
THE BACTERIAL CELL. Robert Cruickshank.
THE CELL IN CULTURE. Honor B. Fell.
CYTOCHONDRIAL ASPECTS OF CELLULAR PATHOLOGY. John W. Harman.
TWO BIOCHEMICAL ASPECTS OF CELL NECROSIS. N. H. Martin.
EXTENSION OF THE LIMITS OF CELLULAR PATHOLOGY: THE ROLE OF ENZYME HISTOCHEMISTRY. A. G. Everson Pearce.
THE EFFECT OF REDUCED OXYGEN TENSION ON PLATELET FORMATION IN VITRO. R. J. V. Pulveritt.
THE ANTIBODY CONTENT OF SINGLE CELLS. M. C. Berenbaum.
THE CHAIRMAN'S SUMMING-UP. G. J. Cunningham.

Medical and Biological Illustration.—Issued four times a year (£3 annually). The new issue, Vol. 8, No. 4, includes:

MYXOEDEMA. J. H. Briggs.
MAX BRÜDEL, 1879-1941. Sylvia Treadgold.
THE ILLUSTRATION OF BRAIN SECTIONS FOR REPRODUCTION. W. Hewitt.
SILHOUETTES. C. E. Engel.
A METHOD OF PRODUCING MODELS OF HOLLOW ORGANS. J. A. E. Gleave.
FLASH PHOTOMICROGRAPHY OF LIVING ORGANISMS. B. A. Jarrett.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, December 15

● GUY'S HOSPITAL.—At Anatomy Lecture Theatre, 5.15 p.m., lecture: demonstration in endocrinology by Dr. P. M. F. Bishop: Anomalies of Sex Differentiation. Guest speaker, Dr. P. E. Polani. A clinical exhibition will be on view before the lecture.
● HUNTERIAN SOCIETY.—At Talbot Restaurant, London Wall, E.C.4, 7 for 7.30 p.m., dinner meeting, 8.30 p.m., discussion: Human Endurance. To be opened by Sir Vivian Fuchs and Dr. O. G. Edholm.
MANCHESTER MEDICAL SOCIETY: SECTION OF GENERAL PRACTICE.—At Clinica! Sciences Building, York Place, 8.30 for 9 p.m., medical film programme.

Tuesday, December 16

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Dr. J. G. Scadding: Sarcoidosis—Diagnostic Aspects.
ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—5 p.m., Sydney Watson Smith Lecture by Professor R. Platt: Some Consequences of Renal Inadequacy.
SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, 8.30 p.m., Mr. R. S. Lawrie: Some Surgical Cases.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Mr. L. C. Oliver: Contributions of Surgery to the Treatment and Understanding of Parkinsonism.

Wednesday, December 17

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—8 p.m., Sir John Wolfenden, Kt.: Homosexuality and the Law.
BRITISH PSYCHOLOGICAL SOCIETY: MEDICAL SECTION.—At Medical Society of London, 8.30 p.m., papers by Dr. S. I. Abrahams, Dr. V. J. Marmery, Dr. H. S. Pasmore, and Dr. M. Balint: The Integrating Role of the General Practitioner.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Guest lecture by Dr. J. M. Barnes: Experimental Study of Toxic Substances.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. J. G. Sandrey: Epididymitis.

Friday, December 19

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At Royal Faculty of Physicians and Surgeons of Glasgow, 8.30 p.m., Professor P. Alexander: Hamlet and the Psychoanalyst.

APPOINTMENTS

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.1.—Rosalie E. B. Eastwood, M.B., Ch.B., House-physician; V. Ratner, M.B., B.S., Resident Officer to Neurological and Neurosurgical Department; E. P. Berwick, M.B., B.Ch., D.A., Resident Anaesthetist, Tadworth.
LIVERPOOL REGIONAL HOSPITAL BOARD.—Cynthia J. Discombe, M.D., part-time Consultant Pathologist giving six sessions per week to Ormskirk and District Hospital Management Committee group.
WOLLEN, W., M.B.E., Med.Dip., D.P.H., D.P.M., consultant psychiatrist and deputy physician superintendent, Darent Park Hospital.

BIRTHS, MARRIAGES, AND DEATHS

DEATHS

MacLean.—On November 10, 1958, at Arichat, Nova Scotia, Iain Malcolm MacLean, M.R.C.S., L.R.C.P., formerly of Isle of Skye, and Sierra Leone, aged 41.
Male.—On November 20, 1958, at Dorchester, Dorset, Maurice Taylor Male, M.B., D.P.H., Surgeon Commander, R.N., retired, of Upwey House, near Weymouth, Dorset, aged 83.
Robb.—On November 19, 1958, at Western General Hospital, Edinburgh, John Robert Beith Robb, M.D., F.R.F.P.S., B.L., J.P., of Torkillie House, by Carnoustie, Angus, formerly of Lenzie, Dunbartonshire.
Vlasto.—On November 17, 1958, at "Sherwoods," Hartley Wintney, Hants, John Alexander Vlasto, M.C., M.B.
Withey.—On November 10, 1958, Thomas Nicholson Withey, L.R.C.P., F.S.Ed., L.R.F.P.S., of Low Fell, Gateshead, Co. Durham, aged 83.
Witherspoon.—On November 15, 1958, at Bow End House, Betley, near Crewe, Cheshire, Allan Witherspoon, M.B., Ch.B., D.P.H., late of Stoke-on-Trent, Staffs, aged 68.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Treatment of Diphtheria

Q.—Has diphtheria antitoxin any place in the treatment of diphtheria? How should the general practitioner deal with a suspected case of diphtheria?

A.—Diphtheria antitoxin remains the only specific treatment for diphtheria: antibiotics have little if any place in the treatment. No doctor should take any risks with a suspected case of diphtheria. If the child is croupy he should be sent to hospital, as he needs expert treatment whether the croup proves diphtheritic or not. If a throat swab has been reported positive for diphtheria bacilli the patient should be sent to hospital: if there is membrane in the throat he will be treated urgently as a case of diphtheria; if there are few clinical signs, he will be isolated for several days until the results of a virulence test are known. If the patient has exudate on the throat which the general practitioner thinks might be diphtheritic, he should try to get the advice of a consultant from an infectious diseases hospital—the only person likely these days to have clinical experience of diphtheria. If admission to hospital is not arranged, a throat swab for organisms and blood for white cell count and Paul-Bunnell test should be sent to the laboratory. Infectious mononucleosis is the commonest cause of membrane in the throat resembling diphtheria. If the degree of suspicion is high enough to suggest giving antitoxin, then not less than 20,000 units should be given—this is an adequate therapeutic dose for a mild case of faucial diphtheria. But if antitoxin seems necessary, admission to hospital is even more necessary.

Cushing's Syndrome

Q.—How can one differentiate between the pituitary and adrenal types of Cushing's syndrome?

A.—The clinical features of these conditions are described by some as Cushing's disease and Cushing's syndrome, respectively, to denote the so-called pituitary and adrenal types. More generally the term Cushing's syndrome is used in the description of the whole group. It seems certain that in all instances there is increased formation of cortisol by the adrenals, and this is of the greatest importance in the production of the clinical features. The adrenals may be of normal size or, more usually, hyperplastic and occasionally the site of an adenoma or carcinoma. A patient with a tumour may occasionally be distinguished clinically by the additional presence of signs of virilization.

It is widely assumed that all the non-tumorous adrenals are stimulated by excess of secretion of corticotrophin by the anterior pituitary, but this has been shown to be true in only some and not all of the few cases examined. Sometimes small basophil adenomas are present in the pituitary but are not large enough to be detectable by clinical means. Rarely, larger basophilic or chromophobe tumours are found, sufficient to produce local radiological abnormalities or even an occurrence of visual changes due to chiasmal pressure. If such changes are present the pituitary can definitely be incriminated. More usually the problem resolves itself into an attempt to demonstrate the presence of an adrenal tumour, and this may be based on some or all of the following observations: (1) Abnormal renal position shown by I.V.P. (2) Outline of tumour by presacral air insufflation. (3) Excess excretion of adrenal corticoids with notable increase of 17-ketosteroids. (4) Poor response of corticoids to corticotrophin stimulation together with absence of significant diminution after the administration of suppressing steroids such as 9 α -fluorohydrocortisone. (5) The

presence of secondary growths (although here care must be taken to distinguish those occasional cases of Cushing's syndrome associated with bronchogenic carcinoma). (6) Operative demonstration of a tumour.

The practical importance of making the questioner's differentiation is that tumours of the adrenal should always be removed if this is possible. In some cases where it is thought that the pituitary is excessively stimulating the adrenal, it may be desirable to treat by local application of β radiation, proton bombardment, x-irradiation, or possibly by hypophysectomy, rather than choose the alternative of subtotal or total bilateral adrenalectomy.

Nystagmus

Q.—In the absence of organic disease, can nystagmus be present in a person who is not under the influence of drink or drugs?

A.—Congenital nystagmus can occur in the absence of any demonstrable lesion of the visual system or of the vestibular nerves and their central connexions. It is usually a rapid, pendular movement, sometimes associated with movements of the head. The condition may be present in several members of the same family. Hysterical nystagmus is said to occur, but the writer has never seen it. The tale is told of a medical student who was able to astonish his teachers by the voluntary production of nystagmus.

NOTES AND COMMENTS

Barbiturate Chemistry.—Mr. H. H. ARMSTRONG, F.R.I.C. (Stockport), writes: May I draw your attention to an error of chemical nomenclature (*Journal*, November 29, p. 1347)? Barbituric acid is classified as a diuretic, whereas it is, in fact, a cyclic monoureide. It is further suggested that the reaction for the formation of barbituric acid should show the working conditions—i.e., phosphorus oxychloride and 100° C.

Disclaimer.—Mr. B. W. RYCKOFF writes: My attention has been drawn to an article which was published in a Sunday newspaper on November 9, in which my name and those of my staff were mentioned. Would you please be kind enough to inform our profession, through your columns, that this article was published entirely without my knowledge, approval, or consent, and that no information was supplied to the newspaper by any member of my staff.

Corrections.—In the article on "Onset Enuresis" by Drs. J. D. Paulett and E. Tuckman (November 22, p. 1266) the word "unreasonably" appeared instead of "unreasoningly" in the sixth line of the right-hand column on p. 1267.

In the article on "Drugs in Treatment of Epilepsy," by Dr. D. Williams (*Journal*, November 8, p. 1155) the long-acting phenobarbitone should have been described as in "spanule" form, not "enseal."

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CORONARY HEART DISEASE AND PHYSICAL ACTIVITY OF WORK

EVIDENCE OF A NATIONAL NECROPSY SURVEY*

BY

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AND

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It has previously been shown that the drivers of London's double-decker buses are more likely to die suddenly from "coronary thrombosis" than the conductors, and that Government clerks suffer more often from rapidly fatal cardiac infarction than do postmen.^{1,2} On the basis of these and similar observations a hypothesis has been stated that *men in physically active jobs have a lower incidence of coronary (ischaemic) heart disease in middle-age than men in physically inactive jobs. More important, the disease is not so severe in physically active workers, tending to present in them in relatively benign forms.*

It is a principle of epidemiological research of this type to seek evidence from as many, as various, and as independent sources as possible.¹⁰ The present report deals with the frequency, in relation to occupation, of ischaemic myocardial fibrosis in men dying from causes other than coronary heart disease itself. These myocardial scars are often evidence of early coronary heart disease and of less severe, or at any rate non-lethal, ischaemia. Thus the present study provides a picture of coronary heart disease in one of its simpler forms, and this may help in elucidating social connexions. At the same time another test of the hypothesis is made, using quite different data from the previous inquiries and upon quite another aspect of the condition. The inquiry it was hoped would provide some information on the pathological mechanisms of any differences with physical activity of work that were found: and in particular we sought to learn something about the relationships of occupation to coronary artery disease. In brief, Can the hearts of men be seen to vary with the kind of work they have done? At what phases in the complex of coronary-myocardial disease as a whole can this particular "cause"—physical activity/inactivity—be seen to operate? More generally the inquiry was intended to provide a statistical account of the coronary arteries of the middle-aged British male population, 1954-6.¹²

Method

Through the universities and regional hospital boards we appealed personally to all pathologists in the National Health Service who might regularly be in

*Part of this report was included in the Ernestine Henry Lecture delivered by one of us (J.N.M.) before the Royal College of Physicians of London on June 10, 1958.

charge of post-mortem examinations to co-operate in the inquiry, and the pathologists of 206 hospitals or hospital groups—between 85% and 90% of the "possibles"—very kindly agreed. We cannot be more precise about this fraction, because it is not known whether some of those who did not reply at all to our letters were in fact regularly responsible for appreciable numbers of necropsies.

Each pathologist was invited to provide particulars on a standard form of 25 consecutive unselected necropsies on men aged 45-70 years, no matter what the cause of death or how the case came to necropsy. 5,000 reports were sent to us: trial runs with records from 1944 to 1951 in the Pathological Institute of the London Hospital^{19, 60} had encouraged the hope that with such numbers stable group patterns would emerge. In all cases *macroscopic details* were requested of *disease in the coronary arteries*, its nature, amount, and distribution, with descriptions of any stenosis; and of *fibrosis of the myocardium of the left ventricle and interventricular septum*, using lesions of 1 cm. in any dimension as markers; and the *heart weight*. Particulars were also asked about the main causes of death and other important clinical and pathological findings such as valvular heart disease, including especially aortic stenosis. By appealing for detailed descriptions of lesions seen, discouraging evaluations such as "slight" or "much," and giving guidance on terminology if not on technique, we hoped to reduce the variability of such procedures. It was postulated, moreover, that the variability in observation and recording over so many departments of pathology would be "random" in relation to the main factor with which pathology was to be correlated—physical activity of work.

The pathological data on each record relating to disease in the coronary arteries and fibrosis of the myocardium were graded, agreed, and coded by at least two and often three physicians in the unit. It took many months to define appropriate scales; but finally scales emerged that made pathological sense, were simple in use, having no more than five points, and the gradings on which proved highly reproducible by ourselves and by others.

Pathologists were also invited to give details of the *last occupation* of the deceased, but in many cases this information had to be obtained by the unit from the

General Register Office. The last stated occupation, apart from other difficulties,³⁷ is unlikely to be an exact indicator of men's jobs during their middle-age. The present inquiry, however, is concerned only with *type of job* in terms of its characteristic *physical activity*. Some special categories apart, the last job is probably by and large an adequate indicator of this. (Occupational histories of their national series kindly made available to us by Doll and Hill^{11, 13} showed on analysis that among 152 fatal cases of lung cancer in men aged 55-64, 80% had been in the same job for more than their last 10 years and a further 10% had changed jobs during the last 10 years of life but remained in the same physical activity category. These proportions over 15 years were 70% and 14% respectively; over 20 years, 61% and 17%.)

The 1,700 different descriptions of occupations included in the 5,000 returns of the present inquiry were classified, in terms of the physical activity habitually involved, by two experts in industrial medicine who first graded all the jobs independently and then presented the unit with an agreed coding. They used a three-point scale: typically "light" jobs (for example, schoolmaster, bus-driver, clerk of any description); "active" jobs (for example, postman, carpenter); or "heavy" jobs (for example, boilermaker, dock labourer). Light jobs, that is, include sedentary; heavy include the heaviest.

The technical problems involved in such studies as the present have already been considered,^{37, 40, 42} and further comments are included in this and will be given in subsequent papers. There are many imperfections in the data on both biological and social sides of the equations to be attempted. The method used, like any other, and more than most, has its limitations as well as its possibilities. In particular, detailed occupational histories could not be obtained, which may be a considerable loss, and more than occupation-wise, since related economic/nutritional standards varied far more widely in the 1930s than in the 1950s.^{13, 36, 51} Moreover, considered agreement on pathological techniques, not to say uniformity, has been sacrificed for numbers. The crucial issue was that of range of occupation: only a countrywide and comprehensive survey gathering large numbers of cases from many different centres could include enough men in the diminishing categories of truly "heavy" workers—coal hewers, farm labourers, men in heavy engineering, and the like. The interest of the questions that can be asked only from the present kind of study will, it is hoped, compensate for what has had to be forgone—and suggest what might next be done.⁴¹

Material

Necropsy material may be classified for our present purposes as follows^{39, 42}:

Group A.—Deaths due to coronary heart disease: coronary heart disease itself; or with hypertension, and/or other pathology; and including slow, congestive cardiac failure as well as the more numerous sudden deaths. There were about 1,200 altogether in Group A.

Group B.—Deaths from conditions associated with a specially high prevalence or severity of coronary artery disease—for example, deaths from hypertension and its complications; deaths from vascular disease in sites other than the coronary arteries, with or without hypertension; ("senile") aortic stenosis; deaths from destructive renal disease; the cases of diabetes. In addition to such well-recognized associations it was noticed that deaths from

peptic ulcer in the present material showed a significant excess of occlusive coronary artery disease, and these deaths were therefore included in Group B. This group of 1,000 cases was called the *high coronary artery disease group*.

Group C.—Deaths from other conditions, the remainder and majority of necropsies, including injuries, infections, cancers. No disease or disease-group with 100 cases or over included in Group C showed significantly more or significantly less coronary artery disease at the 5% level than the remainder, as judged by the prevalence and amount of mural disease and the frequency of lumen narrowing of 50% or more in a major artery. This group is therefore called the *basal group* as regards coronary artery disease. There were 2,800 cases in it.

The present report deals with the 3,800 cases in Groups B and C. Brief reference is also made to Group A, but these cases will be fully considered on another occasion.

Ischaemic Myocardial Fibrosis

In some 500 of the 3,800 non-coronary deaths fibrosis was reported in the myocardium of the left ventricle and/or septum. All these records were scrutinized, and any subjects with rheumatic heart disease or other possible cause of myocardial fibrosis, the collagen-vascular diseases, for example, or ostial syphilis, were excluded: cases with generalized, "diffuse" fibrosis not otherwise described were also discarded. ("Myocarditis" was rarely mentioned by the pathologists; no microscopical examination was requested.) This left close on 400 cases with scars, commonly in the lower, antero-lateral walls of the left ventricle, in the front of the septum, or high on the posterior wall, which are presumptively ischaemic, will henceforth be regarded as *ischaemic myocardial fibrosis*, and have alone been analysed. In most of these 400 cases there was much coronary artery disease and a report of topical coronary narrowing.* The few scars in the right ventricle were ignored.

Scars were classified on two axes, whether they were single or multiple and large or small. Two main types of ischaemic myocardial fibrosis soon identified themselves, and provided a quick first answer to one of the main questions of the inquiry:

Type 1.—The *large, discrete patch* of fibrosis, over 1.5 cm. in one dimension, and often solitary. These patches were commonly transmural, and they are presumably the healed end-result of major and maybe acute infarction—"large healed infarcts"—or sometimes of confluent lesser infarcts. They were usually associated with occlusion or near-occlusion in the related main coronary artery, often high in it, rather than with lesser coronary narrowing. All aneurysmal dilatations have been included here, and also some large areas of fibrosis which were not clearly circumscribed.

Type 2.—*Small, multiple scars*, in the left ventricular wall, the septum, or papillary muscles which were usually thinner and less defined than type 1 and were associated in this material mostly with minor degrees of focal narrowing, low in a main coronary artery, for example, or in smaller branches. These scars are commonly regarded as the product of lesser and more slowly developing coronary insufficiency and myocardial ischaemia. However, some of this "focal myocardial fibrosis" may well be the result of very small infarcts.

It was soon apparent that the occurrence of a large patch was strongly related to physical activity/inactivity of occupation, the occurrence of the small multiple scars less so. Discrete patches of 0.5-1.5 cm. in diameter, and some very small scars also regarded as ischaemic, were all found to behave much more like type 2 in relation to occupation, to coronary narrowing (and, as seen later, to hypertension).

*In the minority of scars in which there was no record of topical coronary narrowing the same relationships with physical activity of occupation were observed as among the majority with a record of obstructive arterial disease. Only one tabulation is therefore presented.

than the large healed infarcts of type 1, and they have therefore been classified to type 2. All type 2 scars will, for convenience, be called "focal myocardial fibrosis." Mixed cases with both types of fibrosis were included with type 1.

Results

As stated, this report deals mainly with the (presumptively) ischaemic myocardial fibrosis found in a national sample of 3,800 non-coronary deaths in middle-aged men. Table I sets out the findings, first for the 2,800 miscellaneous deaths from injuries, infections, cancers, etc., and, below, for the 1,000 deaths from hypertensive and other vascular disorders, the deaths in diabetics, etc. Throughout, in each line of Table I, the rate among the "light" workers (e.g., 2.0% in the first line) is substantially higher than in the "heavy" (0.3% in the first line). The "active" rates mostly fall between, but occasionally are below the "heavy" (as in the second line of the Table). This trend was repeated time after time in the analysis of Group C, Group B, and various pathological, medical, and social subdivisions of these; it was found in Scotland, Wales, Greater London, and the rest of England, separately; in London teaching hospitals, other teaching hospitals, and non-teaching hospitals when these were distinguished; and it was also the main finding of the trial study of the 1944-51 Woods and Russell London Hospital cases.

The results in Table I can be summarized thus:

1. Disregarding age, cause of death category, and type of scarring (last line of the Table) there is twice as much

ischaemic myocardial fibrosis in the "light" workers as in the "heavy"—13.4% compared with 6.8%.

2. There is a stronger gradient with physical activity of occupation in the cases with large fibrous patches—three-fold overall, 3.5% to 1.2%—than in those with the smaller/multiple scars—9.9% to 5.7% (second and third last lines of Table I).

3. This excess of large healed infarcts among the "light" workers is more evident in the younger age group than at 60-70 years. At 45-60 years, in Groups B and C combined, there are four to five times as many of these scars in "light" workers as in "heavy"; at 60-70, two to three times as many (Table II).

Numbers are often small, but it seemed preferable to set out all the data instead of amalgamating the active and heavy occupations and comparing these with the light, which was the alternative the data indicated. Table I emphasizes that even among the heavy occupations there is a good deal of ischaemic myocardial fibrosis; though, in fact, large healed infarcts were as common in light workers aged 45-54 (2.0%) as in heavy aged 65-70 (1.9%).

TABLE II.—Large Healed Myocardial Infarcts. 3,800 Non-coronary Deaths. Men

Ages	Occupation		
	Light	Active	Heavy
45-60	2.3%	1.3%	(0.49%)
60-70	4.7%	2.6%	1.8%

TABLE I.—Proportions with Ischaemic Myocardial Fibrosis by Physical Activity of Occupation ("Light," "Active," "Heavy"). 3,800 Non-coronary Deaths. Males Aged 45-70

Age	Ischaemic Myocardial Fibrosis	Occupation			
		Light	Active	Heavy	
Deaths from Conditions in "Basal" Group					
45-60	No. of cases	509	516	324	
	With large fibrous patch	10	5	1	
	Rate %	2.0%	1.0%	(0.3%)	
	With smaller multiple scars	21	14	9	
60-70	Rate %	4.1%	2.7%	2.8%	
	No. of cases	486	518	344	
	With large fibrous patch	16	12	3	
	Rate %	3.3%	2.3%	(0.9%)	
45-70	With smaller multiple scars	45	34	19	
	Rate %	9.3%	6.6%	5.5%	
	No. of cases	995	1,034	668	
	Total with ischaemic myocardial fibrosis	92	65	32	
Rate %	9.2%	6.3%	4.8%		
	Deaths from Conditions in "High" Coronary Artery Disease Group				
45-60	No. of cases	193	189	82	
	With large fibrous patch	6	4	1	
	Rate %	3.1%	(2.1%)	(1.2%)	
	With smaller multiple scars	33	16	5	
60-70	Rate %	17.1%	8.5%	6.1%	
	No. of cases	252	206	112	
	With large fibrous patch	19	7	5	
	Rate %	7.5%	3.4%	4.5%	
45-70	With smaller multiple scars	43	32	16	
	Rate %	17.1%	15.5%	14.3%	
	No. of cases	445	395	194	
	Total with ischaemic myocardial fibrosis	101	59	27	
Rate %	22.7%	14.9%	13.9%		
	All Non-coronary Deaths				
45-70	No. of cases	1,440	1,429	862	
	With large fibrous patch	51	28	10	
	Rate %	3.5%	2.0%	1.2%	
	With smaller multiple scars	142	96	49	
Rate %	9.9%	6.7%	5.7%		
	Total with ischaemic myocardial fibrosis	193	124	59	
	Rate %	13.4%	8.7%	6.8%	

National Necropsy Survey, Scotland, England and Wales, 1954-6. Data from 206 hospitals or hospital groups. The number of non-coronary deaths that were analysed varied slightly around 3,800, depending on the availability of data. Forty-six cases have been omitted from this and all subsequent tables because information was inadequate, or it was impossible to classify a main cause of death to Groups A, B, or C (e.g., 12 cases of polyarteritis nodosa). In addition 114 non-coronary deaths have been omitted from tables dealing with the physical activity of occupation because the last job was unknown or could not be classified. Occupations were classified by Dr. R. Murray and Dr. D. Turner. Throughout these tables rates of ischaemic myocardial fibrosis are printed in italic. Rates based on a numerator of less than 5 cases are bracketed (). 45-60 years incl. 45-59 years 60-70 years incl. 60-69 years 45-70 years incl. 45-70 years. Because of the similarity of age distributions crude rates have been used throughout the analysis and tables in amalgamations of 45-70 years inclusive. Tests of Significance.—The test used in this table (and throughout this paper where relevant) is the test for linear trends in proportions (P. Armitage, *Biometrics*, 1955, 11, 375). A significant value of p indicates that the trend in the proportions (percentages) from "light" through "active" to "heavy" occupations is unlikely to be due to chance. The p values in separate subgroups—e.g., age groups 45-60 and 60-70—have usually been combined in the total groups—e.g., aged 45-70—the method of combination allowing for the fact that the trend was in the same direction in each subgroup. Third last line, p < 0.001; 2nd last line, p < 0.001; last line, p < 0.001.

Hypertension

Pathologists were asked to report any clinical or pathological evidence of hypertension, and much detailed information was provided for us. Using one at least of these criteria—(a) a clinical history of hypertension with record of diastolic pressure over 110; often there were particulars of treatment; (b) "concentric" left ventricular hypertrophy; or (c) in younger cases particularly, left ventricular hypertrophy not otherwise described or explained, together with nephrosclerosis—it was possible to distinguish those with "record or evidence of hypertension" from the "others." Close on 10% of the "basal" Group C had incidental hypertension as so defined. In almost half the cases of the "high coronary artery disease" Group B hypertension was present, and considered usually to be a principal factor in the death—for example, in many of the deaths from cerebrovascular disease.

The prevalence of ischaemic myocardial fibrosis in relation to hypertension is summarized in Table III, which shows no difference in the large fibrous patches (large healed infarcts) but substantially more of the smaller/multiple scars (focal myocardial fibrosis) among the hypertensive

($p < 0.001$). This latter excess, it may be noted, held for each of the subtypes of small scars and multiple scars included in type 2; whence the use of the term "focal myocardial fibrosis" for all of type 2 scars.

Table IV continues this analysis by occupation, and includes all the cases in Groups B and C—that is, all the non-coronary deaths. There is nothing of interest in the large fibrous patches, both the hypertensive (e.g., 4th line, in italics, left half of the table) and the "others" (e.g., first line in italics, right half of the table) showing the expected

TABLE III.—Proportions With Ischaemic Myocardial Fibrosis. Factor of Hypertension. 3,800 Non-coronary Deaths. Males Aged 45–70

Ischaemic Myocardial Fibrosis	Cases With Record or Evidence of Hypertension	Others
No. of cases	759	3,086
With large fibrous patch	18	74
Rate %	2.4%	2.4%
With smaller/multiple scars	122	172
Rate %	16.1%	5.6%

TABLE IV.—Proportions with Ischaemic Myocardial Fibrosis by Physical Activity of Occupation. Factor of Hypertension. 3,800 Non-coronary Deaths. Males Aged 45–70

Age	Ischaemic Myocardial Fibrosis	Cases with Record or Evidence of Hypertension			Others		
		Occupation			Occupation		
		Light	Active	Heavy	Light	Active	Heavy
45 < 60	No. of cases	135	130	41	567	575	365
	With large fibrous patch	2	2	0	14	7	2
	Rate %	(1.5%)	(1.5%)	(0%)	2.5%	1.2%	(0.5%)
	With smaller/multiple scars	29	12	2	25	18	12
	Rate %	21.5%	9.2%	(4.9%)	4.4%	3.1%	3.3%
60–70	No. of cases	194	160	78	544	564	378
	With large fibrous patch	10	3	1	25	16	7
	Rate %	5.2%	(1.9%)	(1.3%)	4.6%	2.8%	1.9%
	With smaller/multiple scars	42	23	11	46	43	24
	Rate %	21.6%	14.4%	14.1%	8.5%	7.6%	6.3%
	Total with ischaemic myocardial fibrosis	52	26	12	71	59	31
	Rate %	26.8%	16.3%	15.4%	13.1%	10.5%	8.2%

Tests of Significance

	Hypertensives	Others
Line 1	—	0.02 > p > 0.01
2	0.01 > p > 0.001	0.02 > p > 0.01
3	0.01 > p > 0.001	0.02 > p > 0.01
4	—	0.02 > p > 0.01
5	0.05 > p > 0.02	0.02 > p > 0.01
6	0.01 > p > 0.001	0.02 > p > 0.01

This table amalgamates the "basal" and "high" coronary artery disease Groups C and B, and corresponds with Table I. 0 and 0% = No cases with ischaemic myocardial fibrosis. Tests were for trends in percentages from "light" through "active" to "heavy" occupations (cf. footnote to Table I). * Trend not significant—i.e., $p > 0.05$.

TABLE V.—Coronary Artery Disease by Physical Activity of Occupation. 3,800 Non-coronary Deaths. Males Aged 45–70

Coronary Artery Disease	No. of cases	"Basal" Group			"High" Coronary Artery Disease Group			All Non-Coronary Deaths		
		Occupation			Occupation			Occupation		
		Light	Active	Heavy	Light	Active	Heavy	Light	Active	Heavy
(1) Coronary atherosclerosis present	Rate %	85	82	82	91	90	86	87	84	83
(2) Much coronary atherosclerosis with focal obstruction ("severe disease")	Rate %	10	9	10	24	17	22	14	11	13
(3) Much coronary atherosclerosis without focal obstruction	Rate %	5.7	6.0	4.6	9.0	8.4	9.3	6.7	6.6	5.7
(4) Calcification present	Rate %	19	18	18	32	26	31	23	20	21
(5) Focal obstruction present including	Rate %	21	16	19	34	28	32	25	19	22
(6) Complete or near-complete occlusion of a main coronary artery	Rate %	3.7	3.0	2.5	10.3	7.3	5.7	5.8*	4.2	3.2

The figures in the last panel cannot be used directly as indicators, however crude, of the overall prevalence of coronary artery disease, and of its various manifestations, in the whole middle-aged male population of Britain. Even if the dead can be taken at all to represent the situation in the living, it must be remembered that deaths from clinical coronary heart disease (Group A) have not been considered so far. The great majority of these would of course show severe coronary artery disease, coronary occlusions, etc.; and, whatever proportion of such cases were added to set up a "model" of the total population, the totals of all 6 indicators, except (3), in the last panel would surely be raised. On the other hand, deaths from severe hypertension, as in Group B, are very likely over-represented. However that may be, it seems probable from what is known of the occurrence of clinical coronary heart disease in different occupations that the excess here reported of coronary occlusions among light occupations may be an underestimate. By the same token, there may well be some excess of severe coronary artery disease among light workers in the population as a whole.

* 0.02 > p > 0.01.

trend. But the picture is quite different in the smaller/multiple scars. Among the hypertensives the prevalence of this focal myocardial fibrosis was very high in light workers—22% of these patients aged 45–70 (21.5% and 21.6%) showed it. This rate is higher than that found in the active and heavy workers with hypertension, and much higher than in all with no record or evidence of hypertension (Others in Table). The effects are again clearer at 45 < 60 years; the light occupations showed these small scars almost three times more often at this age than the rest with hypertension, and six times more than the others without hypertension. At 60–70 years the figures are one and a half times, and three times, respectively. Indeed, this special excess of small, multiple scars in light workers with hypertension is largely responsible for the higher overall rate of such scars seen in hypertensives as a whole (Table III) when they are compared with the "others." (These "others" without record or evidence of hypertension, it is interesting, showed little variation of focal myocardial fibrosis with occupation among themselves, but what trend there was is also in the expected direction.) In brief, however,

The physical activity factor is clearly evident in the occurrence of smaller/multiple scars only in association with hypertension. At ages 45–70, light workers with hypertension showed these scars twice as often as active and heavy workers with hypertension, and five times more than all without record or evidence of hypertension. The excess in light occupations is, again, greater at 45 < 60 years than at 60–70.

Coronary Artery Disease

The next question, of course, is whether these various occupational differences in the prevalence of ischaemic heart disease are associated with corresponding differences in the prevalence of coronary artery disease and, in particular, of

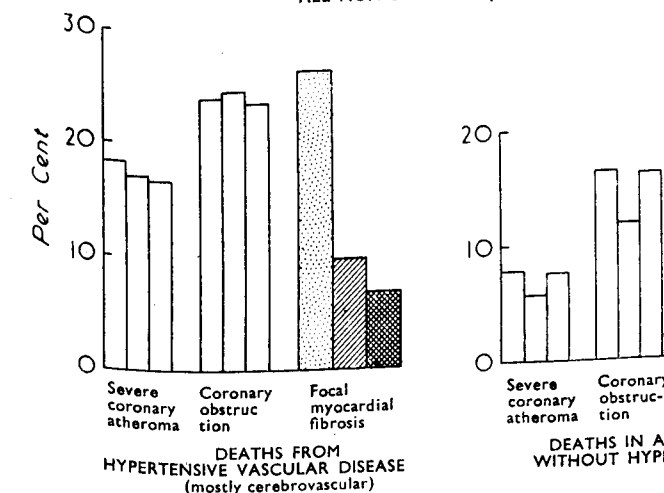
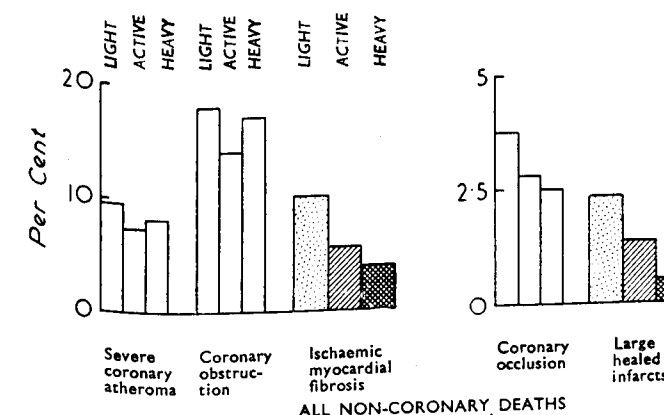


Fig. 1.—Coronary artery disease, ischaemic heart disease, and physical activity of occupation. 1,800 non-coronary deaths. Males aged 45 < 60 years.

coronary narrowing. The pathogenesis of ischaemic myocardial fibrosis may be regarded for the present as coronary insufficiency, and the basic pathology is "atheroma" or "atherosclerosis" (the terms are interchangeable in Britain—and equally unsatisfactory) with focal coronary obstruction. Most ischaemic scars, it will be recalled, were associated with topical coronary narrowing, the large fibrous patches more commonly with complete or near-complete occlusions, the smaller/multiple scars with lesser degrees of coronary narrowing.

Statistical analysis of the condition of the coronary arteries in the 5,000 reports has only been started, and it will inevitably be on less sure ground than with myocardial fibrosis. Meanwhile, Table V presents some preliminary indices of macroscopic disease in the main arteries and large branches^{8 12 16 17 18 22 26 37 38 39 42 47 67} firstly for the basal group C and then for the high coronary artery disease group B, the main classification of the inquiry as a whole. These are the indices:*

(1) The presence of any reported coronary atheroma. Macroscopic intimal disease was reported in 85% of the cases in the light occupations of the basal group, 82% in the active occupations, etc.

(2) The proportion with severe coronary atherosclerosis, using mainly a simple quantitative five-point scale of "none," "little," "moderate," "much," "indefinite" disease. The minimum to qualify as "severe" was (a) "much" atheroma throughout the coronary arteries with large or confluent plaque formation—superficial flecking or streaking alone did not count—showing also (b) some focal obstruction.

(3) The presence of much mural disease without encroachment upon the lumen. Cases with arterial dilatation were also included here.

(4) The presence of calcification.

(5) The proportion with coronary obstruction—that is, lumen stenosis or narrowing of any degree; and including

(6) Complete occlusion or near-complete (e.g., "admitting fine probe only") of a main coronary artery (left, left anterior descending, circumflex, right). This alone was called "coronary occlusion."

Diffuse intimal fibrous thickening, by itself, was ignored.

There is much in Table V, but attention is here paid only to the frequency of coronary artery disease by occupation. Both in the basal group and in the cases of the high coronary artery disease group—Table V corresponds to Table I but is set out horizontally—gross coronary artery disease (1), (2), (3), and (4) is exceedingly common: however, there is no occupational trend of any interest. Index (5) again

reveals no material difference in the overall frequency of coronary obstruction among the occupation groups. In terms of one of the original hopes in the design of the inquiry the stability of these various indices of coronary artery disease is reassuring—if for other reasons disappointing! The first observation of note is in (6), the greater frequency of complete or near-complete occlusions in light occupations (5.8%) compared with heavy (3.2%). The rate of coronary occlusion, as defined, is about the same in light workers aged 45 < 60 as in heavy workers 10–15 years older (Table VI). Straightaway, however, it is obvious that the excess of occlusion in light workers is less than the excess of large healed infarcts already reported in Table II.

Comparison of the condition of the coronary arteries in cases with hypertension and in others showed much more atherosclerosis

*The Report of the World Health Organization's Study Group on the Classification of Atherosclerotic Lesions (*Wld Hlth Org. techn. Rep. Ser.*, 1958, 143) became available too late for use in this analysis.

TABLE VI.—Coronary Occlusion. 3,800 Non-coronary Deaths. Men

Ages	Occupation		
	Light	Active	Heavy
45-60	3.8%	2.8%	2.5%
60-70	7.6%	5.5%	3.9%

TABLE VII.—Severe Coronary Atherosclerosis. 3,800 Non-coronary Deaths. Males Aged 45-70

Cases	Occupation		
	Light	Active	Heavy
With hypertension	22%	19%	19%
No record or evidence of hypertension	12%	9%	12%

in the hypertensive throughout 45-70 years of age.^{26, 44} For example, the proportion with severe coronary atherosclerosis, as previously defined, was as shown in Table VII. The prevalence of coronary occlusions was higher in the hypertensive, and it was greatest again in the light occupations. There was no occupational trend, however, in the frequency of lesser degrees of coronary narrowing among the hypertensives; though, as stated above, these cases showed a strong light-heavy trend in the frequency of focal myocardial fibrosis, and the small/multiple scars are particularly associated with such lesser narrowing.

Fig. 1 illustrates these points in the most interesting cases, men under 60. If all such cases are taken together, there is no particular difference with occupation in the prevalence of severe coronary artery disease, or in the overall prevalence of coronary obstruction, but quite a clear trend in ischaemic scarring. There is a gradient with occupation in the frequency of complete or near-complete coronary occlusions—notice the change of scale—but a steeper one in the large healed infarcts. It is striking how, with similar occupational frequencies of coronary obstruction, the hypertensive cases (the most important cases in Group B have been used for this illustration—the deaths actually from hypertensive vascular disease, mostly cerebral) show a marked occupational difference in the frequency of focal myocardial fibrosis. On the other hand, in the cases without hypertension there are again similar prevalences of arterial obstruction in the occupation groups but, now, very little occupational trend in such scars. (The contrast with focal myocardial fibrosis is the same if the prevalence of lesser coronary narrowing alone is included.) It looks, then, as if much of the variation in ischaemic myocardial scarring with physical activity of work does not depend on occupational differences of, at any rate, gross coronary artery disease. Or, another way of looking at the data, there is no suggestion in the present material that habitual physical exertion materially affects coronary atheroma, but an indication that it is related to the frequency of coronary occlusion.*

*Hypertension. We have shown that focal myocardial fibrosis was commoner in hypertensive cases than in those without record or evidence of hypertension and that, among the hypertensives, light workers showed substantially more of these small scars than did the active and heavy workers. There is another point of interest. In this material, the proportion of cases with hypertension among heavy workers, throughout 45-70 years of age but more so in the younger men, is smaller than among light workers. In Group C, at 45-60, 3% of the men in heavy occupations showed it, compared with 8% in light; in Group B, 39% compared with 50%.⁴⁵ "Following through" this observation from the Group C through Group B into Group A, it may be seen in Table XII (next footnote) that the proportion with hypertension in these deaths from coronary heart disease, etc., was lower in heavy occupations than the others. Broadly speaking, in the material as a whole the frequency of hypertension in heavy workers aged 60-70 was the same as in light workers of 45-60 years of age.

Two special factors, then, may be operating in relation to hypertension: heavy workers possibly have less of it; and light workers with hypertension may be specially liable to cardiac damage. The suggestion that the combination of high blood pressure and light occupation may be particularly important, may provide a "way in" for the study of the complicated relations of hypertension with coronary heart disease.

Occupation and "Social Class"

The distribution, in Britain, of mortality from coronary heart disease by social class is well known. First established in 1930-2,⁴⁶ the most recent figures (Table VIII) relate to 1949-53.

TABLE VIII

Social Class	Scotland ⁴⁶ 58 Males, Aged 15 and Over		England and Wales ⁵³ 57 Males, Aged 20-64	
	I	II	III	IV
I	167	119	147	110
II	109	109	105	105
III	85	85	79	79
IV	79	79	89	89
All classes	100	100	100	100

The mortality in social class I (Osler's⁵² "better classes") when adjusted for age, as in the above, is much higher than in the rest and about twice that in classes IV and V.

"Social class" is intended to reflect "general standing within the community," social class I including the leading professions and business, class III the craftsmen and skilled workers, and class V the unskilled. Classes II and IV are intermediate. It seems clear that, for men in the age range dealt with, "class" also provides an economic grading.

The 3,800 non-coronary deaths of the present inquiry were analysed by social class⁵³: the present approach has the advantage that the "level" or "plane" of description and diagnosis is probably the same for all classes. The result in Table IX shows a steady fall in ischaemic myocardial fibrosis from 13.3% to 7.8%. This trend, however, disappears when the social classes are analysed in terms of the physical activity of the occupations in them. Table X(A), read downwards, shows that the frequency of the fibrosis in these light workers of similar ages is about the same in social classes I, II, III, and IV—that is, there is no

TABLE IX.—Proportions With Ischaemic Myocardial Fibrosis by Social Class. 3,800 Non-coronary Deaths. Males Aged 45-70

Social Class	No.	Proportion with Ischaemic Myocardial Fibrosis
I	98	13.3%
II	510	12.1%
III	1,847	10.5%
IV	605	9.2%
V	683	7.8%

The trend of the proportions with ischaemic myocardial fibrosis is statistically significant ($p < 0.01$). Occupations were allocated to social class in accordance with the General Register Office Classification of Occupations, 1950.⁵⁸ 102 cases could not be so allocated because of insufficient information.

TABLE X.—Proportions with Ischaemic Myocardial Fibrosis by Social Class and Physical Activity of Occupation. 3,800 Non-coronary Deaths. Males Aged 45-70.

Social Class	Light Occupations %	Active Occupations %	Heavy Occupations %	All %
I	13.7	(0)	—	13.3
II	13.4	9.2	(0)	12.1
III	13.8	8.0	8.2	10.5
IV	13.5	10.1	4.9	9.2
V	8.9	9.0	7.1	7.8
All	13.4	8.7	6.8	10.0

(A) Ischaemic Myocardial Fibrosis by Social Class and Physical Activity of Occupation:

I	13.7	(0)	—	13.3
II	13.4	9.2	(0)	12.1
III	13.8	8.0	8.2	10.5
IV	13.5	10.1	4.9	9.2
V	8.9	9.0	7.1	7.8

(B) Large Healed Infarcts by Social Class and Physical Activity of Occupation:

I and II	4.3	(2.1)	(0)	3.8
III	3.2	1.8	(1.2)	2.3
IV	(3.6)	2.1	(1.5)	2.3
V	(2.2)	(2.2)	(1.0)	1.5

(C) Focal Myocardial Fibrosis by Social Class and Physical Activity of Occupation:

I and II	9.1	6.9	(0)	8.6
III	10.6	6.2	6.9	8.2
IV	9.9	8.0	3.4	6.8
V	6.7	6.7	6.1	6.3

*No cases at all.

variation with social class and, incidentally, no indication of the particular excess seen in the national mortality data among social class I. There is again no class trend in the active occupations (middle column of Table X(A)) and less than none in the heavy. But reading Table X(A) across, the light-heavy trend previously reported is pretty clear within each social class, the light occupations showing more with scars than the active in class II, and the light in class III and class IV a higher prevalence than the active and heavy in these classes. That is to say, among men of comparable social-economic circumstances, those in light occupations showed a clear excess of ischaemic myocardial fibrosis.⁴³ As would be expected—Tables X(B) and (C)—the reduction in the frequency of fibrosis that occurs with physical activity of occupation within the social classes is more evident for the large healed infarcts; though the numbers in Table X(B) are impossibly small.

The irregularities in these tables are also interesting. Social class V stands out on its own, both in showing low rates among light workers and in showing little trend with occupation. It is just in these men that the classification of

occupations by "activity" is at its weakest. On the one hand, the light occupations—for example, lift attendant, night watchman—are reserved mostly for disabled persons; therefore the last and "light" job, more than in other classes, is apt to be an inaccurate indicator of the main or usual job during working life. On the other hand, all "general labourers" were perforce graded as "heavy" workers, though, as is well known, many an elderly "labourer," officially or unofficially disabled, does little more than odd jobs on a building site and the like, and may have been so occupied for years before his death. There is an irregularity in social class III because some very heavy workers—for example, stonemasons and boilermakers—have a high prevalence of scars, high for heavy workers; a hint here, perhaps, of the dangers of too much physical activity.⁴⁴ The rate for heavy occupations in class IV is particularly low because agricultural workers show little ischaemic fibrosis—little even for heavy workers. These special features of classes III and IV persist when the prevalence of scarring in these particular occupations is compared also with that of other heavy workers in the same

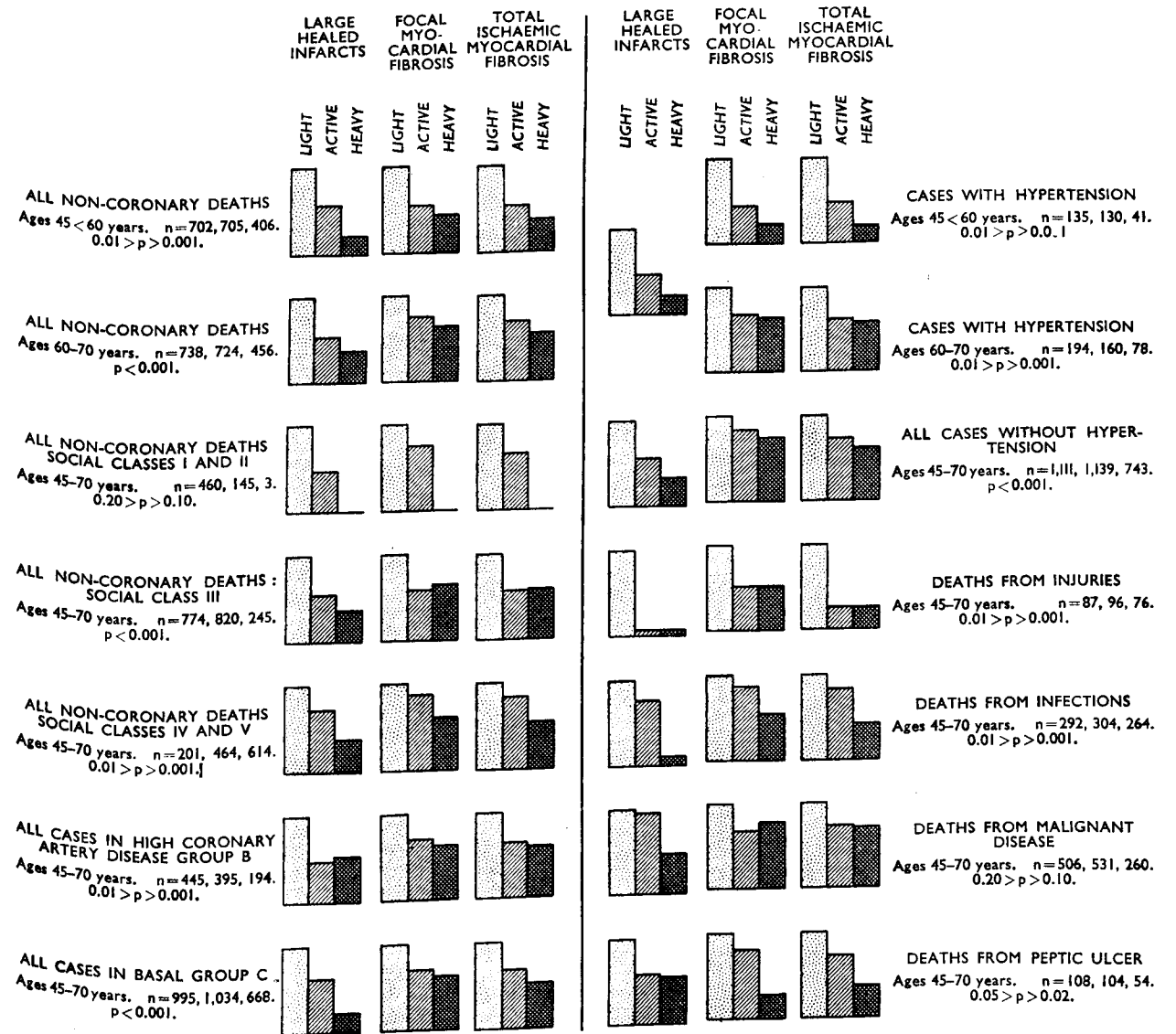


FIG. 2.—Frequency of ischaemic myocardial fibrosis, by physical activity of occupation. 3,800 non-coronary deaths. Males aged 45-70 years. In each block of three columns the first column is the rate among light occupations regarded as 100%. In the second column (active occupations) and the third column (heavy) the rates have been recalculated as proportions of the rate among light occupations. In each line the first block represents the large fibrous patches; the second block represents the smaller/multiple scars; and the third is the total of ischaemic myocardial fibrosis. n gives the numbers of cases in light, active, and heavy occupations in that order. The test of significance applies to the total of ischaemic myocardial fibrosis. In deaths from injuries active and heavy occupations have been amalgamated.

sets of necropsy reports, the kind of internal "control" that is so important in this type of study.⁴⁰

In brief, in this material there is no evidence of any important "class" factor. Most of the social class trend in ischaemic myocardial fibrosis seems to arise from the distribution of "light" and "heavy" workers among the classes (Table XI), though there is evidence also of other and it may be more specific occupational factors affecting the class rates. The association of ischaemic myocardial fibrosis with physical activity of work in these data seems to be independent of standards of living, including obviously in the present instance levels of education and skill and possibly also of responsibility.

TABLE XI.—Distribution of Occupations Within the Social Classes

Social Class	Percentage of			Total
	Light Occupations	Active Occupations	Heavy Occupations	
I	97	3	—	98
II	72	28	1	510
III	42	44	13	1,847
IV	18	47	34	605
V	13	26	60	683

Summing up the 3,800 Non-coronary Deaths

Fig. 2 sums up the main findings. In each block the rate of ischaemic myocardial fibrosis in the light occupations is regarded as 100%, and the rates in active and heavy occupations are calculated as proportions of this. In each line the first block illustrates the prevalence of the large fibrous patch, the middle block that of the smaller scars, and the third is the total of ischaemic myocardial fibrosis. (In the first two lines of the second column dealing with hypertensive disease the data have been amalgamated for 45-70 years of age in the large healed infarcts, but distinguished by the two age groups in focal myocardial fibrosis.) There is, of course, considerable overlapping in these various extracts from the data, and some of the numbers—the total is given in each line for light, active, and heavy in that order—are small. The tests of statistical significance apply to the total with scars in each line.

The consistency of the pattern is striking and makes it unlikely that the association of ischaemic myocardial fibrosis, and particularly the large healed infarcts, with physical activity of occupation is the product of some gross bias in this necropsy material. There is quite conceivably an association between ischaemic myocardial fibrosis and the chances of dying and/or undergoing necropsy. But it is less conceivable that such an association could be systematically greater in light occupations than heavy, so that with equal real prevalence of fibrosis among occupations the rate would appear higher in the light. And it is difficult to conceive how such a bias could be effective in the wide variety of disease (and other categories) illustrated in Fig. 2. But, of course, bias can be "built-in" in goodness knows how many ways, and no individual study can deal with all of even the recognized sources. Other studies will need to be done, and also on large numbers, to repeat these observations and to permit still further and quite different subdivisions of the data.

Evidence from 1,200 Deaths from Coronary Heart Disease

As stated before, about 1,200 of the 5,000 reports in the inquiry were on deaths in which coronary heart disease was the main cause—coronary heart disease by itself, or coronary heart disease with hypertension or with other pathology (for example, the post-operative cases)—together with a small number of less-defined though related

cardiac conditions. These 1,200 will be described elsewhere. Much less can be made of them because they raise acutely the intractable problem of selection of cases; problems that are of less moment, as just discussed, in conditions like ischaemic myocardial fibrosis which are not the main cause of death and are incidental and often chance findings at necropsy. Moreover, no base or denominator can be defined for the estimation of frequency rates of coronary heart disease—for example, by type of occupation. Less effort was therefore made to obtain a good national sample. Thus no request for co-operation was made to the coroners' pathologists in Greater London; though in the provinces many coroners' cases were included in the series of 25, and there were a fair number also, as a matter of fact, in the Metropolitan hospitals' series. However, the 1,200 deaths from coronary heart disease can be classified by occupation and ratios comparing the actual number of cases in each of the three occupation groups can be calculated. This was done.

There were 482 deaths from coronary heart disease and related conditions in light workers, 436 in active workers, and 230 in heavy workers, a ratio of 1.0:0.9:0.48; and there is little doubt, from previous inquiries by the unit,⁴¹ that if the London area had been fully represented the excess of light occupations among deaths from coronary heart disease would have been greater still. Meanwhile it may be noted that the trend with occupation in deaths from coronary heart disease is greater in the cases with hypertension than in the others.

Fig. 3 sets out the occupational ratios of the coronary heart disease and related deaths (Group A), and for completeness the ratios of the cases with ischaemic myocardial fibrosis in the high coronary artery disease group B, then of the cases with such fibrosis in the basal group C. Fig. d gives the ratio (using again the numbers in light, active, and heavy occupations) of all these cases with evidence of ischaemic heart disease in Groups A, B, and C added together—that is, in the whole series of 5,000. This is 1.0:0.84:0.43. Fig. 3e is for the rest of the 5,000 reports, those showing no evidence of ischaemic heart disease—1.0:1.05:0.64; and this ratio is plainly not of a kind with the previous ($p < 0.001$). For what such evidence is worth, then—and this is by no means the right way of asking this particular question—there is indication of higher mortality from clinical coronary heart disease among light workers.*

Discussion

An association has been demonstrated between physical activity/inactivity of work and one form of coronary heart disease, ischaemic myocardial fibrosis. Explanation of this may be attempted along several lines. First, that light occupation increases the incidence of ischaemic myocardial fibrosis, heavy jobs are protective. Second, that the association is effect rather than cause; on account of disability from myocardial ischaemia men give up heavy jobs for light ones and a higher prevalence of scarring is thereby created among light workers. Third, that the association is indirect:

*Other sums can be done with the data if required:

TABLE XII.—Number of Cases of Ischaemic Heart Disease in a National Sample of 5,000 Necropsies. Males Aged 45-70

Occupation	"Coronary" Deaths, Etc.		Non-Coronary Deaths, with Ischaemic Myocardial Fibrosis		Non-Coronary Deaths, with No Ischaemic Myocardial Fibrosis	Total
	Hypertension Present	Others	Large Healed Infarcts	Focal Myocardial Fibrosis		
Light (No.) ..	145	337	51	142	1,247	1,922
Active (No.) ..	127	309	28	96	1,305	1,865
Heavy (No.) ..	51	179	10	49	803	1,092
Total ..	323	825	89	287	3,355	4,879

160 cases were excluded for one reason or another, cf., Table I.

for example, susceptibility to coronary heart disease and individual choice of job may both be the product of host factors in constitution (and previous experience); or physical activity/inactivity may be reflections merely of the nervous strain of jobs, and it is this that really matters in coronary heart disease. All these processes, it could reasonably be proposed in the present state of knowledge, contribute to the community picture of coronary heart disease; but, of course, the first is the most interesting.

The present study sheds no light on personality factors, though we hope other inquiries in which we are engaged—on somatotype and occupation, for example—will do so.⁴² No attempt has yet been made to classify the 1,700 different job descriptions in terms, say, of responsibility, of nervous strain—and emotional support. This might be done; but it is an appalling prospect, and the similarity of the rate of fibrosis among the professional and business men of class I to that found in the semi-skilled light workers of class IV does not encourage us to try. The study of psychological stress in relation to coronary heart disease still lacks an appropriate method (we have long thought that a forward-looking study among doctors from their late thirties or early forties is the most hopeful). The possibility that the high prevalence of fibrosis in light jobs is the result of transfer by men into these because of coronary insufficiency has not

workers shows an excess. The heavy workers had less ischaemic fibrosis altogether, and relatively more of it took the form of smaller patches and small, often very small, scars. That is to say, in this material ischaemic myocardial fibrosis is not so severe in physically active and heavy workers. But the prevalence of these minor forms of myocardial fibrosis also was lower in active and heavy than in light occupations; which rather suggests that the excess of angina previously noted in physically active men (bus conductors and postmen) is more likely to be a matter of symptom formation, of the disease being elicited and made manifest in them by their physical effort, rather than of an absolute excess of any particular pathology in active workers.⁴³

Evidence can now be advanced relating physical activity of occupation to the incidence of coronary heart disease, to sudden death and other rapidly fatal cardiac infarction, to the prognosis in the survivors of the first clinical episode, to the prevalence of the disease, to total coronary mortality in middle-age, and to several forms of ischaemic myocardial fibrosis. The time seems to have come, in view of the convergence of such varied and independent evidence, for a restatement of the general hypothesis in causal terms: *Physical activity of work is a protection against coronary (ischaemic) heart disease. Men in physically active jobs*

have less coronary heart disease during middle-age, what disease they have is less severe, and they develop it later than men in physically inactive jobs.

It must be emphasized, however, that, overall, the evidence on this problem is quite conflicting.^{2 5 7 9 11 22 23 24 27 34 45 48 53 64 66 69}

In several studies coronary heart disease has been found to be associated with physical activity/inactivity of occupation in the expected way. In as many, no relationship was demonstrated, or an equivocal or opposite one; and why this is so is still quite unclear. Different methods are being

used by different investigators and different aspects of the disease are being studied. Moreover, the "epidemic constitution" may be different in the U.S.A. from the U.K.—the important causes may be present in different degrees and in different combinations.²²

Some speculations may be worth airing here. The diminishing physical activity of work during the present century may be one of the causes of the increasing incidence of coronary heart disease that seems to be occurring, and, if the increase is as modest as is now often suggested, a principal cause. This question might be studied through the historical experiences of "underdeveloped" populations becoming "westernized." If it is argued that constitution and mesomorphy is the crucial variable, unexpressed mesomorphy, the disuse of large-muscle masses, may be said to be one of the characteristic biological consequences of industrialization. Then, it may be asked whether regular physical activity outside work protects against coronary heart disease in middle-age. There is no information, meanwhile, on the relations, if any, between physical exertion in leisure, for example, and the incidence or prevalence of coronary heart disease; but plainly this is the main implication of observations such as the present for preventive medicine, and means of testing such a hypothesis must be found. Typical of to-day's problems in epidemiology, this will involve *ad hoc* studies of large numbers of individuals; and even preliminary indirect studies of coronary heart disease and leisure activities in ready-made social groups such as the social "classes" cannot be made.

A final speculation may be advanced that *habitual physical activity is a general factor of cardiovascular health in middle-aged men* since it may be related to blood lipid levels, to clotting and to fibrinolysis, to diabetes, to hypertension and its complications, to coronary occlusion, and to ischaemic heart disease.^{3 10 20 25 28 29 30 31 35 40 50 55 61} Regular physical exercise could be one of the "ways of life"

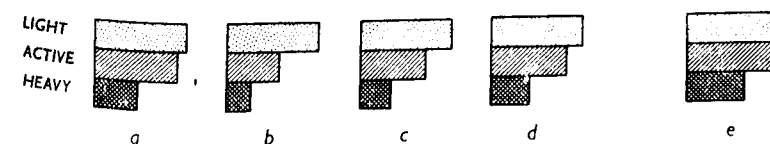


Fig. 3.—Ratios of the number of cases of ischaemic heart disease in the three occupational groups, the number in light occupations being regarded as 1.0. National sample of 5,000 necropsies. Males aged 45-70. Scotland, England and Wales, 1954-6. (a) Group A: Deaths from ischaemic heart disease, etc. (b) Ischaemic myocardial scars in cases of Group B. (c) Ischaemic myocardial scars in cases of Group C. (d) Showing a, b, and c added together. (e) All the cases without ischaemic heart disease.

been directly considered. It can only be said that the evidence available gives no hint that such transfer, which must surely be common, explains all or even much of the occupational distribution found. Thus the excess of scarring among light workers is no greater at 60-70 years of age than at 45-60, and, indeed, for the large patches it is more evident in the younger men. Moreover, it may again be pertinent that the rate among the light occupations of social classes I and II, drift into which from heavy jobs in unlikely, is just as high as that in class III, where such drift is more likely, and class IV, where it is very likely. In social class V itself there was little if any excess among the light occupations, which is as reassuring as it was unexpected: because, as already said, it is just these jobs—messenger, lift attendant, night watchman, and the like—that "disabled" manual workers so often select, and drift into, which for lesser impairment is also very likely. But this difficult and important problem needs to be tackled in other ways: an attempt is now being made in this unit, for example, to determine the prevalence of quite silent coronary heart disease by electrocardiographic study of workers with contrasting physical activity of jobs.

Restatement of Hypothesis

Another piece of evidence has thus been provided in this report that confirms the general hypothesis, and using on this occasion quite different material from before. In the present data as a whole, and in every sizable category of it, there was a lower prevalence of ischaemic myocardial fibrosis among men who had been in physically active and heavy jobs than among those in sedentary and light jobs. Study of the detailed morbid anatomy of this social difference supports the second part of the original hypothesis. It is particularly in the prevalence of the large, often and for obvious reasons solitary, patch of fibrosis, the probable result it may be said of major and acute infarction (and homologue of sudden death in the bus driver?) that light

that promote health in middle-age, and ischaemic heart disease may be in some degree a deprivation syndrome, a deficiency disease.

Mechanisms of the Occupational Difference

Nothing corresponding to the differences with physical activity which have been found in experimental atherogenesis^{11, 12} were observed in the present material. Clearly the main causes of coronary atherosclerosis in man have to be sought elsewhere—for example, in hypertension and, the principal field of interest at present, in diet and lipid metabolism. There is more coronary occlusion among the light occupations, which is particularly interesting because the factor of intracoronary thrombosis may be particularly associated with these complications of atheroma^{13, 14, 15, 16, 17, 18, 19, 20} and the present findings may be another indication of the relationship between physical activity and intravascular clotting.^{21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100} If, as many would argue, the pathogenesis of all degrees of coronary obstruction is the same, then, it would appear, the capacity to cope and to resolve such obstructions must vary with occupation so that actual occlusion of large coronary vessels is less common in active and heavy workers than in sedentary and light workers. However that may be, the excess of coronary occlusion is inadequate to explain the excess of large healed infarcts in light occupations; and the other indicators of coronary artery disease so far studied do not help at all to account for the occupational distribution of the scarring. Mechanisms of the occupational differences in ischaemic myocardial fibrosis need therefore to be postulated that operate additionally to those of gross coronary artery disease,^{10, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100} in general and local haemodynamics, it may be, in neuro-hormonal mechanisms, in special relationships with hypertension, in the physiological capacity of the main arteries and branches, in intercoronary collateral circulation.^{19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100} Recently it has been observed that effective collateral vessels in dogs with coronary obstruction develop more profusely if the dogs are exercised; functional myocardial hypoxia might be the mechanism relating physical activity to collateral formation.^{19, 20}

Distinction of Ischaemic Heart Disease from Coronary Artery Disease

In the first report of the present series³⁹ it was suggested that the recent history of coronary thrombosis/myocardial infarction on the one hand, and that of coronary atheroma on the other, are different. The former, there is good reason to believe, have increased during this century; there is no evidence whatever in Britain that the latter has, and, indeed, coronary atheroma may have declined here during the past 40 years.^{40, 41} The historical material, that is to say, suggests that ischaemic heart disease is not a simple, proportional function of coronary atherosclerosis. The evidence now presented goes further in dissociating the heart disease from the arterial disease, because it suggests that even when the latter is analysed into obstructive and non-obstructive processes nothing like a 1:1 relationship emerges between myocardial damage and the obstructive arterial disease. Social grouping of the pathological data (by occupation) shows substantial differences in the frequency of myocardial fibrosis which correspond only moderately to the frequency of coronary occlusions and correspond not at all to the frequency of lesser narrowing of the coronary lumen. Such identification of syndromes from undifferentiated clinical material—in this instance of ischaemic heart disease from coronary artery disease—is one of the uses of epidemiology, and theoretically is of much interest.⁴²

A Word on the Method

Finally, it may be remarked that post-mortem reports are just about the most difficult medium for epidemiological analysis: many sources of bias in the material are known; as many, it must be assumed, are quite unknown. The use of necropsy data finds its main warrant in asking questions, such as the present report illustrates, that cannot be asked by any other method. But the limitations of any one set

of data, with its inevitably imperfect "population" samples and incomplete ascertainment of disease, make it very necessary that studies are repeated in quite different situations.

Summary and Conclusions

This report is one of a series on the epidemiology of coronary disease, and it continues the study of coronary (ischaemic) heart disease in relation to physical activity of work.

The hypothesis was previously stated that *men in physically active jobs have a lower incidence of coronary heart disease in middle-age than men in physically inactive jobs. More important, the disease is not so severe in physically active workers, tending to present in them in relatively benign forms.* The investigation now reported deals with the relations between physical activity of work and the frequency of ischaemic myocardial fibrosis in a sample of 3,800 middle-aged men dying from causes other than coronary heart disease.

All departments of morbid anatomy in the hospitals of the National Health Service of Scotland, England, and Wales were invited to take part in a national necropsy survey during 1954-6 by sending particulars in standard form of the naked-eye findings on the coronary arteries, the myocardium, and other specified items for a consecutive series of 25 males aged 45-70 years coming to necropsy. 206 departments co-operated, more than 85% of those eligible. About 5,000 reports were received, made up in round numbers thus: 1,200 deaths from coronary heart disease, etc. (Group A); 1,000 deaths from conditions with a specially high prevalence of coronary artery disease—for example, deaths caused by hypertension and its complications, deaths in diabetics, deaths from arterial disease in other sites (Group B); and, the remainder, 2,800 deaths from miscellaneous conditions, their main causes having no particular association with coronary artery disease—for example, injuries, infections, cancer (Group C). Groups B and C comprise 3,800 non-coronary deaths.

Two broad types of *ischaemic myocardial fibrosis* in the left ventricle and interventricular septum are described: (1) the large, discrete, often solitary patch which is probably the end-result of major and acute infarction and is associated particularly with complete or near-complete occlusion in a main coronary artery (90 cases among the 3,800 non-coronary deaths); and (2) smaller, commonly multiple scars, the result, it may be, of more chronic and less severe ischaemia, and occurring in hearts showing usually lesser focal narrowings of coronary arteries or branches (290 cases).

Cases were classified as "hypertensive" or "other" on the basis of the clinical and pathological information provided. About half the cases in Group B and 10% of those in Group C were thus regarded as hypertensive. The large healed infarcts—type 1 fibrosis above—were found equally in hypertensive and other cases; focal myocardial fibrosis of type 2 was commoner in hypertensive cases than in those without record or evidence of hypertension.

The last occupation of each man was graded on a three-point scale in terms of the physical activity the job typically involved as "light," "active," or "heavy."

Relation of Fibrosis to Occupation.—Ischaemic myocardial fibrosis in these 3,800 necropsies was commoner in the light occupations than in the active and heavy. Scarring among light workers aged 45-60 was as common as in heavy workers 10 to 15 years older.

The two main types of ischaemic fibrosis were differently related to physical activity of occupation:

The *large healed infarcts*, type 1 above, showed a strong gradient with occupation, being *three times* commoner in light workers than in heavy workers overall; *four to five times* commoner at 45-60 years of age, and *two to three times* commoner at 60-70 years. The excess of these severe ischaemic lesions in light workers was evident in Group B and in Group C, in hypertensive cases as in others, in every sizable medical and social category that was identified.

Focal myocardial fibrosis, type 2, was strongly associated with occupation only in hypertensive cases. Under 60 years of age, the light occupations among the hypertensives showed these small, multiple scars almost *three times* more often than active and heavy workers with hypertension, and about *six times* oftener than all without record or evidence of hypertension. The corresponding figures at 60-70 years of age were *one and a half* and *three times*.

In brief, ischaemic myocardial fibrosis was commoner in light occupations and it appeared earlier in them. It was also more severe among light workers, particularly at younger ages.

Coronary Artery Disease.—The pathological basis of ischaemic myocardial fibrosis is coronary "atheroma" or "atherosclerosis" with impairment of the coronary circulation. In the present data the overall prevalence of coronary atheroma was exceedingly high, and, little, moderate, or much, it did not vary with physical activity of occupation. Coronary narrowing was similarly common in all occupation groups. But actual occlusion of a main coronary artery, complete or near-complete, was commoner in sedentary and light workers than in the active and heavy. This excess of coronary occlusion was seen in the younger men and older, in hypertensive cases as in those without record or evidence of hypertension. In general, the frequency of coronary occlusion in light workers aged 45-60 was the same as that in heavy workers aged 60-70.

The main results of the inquiry may therefore be stated as follows: atheroma of coronary walls, no relationship with physical activity of occupation; occlusion of coronary lumen, some relationship; ischaemic myocardial fibrosis, much relationship.

Ischaemic Heart Disease and Coronary Artery Disease.—The excess of coronary occlusion among the light occupations was smaller than the excess of large healed infarcts found in them. Among hypertensive cases there was no trend with occupation in the frequency of lesser degrees of coronary narrowing, although, as stated, the frequency of focal myocardial fibrosis was greater in light workers with hypertension than in active and heavy workers with hypertension. That is to say, in the presence of coronary narrowing and occlusion light occupations showed more ischaemic lesions of the myocardium than did active and heavy workers. Analysis of this sample of pathological data by social (occupation) categories thus discloses only very limited correlation between the frequency of myocardial scarring and the condition of the coronary arteries. This is a further suggestion that ischaemic heart disease is not a simple function of coronary artery disease.

Hypertension was less common and occurred at later ages (10-15 years later) in the heavy occupations than in the rest; the excess of coronary occlusions in light workers was seen in hypertensive cases as in the others;

a specially high prevalence of small ischaemic myocardial scars in light workers with hypertension has been described. There are suggestions thus of multiple connexions between physical activity of occupation and the blood pressure which need to be followed up.

The expected trend of ischaemic myocardial fibrosis with *social class* was found, the rate falling from 13.3% in class I through 10.5% in class III to 7.8% in class V. This trend, however, disappeared when the social classes were broken down into categories of physical activity, and the occupations of which each class is composed were graded as "light," "active," or "heavy." Light workers in classes I, II, III, and IV all had similar prevalence of ischaemic scarring, and there was no class trend in the fibrosis among active workers or in heavy workers. On the other hand, the relationship of fibrosis to physical activity of occupation was independent of social-economic circumstances, being evident within single social classes: light occupations in class II showed more ischaemic fibrosis than the active in that class, light skilled workers a higher rate than the active and heavy occupations in class III, the light occupations of class IV more scarring than the active and heavy in that class. The overall trend with social class in this material is largely a function of the different proportions of light and heavy workers in the different classes.

Evidence has now been produced relating several aspects of clinical and subclinical coronary heart disease to physical activity of work. The general hypothesis may therefore be restated in causal terms that *physical activity of work is a protection against coronary (ischaemic) heart disease. Men in physically active jobs have less coronary heart disease during middle-age, what disease they have is less severe, and they develop it later than men in physically inactive jobs.* Since there are suggestions of other connexions between physical activity of work and cardiovascular disease of middle-age, and multiplying evidence from laboratory experiment of the beneficial effects of exercise on relevant cardiovascular physiology and pathology, the speculation may be advanced that habitual physical activity is a general factor of cardiovascular health in middle-age, and that coronary heart disease is in some respects a deprivation syndrome, a deficiency disease. In the present material the hearts of sedentary and light workers showed the pathology of the hearts of heavy workers 10-15 years older.

Perspective.—Coronary heart disease among heavy workers, though less common, less severe, and occurring later than among light workers, is nevertheless common enough to constitute a major health problem in them: absolutely; and in comparison with the greater freedom from the disease heavy workers, like the rest of the population, seem to have enjoyed earlier this century and in many countries apparently still enjoy.

We are greatly obliged to many for their participation and help in this inquiry: to the pathologists, and their medical and lay colleagues, of the hospitals listed in the Appendix, with associated hospitals, for a prodigious amount of painstaking work, carried out often, we know, in circumstances of considerable difficulty; to Dr. K. Ball, Professor T. Crawford, Dr. I. Doniach, Professor J. Duguid, Professor G. L. Montgomery, Dr. M. F. Oliver, Professor D. S. Russell, and Dr. C. S. Treip for advice on the design of the Report Form and/or pilot work; Dr. R. Murray, formerly H.M. Medical Inspector of Factories and now of the I.L.O., and Dr. D. Turner, of the Medical Research Council's Environmental Hygiene Research Unit, for the classification of occupations; the Factory Department of the Ministry of Labour and Dr. E. R. Bransby, of the Ministry of Health, for advice on this problem; Dr. Richard Doll and Professor A. Bradford Hill for access to

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APPENDIX: PRINCIPAL PARTICIPATING HOSPITALS

SCOTLAND

NORTHERN REGION:
Royal Northern Infirmary, Inverness.
NORTH-EASTERN REGION:
Teaching Hospitals: Aberdeen Royal Infirmary; Woodend General Hospital, Aberdeen.
EASTERN REGION:
Teaching Hospitals: Dundee Royal Infirmary; Maryfield Hospital, Dundee; Perth Royal Infirmary.
SOUTH-EASTERN REGION:
Teaching Hospitals: Royal Infirmary, Edinburgh; Western, Northern, and Eastern General Hospitals; Leith Hospital.
Cameron Hospital, Windygates, Fife.
WESTERN REGION:
Teaching Hospitals: Western Infirmary, Glasgow; Royal Infirmary, Glasgow; Victoria Infirmary, Glasgow; Southern General Infirmary, Glasgow; Stobhill Hospital, Glasgow.
Kilmarnock Infirmary; Royal Infirmary, Dumfries; Stirling Royal Infirmary.

ENGLAND

Teaching Hospitals.—Manchester Royal Infirmary; Liverpool Royal Infirmary; Royal Victoria Infirmary, Newcastle upon Tyne; Queen Elizabeth Hospital, Birmingham; Accident Hospital, Birmingham; the General Hospital, Birmingham; Bristol Royal Infirmary; Addenbrooke's Hospital, Cambridge; Radcliffe Infirmary, Oxford.
Manchester Region.—Royal Lancaster Infirmary; Westmorland County Hospital, Kendal; Royal Infirmary, Blackburn; General Hospital, Burnley; Bolton Royal Infirmary; Hope Hospital, Salford; Salford Royal Hospital; Crumpsall Hospital, Manchester; Park Hospital, Davey Hulme; Withington Hospital, Manchester; Stockport Infirmary; Macclesfield Hospital.
Liverpool Region.—County Hospital, Whiston; Walton Hospital, Liverpool; Sefton General Hospital, Liverpool; General Hospital, Birkenhead; Chester Royal Infirmary.
Newcastle Region.—Newcastle General Hospital; General Hospital, South Shields; Preston Hospital; Hexham General Hospital; Royal Infirmary, Sunderland; Shotley Bridge General Hospital; Dryburn Hospital, Durham; Bishop Auckland General Hospital; Sedgfield General Hospital; Darlington Memorial Hospital; West Hartlepool General Hospital; Cumberland Infirmary, Carlisle.
Birmingham Region.—Selly Oak Hospital, Birmingham; Dudley Road Hospital, Birmingham; Staffordshire General Infirmary; City General Hospital, Stoke-on-Trent; North Staffordshire Royal Infirmary; Walsall General Hospital; West Bromwich and District General Hospital; the Royal Hospital, Wolverhampton; Royal Salop Infirmary, Shrewsbury; Warwick General Hospital; General Hospital, Burton-on-Trent; Worcester Royal Infirmary; County Hospital, Hereford.
Leeds Region.—Scarborough Hospital; County Hospital, York; Hull Royal Infirmary; Clayton Hospital, Wakefield; Huddersfield Royal Infirmary; Royal Halifax Infirmary; St. James Hospital, Leeds; Victoria Hospital, Keighley; Oley General Hospital; Harrogate General Hospital.
Bristol Region.—Southmead General Hospital, Bristol; Frenchay Hospital, Bristol; Cheltenham General Hospital; Manor Hospital, Bath; Musgrove Park Hospital, Taunton; Royal Devon and Exeter Hospital; North Devon Infirmary; Torbay Hospital, Torquay; Royal Cornwall Infirmary, Truro; St. Martin's, Bath; Redruth Miners' and General Hospital, Camborne; West Cornwall Hospital, Penzance.
Sheffield Region.—City General Hospital, Sheffield; St. Helen Hospital, Barnsley; Doncaster Royal Infirmary; Chesterfield Royal Hospital; Derbyshire Royal Infirmary; Nottingham General Hospital; Leicester Royal Infirmary; Lincoln County Hospital; Grimsby General Hospital; Leicester General Hospital; Victoria Hospital, Workson.
Oxford Region.—Royal Berkshire Hospital, Reading; Kettering General Hospital; Victoria Hospital, Swindon.
East Anglia Region.—Newmarket General Hospital; West Suffolk General Hospital; Ipswich and East Suffolk Hospital; Borough General Hospital, Ipswich; Norfolk and Norwich Hospital.
London Teaching Hospitals.—Charing Cross Hospital; Guy's Hospital; London Hospital; King's College Hospital; Royal Free Hospital; St. Bartholomew's Hospital; St. George's Hospital; St. Mary's Hospital, Paddington; St. Thomas's Hospital; University College Hospital; West London Hospital; Royal Marsden Hospital; Hammersmith Hospital.
North-west Metropolitan Region.—Bedford General Hospital; Luton and Dunstable Hospital, Luton; Lister Hospital, Hitchin; Canadian Red Cross Memorial Hospital, Taplow, Bucks; King Edward VII Hospital, Windsor; Barnes General Hospital; St. Albans City Hospital; Peace Memorial Hospital, Watford; Hillingdon Hospital, Uxbridge; West Middlesex Hospital, Isleworth; King Edward Memorial Hospital, Ealing; Central Middlesex Hospital, Willesden General Hospital; Royal Northern Hospital; the Royal London Homoeopathic Hospital; Whittington Hospital.
North-east Metropolitan Region.—Chase Farm Hospital; Prince of Wales Hospital; Bethnal Green Hospital; Hackney Hospital; Mile End Hospital; St. Andrew's Hospital, Bow; Queen Mary's Hospital, Stratford; Whipps Cross Hospital; Oldchurch Hospital; Southend General Hospital; Rochford General Hospital; St. Margaret's Hospital, Epping; St. John's Hospital, Essex; Essex County Hospital, Colchester; Black Notley Hospital, Braintree.
South-east Metropolitan Region.—St. Olave's Hospital; Miller General Hospital; St. Alfege's Hospital, Greenwich; Lewisham Hospital; Brook General Hospital; Dreadnought Seamen's Hospital; Queen Mary's Hospital, Sidcup; West Hill Hospital, Dartford; St. Bartholomew's Hospital, Rochester; Kent and Canterbury Hospital; Ramsgate and Margate General Hospital; Buckland Hospital, Dover; Pembury Hospital, Kent; Queen Victoria Hospital, East Grinstead; Orpington Hospital; Farnborough Hospital; Bromley Hospital; Princess Alice Memorial Hospital, Eastbourne; St. Mary's Hospital, Eastbourne; Cuckfield Hospital, Haywards Heath.
South-west Metropolitan Region.—Lambeth Hospital; St. Mary Abbot's Hospital; Kingston Hospital; St. Helier Hospital, Carshalton; St. Peter's Hospital, Chertsey; St. Thomas's Hospital, Godalming; Royal West Sussex Hospital; Worthing Hospital; Portsmouth and Isle of Wight Area Patho-

logical Service, Central Laboratory, Portsmouth; Royal South Hants Hospital, Southampton; Poole General Hospital; Royal Hants County Hospital; Salisbury General Infirmary; County Laboratory, Dorchester; Royal Portsmouth Hospital; Royal Isle of Wight County Hospital; Southampton General Hospital.

WALES

Teaching Hospital.—Royal Infirmary, Cardiff.
Welsh Region.—Royal Gwent Hospital, Newport, Mon.; St. Woolos Hospital, Newport, Mon.; St. James Hospital, Tredegar; Caerphilly District Miners' Hospital; St. David's Hospital, Cardiff; St. Tydfil's Hospital, Merthyr Tydfil; East Glamorgan Hospital; Neath General Hospital; Morriston Hospital, Swansea; General Hospital, Swansea; West Wales General Hospital, Carmarthen; Pembroke County War Memorial Hospital, Haverfordwest; the Llandudno General Hospital; Royal Alexandra Hospital, Rhyl; Denbigh Infirmary; War Memorial Hospital, Wrexham; North Wales Mental Hospital, Denbigh.

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PREMATURITY AND "CEREBRAL PALSY"

BY

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That there is an association between prematurity and "cerebral palsy" impressed the earliest students of this neurological condition (Little, 1862; Freud, 1897). Its nature has puzzled many; for some, like Brissaud (1894), the effect of prematurity is to cause a developmental anomaly of the pyramidal tracts; for others, like Collier (1924), the two conditions are parallel manifestations of an intrauterine abnormality causing both prematurity and primary antenatal degeneration of cerebral neurones.

Although data on prematurity are available in the collection of cases published by Little, it is largely in recent times that the association between prematurity and cerebral palsy has been put on a quantitative basis. Evans (1948), in 76 cases, and Asher and Schonell (1950), in 400 cases, found an incidence of prematurity of 39%, about eight times that in the normal population, while Lilienfeld and Parkhurst (1951), for 505 cases, give a figure of 22.2% with an incidence of prematurity in their control population (115,281) of 4.8%. It is to be noted that the controls used by Lilienfeld and Parkhurst were survivors at the end of the first month of life, those of Asher and Schonell were survivors at the end of the first year, and those of Evans were matched for age with his cerebral palsy cases. So that in these studies an attempt was made to overcome the error that would result from using figures referring to incidence of prematurity at birth due to the high mortality of premature infants (mainly in the neonatal period), particularly those of lower birth weight (Alm, 1953; Dunham, 1955).

A further idea of the importance of prematurity in cerebral palsy can be obtained from Evans's (1948) data, by considering the proportion of premature infants weighing 4½ lb. (2,040 g.) or less at birth. The relevant figures are: 21 such premature infants among 76 cerebral palsy cases and 1 among 50 controls (28% and 2% respectively). The figures given by Knobloch *et al.* (1956) further support this point. They found an incidence of "overt neurological defect" at 40 weeks of gestation of 57 premature babies weighing 1,500 g. or less, 12.3% in 443 larger prematures, and of 0.6% in 492 full-term controls matched for race, season of birth, parity, hospital of birth, and socio-economic status.

Cerebral palsy is an aggregate of clinical syndromes with various origins, and so is prematurity. The causes of prematurity act on the foetus with varied intensity and at different developmental stages. Furthermore, the foetus prematurely delivered is exposed to extra risks during labour, and the premature newborn baby also faces numerous hazards.

Incidence of Prematurity in Cerebral Palsy

One might expect some types of cerebral palsy to be more strongly associated with prematurity than others. Freud (1897) and Brissaud (1894) correlated prematurity particularly with diplegia. The combined figures of Evans (1948)

*This term is used here to mean a persisting qualitative motor disorder due to non-progressive damage of the encephalon occurring before the growth of the central nervous system is complete.

and Asher and Schonell (1950) show a significant difference in the incidence of prematurity between "non-rhesus athetoids" (29% of 74 cases) and "paraplegias and tetraplegias" (44% of 223 patients). The proportion of prematures among 104 cases of congenital hemiplegia was reported by Asher and Schonell as 30% and by Perlstein and Hood (1953) in their 222 cases as 12%.

A series of 93 cases of dystonic and choreo-athetoid cerebral palsy† was analysed (Polani, 1957, unpublished data). Of 28 cases with severe neonatal jaundice due to blood-group iso-immunization three were premature (11%); of 20 patients with a history of severe neonatal jaundice not associated with blood-group incompatibility 14 were premature (70%); and of 45 patients who did not have severe neonatal jaundice 16 were premature (35.5%). By contrast, in a group of 42 patients with cerebral spastic paraplegia/diplegia, 59.9% were premature (Polani, 1957, unpublished data). Thus the association with prematurity seems high in cerebral palsy due to non-rhesus jaundice and in cerebral spastic paraplegia/diplegia.

The figures given by Ingram and Kerr (1954) confirm the striking association between cerebral spastic paraplegia/diplegia and prematurity (see Table). These figures suggest

Survivors, by Birth Weight, Edinburgh, 1948-52 (Ingram and Kerr, 1954)

Birth Weights	No. of Survivors	Diplegics/Paraplegics Total No.	Incidence per 1,000
All weights	36,400	36*	1
Over 5½ lb. (2,500 g.)	35,143	23*	0.65
4-5½ lb. (1,800-2,500 g.)	1,017	2	1.96
Under 4 lb. (1,800 g.)	240	11	45.83

* Estimated on the basis of the period 1943-7 (33 cases in 35,866 children).

that, compared with full-term children, premature babies of high birth weight show a threefold increase in the incidence of cerebral spastic paraplegia/diplegia and those of lower birthweights a seventyfold increase. Thus among premature infants weighing under 4 lb. (1,800 g.) at birth the chance of cerebral spastic paraplegia or diplegia is apparently about 1 in 20.

If we accept Lilienfeld and Parkhurst's (1951) idea of a "continuum of reproductive wastage," with cerebral palsy as one link in a chain of unfavourable reactions, other elements of which are mental defect (Pasamanick and Lilienfeld, 1955b; Lilienfeld and Pasamanick, 1956), epilepsy (Lilienfeld and Pasamanick, 1954; Pasamanick and Lilienfeld, 1955a), behaviour disorder (Pasamanick, 1954; Rogers *et al.*, 1955, Pasamanick *et al.*, 1956), and foetal and neonatal death, we may observe even more subtle cerebral effects associated with prematurity. For example, the lowered intelligence quotient found by Douglas (1956) in his group of premature children, and confirmed by Dann *et al.* (1956), may represent more limited (or different) results of a harmful association between prematurity and brain function.

Causal Connexion

What could be the causal connexion in the association between prematurity and cerebral palsy? As stated, this association may manifest itself in different effects, depending on the different causes of prematurity, the different times in foetal development when they act, their different intensities, and the various stresses to which prematurity itself subjects

†In dystonic cerebral palsy abnormalities of muscle tone predominate, and the hypertonus, when present, is plastic in character (Denny-Brown, 1946). In choreo-athetoid cerebral palsy the outstanding motor abnormality is the presence of unwanted movements—dyskinesia of Perlstein (1952) and Balf and Ingram (1955).

‡Cerebral spastic paraplegia denotes a condition of lower-limb paralysis of cerebral origin, without notable functional involvement of the upper limbs. Patients with spastic diplegia have predominantly lower-limb and trunk involvement, and also upper-limb involvement, which, however, is less marked than that of the lower limbs. The difference between the two conditions may be essentially one of degree.

the developing organism. To deal with one example, prematurity may cause cerebral palsy (generally dystonic or choreo-athetoid cerebral palsy) through the mechanism of neonatal jaundice. Premature babies have a greater tendency to a rise in the serum-bilirubin level, presumably because of an inability of their livers to conjugate the liposoluble bilirubin (indirect-reacting bilirubin) with glucuronic acid and transform it into the water-soluble pigments I and II (direct bilirubin, bilirubin mono- and diglucuronide) (see Cole and Lathe, 1953; Billing *et al.*, 1957; Gray, 1957). For this reason, in a proportion of premature infants, even in the absence of increased haemolysis due to blood-group iso-immunization, the serum bilirubin will rise to dangerous levels and the liposoluble pigment cross the blood-brain barrier and produce kernicterus*.

If the breakdown of red cells is increased, as, for instance, when certain vitamin-K analogues are given in excess (Laurance, 1955; Crosse *et al.*, 1955; Allison, 1955), the extra production of bilirubin will increase the proportion of premature babies who get kernicteric damage. It has furthermore been shown by Diamond (1956) that the administration of sulphafurazole ("gantrisin") to premature babies may favour kernicteric damage without an excessive rise in serum bilirubin; Lathe (1957) has suggested that this is due to a lowering of the threshold of the blood-brain barrier. Kernicterus in a rabbit has been produced by this mechanism (Ernst *et al.*, 1957).

Anoxic and Mechanical Trauma

But prematurity may be responsible for cerebral palsy through other mechanisms. The premature baby is generally frail and his respiratory efficiency is often less than that of the full-term infant, with consequent possibilities of "anoxia." Furthermore, the lower the birthweight of premature infants (Calkins, 1955) the higher the incidence of breech delivery, which exposes the foetus and the newborn to added risks from mechanical or asphyxial injury, with consequent possibility of brain damage and so of cerebral palsy. Such mechanical or "anoxic" trauma would explain reasonably well some forms of cerebral palsy, such as double hemiplegia and "post-anoxic" choreo-athetoid and dystonic forms of the disorder.

Although, admittedly, anoxia can be selective in its action, the frequency of the association between cerebral spastic paraplegia and prematurity is more difficult to explain adequately on the grounds of a relatively indiscriminate and diffuse cerebral damage. The post-prematurity spastic paraplegia type of cerebral palsy is a striking clinical entity, striking for the symmetry of the neurological signs, for their distribution, for the relatively good intelligence of the patients, and for their comparative freedom from seizures; and all these features tend to militate against the idea of brain injury being responsible.

Possibility of a Development Mechanism

A developmental origin (Brissaud, 1894) seems a more logical explanation for the syndrome, and it might be reasonable to accept Collier's (1924) idea that the same factors which are responsible for the disturbed mother/foetus relationship, and so for prematurity, are also responsible for the disorder of brain development and so for cerebral spastic paraplegia. If this were so, the incidence of cerebral spastic paraplegia (and diplegia) might be expected to vary in groups of premature infants when the prematurity is due to different causes. If the disordered development were related to the cause of prematurity it would follow that the cerebral abnormality would be of prenatal origin. Prevention would be possible only if the causative factors were avoidable.

It should be made clear that when cerebral palsy cases are compared with a control population to assess the impor-

*The present evidence is in favour of the cerebral damage being due to a direct action (Claireaux *et al.*, 1953; Ernst *et al.*, 1957).

tance of obstetric factors in the aetiology of cerebral palsy (toxaemia of pregnancy, ante-partum haemorrhage, breech delivery, forceps delivery, breathing "difficulty," etc.) the control population generally contains a much lower proportion of premature children, so that what such comparisons reveal in the cerebral palsy population is the excess of obstetrical factors responsible for the prematurity though not necessarily for the cerebral palsy. Such comparisons would be more valid if the control population were matched for incidence of prematurity.

Few studies have separated prematurity into aetiological groups and correlated them with the frequency of cerebral palsy, thus trying to link causes of prematurity and cerebral palsy. Douglas's (1956) findings are worth noting in this context, though they do not refer to cerebral palsy but to mental ability of premature children. He examined a prospectively studied national sample of premature children aged 8 years and found a small group of them who made "outstandingly poor scores in all tests—namely, those whose prematurity is unexplained either by obstetric abnormality" or by their genetic background. Lilienfeld and Parkhurst (1951) found a higher incidence of prematurity among those cases of cerebral palsy where complications of pregnancy and labour had not been present than among those where they had. They tried to explain this finding by suggesting a higher mortality rate among cerebral palsy premature infants with complications of pregnancy. Eastman and DeLeon (1955) have shown that in only one-third of their cerebral palsy cases associated with prematurity was there a complication of pregnancy that could have been responsible for the cerebral palsy through the mechanism of foetal anoxia. In two-thirds they concluded that the origin of cerebral palsy was in some way attributable to the prematurity itself.

It is possible to suggest mechanisms by which prematurity, by itself, is at times the operative factor in determining the paraplegia/diplegia type of cerebral palsy. The condition might be of post-natal origin, from failure of final structural and functional maturation of the brain, and it would then be the degree of prematurity rather than its cause that would be linked with the frequency of the condition. The figures of Ingram and Kerr (1954), given in the Table, stress the association between a greater degree of prematurity and a greater frequency of cerebral spastic paraplegia/diplegia.

A Matter for Conjecture

How this particular type of cerebral palsy could be produced by prematurity itself is a matter for conjecture. A possible explanation would be one that took into consideration the relatively anaerobic metabolism of the foetal nervous system, and its maturation, centre by centre, to the adult aerobic metabolism, apparently essential for the quick release of high energy presumably required for brain function. This has been demonstrated in the experimental animal by Himwich (1951) and his collaborators, and has been suggested in the human by the work of Racker (1942). It is a plausible conjecture that, possibly through interference with enzymic maturation or adaptation, premature birth deprives those parts of the nervous system which are at a crucial stage of anatomical development or functional maturation of the environment favourable to this development or maturation. The damaging factor may well not be anoxic, but rather hyperoxic, though even a hyperoxic insult may ultimately result in anoxic damage through interference with oxidative enzymes (Himwich, 1953; Dickens, 1946a, 1946b). Alternatively, brain structure and function may be damaged by a prolonged condition of absolute or relative hyperoxia, through alteration of the blood vessels of the differentiating cortex, much as can happen in the eyes of premature babies, with consequent retrolental fibroplasia.

It is perhaps relevant in this connexion to mention the work of Ashton *et al.* (1957), who poisoned the eyes of kittens with fluoride and iodoacetate and observed changes

similar to those resulting from exposure to high oxygen concentrations. They tentatively suggested that the mechanism at work was one of inhibition of glycolysis resulting in swelling of retinal tissue and subsequent vascular compression and obliteration (see also Graymore, 1958). By this technique they were able to produce a biochemical lesion owing to a particular vulnerability linked to a definite stage of functional development and maturation, and it is worth noting that similar changes could not be produced by them in the eyes of more adult cats. If the incidence of cerebral palsy (particularly cerebral spastic paraplegia/diplegia) were greater in babies stressed by high oxygen concentrations, the hyperoxic hypothesis would perhaps be more acceptable. Fuldner (1955) found an association between cerebral spastic paraplegia and retrolental fibroplasia. That the incidence of cerebral spastic paraplegia/diplegia in babies with retrolental fibroplasia is greater than would be expected has been shown by Ingram and Kerr (1954). However, they suggested that the cause of cerebral damage in their patients was abnormality of pregnancy and of labour, leading to post-natal asphyxia which necessitated oxygen therapy and in turn caused retrolental fibroplasia.

The above suggestion that premature birth may at times cause post-natal interference in development and maturation of critically maturing neurones is entirely hypothetical. It can be put to the test by experiments with high oxygen pressures in immature animals. The understanding of the delicate metabolic mechanisms involved can be furthered by detailed studies of the vascular, enzymic, histological, and functional maturation of the human brain, in continuation of the work done by Racker (1942) and Vilce (1953). The main use of such a hypothesis is that it directs attention to possibilities of prevention.

Summary

The incidence of prematurity in various clinical types of cerebral palsy is reviewed. A particularly strong association is found with two neurological syndromes: dystonic/choreo-athetoid cerebral palsy following severe neonatal jaundice not due to blood-group incompatibility, and cerebral spastic paraplegia/diplegia. The possible mechanisms of this latter relationship are considered and a selective developmental origin for the neurological troubles is favoured tentatively. Because of the association between retrolental fibroplasia and cerebral spastic paraplegia/diplegia, and because of the clinical features of the cerebral spastic paraplegia syndrome without history of perinatal or postnatal troubles, a postnatal interference with development is the mechanism postulated for this clinical type of cerebral palsy.

The terminology on cerebral palsy used in this paper is based on the discussions of a group of workers interested in the subject at meetings of the Little Club. The help of those concerned is gratefully acknowledged.

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CORTICOTROPHIN AND STEROIDS IN THE DIAGNOSIS AND MANAGEMENT OF "OBSTRUCTIVE" JAUNDICE

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Jaundice due to hepatitis with prolonged bile retention (Eppinger, 1937; Watson and Hofbauer, 1946) or occurring as a complication of therapy with chlorpromazine and other drugs (Hanger and Gutman, 1940; Hollister, 1957) may have clinical and biochemical features indistinguishable from that associated with extrahepatic biliary obstruction. Solem and Olsen (1953), aware that jaundice in patients with hepatitis often clears rapidly with steroid therapy (Ducci and Motlis, 1951), reported that the effect of a four to seven-day trial of corticotrophin (A.C.T.H.) therapy on the icteric index permitted a clear-cut distinction between extrahepatic obstructive jaundice, which was not significantly influenced, and hepatitis. However, later observations showed that the effect of corticotrophin or steroids in hepatitis was very variable (Sborov *et al.*, 1954) and that considerable reduction in serum bilirubin concentrations could follow use of the drugs in extrahepatic biliary obstruction, thus invalidating their application as a diagnostic test (Chalmers *et al.*, 1956; Katz *et al.*, 1957).

The subject has received only passing mention in this country (Shaldon and Sherlock, 1957; Summerskill, 1958), although the laparotomy indicated in extrahepatic obstruction may be unnecessary and hazardous in hepatitis. We therefore report the effect of corticotrophin and steroid drugs on serum bilirubin and alkaline

† Presumed to have hepatitis on the basis of a negative laparotomy and surgical cholangiography. However, nine months later, jaundice and itching continued and the possibility of a bile-duct carcinoma becomes increasingly likely.

bilirubin excretion. The decreases in serum bilirubin concentrations during treatment in Case 9 cannot be attributed to this, and delay in red cell or haemoglobin breakdown due to steroids (Katz *et al.*, 1957) seems unlikely to explain such great reductions. Alternatively, deviation of haemoglobin metabolism to compounds which do not react with the diazo reagent, or increased storage of bilirubin in the reticulo-endothelial system and other tissues, might be responsible, but the coincident decreases in this study in serum levels of alkaline phosphatase, which is thought to be eliminated mainly in the bile, are more compatible with increased excretory activity.

The usefulness of corticotrophin and steroids in distinguishing between intrahepatic and extrahepatic jaundice has encouraged us to incorporate the test in the routine investigation of obstructive jaundice of uncertain cause. After two weeks, in which time standard investigations (stool occult blood, haematology, barium meal, liver-function tests) have been done, a five-day trial of corticotrophin or steroids on the serum bilirubin level is performed if the diagnosis remains in doubt. Oral prednisone (20 mg. t.d.s.) may be the drug of choice. It reaches the liver direct in portal blood, and corticotrophin has the disadvantage of variable potency due to batch differences. An apparent response to this measure is followed by continued treatment. In patients who fail to respond and in whom there is no haematological contraindication, liver biopsy can be performed with less hazard than laparotomy in the jaundiced patient, and its interpretation in obstructive jaundice was well reviewed by Johnson and Doenges (1956).

Unfortunately, cases which are equivocal from clinical and biochemical standpoints often have non-specific histological findings. However, dilatation of large intrahepatic bile ducts and bile extravasation suggest extrahepatic obstruction, while, as in Case 2, evidence of liver-cell damage and cellular infiltration indicates hepatitis. In addition, cirrhosis or another unsuspected lesion may be demonstrated, as in Case 12. If the diagnosis is still in doubt, laparotomy with arrangements for cholangiography must be considered to resolve the doubts of both doctor and patient. Obstructive jaundice is not harmful (Atkinson *et al.*, 1956), and it is reasonable to wait eight weeks for possible improvement, as operation is poorly tolerated by patients with hepatitis (Sherlock *et al.*, 1954). Sometimes, as in Case 1 (who was jaundiced for nine months), laparotomy appears inevitable in a patient subsequently shown to have hepatitis, but the relative absence of liver-cell damage on clinical, biochemical, and histological investigation probably allows these patients to withstand operation better than others with hepatitis.

Summary

In 12 patients with obstructive jaundice of uncertain cause, the effect of a five-day trial of steroid or corticotrophin therapy was of great value in reducing serum bilirubin levels and in differentiating between intrahepatic obstruction due to hepatitis and extrahepatic obstruction. Serum alkaline phosphatase concentrations also fell during treatment, although to a less extent, thus suggesting that the reduction of jaundice caused by corticotrophin or steroid drugs was due to increased bile excretion. The drugs acted immediately and no difference was apparent between corticotrophin and steroids.

The place of these drugs and other measures in the diagnosis and management of obstructive jaundice is discussed.

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THROMBOCYTOPENIC PURPURA DUE TO QUINIDINE

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The fundamental observations on drug-induced thrombocytopenia were made by Ackroyd (1949a, 1949b, 1951, 1954) in his classical work on "sedormid" purpura. He showed that the drug caused agglutination and lysis of the patient's platelets *in vitro*, and that the addition of the drug to the patient's blood *in vitro* inhibited clot retraction.

We describe below a simple method for showing platelet agglutination. This method enables the investigator to obtain suspensions of platelets which have no tendency to spontaneous clumping. Stress is laid on the clinical features of quinidine purpura and the practical conclusions to be drawn from them.

Case Report

On December 31, 1957, a man aged 50 was admitted to Hadassah Hospital because of haematuria and purpura. He looked seriously ill. There were widespread petechiae, and blood-filled blisters were seen in the mouth and on the tongue. The urine had the appearance of blood. The blood pressure was 170/100. The blood count showed haemoglobin, 69%; erythrocytes, 3,500,000; leucocytes, 10,000 (neutrophils 59%, eosinophils 2%, monocytes 2%, lymphocytes, 37%). No platelets were seen; bleeding-time was 2 minutes; coagulation time 2 minutes, and prothrombin 58%. The urine showed many red cells. The tourniquet test was strongly positive. Prednisone, 60 mg. a day, was given. By his fourth day in hospital the urine was clear, the platelet count had risen to 25,000, and he was feeling much better. By the seventh day the platelets had risen to 100,000; two days later they numbered 240,000.

A detailed history revealed that the patient had had a myocardial infarction two years previously. In July, 1957, he was given quinidine because of palpitations; he took four 0.2 g. tablets. A month later he took another tablet. Two days before admission he felt palpitations and took two tablets, one at midday and one in the evening (0.4 g.). That night he had a severe rigor and his temperature rose to 39° C. (102.2° F.). Next day he felt weak and noticed a rash on his hands. On the following day blood appeared in his urine and he was sent to hospital. He had taken 1.4 g. of quinidine at intervals, over a period of six months.

In the third hospital week—that is, when the patient's blood picture had become entirely normal and the prednisone treatment had been stopped—the following tests were carried out:

Clot Retraction Test, Qualitative Method

This test was done in the ward as follows: solutions (in normal saline) of quinidine sulphate 1:2,000 and quinine hydrochloride 1:2,000 were procured. Three standard laboratory test-tubes were taken; to the first was added 0.2 ml. of the quinine solution, to the second 0.2 ml.

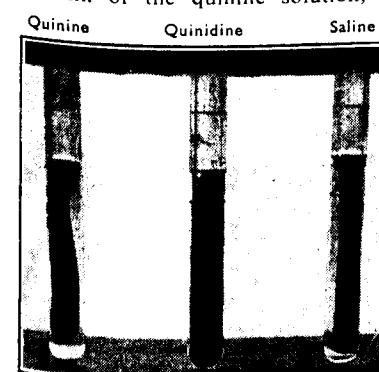


FIG. 1.—The clot-retraction test (qualitative method) as performed in the ward. The two outside tubes (quinine and saline) show negative results; the centre tube (quinidine) shows a positive result. In this photograph the test was done with Linzenmeier blood sedimentation tubes.

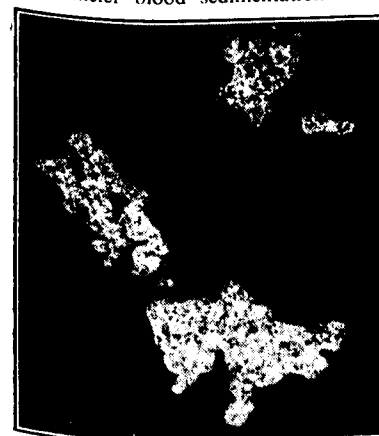


FIG. 2.—The thrombocyte-rich plasma of the patient after incubation with quinidine solution at 37° C. for one hour, showing agglutination of platelets (+++).

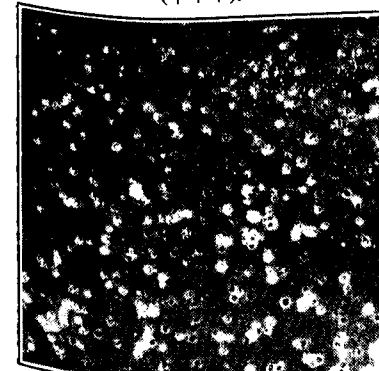


FIG. 3.—The thrombocyte-rich plasma of the patient with saline (control), showing complete absence of agglutination. Photographs of Figs. 2 and 3 were taken with the phase contrast microscope. (x400.)

of the quinidine solution, and to the third 0.2 ml. of normal saline. Blood was taken from the patient by venepuncture, using a ward syringe. To each tube was added 2 ml. of blood. The tubes were inverted four times. They were kept at room temperature and examined after 4 and 24 hours. If free serum was seen the test was taken as negative; if no free serum could be seen it was regarded as positive. In this way quinidine repeatedly gave positive reactions, while quinine and saline always gave negative reactions (Fig. 1). Quinidine gave negative results when tested similarly with the blood of 10 other patients.

The reliability of this simple procedure is stressed, since it enables the clinician to make the diagnosis in the ward. This test, as performed above, was still positive 10 weeks after the patient's admission; a further test four weeks later was negative. These results were confirmed in the laboratory, using the quantitative method.

Patch Test.—This was carried out according to the method of Freedman, Brody, and Barr (1956). The results were negative.

Thrombocyte Agglutination Test

The anticoagulant was Na₂ "sequestrene" 5% at pH 7.2 (corrected with NaOH). Glassware was siliconized with "siliclad." Drug solutions were made up as follows in normal saline: quinidine sulphate, 2 and 20 mg., quinine hydrochloride 2 and 20 mg., phenobarbitone 2 and 20 mg. per 100 ml. A siliconized bacteriological test-tube (5 cm. long with outside diameter 9 mm.) was marked with wax pencil at the 1-ml. level; 0.1 ml. of anticoagulant was added. After warming the hand a deep finger puncture was made. When the blood was flowing freely it was collected straight into the tube up to the mark and well mixed with the anticoagulant; 1 ml. of blood was usually enough. The tube was then centrifuged at room temperature at 800–1,000 r.p.m. for three to five minutes. The upper layer of thrombocyte-rich plasma was removed with a siliconized pipette and transferred to a small siliconized test-tube, which was tapped gently to secure even spread of the platelets. This thrombocyte-rich plasma was distributed into small siliconized test-tubes, two drops in each tube. To each tube was added one drop (of the same size) of one of the drug solutions under test. The mixtures were incubated for one hour in a water-bath at 37° C. The tubes were removed and, using a siliconized pipette, a small drop was placed on a siliconized slide, covered with a siliconized coverglass, and examined microscopically. Incubation for a further hour caused the agglutination to be even more marked; platelet flocculation could then be seen with the naked eye.

Results.—This test, and the clot-retraction test, were performed on the patient's blood in the third hospital week, and repeated once a week for eight weeks. Tests with the controls were done twice. The results were graded as follows:

- +++ Complete agglutination into large clumps with no free platelets (as in Fig. 2).
- ++ Agglutination into smaller groups with free platelets to be seen.
- +, Agglutination into very small groups; from 2 to 3 agglutinates visible in every field.
- , No tendency to agglutinate whatsoever. (As in Fig. 3.)

	Quinidine		Quinine		Phenobarb.		Saline
	2 Mg./100 ml.	20 Mg./100 ml.	2 Mg./100 ml.	20 Mg./100 ml.	2 Mg./100 ml.	20 Mg./100 ml.	
Patient	+++	+++	—	—	—	—	—
20 controls .. .	—	—	—	—	—	—	—
6 patients on quinidine ..	—	—	—	—	—	—	—
Patient's daughter ..	—	—	—	—	—	—	—

Follow-up: fourteen weeks after admission the patient's platelet-rich plasma was examined again with quinidine; result was ++. At examination seven months after admission the result was +.

Clot Retraction Test, Quantitative Method

In this test the drugs and glassware were as above. 0.1 ml. of the drug solution was mixed with 0.9 ml. of the patient's blood, taken as above. The test-tubes were incubated for three hours at 37° C. Readings were made according to the formula:

$$\frac{\text{serum expressed, in ml.}}{\text{whole blood in ml.}} \times 100$$

Results are shown in the following Table.

	Quinidine 20 Mg./ 100 ml.	Quinine 20 Mg./ 100 ml.	Phenobarb. 20 Mg./ 100 ml.	Saline
Patient	0	52–56	52–56	52–56
20 controls .. .	48–60	48–60	48–60	48–60
6 patients on quinidine ..	52–58	52–58	52–58	52–58
Patient's daughter ..	51	53	53	51

Follow-up: The test was repeated on the patient's blood 14 weeks and seven months after admission; clot retraction

in the presence of quinidine showed no difference from the saline control on both occasions.

Controls.—The controls for both tests were 20 patients and medical personnel of both sexes and various age groups who had never received quinidine. We also tested six patients who had regularly been receiving quinidine for periods varying from a month to a year. The blood of the patient's daughter was also examined.

Other Laboratory Procedures

In order to eliminate the possibility of idiopathic thrombocytopenic purpura due to a platelet panagglutinin in the patient's serum, the following procedure was carried out.

Samples of platelet-rich plasma from two normal persons, of the same blood group as the patient, were prepared as above. Two drops of the patient's serum (after inactivation for 30 minutes at 56° C.) were added to one drop of normal platelet-rich plasma, mixed and incubated for one hour, one sample at 4° C. and another at 37° C. Controls were: physiological saline and serum from two blood-compatible normal persons in place of the patient's serum. Thus, samples of platelet-rich plasma from two normal persons were tested with the patient's serum, the serum of two normal persons, and with saline. No agglutination was observed.

In order to find evidence of a factor in the patient's serum capable of agglutinating normal platelets in the presence of quinidine, the above procedure was repeated with the addition of one drop of quinidine solution (2 mg. per 100 ml.) to each mixture. Control tests were done simultaneously without quinidine. No agglutination was observed. This finding is commented upon below.

(These procedures were carried out in the third and fourth weeks following admission.)

Discussion

Dose of Quinidine

Purpura may appear at any time in any patient taking quinidine. Thus a patient may take quinidine for years, either continuously or intermittently, when suddenly purpura appears (Freedman *et al.*, 1956; Bigelow and Desforges, 1952). Sensitization may develop during a patient's first course of quinidine; in such cases there is a "lag" period before the onset of purpura; this period may be as short as five days (Collins, 1950). Some of the reported cases resemble our case, in which there is a definite history of a sensitizing dose, followed after an interval by the precipitating dose.

Patients suffering from quinidine purpura vary considerably in their sensitivity to the drug. This is readily seen in the summary compiled by Bolton and Dameshek (1956), in which are tabulated the results of the test doses given in the reported cases. Thus as little as 15 mg. caused the platelet count to drop to 5,000 with bleeding in one case, whilst in another case 0.2 g. caused the platelets to fall to 90,000, no bleeding taking place. The sensitivity of the individual patient also does not remain constant. This is exemplified in the case of Moodie (1950): here a test dose of 0.2 g. a day led to purpura after four days, but later on purpura appeared after a total of only 64 mg. had been administered during four days.

Since the sensitivity varies from patient to patient, and since the sensitivity varies in the same patient from time to time, it is impossible to fix an "optimal" test dose in any given case; by "optimal" is meant a dose which causes a drop in the platelet count large enough to be convincing but which does not cause bleeding. We believe that it is ethically wrong to give a test dose, because its outcome can never be predicted.

Although there is no definite correlation between the amount of quinidine ingested and the extent of the bleeding which it provokes, we stress that in the fatal case reported by Bourne and O'Sullivan (1957) the patient went on taking 0.96 g. of quinidine daily for four days after the onset

of purpura. Death was due to cerebral haemorrhage. It follows that a patient should stop taking the drug at the very first signs of thrombocytopenia; it is of practical importance to know what these signs are.

Prodromal Symptoms

In our case there appeared to be a definite prodromal stage; after having taken two tablets of quinidine, the patient had a severe rigor during the night and his temperature rose to 39° C. Several authors describe similar features. Siegal and Horn (1950) reported fever after a test dose. Hirsch and Dameshek (1950) described a case in which gum bleeding and purpura were preceded by a chill and a feverish sensation. In Case 2 of Bolton and Dameshek (1956) the bleeding episode was preceded by a period of a week marked by chills, fever, and fatigue followed by nausea, abdominal pain, and diarrhoea.

Other symptoms are described. Nussbaum and Shulman (1952) described lethargy and somnolence. In the case of Collins (1950) lethargy followed a test dose. In Case 4 of Bolton and Dameshek (1956) weakness, nausea, and tiredness are mentioned. In the case of Norcross (1950) the illness began with coma and convulsions. Larson (1953) mentioned headache after a test dose. In the case of Breu and Zollner (1940), which terminated fatally, the illness started with anaphylactic shock and urticaria. Other symptoms mentioned in the case reports are itching, feeling uncomfortable, and pains in the limbs.

It is impossible to assess in what proportion of cases the purpura is preceded by prodromal symptoms, since some authors omit to state how the patient felt before the bleeding started. Barkham and Tocantins (1954) described a case without such symptoms.

It may be concluded that in an appreciable proportion of cases the bleeding episode is preceded by various symptoms, the main ones being fever, chills, weakness, lethargy, nausea, and headache. It may be noted that the prodromal symptoms of quinidine purpura share certain features with "cinchonism" (as described by Goodman and Gilman (1955)), such as nausea, headache, and fever.

The Haemorrhagic Episode

The bleeding may start in an atypical fashion. Our patient noticed black spots on his tongue, but their importance was understood only next day. In the case of Nussbaum and Shulman (1952) there occurred gum bleeding, which at the time was attributed to local causes. Local causes could easily be blamed for epistaxis or for uterine bleeding. Bleeding of all kinds and in all grades of severity have been described, including melaena, cerebral haemorrhage, haemoptysis, and haematuria. In the great majority of cases a purpuric skin rash is present.

It is worth noting that the best-known complication of quinidine treatment—embolism after reversion from atrial fibrillation to sinus rhythm—might be confused with the results of haemorrhage due to thrombocytopenia. For example, either of these complications might be the cause of haemoptysis during quinidine treatment. Should haematuria or hemiplegia appear the same differential diagnosis must be considered.

Duration of the Haemorrhagic Episode

Our patient was seriously ill on admission. His condition rapidly improved: seven days after his taking the quinidine the haematuria had ceased and the purpura was beginning to fade; return of the platelet count to normal levels took another four days. All the case reports of quinidine purpura show the same picture—that is, a haemorrhagic state which lasts from one to seven days after stopping the drug, full haematological remission usually coming some days later. Likewise, this same pattern is reported to be usually seen in cases of sedormid purpura. This "seven-day pattern" of thrombocytopenic purpura, characterized by cessation of bleeding within a week of stopping the drug, seems to be the typical result of the action of a rapidly eliminated factor whose primary effect is the destruction of

thrombocytes in the peripheral blood. Many reports of drug purpura in the literature conform to this "seven-day pattern." As examples may be cited the following cases: butobarbitone (Young, 1957), quinine (Steinkamp *et al.*, 1955), digitoxin (Berger, 1952), "mapharsen" ("mapharside," oxophenarsine hydrochloride) (Schwartz and VonderHeide, 1945). However, the clinical pattern cannot be taken as the only criterion in classifying the drug purpuras; it is merely suggestive. It may be postulated that the purpuras due to quinidine, quinine, and sedormid form a clinico-pathological entity.

To this group may be added other drugs if they conform to the following criteria: (a) The clinical picture should be typical, with cessation of bleeding within a week of stopping the drug, full haematological remission coming some days afterwards. (b) The primary action of the drug is platelet destruction in the peripheral blood. This may be assumed when thrombocytopenia follows within a few hours of giving the drug; absence of megakaryocyte aplasia in the bone marrow tends to confirm this. (c) Thrombocyte agglutination should be demonstrable in the presence of the drug *in vitro*. This should be confirmed by the inhibition of clot retraction in the presence of the drug.

Practical Considerations

The physician using quinidine will wish to know how common quinidine purpura is, and what should be done about it. In 1941 Broch described the first undoubted case: by 1956 Bolton and Dameshek were able to list 28 cases. If we add our case, the fatal case of Bourne and O'Sullivan (1957), and the four cases of Freedman *et al.* (1956), at least 34 cases are on record. The last-mentioned authors comment on the fact that they diagnosed their four cases during a period of seven months at one hospital. The condition is not common, but it is not merely of academic interest.

It is pointless to do daily platelet counts during the administration of quinidine, since the drop can occur suddenly at any time. It is the usual practice to give a test dose of one tablet before starting a course of quinidine; two to three hours later the treatment is begun if there are no untoward effects. We make the suggestion that if any suspicious symptoms arise a tourniquet test should be performed and, if possible, a platelet count done before proceeding. The physician prescribing quinidine should be alert for the prodromal symptoms of thrombocytopenia, described previously; the similarity of these symptoms to those of cinchonism must not be ignored. The appearance of constitutional symptoms calls for the immediate cessation of the drug, which must not be resumed until a platelet count is done. As many of the recorded cases of quinidine purpura were in patients who had been taking the drug at home with little or no supervision, it is important to impress on domiciliary patients to stop the drug and seek medical advice on the appearance of constitutional symptoms, a rash, or bleeding.

Serological Findings

The addition of quinidine to the patient's platelet-rich plasma caused the platelets to clump into large discrete masses. No lysis of platelets occurred; this agrees with Ackroyd's (1951) observation that lysis appears only in the presence of complement. We used sequestrene as anticoagulant, making use of its anticomplementary effect (Bolton, 1956), so as to prevent platelet lysis and thus simplifying the reading of the results.

In his studies on sedormid purpura, Ackroyd (1949a, 1949b) showed that there is a factor in the serum of sensitized patients, which, when added to the platelets of normal persons, causes agglutination in the presence of the drug. He concluded (Ackroyd, 1954) that sedormid unites with platelets to form an antigen which reacts with the factor in the serum. A similar factor in the serum of patients with quinidine purpura has been demonstrated by Bolton and Young (1953), Weisfuse, Spear and Sass (1954), and Bolton and Dameshek (1956); they were able to obtain

agglutination of normal platelets on the addition of the patient's serum and quinidine. Bigelow and Desforges (1952) had inconsistent results, as they found the factor in plasma but not in serum. However, Barkham and Tocantins (1954) were unable to find such a factor in the serum of their patient. We, too, were not successful in demonstrating the presence of a serum factor. Apparently these inconsistencies are due to variations in technique, such as the choice of anticoagulant and the period and temperature of incubation.

However, we wish to put forward for consideration the following theoretical possibility: that the serological process is a direct antigen-antibody reaction between quinidine and sensitized platelets. It might then be postulated that changes in the platelets *in vitro* due to blood coagulation or to centrifugation could detach the factor from the platelets, and this could account for its presence in the serum. The extraordinary rapidity of action of quinidine in cases of sensitivity seems to support the idea of a direct reaction.

Summary

A case of quinidine purpura is described. It is shown that the diagnosis can be made in the ward by a simplified version of the clot-retraction test.

A simplified method for demonstrating platelet agglutination is described.

The prodromal symptoms of quinidine purpura are described and their importance is stressed.

It is shown that many of the drug-induced thrombocytopenias conform to a definite clinical pattern, and certain criteria are proposed for classification.

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A memorandum on the care of epileptics has been prepared for the Central Health Services Council by the Standing Medical Advisory Committee and is to be sent to all general practitioners in the National Health Service. Concentrating on the medical and social aspects of epilepsy, the memorandum offers advice on the "management" of epileptics, and on their training and employment. There are paragraphs about the welfare services available to them, about epileptic colonies, and about the problems of marriage and having children. The memorandum states that there are about 180,000 epileptics in England and Wales: probably about 70% of cases occur before the age of 20 and 85% before the age of 25.

PLACE OF ROUTINE EXAMINATIONS IN PROMOTION OF HEALTH AMONG INDUSTRIAL EXECUTIVES*

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Although occupational medicine has been well recognized and well implemented in industry in the United States for a number of years, it is only during the past eight to ten years that the executive health phase of this programme has been stressed to any great extent. That industrial medicine has progressed rather rapidly during the past several years in the United States is shown by its recognition as a specialty under the American Board of Preventive Medicine, other subspecialties under this board being public health and aviation medicine.

Industrial Medical Programme

Management has recognized the value of a medical programme in industry, including an executive health programme. Ruffin (1957) has stated that "the health, wellbeing and morale of the men and women are among the most precious assets that we have in industry," and, in general, industry has accepted its measure of responsibility for the health and safety of its employees. Health maintenance programmes are of primary benefit to the employee, but they play their full share in keeping down the competitive costs, reducing operating expenses, and increasing efficiency. According to Proudfoot (1957), the accumulated experience of companies that have fostered modern industrial medical programmes has made it plain that an investment in health is good business and that any manager who is required to operate without needed medical service or with expensive unsolved health problems in his employees knows it is bad business not to have available good medical counsel and service. He refers to a report furnished by the American Management Association in which it is concluded that, from data furnished by a number of industries with medical departments, there is a consistent profit of \$3.50 to \$5 for each dollar spent in the medical department.

Irvin (1952), as the result of comments obtained from a questionnaire submitted to executives who had undergone a periodic health check, concluded that health maintenance of key personnel was a sound financial investment and that the executive was very appreciative of the annual check-up on his physical status. Trickett (1952), in a survey of industry having executive health programmes in the San Francisco area, found that as a rule such a programme was of value. However, his study revealed that health problems of management employees were often overlooked, which seemed amazing, since direct or indirect financial loss can result from inadequate performance and also since executives are often careless of their own health.

There is considerable variance of opinions on whether or not the death rate among executives is greater than in similar age groups of individuals not occupying executive positions. However, we do know that disease incidence and trends have changed remarkably in the past several decades. There is less tuberculosis, and cases of communicable disease and pneumonia are fewer. The infant mortality is less and longevity is greatly extended. With increasing age there is less resistance to disease and consequently an increase in the number of degenerative diseases, with heart disease and malignancies being responsible for a large percentage of deaths in the older age groups. Since the executive is usually in the older age group he is more prone to

acquire one of the degenerative diseases and therefore should be included in the health maintenance programme. Executive ability represents great worth to any industry, the potential value of the executive being variously estimated to be between \$50,000 and \$250,000, depending on how far down or up he is categorized on the management scale. The sudden death of or a serious disabling disease in a top executive has in some cases proved to be almost disastrous because of lack of continuity of management.

Objectives of a Health Programme

The objectives of an executive health programme are to provide health maintenance for the purpose of improving health, increasing efficiency, and prolonging life, protecting the company's investment, and ensuring continuity of management.

There are several guiding principles that are generally accepted. First, the programme must have the whole-hearted support of management, since without such support it will fail. Second, it must be decided which groups are to be examined; in other words, will only the top executive groups be included in the programme or will it extend to the lower management groups down to and including the foremen? Third, how often will the periodic examination be given? This depends upon the number of personnel and equipment available and the economic cost. An annual examination is desirable if it can be accomplished within the provisions stated. An annual periodic examination after the age of 40 or 45, with a biennial examination up to that age, might be advisable. Fourth, should the examination be done by the company medical department or should the executive be referred to an outside hospital or clinic? There are arguments on both sides. It is generally believed that an examination by the company medical department is the better of the two plans, since it is more convenient, the medical director of the company is more familiar with the working conditions, follow-up medical procedures are easier to implement, and it is usually more economical. Fifth, the findings should be treated as confidential between the examinee and the examining physician. Sixth, those cases requiring definite medical care should be referred to outside physicians.

Before discussing the routine examination, it is felt that a few words would be appropriate on the preplacement examination. In airline operation the preplacement examination for the pilot is very thorough, very exacting, and very selective. The examination is conducted not only on the basis of the applicant's present condition but also on the pilot's potential physical and mental condition twenty to thirty years in the future. On this basis a fair percentage of pilots are disqualified physically because of one or several minor defects which may in the future prove to be detrimental to his health. The disqualification rate of pilot applicants varies between 10 and 15%. On the other hand, the examination of the ground employee, including the potential executive, is not as exacting, since the condition of many of these individuals is acceptable for ground duty but not for pilot duty.

After the initial examination for employment, subsequent routine or periodic examinations are for the purpose of conserving or maintaining health. The main intent of this examination is to disclose disease processes in their incipency so that corrective action can be taken. The principles of preventive medicine are first involved in the preplacement examination and continued during the periodic and special examinations.

Periodic Physical Examination

What should the routine physical examination include? Once again the extent of the examination depends upon the time available, the number of personnel, and the amount of available equipment in the medical department. However, a good periodic examination should include the following: a good history, thorough physical examination, including

some procedures which often are overlooked, such as an ocular tension determination, an examination of the fundi, palpation of the peripheral blood vessels, rectal examination, and a detailed vision examination; laboratory studies, including urinalysis, haemoglobin estimation, sedimentation rate, blood sugar if over 40 years of age; x-ray picture of the lungs; and an electrocardiographic tracing if over 40 years of age. Other laboratory procedures, such as serum cholesterol and non-protein nitrogen estimations and a glucose-tolerance test, should be requested if and when deemed necessary. Unless definitely indicated it is not believed that routine diagnostic x-ray procedures such as gastro-intestinal series, barium enemas, or cholecystography should be done. Likewise, routine serological tests have now been discarded by many.

It is generally conceded that the routine periodic examination is of very definite value. Roberts (1958), in a review of the literature, found that 37.1% of 16,715 individuals examined had significant disease. He also reported that in a tabulation of the results of "routine" laboratory examinations 2.5% of 425,005 cases were abnormal for sugar, 3.2% of 45,961 cases were abnormal for albumin, and 11.91% of 15,619 subjects examined electrocardiographically had abnormal tracings. Franco (1950) found that 149 of 307 executives examined had major medical defects. Cardiovascular conditions accounted for 36% of the defects, and obesity was diagnosed in 25%. Thompson and Staack (1956) found that, in a study of 600 executives, diseases of the arteries and heart made up the largest percentage of newly discovered diseases. These consisted mainly of hypertension and arteriosclerotic heart disease, which occurred in approximately 25% of the cases examined. Hartman (1952), in the proctoscopic examination of executives over 45 years of age at the Mayo Clinic, found that 13% had rectal polyps without symptoms, some of which had undergone adenocarcinomatous changes. In a series of 2,000 cases regardless of age or symptoms he reported that the incidence of rectal polyps was 8%.

During the three and a half months from January 1 to April 15, 1958, a statistical analysis was conducted of 120 periodic examinations in the management group in our company. These cases were taken consecutively. Of the 120 examination, 60 were in the top pilot group aged 35 or older, and 60 were in the management group aged 35 or older. The average age of the pilot group was 40.3 years and of the management group 41.4 years. In the pilot group 38 physical defects were found, eight of which were considered of sufficient significance to warrant follow-up corrective action. In 28 of the 60 pilots examined no abnormalities were found. In the management group there were 78 physical defects, 33 of which were classified as significant, no abnormalities having been found in seven cases. In other words, significant defects were found in approximately 50% of the management group as compared with approximately 13% in the pilot group. There are several reasons for the difference in findings in the two groups—namely, those in the pilot group are specially selected from a physical and health standpoint, a health maintenance programme for this group has existed for many years, and, lastly, as a group they are a great deal more "health conscious" than those not engaged in pilot activities.

Examination Findings

Year in and year out the significant conditions most often disclosed, about which we can take positive and definitive measures, are certain metabolic diseases, including obesity, cardiovascular conditions, and gastro-intestinal conditions including peptic ulcers and parasitic infestations.

Obesity is a common finding, and at times it is difficult to convince the individual that weight reduction is indicated. This is particularly true if no other abnormal findings are disclosed. To reduce, the executive must be properly motivated, be convinced of the potential ill effects of overweight and have the will-power to remain on a low-calorie diet.

In those cases where obesity is associated with diabetes or beginning hypertension little or no difficulty is encountered.

Other diseases that have been disclosed are thyroid conditions which are very obvious, and the employees in whom such a condition has been found have been very grateful for the information after corrective action has been taken. Diabetes mellitus is also a relatively common finding. In the original examination of the pilot and executive groups a postprandial urinalysis and blood sugar test is made. It is believed that this procedure is superior to the fasting urinalysis and blood sugar test in recognizing the early or latent diabetic. Applicants are not accepted as pilots if they have diabetes or if they show diabetic tendencies. Postprandial blood sugar tests are made on the pilot group after the age of 35 and on the management group after the age of 40. Prevention of diabetes in the older age group is closely related to the prevention of obesity, control of overweight being particularly important if there is a familial history of diabetes. The close observation of the occasional individual who has a slight glycosuria is also important, since it is believed that transient or alimentary glycosuria is often the precursor of diabetes. It is also a well-recognized fact that the well-controlled diabetic is less apt to develop the early degenerative changes that occur in the uncontrolled diabetic.

In cardiovascular diseases the potential hypertensive individual is seen fairly often, usually associated with obesity. Occasional cases of angina are also disclosed. Electrocardiograms are taken of the pilot and executive applicants so as to have a baseline electrocardiogram for future reference. In the routine physical examination, electrocardiograms are taken annually in the pilot group at 35 years of age and in the executive group at 40. Very infrequently cases of recent coronary thrombosis have been disclosed by the use of the electrocardiogram. Other abnormalities have been found, such as bundle-branch blocks, A-V blocks, etc. Although serious coronary disease may exist with a normal electrocardiogram, depression of RST and T waves in leads I and II and the chest leads may be suggestive of this condition.

In the routine periodic examination it is very rare that hidden asymptomatic malignancy is disclosed. However, those cases in which malignant or pre-cancerous growths can be seen may be picked up and corrective action taken. These include those with lesions involving the skin, nasopharynx, and oral cavity. Although sigmoidoscopy after the age of 45 would be desirable, because of certain limitations we have not been able to include this in our routine examinations.

Certain gastro-intestinal diseases, such as peptic ulcer, have been suspected in a number of cases from the history, and referral has led to corrective action with relief of symptoms. Closely associated with this is the occasional case of cholecystitis and cholelithiasis. Parasitic disease has been a relatively frequent finding consequent upon operation in the tropics.

Mental Stress and Strain

No paper on executive health is complete without some mention of the mental stress and strain which the average executive undergoes in carrying on his duties. In this connection there is an excellent pamphlet by C. G. Roberts (1951) which states: "The ever-increasing intricacy of industrial techniques accompanied by an equally rapid advance in the complexity of social, governmental, commercial and industrial organizations seems now to be taxing the highest levels of man's mental ability to the full." He writes in considerable detail about the nature of mental skill and the responsibility as related to the executive, the cause of stress with its resultant breakdown in some executives, and the solution.

An important phase of the periodic examination is the conference or discussion with the examinee with a view to obtaining any history of previous or intercurrent diseases and informing him of any defects found during the examination. Of particular importance is a discussion relative to

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any stress or strain which he is undergoing, informing him of the importance of the annual vacation, of leaving his work and worries in the office, of hobbies and outside interests, and, finally, of relaxation.

Conclusion

The employee is one of the most valuable assets in any company, and of the employees the management group or executives are particularly valuable because of their training, motivation, and high degree of technical and administrative skill. A health maintenance scheme for the executive is an essential part of any industrial medical programme. Its main object is the detection of disease in its incipency in order that corrective action may be taken so as to maintain him in good health and increase his longevity and efficiency.

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EFFECT OF PREDNISOLONE ON ANAEMIA ASSOCIATED WITH MACROGLOBULINAEMIA

BY

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In spite of numerous case reports, the pathogenesis of macroglobulinaemia remains obscure. The diversity of clinical features in patients with this abnormality (Waldenström, 1952; Wilde and Hitzelberger, 1954; Long *et al.*, 1955; Ferriman and Anderson, 1956; Mackay *et al.*, 1956, 1957; Jim and Steinkamp, 1956; Martin and Close, 1957; Wanner and Siebenmann, 1957; Kappeler *et al.*, 1957) suggests that it does not itself constitute a disease entity, though it appears in many cases to be associated with neoplastic disease of reticulo-endothelial tissue. In most cases therapeutic measures have not affected the macroglobulinaemia and have failed to shed light on the nature of the anomaly. In view of this, we record the findings in an elderly woman with unexplained anaemia and macroglobulinaemia who has shown marked improvement, in respect both of her anaemia and of her macroglobulinaemia, while being treated with prednisolone.

Case Report

The patient, now aged 73, has attended the Royal Perth Hospital periodically for the past 15 years. Hospital records show that in 1943 and again in 1945 the haemoglobin value

of her blood varied between 8 and 9 g./100 ml. No further haematological investigations had been undertaken at those times.

In 1955 she was investigated for anaemia. The clinical history was not informative. She did not suffer from a bleeding tendency. Apart from pallor, clinical examination revealed no abnormality. The liver and spleen were not palpable and the lymph nodes were not enlarged. Anaemia

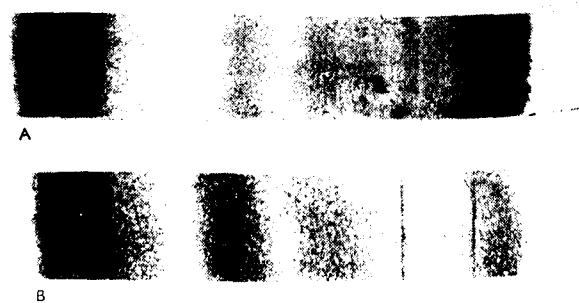


FIG. 1.—Paper electrophoresis of serum. A, Before prednisolone therapy (October, 1956). B, On cessation of prednisolone (June, 1957). The strips have been aligned with the albumin bands to the left.

was of normochromic normocytic type with a haemoglobin value varying between 7.1 and 8.6 g./100 ml. The erythrocyte sedimentation rate was elevated, lying in the range 74 to 155 mm. fall in one hour (Westergren). The total serum proteins as determined by the alkaline biuret reagent of Weichselbaum (1946) were 9.2 g./100 ml. Salt fractionation with 26.9% sodium sulphate solution gave values of 2 g./100 ml. for albumin and 7.2 g./100 ml. for globulin. Paper electrophoresis of serum (Flynn and de Mayo, 1951), using azocarmine B as a protein stain, showed a discrete band of abnormal protein in the γ -globulin region similar to that shown at A in Fig. 1. Bence Jones proteinuria was not present. Examination of sternal marrow and radiological examination of the skeleton failed to reveal any further abnormality, so that a provisional diagnosis of myelomatosis was not sustained. After unsuccessful therapy with a variety of haematinics the patient was treated with blood transfusions.

In 1956 an enlarged lymph node was noted in the left axilla. Further investigations showed that the abnormal serum protein was macroglobulin. It did not migrate from the point of insertion when electrophoresis was carried out in starch gel (Silberman, 1957). On examination in the ultracentrifuge* the serum was found to contain an abnormal component constituting 23% of the total protein (total protein 7.3 g./100 ml.) with a sedimentation constant of 15.3 S. There was also a small amount of a faster sedimenting protein (Fig. 2, A). In addition the serum gave a positive result with the Sia test, although this is not exclusive to macroglobulinaemia.

At this time the haemoglobin value of the blood was 9.1 g./100 ml. and the haematocrit 29%. The reticulocyte

*Spinco model-E ultracentrifuge; rotor An-A; centrifugal force, number $\times$ gravity = 182,000; serum dilution of 1+4 in 0.2 M NaCl solution; pH=7.0; temperature of rotor, 20° C.

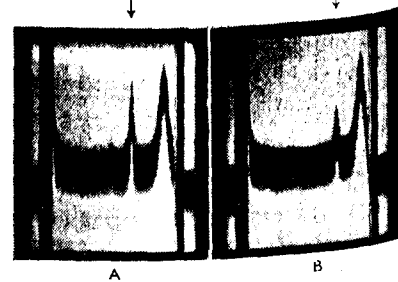


FIG. 2.—Ultracentrifuge pattern of serum. A, Before prednisolone therapy (October, 1956). B, On cessation of prednisolone (June, 1957). Arrows indicate the major macroglobulin component.

count was 2.4% and the Coombs reaction on the patient's red cells negative. Survival of the patient's ^{51}Cr -labelled red cells in her own circulation was normal. The total leucocyte count was 6,600/c.mm., with 53% polymorphs, 37% lymphocytes, 8% monocytes, and 2% eosinophils. The sternal bone marrow was of normal cellularity and showed a moderate increase in lymphocytes, which numbered 29% of all nucleated cells present. There were 2% plasma cells and 16% normoblasts. Further skeletal x-ray films showed no abnormality.

Progress is illustrated in Fig. 3. The patient was transfused in October and December, 1956. Prednisolone therapy was then begun at an initial dosage of 40 mg. a day, which was soon reduced to 20 mg. After an initial fall in the haemoglobin value there was a steady improvement, first noticed one month after starting prednisolone. By April, 1957, the haemoglobin value was 14.2 g./100 ml. and the haematocrit 43%. The patient was in good health except for recurrent furunculosis.

In June she developed an acute sinusitis, which progressed to an orbital cellulitis requiring surgical drainage. During her stay in hospital prednisolone therapy was discontinued. The haemoglobin value of the blood fell to 10 g./100 ml. over a period of a week. With the control of infection it

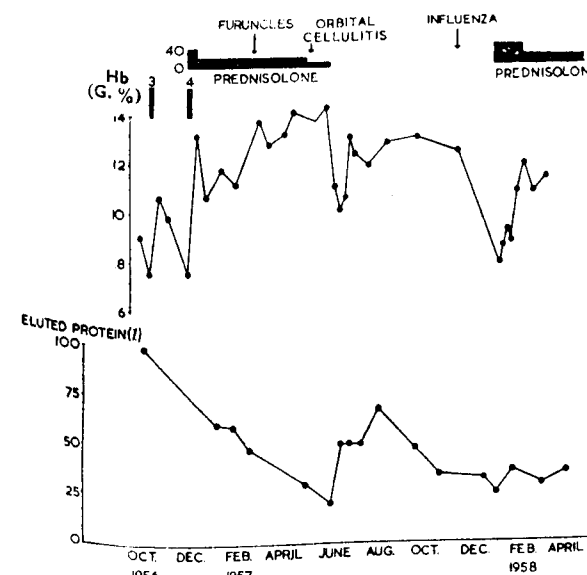


FIG. 3.—Effect of therapy on blood haemoglobin value and concentration of protein migrating electrophoretically as γ globulin. The figures 3 and 4 refer to pints of blood transfused. Concentrations of dye eluted from the γ -globulin region are expressed as a percentage of the concentration found in October, 1956.

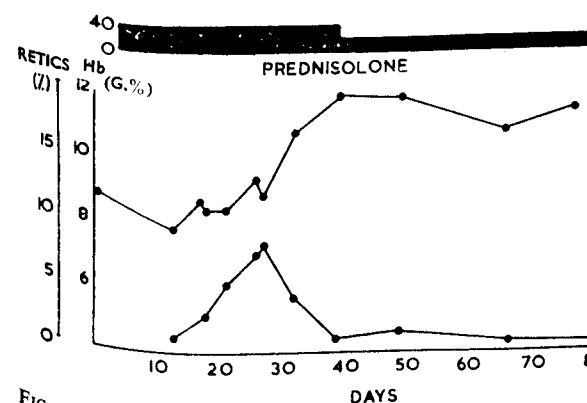


FIG. 4.—Reticulocyte percentages (lower curve) and haemoglobin values (upper curve) during the second course of prednisolone therapy (January, 1958).

spontaneously rose to 12 g./100 ml. and maintained itself at about this level for six months without further therapy.

In December she suffered from influenza. When she was seen one month later, her haemoglobin value was 8.6 g./100 ml. and therapy with prednisolone was recommenced. Subsequent haematological findings are shown in Fig. 4. After 23 days the reticulocytes rose to 8.3%. The haemoglobin value improved shortly after this, and has been maintained since between 12 and 13 g./100 ml. At the time of writing the patient was being treated with a maintenance dose of 10 mg. of prednisolone daily.

Since the beginning of treatment in December, 1956, total serum proteins have been estimated and serum paper electrophoresis performed at frequent intervals. By May, 1957, the dense band of abnormal protein in the γ -globulin position on the electrophoretic strip was distinctly less, and by June, 1957—that is, six months after beginning prednisolone therapy—it had disappeared (Fig. 1, B). Paper electrophoresis at this time showed a slight increase in the α_1 - and α_2 -globulins. Macroglobulins could still be detected on ultracentrifuge analysis, however, but in less amount than previously (12% of total protein; total protein, 6.4 g./100 ml.) (Fig. 2, B). The Sia test was still positive.

Fluctuations in the amounts of serum protein migrating as γ -globulin were followed by eluting the dye from the relevant area of the electrophoretic strips with 2.5 M sodium hydroxide and measuring the amount of dye photometrically. The results, expressed as a percentage of the initial value, are shown in Fig. 3. Between October, 1956, and June, 1957, there was a steady decrease in protein concentration in the γ -globulin position to 21% of the initial value.

On cessation of prednisolone therapy, concurrent with the onset of orbital cellulitis, the γ -globulin fraction rose sharply, then fell again and has since maintained a fairly steady value. The abnormal band reappeared in the γ -globulin position on the electrophoretic strip one month after prednisolone therapy was stopped and has persisted since then. The second course of treatment had produced no obvious change in the electrophoretic pattern at the time of writing.

Discussion

The mechanism of the anaemia is obscure and its duration uncertain. In the absence of other demonstrable causes of anaemia, it seems reasonable to suggest that the low haemoglobin values recorded in 1943 had the same aetiology as the present anaemia. Although the bone marrow contained an excess of lymphocytes, it is unlikely that the anaemia was due to marrow infiltration, as erythropoiesis appeared adequate. The anaemia was not haemolytic in nature. The degree of marrow erythropoiesis was normal, reticulocyte counts have not been increased apart from therapy, and the patient's red cells gave a negative Coombs reaction. Furthermore, the patient's red cells survived normally in her own circulation. On the other hand, an autoimmune mechanism is suggested by the response to prednisolone therapy. The delayed reticulocyte response noted during the second course of prednisolone therapy suggests that the drug corrected the anaemia through some intermediary mechanism, as specific haemopoietic factors usually show demonstrable effects in a shorter time than this.

A patient of Wilde and Hitzelberger (1954) suffered from autoimmune haemolytic anaemia associated with macroglobulinaemia. As might be expected, this responded to cortisone therapy. Other reports in the literature of cortisone therapy in patients with macroglobulinaemia refer to cases in which the clinical findings resembled lymphosarcoma (Di Guglielmo and Antoninix, 1955; Mackay, 1956; Jim and Steinkamp, 1956). In these patients the therapy had little effect.

The duration of macroglobulinaemia in our patients is uncertain. Almost certainly macroglobulins were responsible for the abnormal serum protein results first noted in 1955.

No cause for macroglobulinaemia has been demonstrated. Although the patient has a marrow lymphocytosis and one enlarged axillary lymph node, the liver and spleen are not enlarged, and the findings differ from many of the cases of macroglobulinaemia so far described—for example, Mackay *et al.* (1956), who suffered from a disease resembling lymphosarcoma. However, it is possible that she may eventually develop this syndrome. It is purely speculative to suggest that lymphocytes might be the source of the abnormal protein.

The alteration in the serum electrophoretic pattern after prolonged prednisolone therapy is of great interest. It should be stressed that the values for γ -globulin shown in Fig. 3 represent both "normal" γ -globulin and macroglobulin. Therefore there are difficulties in interpreting fluctuations in their values, as a diminution in either would result in a decrease of total γ -globulin. However, the decrease in values between October, 1956, and June, 1957, was so marked that it is reasonable to conclude that it represents diminution in macroglobulin concentration. This is also confirmed by ultracentrifuge data, which estimated the macroglobulin to have diminished during this time. Furthermore, the discrete component on the paper electrophoretic strip which was presumably due to macroglobulin (Fig. 1, A) could not be seen on the later strip (Fig. 1, B).

The patient probably shows an increased susceptibility to infection, having suffered from recurrent furunculosis, orbital cellulitis, and a respiratory infection over a period of 18 months. It is possible that she suffers from hypogammaglobulinaemia, demonstration of which would be made difficult by the appearance of macroglobulin in the γ -globulin region on serum paper electrophoresis. Evidence to suggest hypogammaglobulinaemia is furnished by the electrophoretic strip performed in June, 1957 (Fig. 1, B). This shows an intensity of staining in the γ -globulin region within normal limits. As the serum still contained a considerable amount of macroglobulin demonstrable by ultracentrifuge analysis, the normal γ -globulin component was probably reduced.

Summary

The clinical findings are described in the case of an elderly woman who suffered from an unusual form of anaemia and macroglobulinaemia for at least three years. Treatment with prednisolone corrected the anaemia, and this was associated with a diminution in the amount of abnormal protein in the blood.

Dr. John O'Dea, Commonwealth Serum Laboratories, Victoria, carried out the ultracentrifuge analyses. One of us (J. A. O.) has received a grant from the National Health and Medical Research Council.

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DEATH CERTIFICATION OF CHILDREN

BY

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The certification of the cause of death is, to the lay person and the administrator, a simple statement of fact. To the pathologist, on the other hand, the "cause of death" is the summation of a number of factors each of which in isolation may be of little importance. At best one knows in part what a person dies with, but not necessarily what he dies from.

The practice of clinical medicine necessitates a concentration on the treatable aspects of disease and a simplification of pathology requisite for a practical approach to the patient. The present form of death certification is designed by necessity for use by clinicians. It has a twofold approach: first, steps in the progress of a major disease, and, secondly, associated disease. Its form is probably as good as can be devised.

The present small survey of 150 deaths was made to assess the efficiency of death certification as carried out in a children's teaching hospital. The resulting figures are statistically significant and show a degree of inaccuracy not generally appreciated.

Material and Method of Survey

Permission is requested to carry out a post-mortem examination on every child dying in the Sheffield Children's Hospital and is granted in over 90% of cases. At the same time the house officers are asked to indicate on the death certificate that additional information may be available later as a result of the necropsy. The cause of death is revised by the pathologist when the final necropsy diagnosis is made.

Other than this being a consecutive series, no particular selection of the 150 cases was made. The children's ages at death varied from several hours to 12½ years: 78 (52%) died at or before 3 months; 12 (8%) between 4 and 6 months; 24 (16%) between 7 months and 1 year; 23 (16%) between 2 and 3 years; and 13 (8%) between 4 and 12½ years. Thus 137 (92%) of the deaths occurred at or before 3 years of age. The cause of death entered on the death certificate was compared with the final pathological diagnosis made after consideration of the clinical findings, naked-eye pathology, and histology of the case. A record was also made of the duration the child had been in hospital, or, in cases where there had been more than one admission for the same condition, the duration under medical supervision was estimated. Each case was then placed in one of five groups, according to the following criteria.

Group 1.—Cause of death recorded on the death certificate accurate and complete as compared with the pathological findings.

Group 2.—Cause of death accurate in major respects but incomplete in minor points, which did not alter the final diagnosis.

Group 3.—Cause of death inaccurate as compared with the major pathological findings, but minor points accurate.

Group 4.—Pathological findings necessitated a complete revision of the cause of death.

Group 5.—Cause of death as recorded not substantiated by post-mortem examination and no adequate pathological cause of death found.

The following are examples of cases placed in the above groups.

<i>Certified Cause of Death</i>	<i>Pathological Findings</i>
Group 1: Girl aged 10 months	
(a) Acute adrenal insufficiency.	Congestion of the adrenal glands and histochemically greatly reduced lipid content. Meningococcal meningitis and septicaemia.
(b) Meningococcal meningitis.	
(c) Meningococcal septicaemia.	
Group 2: Boy aged 4 months	
Tuberculous meningitis.	Tuberculous meningitis. Miliary tuberculosis involving lungs, spleen, liver, kidneys, and meninges. Primary tuberculous complex in right lower lobe of lung and caseating hilar glands.
Group 3: Girl aged 11 days	
(a) Bronchopneumonia.	Purulent meningitis associated with hydrocephalus due to congenital obstruction between lateral and third ventricles and lumbar meningomyelocele. Oedema of lung (no pneumonia).
(b) Congenital meningomyelocele.	
Group 4: Girl aged 1 day	
(a) Asphyxia neonatorum.	Cerebral haemorrhage due to tears in the falx cerebri and tentorium. Bilateral atelectasis and left-sided pneumothorax. Bilateral adrenal infarction and renal vein thrombosis. Breech delivery.
(b) Breech delivery.	
Group 5: Boy aged 3 weeks	
(a) Gastro-enteritis.	Post-mortem findings showed wasted mature child, but no adequate cause of death.
(b) Prematurity.	

Group 1 comprises 23 (15%) cases; group 2, 59 (40%); group 3, 33 (22%); group 4, 28 (18%); and group 5, 7 (5%). If one omits group 5 and combines groups 1 and 2, as those cases where there was no significant change in the certification, and combines groups 3 and 4, where the pathological findings differed considerably from the clinical assessment, the distribution becomes: groups 1 and 2, 82 (55%); groups 3 and 4, 61 (40%). These figures may be regarded as having a statistical trustworthiness—that is, as indications of a firm underlying rate—of about ± 15 ($\pm 10\%$) in both cases.

In seven of the 150 cases no pathological diagnosis was eventually made. These deaths all occurred at or before 3 months and represented almost 10% of deaths occurring under 3 months or 5% of all deaths.

Effect of Age.—The ratio of groups 1 and 2 to groups 3 and 4 at different ages is shown in the Table. The figures

Group:	1	2	3	4	5	Total
No. in group	23 (15%)	59 (40%)	33 (22%)	28 (18%)	7 (5%)	150
	82 (55%)		61 (40%)			
Age at death:						
0-3 days	7		13		3	23
4 days-3 months	32		19		4	55
4 months-1 year	22		14		—	36
1 year-3 years	12		11		—	23
4-10 years	9		4		—	13
Duration under medical care:						
24 hours or less	26		17		4	47
2-5 days	9		18		1	28
6 days-6 months	36		21		2	59
7 months+	11		5		—	16

give no statistically significant—that is, by tests using the 5% level of significance—or even strongly suggestive evidence that the age of death played any part in determining the accuracy of the cause of death given.

Duration under Medical Supervision.—In assessing the consistency of diagnosis related to the duration of the children's medical care, of 47 children who died after medical care for 24 hours or less, 26 (55%) had an accurate diagnosis. Among the 28 dying after medical care of two to five days' duration, 9 (32%) diagnoses were accurate. Of 59 under care for six days to six months, 36 (61%) diagnoses appeared accurate, and among the 16 cases with medical care of over six months, 11 (69%) were apparently accurate. These figures show no significant difference, and suggest that the duration under treatment is not a major factor in the accuracy of diagnosis.

Discussion

In this series of 150 certifications the correct cause of death, as assessed by the pathologist, was not given in more than 55% of the cases. The accuracy or inaccuracy of the primary entry was influenced very little by the age of the child at the time of death or by the length of time the child was under medical care.

The cause of death entered on the certificate is not necessarily the complete clinical diagnosis made in hospital. That 40% of the total number of cases fell into group 2 (accurate but incomplete) and 40% into groups 3 and 4 suggests that the information submitted on the death certificate was not adequate.

It would seem possible that doctors may have been to some extent influenced by the knowledge that they were initialling the reverse side of the death certificate, but this would affect only the accuracy of certifications as between our groups 1 and 2, but not between groups 2 and 3. The same applies to the use of different terms to describe similar conditions.

The accuracy of the cause of death statistics according to death certification appears to have been of more concern to American workers than to workers in this country (Lane and Holla, 1954; West, 1955), and varying degrees of accuracy of certification have been given as a result of several surveys. We have been unable to find any published figures of this kind for this country.

The Registrar-General is well aware of the problems of accuracy of death certification, and has discussed these in his reports for 1940 and 1950, stressing improvement in certification which follows necropsy.

The extent of the problem is shown in his report for the year 1953 (Registrar General, 1956), where he analyses the certification of causes of 114,642 deaths for the June quarter of 1953, grouping the certifications according to whether the certificate was filled in by the coroner or by the general practitioner, and whether death occurred inside or outside hospital. Great variation in the causes of death in these different groups was found, ranging from 1% disagreement for senility to 70% for pneumonia in the newborn and 75% for meningococcal infections. These certifications obviously involve different groups of cases, and the Registrar-General, by the very nature of the information available to him, is able to compare only the causes of death certified by different groups of people on different cases, but he is not directly able to compare the differing diagnoses in the same cases, the essential for a fair comparison.

Swartout and Webster (1940) report an accuracy of 79% in a study of 8,000 deaths in Los Angeles. They compared the necropsy diagnosis with what they considered would have been the clinical diagnosis, but without reference to the original death certificates. Evans (1949) found an accuracy of only 43% in a study of 3,900 death certificates, basing the findings on his own judgment and without the aid of necropsy findings. Korns and Lintz (1949) found disagreement between the clinical cause of death statement

and pathological findings in 11–20% of 500 hospital cases; and James, Patton, and Heslin (1955) found 71% of original certificates agreeing with necropsy reports in a survey of 1,889 necropsies, but with wide variation within the groups of different diseases, ranging from 21% agreement in the group of arteriosclerotic heart disease to 93% agreement in the group covering tuberculosis. Pohlen and Emerson (1942, 1943) found consistency in diagnosis in 96% of tumours of the heart, compared with 26% in liver tumours, 99% in measles, and 52% in heart disease.

In the above articles, all of which come from public health departments, there is a tendency to state that errors in registration occur between the few larger groups of causes of death, and that the errors in one direction tend to cancel the others out, making the overall statistics relatively accurate. This seems to be an unfortunate argument, as it would appear to give the published figures false accuracy—the type of accuracy obtained by drawing random diagnoses out of a hat—and minimize the danger of arguing from any of the registrar's statistics.

In assessing the accuracy of certification, any comparison made must be between the cause of death as originally certified and the cause of death after survey of all information obtained by clinical and necropsy examination. Inaccuracies in certification arise in two ways: first, a failure to record accurately the knowledge available at the time of death—that is, negligent certification; and, secondly, the inadequacy of the knowledge available at the time of certification.

In a teaching hospital, where every child, particularly an ill child, is under constant discussion, it is unlikely that faulty certification is due to the absence of available knowledge of diseases; on the other hand, certificates are often filled in by junior housemen who have not acquired the art of avoiding terminology that may lead to inquiries by the coroner. The tendency in both of these instances would be towards a more accurate registration if not conventional. We would thus expect the registration in the present survey to be at least as accurate as is likely to occur in the general field of child deaths.

Summary

A survey of the accuracy of the causes of death given to the registrar at a children's hospital showed that almost one-half of the certifications were not correct as judged by the final pathological diagnosis.

We are grateful to Dr. G. H. Jowett, head of the Department of Statistics of the University of Sheffield, for his advice and comments, and to our clinical colleagues for permitting these diagnostic ablations.

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In an address on "The Art and Science of Research," before a sectional meeting of the Manchester Medical Society last month, Dr. J. H. SCOTT, lecturer in anatomy at Queen's University, Belfast, defined research as the intellectual fashion of our time. He compared "useless" and "useful" research as illustrated by the discovery of Nasmith's membrane in 1839 and of penicillin in 1929, and the part played by chance in certain cases. Discussing Humphry's work on jaw growth in pigs, he pointed out how the results of research were not always applied successfully to the solution of the problems they were supposed to solve. Research, he said, did not primarily depend on money, or on complicated apparatus, but on a peculiar attitude of mind in which curiosity, persistence, and clarity were essential features.

INFLUENCE OF MATERNAL MALARIA ON NEWBORN INFANTS

BY

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It is well known that schizonts of *Plasmodium falciparum* tend to concentrate in the maternal tissue of placenta in the latter half of pregnancy in women infected with that parasite (Blacklock and Gordon, 1925; Garnham, 1938; Bruce-Chwatt, 1952). There has, however, been considerable controversy about what effect this concentration has on the infant born of such placenta to women who are natives of territories where malaria is so prevalent that adult immunity to it is substantial. On the one hand is the Sierra Leone series of Blacklock and Gordon containing "proof of a very complete association between maternal infection of the placenta and death of the child in utero or within a seven-day observation period after birth." On the other hand is Garnham's (1949) diametrically opposite assertion from observations in Kenya that "malarial infection in the mother seldom resulted in stillbirths or in death of the infant in the first week," and that "Luo children are unlikely to suffer ill effects from infection in the mother."

Observations in Lagos (Bruce-Chwatt, 1952) have shown that, although there is no apparent correlation there between neonatal mortality and malarial infection of the placenta, yet there are grounds for believing that such infection is a cause of prematurity and, more generally, of the birth of underweight babies. A further report from Southern Nigeria (Archibald, 1956) confirmed these ill effects.

The present paper presents evidence from Northern Nigeria that this infection commonly prevents African infants born there to malarious mothers from reaching their proper weight at birth.

Present Investigation

The evidence was collected from a number of centres in Northern Nigeria where the birth weight of infants was noted, a number of particulars were obtained from the mother, and blood smears were collected from the maternal surface of the placenta and from the mother's finger at the delivery. The blood smears were examined by the regional malaria unit. The group investigated was mainly drawn from deliveries which took place in medical institutions, and was obviously a selected sample of the population. This was underlined by the finding of malaria parasites in only 15% of the smears examined, a rate much lower than the adult parasite rate generally found in the Northern Region of Nigeria.

The present series consisted of 484 women, 73 of whom were infected at delivery with *P. falciparum* (a few were also infected with *P. malariae*). In most of the mothers, parasites could be detected in the smear both from the finger and from the placenta, but in eight cases they were found only in the placenta and in seven only in the finger. Of the 484 pregnancies, 18 were multiple, two of triplets; and of the 504 infants born, 30 (5.9%) were stillborn, 4 (0.8%) were born alive before term, and 470 born alive after pregnancies which had gone to full term. Of these full-term babies, 440 were single deliveries, and it is with these that the further analysis deals.

Table I shows the distribution of birth weights of these babies. Of the 62 infants born from malarious placenta, 13 (20.6%) were premature—that is, weighing 5½ lb. (2.495 g.) or under (W.H.O., 1950)—as contrasted with 31 (8.2%)

TABLE I.—Record of Birth Weight of 440 Infants Born Alive in Single Deliveries After Full-term Pregnancies

Weight	Infants Born from Malarious Placentae		Infants Born from Non-malarious Placentae	
	lb.	g.	lb.	g.
Over 2½	1,130–	—	1	—
" 3½	1,360–	2	2	—
" 4½	1,585–	1	4	—
" 4½	1,815–	5	8	—
" 5½	2,040–	5	16	—
" 5½	2,270–	12	50	—
" 6½	2,495–	16	65	—
" 6½	2,720–	10	74	—
" 7½	2,950–	7	78	—
" 7½	3,175–	3	38	—
" 8½	3,400–	1	25	—
" 8½	3,630–	—	11	—
" 9½	3,855–	—	4	—
" 9½	4,080–	—	1	—
" 10½	4,310–	—	1	—
" 10½	4,535–	—	—	—
Total	62	378		
Mean weight in group	6 lb. 2 oz. (2,778 g.)	6 lb. 12½ oz. (3,076 g.)		
Standard deviation	14.4 oz. (408 g.)	16.4 oz. (465 g.)		

TABLE II.—Record of Birth Weights of 440 Infants Born Alive in Single Deliveries After Full-term Pregnancies, Recorded by Race

Race	No.	Average Weight of Those From Malarious Placentae		No.	Average Weight of Those From Non-malarious Placentae	
		lb. oz.	g.		lb. oz.	g.
Ibo	17	6 5	2,865	124	6 13	3,090
Yoruba	26	6 1	2,750	117	6 11	3,035
Hausa	11	5 12	2,610	70	6 12	3,060
Fulani	—	—	—	12	6 11	3,035
Kanuri	—	—	—	6	6 13	3,090
Others	8	6 4	2,835	49	6 13	3,090
Total	62			378		

of 378 infants born from uninfected placenta. This contrast is significant ($\chi^2=9.7$; $P<0.01$). The mean weight of the 62 infants born from malarious placenta was 10½ oz. (298 g.) less than that of the 378 infants born from uninfected placenta.

The distribution of the 440 single full-term deliveries according to the race to which the mother belonged is shown in Table II. The mean weight of infants born from malarious placenta is consistently lower than that of infants born from uninfected placenta, irrespective of the mother's race. It is of interest to note that the mean birth weight of the infants born from uninfected placenta is very much the same for all racial groups represented in this series, whereas the Hausa infants born of infected placenta were on the average of lower weight at birth than either the Yoruba or Ibo babies. This is consistent with the hypothesis that the immunity developed by the indigenous people of Northern Nigeria, where there is a strictly circumscribed wet season and an explosive seasonal intensification of malaria transmission, is less well established than is that developed by Southern Nigerians who have been bred in conditions where malaria is stable.

An attempt was made to classify the families into which those 440 infants were born in accordance with the standard classes used by the Registrar-General of the U.K. (class I, professional; class III, skilled workers; class V,

TABLE III.—Record of Birth Weights of 440 Infants Born Alive in Deliveries After Full-term Pregnancies Recorded by Social Grouping

Social Group	Delivered from Malarious Placentae			Delivered from Non-malarious Placentae		
	No. in Group	Average Weight at Birth		No. in Group	Average Weight at Birth	
I	2	5 10	2,550	1	5 12	2,610
II	1	6 7½	2,935	24	6 12	3,060
III	30	6 1	2,750	206	6 12½	3,075
IV	14	6 5	2,865	76	6 13	3,090
V	4	6 6	2,890	33	6 12	3,060
Not known	11	6 0	2,720	38	6 11½	3,050
Total	62	6 2	2,780	378	6 12½	3,075

unskilled). This was not very successful because of the large number of families claiming to be "traders," a group which might embrace the merchant prince or the match-box seller. In fact, the average weight of infants at birth was surprisingly similar for all social classes, although for each class the babies born from malarious placenta were under weight as compared with those born from uninfected placenta. The finding that the birth weight did not improve with social class is not in accord with experience in developed countries, but the explanation may be that in the conservative polygamous society of Northern Nigeria a wife may not enjoy her husband's social advantages. Table III shows the social classification of the 440 infants. The small numbers in this series from social classes I and II indicate that advantage of Western obstetric facilities is not taken by the conservative orthodox leaders of Northern Nigerian society.

The influence of maternal parity on the weight of an infant at birth is well known. In the present small series it was found that, in each class, the infants from malarious placenta were less heavy than the others, but the overriding importance of parity was shown by the poor weights of babies born to primiparae.

Discussion

The present series of cases differs from those previously published from Southern Nigeria (Bruce-Chwatt, 1952; Archibald, 1956) in that the effect of malaria on birth weight is more pronounced in this northern than in previous southern groups. This is shown in Table IV.

The proportion of mothers in the series who at the same time showed infection in both blood and placenta was also much higher than has usually been found. In these women in Northern Nigeria, 79% of infections were manifest in both blood and placental smears. Schwetz and Peel (1934) reported a similar coincidence (74%) from the Congo, but in Blacklock and Gordon's (1925) Freetown series only 20% of infections were found in blood and placenta at the same time; in Garnham's (1938) Kenya series it was 59%, and in Bruce-Chwatt's (1952) Lagos group 43%. It is probable that these differences can be explained as being due to

TABLE IV.—Influence of Malarial Infection of Placenta on Birth Weight of Nigerian Babies

Series	Premature		Average Weight	
	In Malarious	In Non-malarious	In Malarious	In Non-malarious
Northern Nigeria	13/62 (20.6%)	31/378 (8.2%)	6 lb. 2 oz. ± 14.4 oz. (2,778 ± 408 g.)	6 lb. 12½ oz. ± 16.4 oz. (3,076 ± 465 g.)
Southern Nigeria	20/68 (29.4%)	65/395 (16.5%)	6 lb. ± 10 oz. (2,722 ± 283 g.)	6 lb. 6 oz. ± 14.6 oz. (2,892 ± 414 g.)
Lagos	15/73 (20.5%)	26/237 (11.0%)	5 lb. 13½ oz. ± 17.4 oz. (2,651 ± 493 g.)	6 lb. 2 oz. ± 15.1 oz. (2,778 ± 428 g.)

variations in the immunity of the mothers. Probably coincident infection of blood and placenta indicates that the woman has not succeeded in mastering the infection. On that postulate, the high coincidence of infection of both blood and placenta in the present series would signify that these women did not have a strong immunity. This is consistent with earlier impressions that immunity to malaria in Northern Nigeria is not firmly established.

Summary

A series of 440 full-term deliveries of single infants is analysed to elicit the effect produced by *P. falciparum* infection of the placenta on the weight at birth of African babies.

The series is analysed by race, social class, and maternal parity, and in each group the effect of malaria infection has been that infants born from infected placenta have a mean weight at birth below that of those born from uninfected placenta.

The effect of *P. falciparum* infection is more pronounced in the present series than in previous groups collected in Southern Nigeria.

The series showed an unusually high proportion of mothers with both blood and placental infections detectable at the same time.

It is postulated from the last two observations that the mothers in the present series were not succeeding in mastering their parasitaemia, and this is thought to strengthen earlier impressions that malarial immunity is not firmly established in the population of Northern Nigeria.

I am indebted to those members of the Medical Department of the Northern Region who assisted in the investigation, and to Dr. R. A. B. Dikko, Acting Principal Medical Officer of the Endemic Diseases Division of the Ministry of Health of the Region, for permission to publish this paper.

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ISOLATION OF E.C.H.O. VIRUS TYPE 9 DURING AN OUTBREAK OF MENINGO-ENCEPHALITIS

BY

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During July, 1956, an epidemic of lymphocytic meningo-encephalitis with marked myalgia occurred in Newton-le-Willows, Lancashire (Lyle, 1956). At the same time type I poliomyelitis was occurring in Manchester and Cocksackie B meningitis in Stockport. Neither the epidemiology nor the symptomatology of the Newton-le-Willows outbreak suggested non-paralytic poliomyelitis or the clinically indistinguishable Cocksackie meningitis, but attempts were made in tissue cultures to isolate an agent from the faeces of seven patients.

Virus Studies

Faecal suspensions were prepared in saline and purified by high-speed centrifugation to remove contaminating bacteria. The resulting supernates were inoculated into stationary monolayer tube cultures of monkey-kidney cells prepared by a modification of Youngner's (1954) method.

Two specimens were tested shortly after receipt and both were found to be highly toxic to the culture cells, non-specific degeneration occurring within 24 hours of inoculation.

The residue of these, together with five other prepared specimens, were stored in a low-temperature refrigerator (-25°C), as prolonged storage has been found to diminish the toxicity of faecal extracts.

At the end of four months all the specimens were tested in monkey-kidney cultures as before, and also in stationary HeLa-cell cultures. Negative results were obtained in both types of culture with specimens from two adults and one child taken on the third, seventh, and sixteenth days of illness respectively. Of the other four specimens from children, two showed slight degenerative change in kidney cells with no effect in the HeLa strain, while the other two showed no change in either type of culture. In all four cases sub-inoculation of culture fluid was made to fresh kidney- and

HeLa-cell cultures. It was not until the fourth blind passage that definite cytopathogenic degeneration was noted in HeLa cells, although it was evident in all the monkey-kidney cultures at the second passage. A further series of blind passages in tissue culture was made with the three negative specimens previously referred to, without results at the fifth passage, when the material was abandoned. Lesions were not produced in 1-day-old mice either by original faecal suspensions or by tissue-culture fluids from cultures showing cytopathogenic effect inoculated by the intracerebral or subcutaneous routes.

Neutralization tests on tissue-culture fluids were carried out with antisera against poliovirus types 1, 2, and 3, and Cocksackie virus types B1-B5, with negative results. Tests with E.C.H.O. virus type 9 antiserum gave positive results identifying the agent.

Significant rises in neutralizing antibody in E.C.H.O. 9 virus were demonstrated by Dr. D. A. J. Tyrrell, of the Virus Research Laboratory, Sheffield, and by Dr. A. D. Macrae, of the Virus Reference Laboratory, Colindale, in 8 out of 10 cases from which paired sera were available, including one with negative faeces, and three of the four cases from which isolations were achieved. The fourth case had a high neutralizing antibody titre in the first serum specimen, and this was unchanged 15 days later.

Clinical Notes.—The ages of the children from whom isolations of virus were made were 5, 6, 7, and 12 years. All had fever, headache, and enlargement of posterior cervical lymph nodes. In three of the cases axillary glands were also involved, and two of these had inguinal gland enlargement as well. Central nervous symptoms were not prominent, but one child had a positive Kernig sign with slight neck rigidity, one had a transient loss of knee-jerks, and a third had some neck stiffness.

Discussion

The association of E.C.H.O. virus type 9 with cases of aseptic meningitis has been reported from West Virginia (Committee on E.C.H.O. viruses, 1955), and Belgium (Nihoul *et al.*, 1957). In the United Kingdom, Tyrrell and Snell (1956) and Tyrrell (1957, personal communication) recovered this agent from cases similar to Lyle's occurring in the Sheffield area in September, 1956, and a closely related agent with the additional property of pathogenicity for suckling mice has been isolated during outbreaks in East Suffolk (Boissard *et al.*, 1957), Leicester (Rotem, 1957), and Sweden (Wesslén *et al.*, 1958).

The initial negative findings in HeLa-cell cultures suggest that these are less sensitive than monkey-kidney cells for the primary isolation of this virus, and this is confirmed by the findings of Jamieson *et al.* (1958), who isolated five strains in monkey-kidney cells, but could not detect any virus using HeLa-cell cultures.

Although repeated passage in HeLa cells may lead to adaptation to this cell strain (Archetti *et al.*, 1957), this is not normally a practicable diagnostic procedure.

Summary

An agent serologically identical with E.C.H.O. virus type 9 has been isolated from four cases of lymphocytic meningo-encephalitis with myalgia and a rash occurring in an epidemic outbreak.

The expenses of this work were defrayed by a grant from the National Fund for Poliomyelitis Research. Clinical details of cases were made available by Dr. W. H. Lyle, to whom I express my thanks.

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Medical Memoranda

Pituitary Deformity from Carotid Compression— a Potential Hazard in Pituitary Ablation

One of the ways in which certain hormone-dependent tumours are treated is by ablation of the pituitary body. Among the methods used is one involving the injection of a radioactive substance into the gland. This is performed by needle puncture of the floor of the sella turcica via the nasal route. The procedure is done under some form of x-ray control, but is nevertheless one that requires great skill if numerous important anatomical relations of the pituitary are to escape injury. The object of this paper is to draw attention to a change in the carotid arteries which makes them more vulnerable and puncture or irradiation of them an added hazard of this form of treatment.

The normal relations of the carotid arteries to the pituitary are such that they do not impinge on the lateral extremities of the organ.

I have frequently observed, *post mortem*, that atheromatous internal carotid arteries may be varicose to a greater or less degree. Where the carotid dilatation is slight one sees small oval depressions on the sides of the pituitary.



Upper aspect of dumb-bell type of pituitary deformity. Posterior lobe is below.

With further ectasia of the vessels the pituitary becomes hollowed inferolaterally, and in extreme varicosity the pituitary is bilaterally compressed about its middle and acquires a dumb-bell shape. The accompanying photograph shows the appearance in such an advanced case and also, what is often seen, that the carotids are unequally

affected, so that the dumb-bell is asymmetrical. It measures 4.5 mm. across its waist instead of the normal 12 to 13 mm. The youngest subject in whom I have seen the most severe degree of the deformity was a man of 57. Clearly the encroachment towards the midline of the carotid arteries is a potential hazard in closed operations in the fossa. The condition is mentioned by Henke and Lubarsch (1926), and a photograph in their handbook shows the appearance of the sella turcica in such a case. It was not noted by Beattie and Heasman (1958) in a recent study of 82 pituitaries from elderly mental patients with and without hypertension. (Sheehan and Summers (1949) do not mention it under "Extrasellar tumours—miscellaneous," but remark about this group in general: "In many cases there is an astonishing lack of symptoms despite quite gross compression of the pituitary.") In the cases I have seen there were no post-mortem findings or clinical data to suggest that hypopituitarism existed, nor would it be expected with such a volume of surviving glandular tissue.

I thank Dr. N. F. C. Gowing and Mr. W. P. Greening for their advice and help.

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Tuberculous Meningitis as a Cause of Mental Deficiency

Some 17 years ago I saw a series of cases of tuberculous meningitis admitted to a psychiatric observation ward on account of acute psychotic features (Kirman, 1943). At that time there was no effective treatment for the disease, and residual effects were not a problem. Tuberculous meningitis was always looked upon as a fatal disease until the introduction of streptomycin. It was not, therefore, a cause of mental deficiency.

A SERIES OF CASES

The first case admitted to the Fountain Hospital was in 1951, since when a total of 13 cases have been admitted (Table I). The condition is best described as meningo-encephalitis, and unless response to treatment is prompt permanent damage to mental capacity is inevitable. Our hospital accommodates 600 children with mental deficiency, and the admission rate is approximately 80 a year, being the majority of mentally defective children admitted from the counties of London and Surrey. The cases admitted represent the intermediate group between those who die and those whose illness results in lesser degrees of brain damage expressed as educational retardation or behaviour disturbance. It is difficult to draw conclusions from small numbers, but our experience does suggest that there has been an improvement in the situation since 1949–50 and that this disease should very seldom in the future be a cause of mental defect.

Social factors are very important in our group of cases. In part this is the result of tuberculosis in the family (Table II), which may reduce the income or the ability to provide a home, but low incomes and inadequate housing appear often to have anteceded the infection.

The mental grade in these cases was: idiot in 7, imbecile in 4, and educationally subnormal in 2. After much patient effort it was possible to return to the educational system the two children who proved to be above imbecile level. The main handicap in these two cases was restlessness, and they later became stabilized.

TABLE I.—Tuberculous Meningitis

Year:	1948	1949	1950	1951	1952	1953	1954	1955	1956	Total
Onset	1	4	2	3	1	0	1	1	0	13
Admission	—	—	—	1	6	2	0	0	4	13

The ages in years at onset were <1 in 5 cases; 1– in 5; 2– in 1; 3– in 1; 4– in 0; and 5– in 1.

TABLE II.—Tuberculosis in Family

Father died ..	2	Sibling died ..	1	Other relatives ..	3
Father ill ..	4	Sibling ill ..	3	Lodger ..	1
Mother ill ..	3				

Physical disabilities found were: blindness in 6, strabismus in 5, hemiplegia in 3, spastic diplegia in 2, hydrocephalus in 2, deafness in 2, and epilepsy in 2.

In our experience tuberculous meningitis has about the same importance at the present time as kernicterus as a cause of mental defect. It is about six times as important as cretinism or congenital syphilis, and accounts for about one-third of the number of cases produced by phenylketonuria.

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The Ministry of Agriculture, Fisheries, and Food has reminded farmers of the very serious danger to anyone entering a grain bin or silo when the grain is being run out of the bottom of the bin. A vortex is created and anyone on the grain is liable to be drawn down and suffocated. Two fatal accidents have recently occurred in this way.

Reviews

HORMONE PRODUCTION IN ENDOCRINE TUMOURS

Ciba Foundation Colloquia on Endocrinology. Volume 12. Hormone Production in Endocrine Tumours. Edited by G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Maeve O'Connor, B.A. (Pp. 351+xii; illustrated. 48s.) London: J. and A. Churchill, Ltd. 1958.

Laboratory studies of the endocrinological background of human breast cancer need the support of the experimental approach if we are materially to increase our understanding of the general biological significance of hormone dependence or, and to a far greater extent, of the state of independence which is so often its tragic sequel. This report of a Ciba Colloquium reveals the encouraging possibility that the study of hormone dependence in naturally occurring or experimentally produced animal tumours may lead us farther towards the solution of this urgent problem. It records twelve major contributions and eight short papers given by workers from Denmark, Sweden, the Netherlands, the United States of America, and Great Britain. Half the papers dealt with hormone-dependent animal tumours, the majority being hormone-induced. These included pituitary tumours in mice (Furth) and in hamsters (Hornig), in the thyroid (Leatham), the ovary (Mühlbock and also Gardner), the adrenal cortex (Woolley), and the testis (Huseby). In most of these papers accounts of the author's own work were prefaced by short, valuable general surveys of each problem. The other papers reported intensive investigations into tumours of the human endocrine organs and included reports on the iodinated compounds in the serum in thyroid cancer (Tata), and the study of body fluids in patients having functioning tumours of the gonads and adrenal cortex. In this paper given by Ralph Dorfman, the chairman of the symposium, the results, obtained by all the refinements of modern techniques, were correlated with biosynthetic studies of the tumour itself in a successful attempt to clarify the biosynthesis of the steroid hormones. Other papers dealt with the histology, enzymology, and hormone production in tumours of the human adrenal cortex (Symington and Currie), the estimation of urinary steroids in the differential diagnosis of hyperplasia and neoplasia of the adrenal cortex (Robinson), the bioassay of urinary gonadotrophins in hydatidiform mole and uterine chorion epithelioma, and of gonadotrophins, androgens, and oestrogens in malignant testicular tumours (Hamburger).

As in all Ciba Colloquia, the discussions reached a high critical standard by the inclusion of workers of long experience in their own subject. The omission of these discussions would certainly rob these Colloquia of what is probably their most valuable feature. For the more general reader, two commendably clear accounts of hormone dependence in animal tumours by W. U. Gardner, of the Yale University School of Medicine, are outstanding. This is the twelfth of the "Colloquia on Endocrinology" and includes a carefully compiled cumulative index of Volumes 1 to 12.

GEOFFREY HADFIELD.

TRENDS IN ANAESTHESIA

Modern Trends in Anaesthesia. Edited by Frankis T. Evans, M.B., B.S., F.F.A.R.C.S., D.A., and T. Cecil Gray, M.D., F.F.A.R.C.S. (Pp. 318+ix+13; illustrated. 67s. 6d.) London: Butterworth and Co. (Publishers), Ltd. 1958.

In any branch of medicine in which rapid development is going on there is a real need for a bridge between the textbook, which rarely includes matters at the spearhead and in which the fundamentals may be out of date by the time the book appears, and the specialist journals, which may be nearly impossible for one individual to cover adequately. The "Trends" series bridges this gap admirably. This newest number on anaesthesia lives up to the reputation of the others. In the space of only 300 pages most of the

important aspects, both theoretical and practical, of anaesthesia are dealt with by well-chosen experts who do their job well. For example, W. D. M. Paton discusses very competently the nature of the mechanisms involved in neuromuscular transmission and block. Current work on the behaviour of the motor endplate to relaxants, and on the role played by the small myelinated gamma motor fibres in reflex action, is particularly clearly summarized. C. Gray gives a picture of the present status of hypothermia that could not be bettered for brevity and completeness. Both the methods of cooling patients and the physiological effects that follow are described in the light of modern work. While the indications are clearly expounded, the risks and limitations of the methods are no less so.

Other equally outstanding contributions come from A. B. Dobkin on pulmonary ventilation and control during anaesthesia, J. J. Bonica on the place of regional anaesthesia, and I. C. Geddes on local analgesics. There are 17 other chapters, however, all full of interest and well documented with references. The authors have been gathered widely. Besides Britain, the United States (J. J. Bonica, E. M. Papper), Canada (A. B. Dobkin), and Sweden (E. Nilsson) are represented. Illustrations, mostly graphs, are comparatively few (30) and far between. There is little hesitation in describing this book as an important and valuable contribution to anaesthetic literature. At its present standard a life of many editions is assured.

W. W. MUSHIN.

GENERAL SURGICAL OPERATIONS

Orr's Operations of General Surgery. By George A. Higgins, M.D., F.A.C.S., and Thomas G. Orr, Jr., M.D., F.A.C.S. Third edition. (Pp. 1,016+vi; illustrated. £7.) Philadelphia and London: W. B. Saunders Company. 1958.

This well-produced and lavishly illustrated volume of over 1,000 pages is intended for general surgeons. This raises the question, What (or who) is a general surgeon? By looking through this book one may find some limitations which the authors would impose. We find, for example, that partial gastrectomy is well described but total gastrectomy is omitted; that there is a description of partial pancreatectomy but removal of the whole pancreas is not included. The only operations on the skull which are described are for fracture, extradural and intradural bleeding, and, curiously enough, arterial encephalography. All operations on the brain are excluded, and there appears to be no mention of operations on the mastoid process in the book. But there is still a wide range left. There are detailed descriptions of removal of a lung or larynx, excision of coarctation of the aorta or an abdominal aneurysm, and all types of amputation (including the hind-quarter); even vaginal hysterectomy and vesico-vaginal fistula are included. It is, of course, impossible to set a limit for any particular general surgeon. Experience, opportunity, personal skill and inclination, all have a part in determining which operations a surgeon will be prepared to perform. It would be a retrograde step to make too hard-and-fast limitations. Certainly most general surgeons will find this book useful.

ZACHARY COPE.

CHILDHOOD ASTHMA IN KANSAS

The Management of Childhood Asthma. By Frederic Speer, M.D. (Pp. 116+xii; illustrated. 36s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1958.

This small volume is essentially concerned with the management of extrinsic allergic factors in asthmatic children as they are found in Kansas in the United States. It is emphasized that foods and inhalants are the basic causes of asthma in children, and only by careful investigation and treatment on these lines can success be obtained. Foods are considered the "leading" allergens, milk, chocolate-cola, egg, and "legumes" accounting for just over 80% of food allergens. The limitations of skin testing for foods are discussed, and the emphasis is on detection of food allergens by thorough trial dieting. In the chapter on the

management of problem cases the author writes: "The problem of intractable asthma which is at once the most important and difficult is that of hidden or latent food allergies. It is a difficult problem because hidden food allergens may become manifest only when the child is under stress"—a viewpoint which has little support in Great Britain.

The investigation and treatment of inhalant allergens follows conventional lines, but it is surprising to us in Britain to find that *Alternaria* mould spores are considered of outstanding importance, occurring in 67% of all inhalant allergens, ragweed-pollen sensitivity occurring in 43%, house dust in 38%, *Helminthosporium* in 23%, and grass pollen in 18%. The mould-spore and pollen counts found in Kansas are set out. These findings, both botanical and clinical, emphasize the considerable differences which exist between Kansas and Great Britain. In the latter country there is no ragweed, *Helminthosporium* is rarely caught on our slides and culture plates, and *Alternaria* occurs only in relatively small numbers. "Psychic stress" is a recognized contributory factor in certain cases, and infection is considered as a common and treacherous problem in asthmatic attacks, especially in infants; but comparatively little space is given to these aspects of asthma. The treatment of the asthmatic is well set out and includes advice on cortisone and corticotrophin dosage. It is an easily read and well-produced book.

D. A. WILLIAMS.

ENCHONDRAL DYSOSTOSES

Wesen und Bedeutung der Enchondralen Dysostosen. By Hans Mau. (Pp. 219+xii; illustrated. DM.27.) Stuttgart: Georg Thieme Verlag. 1958.

In this book on the "Nature and Significance of Enchondral Dysostoses" Dr. Hans Mau has with great application collected and correlated a large number of skeletal abnormalities whose origins lie in the maldevelopment of the epiphysis or the metaphysis. He has reconsidered the aetiology, pathology, and clinical, biological, and radiological aspects of the congenital disturbances of ossification called chondrodystrophy or multiple dyschondroplasia, and with this he has also studied gargoylism and chondrodystrophia calcificans. The object of the work is to relate various deformities one to another under the term "enchondral dysostoses." By this is meant a hereditary metaphysal or epiphysal ossification—collectively uncomplicated and without resemblance to tumour formation and varying in severity. To this group also belong asymmetrical forms and some cystic forms, even if these are not hereditary.

A very wide range of bony abnormalities is included in this definition; to quote a few: cleido-cranial dysostosis, osteogenesis imperfecta, Ollier's disease, osteochondritis vertebralis, dyschondroplasia, varieties of coxa vara, and osteochondritis dissecans. It is not Dr. Mau's fault that many of these syndromes, recognized entities and single cases, have in many instances several names of a complicated nature, in English and in other languages. Some of these names appear even more terrifying and incomprehensible in German. This makes hard reading. Dr. Mau, however, makes his main points, and deserves great credit for drawing attention to the essential similarity of many skeletal abnormalities and their hereditary basis, and for emphasizing the need to examine the whole skeleton if the general manifestations which frequently accompany a particular deformity are not to be overlooked—for example, dwarfism and skeletal disproportion or coxa vara. Of the propriety of casting his net so widely only time will tell. In discussing osteochondritis dissecans the massive, often bilateral, form with a hereditary basis is not clearly distinguished from the minute, more common, post-traumatic form, but so many conditions are included that the discussion of each one must inevitably be short.

The book will stimulate those who read it to take a deeper interest in hereditary and epiphysal defects, and to examine their cases more carefully both clinically and radiologically to exclude defects elsewhere. Of the primary

cause of these defects the author can say nothing new. A rationalized approach such as he gives should lead to wider observation and the collection of associated defects which may eventually assist in solving the mystery of their formation.

J. G. BONNIN.

INTERNATIONAL CARDIOLOGY

L'Année Cardologique Internationale: Tome VI. By Camille Lian. (Pp. 360; illustrated. 2,000 fr.) Paris: Expansion Scientifique Française. 1957.

The "International Cardiological Year" is edited, as before, by Dr. Camille Lian. There are 26 contributors, all working on the Continent of Europe. The first paper, dealing with obliterative arterial disease, recommends "raubasine" (rauwolfia) and the subcutaneous injection of radioactive waters. A discussion of the regimens for treating heart failure warns against too rigid restrictions, which may be worse than the malady. There is an interesting discussion of the effects of mitral disease on the lungs, and of the relief by valvotomy. The treatment of acute pulmonary oedema is helped by anti-foam preparation, such as silicones if an irritating substance has been inhaled; otherwise aerosol in alcohol is recommended. The clinical picture of the premonitory period of myocardial infarction is discussed. Transient subendocardial or subpericardial lesions are shown in the electrocardiogram. Anticoagulants and vasodilators may prevent actual infarction. In the prevention of myocardial infarction by anticoagulants it is suggested that this be used only in grave cases; the difficulties of proper control and really efficacious treatment are emphasized. For Stokes-Adams attacks isopropylnoradrenaline is favoured. In the diagnosis of myocardial infarction a rise of transaminase in the serum is found in all cases in the first three days; it does not occur in pulmonary infarction. Hydatid cysts of the heart are the subject of a paper. There is an interesting article on the familial incidence of derangements in the metabolism of cholesterol. Ammi visnaga (khellin) is thought to be of some use in effort angina.

This is a useful collection of papers from various countries showing the trends of thought and interest on various important topics that stand out at the present time. Many papers have references; in some it is a pity that only names are given, but no references at all.

TERENCE EAST.

The Dr. Albert Wander Memorial Lectures have been delivered in Berne biennially since 1952. The first three lectures have recently been published in one volume (*Dr. Albert Wander Gedenkvorlesung, Heft 1*; 89 pp., illustrated; Hans Huber, Berne and Stuttgart, 12.40 Swiss francs) and comprise "Das Höhenklima und sein Einfluss auf den Menschen," by Alexander von Muralt, "The Conquest of Bacterial Disease," by Sir Howard Florey, and "Sulfamides et Biologie," by Jacques Tréfouël.

In 1947 the Universities Federation for Animal Welfare produced the first edition of its *Handbook on the Care and Management of Laboratory Animals*. The considerable advances in knowledge of the subject since that time have now been incorporated in a second edition, obtainable from the Federation, 7a, Lamb's Conduit Passage, London, W.C.1 (pp. 951, illustrated: 70s.). Joint editors of the new edition are Mr. A. N. Worden and Dr. W. Lane-Petter, and Sir Harold Himsforth has contributed a foreword. The first 16 chapters deal generally with housing, breeding, and other considerations common to laboratory animals, while the remainder of the book discusses some 50 individual species or groups of species. Relevant references are appended to each chapter and there is a full index.

In *New and Non-Official Drugs 1958* the Council on Drugs of the American Medical Association describes drugs that have been newly introduced. Short monographs give chemical and biological details, notes on therapeutic administration and dosage, and contraindications. The drugs are "evaluated on the basis of available scientific data and reports and investigations." Published by J. B. Lippincott and Co., the book is marketed in Great Britain by the Pitman Medical Publishing Co. Ltd. for 30s.

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PHYSICAL ACTIVITY AND CORONARY
DISEASE

In Britain coronary thrombosis, angina, and arteriosclerotic myocardial degeneration are now registered as the cause of about one-quarter of all male deaths over the age of 40. Even though the rising incidence of ischaemic heart disease may not be so dramatic as is sometimes stated, it is one of the principal sources of ill-health and premature death in middle age.

Investigations into the causes of coronary heart disease in Britain have been principally directed towards an assessment of the significance of intravascular thrombosis,¹ defects in blood coagulation,^{2,3} hormonal factors,⁴ and physical activity.⁵ J. N. Morris and his colleagues⁶ have reported that rapidly fatal ischaemic heart disease is more common in the sedentary drivers of London's double-decker buses than in the more physically active conductors, and more common in the sedentary postal and telephone clerks than in physically active postmen. Moreover, the bus conductors and postmen, when they did suffer from coronary disease, had it less severely than drivers and clerks. On the basis of these observations Morris advanced the hypothesis that men in physically active jobs have a lower incidence of ischaemic heart disease than men in sedentary jobs, and that the disease is not so severe in physically active workers, in whom it tends to present first as angina pectoris. Subsequently, a study of the sizes of the uniforms worn by bus drivers and conductors indicated that the drivers were larger and presumably

fatter than the more active conductors when they entered the transport service⁷; thus factors other than physical activity, such as selection of occupation, appear to be operating.

Nevertheless, Dr. J. N. Morris and Dr. Margaret Crawford in a remarkably interesting study printed in the opening pages of this issue have gone far towards confirming their hypothesis. Throughout Britain they have had the co-operation of many pathologists, who each completed a standard form of inquiry for 25 unselected consecutive necropsies on men between the ages of 45 and 70 years. From an analysis of the reports of 5,000 necropsies the incidence of large discrete areas of myocardial fibrosis (greater than 1.5 cm. in any one dimension), multiple small myocardial scars, and coronary atheroma was related to occupational activity during life. There were 1,700 different descriptions of occupations, and these were classified into light, active, and heavy jobs according to the physical activity demanded. In 3,800 necropsies on patients dying from some cause other than coronary disease twice as much ischaemic myocardial fibrosis was found in light workers (13.4%) as in heavy workers (6.8%). This was more obvious in cases with large fibrous myocardial infarcts than in those with smaller multiple scars, and an excess of large fibrous infarcts was particularly evident in the younger age groups. In contrast to this striking correlation between ischaemic myocardial fibrosis and physical inactivity, there was only slightly more coronary occlusion in light workers and no significant difference in the prevalence of severe coronary atheroma between the three groups of occupational activity. The necropsies performed on patients whose deaths were due to clinical coronary heart disease numbered 1,200, and heavy workers were the least common among these.

Morris and Crawford include in this article a study of physical activity in relation to the incidence of ischaemic heart disease by social class. In 1910 Osler⁸ commented on the "remarkable fact with which we are all familiar—that angina pectoris is an affection of the better classes, and not often seen except in private practice." After the 1931 census the Registrar-General⁹ published the standardized mortality ratio for various diseases according to occupation. Physicians and surgeons headed the list of deaths from coronary disease. The proprietors of wholesale businesses, the legal profession, and the Church followed close behind. In contrast, chemical workers, agricultural workers, stone quarriers, and certain grades of miners had an unusually low death rate from coronary disease. The pattern is much the

same to-day. J. A. Ryle and W. T. Russell¹⁰ interpreted these findings as a reflection of the exacting character of sustained mental effort required in intellectual and responsible occupations.

J. N. Morris, J. A. Heady, and R. G. Barley¹¹ showed that the incidence of first attacks of angina and myocardial infarction is twice as high in general practitioners as in consultants and specialists, whose rates of morbidity and mortality are similar to those of members of other professions than medicine. They wisely refrained from offering any explanation of these findings, but these various social differences in the incidence of coronary disease are often attributed to the different emotional tensions and environmental stress of contrasting occupations. It is very difficult to judge what is stressful to any particular individual, and W. M. Arnott¹² has emphasized that excessive psychological stress has never been shown to be more harmful in the professional and intellectual classes than in the less privileged classes. Indeed, it might be argued that the stress factor could be expected to operate more in communities where poverty, insecurity, and starvation are rife. P. Stocks¹³ examined the mortality from coronary disease in the various social classes, relating it to the physical demands of occupation, and suggested that the differences could be as well explained by physical activity as by the mental stress of the occupation. Morris and Crawford have confirmed this suggestion by reporting that the incidence of ischaemic myocardial fibrosis shows a steady fall from the professional and executive classes (13.3%) through the skilled technician groups to the unskilled labourers (7.8%). While supporting the popular belief that ischaemic heart disease is commoner in the better-off sections of the community, they found that this trend disappeared when the social classes were analysed in terms of the physical activity of the occupations in them. Thus the frequent occurrence of ischaemic heart disease in the professional and executive classes seems to be more dependent on physical inactivity than on high standards of living, education, skill, and responsibility.

As the authors are undoubtedly aware, their study is open to several criticisms. The nature of only the last occupation has been recorded, and thus no allowance has been made for any alteration in physical activity consequent upon a change of occupation. It is a common aspiration of manual workers to progress towards executive and more sedentary jobs, particularly if they have an ambitious and conscientious personality. It is also possible that the development of ischaemic myocardial fibrosis could so reduce the exertional capacity of active and

heavy workers as to induce them to seek lighter jobs and yet be insufficient, once they had changed their work, to lead to symptoms. Details about earlier employment might therefore have been informative. Again, no account of leisure activity has been given; this is often erratic and hard to assess, but some apparently sedentary workers are probably more active than they seem from analysis of their physical activity at work alone. Much depends on the accuracy of the description of occupation, which is so often casually recorded in case histories. An omission which many will regret is a record of the weight or obesity of the patients in this series. Without further knowledge, therefore, many will not be able to accept unconditionally Morris and Crawford's hypothesis that work entailing physical activity is a protection against ischaemic heart disease.

Although greater physical activity may possibly reduce intravascular clotting, probably its more important effect is to increase the coronary collateral circulation. Physical exertion increases the cardiac output and the coronary blood flow, but not necessarily in parallel. Most adults have some degree of coronary atherosclerosis and rigidity of the coronary arteries; it might be expected, therefore, that coronary flow will not always keep pace with the increase in cardiac output. Minimal myocardial anoxia could develop, and this has been shown to act as a stimulus to the formation of collateral coronary anastomoses.¹⁴ Indeed, effective collateral vessels develop more profusely in dogs with coronary obstruction if the dogs are exercised.¹⁵

Further studies are required, but if they support the proposition that habitual physical activity might reduce the incidence of ischaemic heart disease, then there are certain practical implications to be considered. Artificial restrictions should not be placed on the physical activity of patients who already have symptoms of coronary disease, and, within reason, the patient should be allowed to decide his own level of exercise tolerance. In this way a better coronary collateral circulation might be encouraged, and, in theory at least, the extent of a further myocardial infarct might be limited. The rest of us in sedentary occupations should endeavour to take more exercise regularly, although sudden and violent exertion is probably undesirable, particularly in middle age. Studies of the protective action of leisure activities are now indicated. Meanwhile some good might be done by walking part or all of the way to work and by being less dependent on cars, buses, and lifts. The active in mind should make time to remain active in body.

¹ Duguid, J. B., *Lancet*, 1949, 2, 925.² O'Brien, J. R., *Amer. J. med. Sci.*, 1957, 234, 373.³ Poole, J. C. F., *Brit. med. Bull.*, 1958, 14, 253.⁴ Oliver, M. F., and Boyd, G. S., *Lancet*, 1956, 2, 1273.⁵ Morris, J. N., and Heady, J. A., *Brit. J. Industr. Med.*, 1953, 10, 245.⁶ — et al., *Lancet*, 1953, 2, 1053, 1111.⁷ — Heady, J. A., and Raffle, P. A. B., *ibid.*, 1956, 2, 569.⁸ Osler, W., *ibid.*, 1910, 1, 697.⁹ Registrar-General's Decennial Supplement, England and Wales 1931. Part IIa, "Occupational Mortality," 1938, H.M.S.O. London.¹⁰ Ryle, J. A., and Russell, W. T., *Brit. Heart J.*, 1949, 11, 370.¹¹ Morris, J. N., Heady, J. A., and Barley, R. G., *Brit. med. J.*, 1952, 1, 503.¹² Arnott, W. M., *ibid.*, 1954, 2, 887.¹³ Stocks, P., *Lancet*, 1951, 1, 351.¹⁴ Zoll, P. M., Wessler, S., and Schlesinger, M. J., *Circulation*, 1951, 4, 797.¹⁵ Eckstein, R. W., *Circulat. Res.*, 1957, 5, 230.

LUMBAR PUNCTURE

Examination of samples of cerebrospinal fluid obtained by lumbar puncture is one of the most important and valuable diagnostic measures utilized in the investigation of neurological cases. Consequently it is tempting to carry it out as a routine in all varieties of neurological disease. This is a temptation worth resisting firmly, because lumbar puncture may in certain cases carry serious dangers to life, while at the least it may occasionally prove to be a painful procedure, no matter how skilful the operation; severe and incapacitating headache follows in some cases. Thus the decision to carry it out needs careful consideration of each individual case, with an attempt to weigh the risks against the possible information it may yield.

Of all the contraindications to lumbar puncture, raised intracranial pressure due to a focal intracranial lesion is perhaps the most complete. In such a case removal of spinal fluid from the lumbar theca may result in sudden death from compression of the brain stem due either to herniation of the cerebellar tonsils into the foramen magnum, or of the medial part of one or both temporal lobes through the tentorial hiatus. Hence papilloedema, or clinical suspicion of a cerebral tumour, particularly in the posterior fossa, is usually a contraindication, though it is generally safe to carry out the procedure with caution in patients who are believed to have an infiltrating neoplasm in one or other cerebral hemisphere but who show no clinical evidence of increased intracranial pressure. No hard-and-fast rules are applicable to every case, since in tuberculous meningitis, for instance, there may be papilloedema, but lumbar puncture is nevertheless essential for diagnosis. This fact only serves to underline the necessity for regarding this investigation as a matter for individual decision, based on clinical appraisal and experience. Local cutaneous and spinal abnormalities such as skin sepsis and ankylosing spondylitis are among other possible contraindications. The belief once widely held that lumbar puncture may promote relapse in disseminated sclerosis no longer appears to be valid, and in certain patients presumed to be suffering from this disease the investigation is essential in order to exclude surgically remediable compression of the spinal cord.

Once the decision to carry out a lumbar puncture is made, all possible steps should be taken to make the procedure as tolerable as possible for the patient. Prior sedation may occasionally be necessary, with paraldehyde for noisy or restless patients, or with sodium amytal or methylpentynol for the

apprehensive. This is not the place to describe many details of technique, except to suggest that the old-fashioned wide-bore needle with a built-in two-way tap should no longer be used, since much finer needles of the Harris type are more satisfactory. There is general agreement that infiltration of the skin and interspinous ligaments with local analgesic should be carried out, but deep infiltration is unnecessary. With these precautions, and with the patient relaxed on his left side with the back arched and the knees drawn up to the chin, the insertion of the needle should be virtually painless. Care is taken not to insert the needle too far, as it may then enter vertebral veins, causing bloody contamination of the fluid, or alternatively it may enter the annulus fibrosus of an intervertebral disk and possibly be responsible for subsequent disk prolapse.

The avoidance of the unpleasant headache which so often follows the examination, even in normal people, is a matter of some difficulty. The headache is believed to be due to continual seepage of cerebrospinal fluid into the extradural space through the hole in the dura left by the exploring needle. It is certainly true that, the smaller the needle which is used, the less frequent are these headaches. It might be expected that in patients whose cerebrospinal fluid pressure is lower than the average these headaches would tend to be more frequent, but no such correlation has been detected. Some recent observations of R. J. Brocker¹ are of interest. He points out that if the patient lies supine after a lumbar puncture the spine is flexed, a negative pressure is created in the extradural space, and cerebrospinal fluid is drawn out through the hole in the dura. He suggests that, in order to separate rather than cut the dural fibres with the point of the needle, it should be inserted with the bevel vertical instead of horizontal; then, immediately the needle has been withdrawn, the patient should be turned into the prone position and should remain there for three hours. Brocker suggests that maintenance of this position, which causes some degree of spinal hyperextension, increases the pressure in the extradural space and prevents leakage of cerebrospinal fluid. His own observations certainly seem to support these views, for, in 894 patients who remained prone for three hours following lumbar puncture, headache occurred in only 4 (0.5%), while the incidence of headaches in 200 patients who were kept supine was 36.5%. Some confirmation of these observations from other workers would be welcome, but it seems that assumption of the prone position immediately after lumbar puncture may be an effective means of reducing the incidence and severity of headache.

¹ Brocker, R. J., *J. Amer. med. Ass.*, 1958, 168, 261.

ADMINISTRATION OF OXYGEN TO INFANTS

Oxygen has for long been an accepted part of the treatment of so many disorders and a life-saving remedy in emergencies that it is sometimes overlooked that there may be certain hazards associated with its administration. Unfortunately these hazards are most often encountered just when the need for oxygen is greatest—namely, in premature infants immediately after birth. At this time it is certainly a potentially iatrogenic agent; the two diseases for which it has been held responsible, at least in part, are retrolental fibroplasia and hyaline membrane disease.

Retrolental fibroplasia first attracted attention after the report by T. L. Terry¹ in the U.S.A. in 1942. Within a short time it became clear that cases of the disease were widespread in many different countries and the incidence of blindness in babies rose alarmingly. It was not until 1953 that oxygen was finally incriminated² and, with the recognition of the fact that high concentrations must be avoided, the incidence of retrolental fibroplasia fell as precipitously as it had arisen. Nevertheless in the comparatively few years of its existence it brought blindness to many hundreds of infants. It is now general practice in all maternity units and in children's hospitals admitting premature infants for the concentration of oxygen to be carefully controlled and not allowed to exceed 40%.

The recognition of hyaline membrane disease is also of recent origin. It is almost entirely confined to premature infants, is particularly common after caesarean birth, and is usually fatal. The exact cause is not known, but experimental work suggests that oxygen may play an important part. The latest report, from Sweden, by R. Berfenstam and colleagues,³ suggests that excessive oxygen may act by diminishing the ciliary activity in the bronchial tree and thereby favour the retention of the material forming the hyaline membrane. In rabbits exposed to oxygen in 70–80% concentration for 48 hours the ciliary action was both quantitatively and qualitatively reduced. Berfenstam and colleagues suggest that premature infants, adapted to low oxygen tension *in utero*, may show evidence of oxygen toxicity at relatively low concentrations in extrauterine life, and they stress the necessity for determining what level of oxygen concentration is safe for such infants in their earliest days after birth. They also found experimentally that excessive oxygen caused vascular damage with increased capillary permeability, and the resulting exudate probably furnished the main part of the hyaline membrane.

In view of these toxic properties of oxygen the methods of administering it to premature infants require careful supervision. Whereas in later infancy the problem may be how to keep the concentration sufficiently high in such emergencies as laryngotracheobronchitis, bronchopneumonia, and cardiac failure, the problem in the emergencies associated with the establishment and

maintenance of adequate respiration in premature infants is how to do this with an oxygen concentration not exceeding 40%. There are many ways of enriching the infant's atmosphere with oxygen, some simple, some complex; they include administration through a rubber or plastic face mask periodically; by nasal catheter or by a catheter passed into the stomach; and by oxygen tents and complicated incubators incorporating constant humidity and temperature control, carbon-dioxide absorption, and atomized mists to accompany the oxygen. Whenever a closed method is used, repeated estimations of the oxygen concentration are desirable. Simple "perspex" bell covers are notoriously deceptive in the rate at which the oxygen tension rises, even with a flow of only 1 litre per minute, and not all flowmeters are sufficiently accurate for the physician to assume that if the flow remains below a certain rate the oxygen tension will not rise above a certain level. Dry oxygen is more irritating to the lungs than when it is adequately moistened, but bubbling it through a Woulfe's bottle does not produce sufficient moisture unless there are means for maintaining the humidity of the infant's surroundings at or above 65%.

A simple device for administering oxygen to infants and young children has recently been described by R. Batson and W. C. Young.⁴ It consists of a transparent plastic open-top box. Its advantages are that, as oxygen is heavier than air, its maximal concentration is near the bottom of the box, where the infant lies; adequate therapeutic levels can be obtained in 10 minutes; the nursing care of the child is easy and does not interfere with the maintenance of the oxygen supply; there is less likelihood of claustrophobia; and carbon dioxide is adequately disposed of without the necessity for soda-lime. In an emergency they improvised an efficient makeshift with a transparent plastic laundry bag suspended from the cot sides; the infant was placed in the bag and oxygen supplied through a nebulizer with the outflow tube directed into the lower level of the bag. In the treatment of acute bronchopneumonia and similar emergencies in infancy such a simple, cheap, and easily constructed home-made apparatus must have great value. Certainly the open-top box method offers many advantages in the nursing of sick children who require oxygen therapy.

STERIODS IN IDIOPATHIC STEATORRHOEA

In 1951 T. P. Almy¹ described a patient with refractory idiopathic steatorrhea who responded well to treatment with A.C.T.H. There was a striking increase of weight, cessation of diarrhoea, return of normal appetite, and disappearance of abdominal distension. At about the same time A. B. Taylor and his colleagues² reported favourable results from the use of cortisone in six patients, the improvement being accompanied by increased absorption of fat and diminished faecal loss of nitrogen. D. Adlersberg and his colleagues³ used oral hydrocortisone with beneficial results. They found that the free alcohol of hydrocortisone was superior to hydrocortisone acetate. It also appeared to have some advantages over A.C.T.H. and cortisone in that it was

¹ Terry, T. L., *Amer. J. Ophthalm.*, 1942, 25, 203.

² Ashton, N., Ward, B., and Serpell, G., *Brit. J. Ophthalm.*, 1953, 37, 513.

³ Berfenstam, R., Edlund, T., and Zettergren, C., *Acta Paediatr. (Uppsala)* 1958, 47, 527.

⁴ Batson, R., and Young, W. C., *Pediatrics*, 1958, 22, 436.

effective in small doses without side-effects. "No adverse effects, no habit formation, and no resistance to this mode of therapy have been noted."

While these observations were being made in America, European workers were more occupied with the Dutch discovery^{5,6} that a gluten-free diet would render children with coeliac disease symptom-free and permit normal growth and development. These original observations were rapidly confirmed^{7,8} and it has since been found that a considerable proportion of adult patients with idiopathic steatorrhoea respond well to a gluten-free diet.^{9,10} Indeed, the consensus of opinion is that idiopathic steatorrhoea in the adult is the same disease as coeliac disease in children, though tropical sprue appears to be a different illness.

J. M. Finlay and K. J. R. Wightman¹¹ compared the effects of cortisone and a gluten-free diet in adult cases of idiopathic steatorrhoea and found that cortisone rapidly relieved the diarrhoea and improved the absorption of fat. On the other hand, the response to a gluten-free diet, though more slow, was more complete. In terms of practical medicine, the corticosteroids have generally appeared to have only a small part to play in the treatment of idiopathic steatorrhoea, although useful in initiating a remission especially when given in combination with a gluten-free diet. However, M. J. Lepore¹² has now described six patients whom he has maintained in good health on long-term treatment with corticosteroids in quite small doses, such as 40 mg. or less of hydrocortisone a day, for periods of up to seven years. When corticoids have been stopped, these patients have relapsed, sometimes in two or three weeks and sometimes after a longer period. Lepore remarks that in his experience the best responses to a gluten-free diet have been seen in patients with a definite history of coeliac disease in childhood; none of these six patients treated with adrenal steroids had such a history.

The mode of action of adrenal steroids in idiopathic steatorrhoea remains problematical. However, J. W. Paulley's¹³ original observation that the mucosa of the small intestine is histologically abnormal in idiopathic steatorrhoea has been abundantly confirmed by recent studies.¹⁴⁻¹⁷ It is possible that the adrenal steroids act directly on this abnormal mucosa and block whatever

mechanism is responsible for defective absorption in this disease. Even though we do not understand the mode of action, Lepore's work suggests that maintenance treatment with small doses of corticosteroids is worthy of trial in patients who fail to respond well to a gluten-free diet. It is probably wise to continue with the gluten-free diet in addition.

DOES B.H.C. DAMAGE THE BONE MARROW?

When a new chemical is introduced into general use under a variety of conditions, a heavy responsibility rests on those called upon to give an opinion on its safety for such uses. At an early stage reliance must be placed on the reaction of experimental animals and that of the people who may handle the compound during its manufacture and early development. By these standards B.H.C. (benzene hexachloride, "gammexane") seemed at least as safe as D.D.T., on whose heels it followed closely. It seemed to be safe for use as an insecticide under a wide variety of conditions, and has been widely used in public health work and agriculture. There is no evidence that it will produce poisoning except (rarely) under conditions of gross carelessness or misuse.¹⁻³ Enormous quantities have been sprayed in malaria control, and often the wettable powders are dispensed by hand and the suspension stirred by hand. When the same methods were used to handle dieldrin, poisoning soon became evident.⁴

Now, however, a few scattered reports are appearing implying that exposure to B.H.C. can cause agranulocytosis or leukaemia. When such cases are discussed together, as in a recent study of leukaemia in cousins,⁵ the record against B.H.C. at first sight appears rather black. Nevertheless caution is advisable before jumping to conclusions. No cases have been reported among the most heavily exposed people. Have they been missed? This is possible. Among 79 people with illness following the misuse of B.H.C.² there is no report of agranulocytosis, though these people were anaemic—they were also undernourished. It is worth considering the exposure of the victims of these blood disorders: two cousins unloaded bags of B.H.C. for a month about eight months before their illness⁵; one man sprayed crops for two days just before his illness⁶; another disinfested clothes and other articles at irregular intervals in full protective clothing⁷; another worked in a shop in which a vaporizer had been installed a few months earlier.⁸ Both cases of agranulocytosis had a preceding infection. One had received 2.5 g. chloramphenicol; the other had had 6 g. sulphonamide, 0.5 g. chloramphenicol, 200 mg. phenylbutazone, and a suppository containing amidopyrine. It may thus be unreasonable to blame the vaporizer for the

illness. If agranulocytosis were caused by B.H.C., surely it would be much more common among people who handle large quantities of the drug with no particular precautions. At any rate it is among such people that any attempt to substantiate that suspicion should be made.

An unfortunate gap in the technique of experimental toxicology is the lack of any method for reproducing in animals those conditions such as agranulocytosis seen with such regularity after certain drugs are widely introduced into medicine. Indeed, little or nothing is understood about the mechanism of the reaction except that it is believed to be a form of hypersensitivity and therefore presumably has some immunological basis. Meanwhile if anyone is tempted to sum the individual reports referred to here and make out a case against B.H.C., it is also worth bearing in mind the caution expressed by each author about his own case. Such qualifications in the appraisal of individual cases tend to get lost when generalizations are made.

THE EPIDERMIS IN ECZEMA

In patients whose inborn pattern of reaction to stress is dermatological and eczematous, the catarrhal reaction which emanates from the papillary capillaries is thought to result from the action of metabolites derived from epidermal cells. J. H. Allison and F. R. Bettley,¹ by some neatly executed experiments, show that the epidermis of the normal skin in such eczematous patients is "fragile" in the sense of being abnormally sensitive to injury. Cantharidin has a toxic effect on epidermis, causing acantholysis, and can be used to produce a blister on the skin. Allison and Bettley show that the acantholytic effect of cantharidin is more marked in the eczematous than in the non-eczematous subject and is not influenced by the oral administration of prednisone. There is also a significantly greater exudation of fluid and it contains a higher proportion of protein in the atopic subject than in the normal or in those suffering from urticaria or from so-called seborrhoeic, hypostatic, or nummular eczema. The urticarial subjects were chosen as controls because they were presumed to have an abnormality of vascular response leading to increased capillary permeability.

These results suggest that over and above any effect, direct or indirect, of cantharidin on capillary walls, in the atopic subject the vulnerable and damaged epidermal cells contribute something which affects the permeability of the vessel walls, influencing the quantity and character of the plasma exudate. The authors do not give clinical details, but it is presumed that under the not very satisfactory term atopic they imply a state of chronic eczema starting at infancy and associated with hay-fever or asthma and often with urticaria. This syndrome, also known as the asthma-eczema-prurigo syndrome or Besnier's prurigo, may be associated with

xeroderma and sometimes with a special type of juvenile cataract. It is commonly familial. It would have been interesting to know the results of similar investigation with cantharidin in patients with simple xeroderma, but so far as it goes it does perhaps support the suggestion previously put forward that Besnier's prurigo is in part dependent upon an ectodermal defect.²

The investigation is important in suggesting some difference in mechanism between eczema of the inherited or atopic variety and other forms of acquired eczema. The significantly altered reaction in the patients with atopic disease, pointing to a peculiar epidermal component in the reaction, may explain in part the difficulties encountered in treating them and should direct attention to measures which act more directly upon the epidermis.

LEUCINE AMINOPEPTIDASE

Enzyme tests are being increasingly used in diagnosis. One of the latest enzymes to be studied is leucine aminopeptidase, a proteolytic enzyme which hydrolyses leucine-containing peptides. It is present in many tissues but is particularly abundant in duodenal juice and in the kidney and liver. It can be estimated by a colorimetric method based on the formation of an azo dye.¹ Normal values for serum average 142 units for men and 130 for women, while urinary activity is about 82 units in men and 43 units in women. A. M. Rutenburg and his colleagues² have recently analysed the results from determinations of leucine aminopeptidase in over 300 patients with a variety of clinical conditions. Exceptionally high levels in serum and urine—three or four times normal—were found in patients with carcinoma of the pancreas, whether jaundiced or not. The serum activity was significantly higher than that encountered in cases of gallstone in the common duct, in which the level of aminopeptidase was moderately raised. Acute pancreatitis also results in a moderate, though transient, rise in contrast to acute cholecystitis, in which enzyme activity is normal. Serum aminopeptidase is also increased in patients with parenchymatous liver disease, but again to a less extent than in carcinoma of the pancreas. A striking finding was the increased urinary levels in patients with malignant lymphomata, in spite of normal or only slightly raised activity in the serum. Cancer at sites other than the pancreas did not affect aminopeptidase except when liver metastases were present.

It is difficult at this stage to predict the diagnostic value of this particular enzyme. Normal values rule out carcinoma of the pancreas, and its estimation may be of use both in this disease and in the malignant lymphomata. Further work may possibly show that it is a means of differentiating not only extra-hepatic from parenchymatous jaundice, but also jaundice due to stone from that caused by a carcinoma of the head of the pancreas.

¹ Almy, T. P., *Ann. intern. Med.*, 1951, **34**, 1041.

² Taylor, A. B., Wollaeger, E. E., Comfort, M. W., and Power, M. H., *Gastroenterology*, 1952, **20**, 203.

³ Adlersberg, D., Colcher, H., and Wang, C. I., *A.M.A. Arch. Intern. Med.*, 1953, **92**, 615.

⁴ Colcher, H., Drachman, S. R., and Adlersberg, D., *Ann. intern. Med.*, 1953, **38**, 554.

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Drug Treatment of Disease**THE CONTROL OF THE SALE OF POISONS AND DANGEROUS DRUGS**

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"It is more than likely that the annual global injury and number of deaths due to poisoning (excluding alcohol, hashish, opium, and other addictions) exceeds by far the destruction which would be caused by an annual atomic bomb explosion in a heavily built-up area."

Parliament in Great Britain has recognized the risk to the community from poisoning—homicidal, suicidal, and accidental—and for many years has been concerned with legislative measures to lessen the risk. This has been accomplished by restricting the availability of toxic substances to the public. The legislature has distinguished between substances which are toxic and substances which are not only toxic but also lead to addiction. Substances in the first category are described as poisons and those in the second as dangerous drugs.

The current law dealing with these matters is contained in the Pharmacy and Poisons Acts and the Dangerous Drugs Act, 1951, together with their relevant regulations and orders. Owing to the rapid development of the drug industry and the large number of toxic substances being brought into medical use, frequent alterations in the poisons regulations have been necessary. This has made them rather complicated. The following is an attempt to produce a short and simplified account of the present position.

The principal Act is the Pharmacy and Poisons Act, 1933. Section 17 of this Act instructed the Secretary of State to cause the Poisons Board to prepare and submit to him a list of the substances to be treated as poisons and also to divide the list of poisons into two parts—Part I to contain all the poisons in medical, scientific, dental, and veterinary use, and Part II to contain substances in common use.

Substances in Part I of the Poisons List can be sold only by authorized sellers of poisons—namely, registered pharmacists. Substances in Part II of the Poisons List can, however, be sold by authorized sellers of poisons and by listed sellers of poisons—namely, persons whose names are on the local authority's list. Examples of these are iron-mongers and seedsmen who have made successful application to the local authority for inclusion on the list.

Section 23 of the 1933 Act gave the Secretary of State power to make rules for the sale or supply of the listed poisons. This is the authority for the various rules and orders which at present control the manufacture, supply, and sale of poisons.

The most important rules and orders made in accordance with this section are those of 1935. These rules listed poisons to which detailed regulations for supply, purchase, and storage apply. The list appeared in the First Schedule to the regulations, and this is the origin of the term "First Schedule poison." The rules also listed a number of poisons which were to be obtained only on a medical prescription, and these were contained in the Fourth Schedule of the Rules; this is the origin of the term "Fourth Schedule poison." The other schedules to the Act detail further

restrictions, exemptions, and regulations which are chiefly of interest to sellers of poisons.

When new substances are made available and recognized as poisons they are added to the Poisons List, and if they are to be subject to special restrictions they are added also to the First Schedule. If it is considered that they should be available only on a medical prescription, then, in addition to being added to the Poisons List and the First Schedule, they are also added to the Fourth Schedule.

Restrictions on Poisons in First Schedule

These restrictions are concerned mainly with the labelling of the poisons, the recognition of the purchaser as a suitable person to obtain the poison, and the recording of the details of the transaction. A knowledge of them is of importance chiefly to those doctors who dispense their own medicines. Doctors who require First Schedule poisons can obtain them from authorized sellers of poisons either by attending at the premises and signing the poisons register recording the sale or by providing a written order.

Doctors cannot supply poisons except as medicines for their patients. The medicine must be labelled with the name and address of the practitioner. If it is a liquid for external application, the container must bear the words "For external use only" and the name of the article—for example, "The Liniment." The container must be impervious to the poison and must be distinguishable by touch. If the poison is supplied in any way, apart from personal administration, a record must be made in a book showing the date of supply, the ingredients of the medicine, the amount of the poison, and the name of the patient. These records must be made on the same day as the medicine is supplied or, if this is not practicable, on the following day.

All the potent medicinal poisons are included in the First Schedule—for example, arsenical poisons, barbiturates, ergot, hydrocyanic acid.

Restrictions on Poisons in Fourth Schedule

The Fourth Schedule contains a list of substances which can be sold by retail only on a prescription given by a registered medical practitioner, registered dentist, or registered veterinary surgeon. In cases of emergency, when the doctor is unable to give the prescription immediately, the authorized seller may provide the poison in accordance with the doctor's instructions, provided the doctor undertakes to forward the appropriate prescription within 24 hours. The prescription for a Fourth Schedule poison must be in writing, must be signed and dated by the person giving it, and, if it is not a National Health Service prescription, must specify his address. The prescription must also specify the name and address of the person for whose treatment it is given, and must also show the total amount of the substance to be supplied with the dose to be taken.

Restrictions are also imposed upon the dispenser of Fourth Schedule poisons. He cannot dispense these poisons more than once unless the prescriber has stated that they may be dispensed a stated number of times or at stated

intervals. A prescription containing a direction that it may be dispensed a stated number of times, but omitting direction as to the intervals at which it may be dispensed, cannot be dispensed more often than once in three days. A prescription which contains a direction that it is to be dispensed at stated intervals, but without direction as to the number of times, cannot be dispensed more than three times.

In the Rules of 1935, the Fourth Schedule occupied seven lines; the current list of Schedule Four poisons contains thirty-seven lines. This illustrates a tendency which is likely to continue and explains some of the practitioner's difficulties. In this long list, probably the seven most frequently used drugs are: the barbiturates; the sulphonamides; amphetamines and its associated compounds; the antihistamines; chlorpromazine; phenylbutazone; troxidone.

The Dangerous Drugs

These are poisons which also produce some degree of addiction. In addition therefore to being dealt with by the Dangerous Drugs Acts, they are contained also in Part I of the Poisons List and in the First Schedule to the Poisons Rules.

The purpose of the Dangerous Drugs Acts is to regulate the import, export, manufacture, sale, and use of drugs of addiction. The addiction-producing drugs are also an international problem, and developments in their use are kept under constant review by the World Health Organization.

The current Act is the Dangerous Drugs Act, 1951. Numerous regulations and orders have been made under this Act and probably will continue to be made. The principal regulations are the Dangerous Drugs Regulations, 1953.

One of the most important provisions of the Dangerous Drugs Act is that only certain specified persons are allowed to have these drugs in their possession. Doctors find a place in that group, and while many of the regulations under the Act are not of direct interest to them it is important that they should know their obligations in regard to possessing these drugs, prescribing them, and keeping records of them.

As to the possession of Dangerous Drugs, it is important for the doctor to realize that this is authorized only so far as is necessary for the practice of his profession. The continued supply of drugs to a patient solely for the gratification of addiction is not regarded as a medical need.

These drugs can be dispensed only on a prescription by a registered medical practitioner, registered dentist, or registered veterinary surgeon. The prescription must contain the particulars previously detailed in connexion with Fourth Schedule poisons. The Dangerous Drugs cannot be dispensed more than once on the same prescription unless the prescription so directs, and this is restricted to a total of three times and to the intervals specified on the prescription. Sales of Dangerous Drugs may be made directly to doctors in accordance with the Provisions of the Pharmacy and Poisons Act, 1933, as previously detailed for Schedule Four poisons.

Doctors are required to keep records of the Dangerous Drugs obtained by them and of the Dangerous Drugs supplied by them. Separate registers must be kept for these purposes and separate parts of the registers must be appropriated for each of the drugs. The entries must be made on the day in question or on the following day. The entries must give the date on which the drug was received or supplied, the amount and the form of the drug, and the authority of the person supplied to be in possession of it. However, if a doctor keeps a day-book in which he records particulars of drugs supplied by him to his patients, with the name and address of the patient and the date of supply, he may record in a separate book the date and the appropriate reference to the entry in his day-book.

It is not necessary to enter in the register of supplies particulars of drugs administered to a patient by the doctor personally or by someone acting under the direct personal supervision of the doctor.

All Dangerous Drugs must be kept in a locked receptacle. The courts do not consider a locked car to be a locked receptacle.

The authority of a doctor to possess and supply Dangerous Drugs may be withdrawn from a doctor who:

(1) has been convicted of an offence against the Dangerous Drugs Act; or

(2) has been convicted of an offence against Sections 45, 56, or 304 of the Customs and Excise Act, 1952, in respect of goods being a drug; or

(3) is the subject of a reception order under the Lunacy Act, 1890; or

(4) is the subject of an order deemed to be or having effect as if it were an order under the Lunacy Act, 1890; or

(5) is undergoing treatment as a temporary patient under Section 5 of the Medical Treatment Act, 1930; or

(6) in Scotland, is the subject of a reception and detention order, or is a voluntary boarder under the Lunacy (Scotland) Acts, 1857–1919;

and who in the Secretary of State's opinion cannot properly be allowed to remain an authorized person. Notice of the withdrawal of authority is published in the *London Gazette* and the *Edinburgh Gazette*.

The current list of Dangerous Drugs contained forty-seven items as at June 1, 1958. The most important of these are medicinal opium, morphine, heroin, Indian hemp, cocaine, pethidine, and amidone.

Antibiotics and Corticosteroids

In addition to the regulations regarding poisons and Dangerous Drugs, which have been described, Parliament has also been concerned with the control of the supply of penicillin and such other therapeutic substances as may appear to the Ministers of Health of England and Northern Ireland and the Secretary of State for Scotland after consultation with the Medical Research Council to be capable of causing danger to the health of the community if used without proper safeguards. The main legislation concerning these substances is contained in the Penicillin Act, 1947, and the Therapeutic Substances (Prevention of Misuse Act), 1953. So far as the medical profession is concerned, the principal result of these Acts and the regulations made under them is that the antibiotics and cortisone derivatives can be obtained by the general public only on a prescription signed and dated by a registered medical practitioner.

The control of poisons and Dangerous Drugs in hospital is a special subject and has recently been under investigation by a departmental committee.² Those who are concerned with this problem should study the report of the committee and particularly the summary of recommendations.

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The World Federation for Mental Health held its tenth annual meeting at Copenhagen last year, and the papers, together with discussion on them, have now been published as *Growing up in a Changing World* (pp. 238; 15s. net). MARGARET MEAD begins the volume with some contrasts between different cultures in the way infants are cared for, and later S. HERMANN and E. A. KRAFF discuss the work of Unesco and W.H.O. respectively in relation to mental health problems. In a section on the prevention of juvenile delinquency KENNETH SODDY (United Kingdom) draws attention to the limits within which punishment might be effective in keeping children out of delinquent ways. He added, "I think that it requires great qualities of imagination for a child to be deterred from following a delinquent whim by the thought of punishment that he may very well hope to escape." Other themes discussed include problems of puberty, genetics, refugees, and disturbed families. The volume is issued by H. K. Lewis Ltd., of London.

FIRST B.M.A. ANNUAL CLINICAL MEETING SOUTHAMPTON, DECEMBER 4-7

Last week we reported the plenary sessions and panel discussions, the Transatlantic Clinical Conference, the demonstrations of colour television and medical films, and the social events of the first two days of the first B.M.A. Annual Clinical Meeting (*Journal*, December 13, p. 1465). This week we conclude our report with an account of what happened on the last two days. A total of 325 doctors attended the meeting, which was accounted on all sides a great success. The Association plans to hold its second Annual Clinical Meeting next year at Norwich.

PANEL DISCUSSIONS

Saturday, December 6, 9.45 a.m.

Risks of Therapy

As on the Friday, Saturday began with two simultaneous and well-patronized panel discussions. The first was under the chairmanship of Dr. R. M. S. MCCONAGHEY (Dartmouth), who had with him Dr. RICHARD ASHER (London) and Mr. D. F. ELLISON NASH (London). They addressed themselves to the question of "The Risks of Therapy."

Opening the discussion, Dr. MCCONAGHEY remarked that the ancient Egyptians in their "textbooks" had recognized that certain diseases were incurable and "should not be touched." He divided risks of therapy into three kinds—risks to the patient, to the doctor, and to the community.

Dr. ASHER said that one danger to the patient was that therapy could prevent diagnosis. He had been invited to diagnose suspected cases of pernicious anaemia which had already been given vitamin B₁₂, and suspected cases of myxoedema which had been given thyroid. He couldn't do it. An opposite danger was the sudden withdrawal of a treatment which should only be withdrawn gradually, as with adrenal cortical steroids. Withdrawal of therapy could sometimes be very difficult, observed Mr. NASH. Psychiatry, once started, was often hard to stop, as was physiotherapy in cold weather when the patient was getting free transport. He thought that doctors nowadays ran more risks than patients and quoted a report that there were 5,000 complaints a year known to medical defence organizations from patients who considered they had not received proper treatment. Dr. ASHER deplored that the public had got the idea that where there was an illness there was necessarily a remedy. They thought treatments always did good and therefore everyone ought to be getting some. They got this notion from magazines. The community could almost be said to have an addiction to treatment. The unfortunate result was that the doctor gave treatment even if the patient was not ill, because it was expected; and the patient thought that, as he was being treated, he must be ill.

Tests to Impress the Coroner

Dr. K. M. ROBERTSON (Southampton) thought that risks of therapy, especially of new drugs, were overstressed in medical journals, and that this caused doctors to fear to take what should be routine risks. Doctors tended to be frightened unduly by individual catastrophes. He also suspected that hospital doctors might be engaged in trying to keep some new drugs to themselves so as to be one up on the general practitioners. Dr. ASHER retorted that, of course, the consultant must have his mysteries from other doctors—it was gamesmanship. He too thought there might be undue fear of taking risks because of the possibility of being sued. He regretted the use of tests to impress the coroner, if they did not also protect the patient. Weekly blood counts in patients taking thiouracil were an example of this.

Mr. NASH, however, did not think thiouracil a good example of a drug which might be used more freely. It could make patients myxoedematous and possessed of very vascular goitres, altogether unattractive subjects for surgery. He suggested that there was undue fear of using chloramphenicol in urinary infections. When these proved resistant to other drugs chloramphenicol should not be withheld.

On risks of therapy to the community Dr. MCCONAGHEY pointed out that diseased individuals—e.g., epileptics and imbeciles—were being preserved by medicine, and Dr. J. H. BARON (London) reminded the meeting that the population of backward countries was increasing rapidly as a result of medical advances and that this led to immense social problems. Dr. ASHER agreed, but pointed out that it would be quite impossible for a doctor not to treat individual patients, because their survival might present problems to which we could see no solution.

Dr. W. M. DIXON (Fawley) observed that we must not imagine that because drugs are prescribed they are necessarily consumed by the patient, and Dr. ASHER thought that this was an important factor in diminishing the risks of therapy. He thought medical practice was getting needlessly complicated. In his young days blood transfusion was simple. But look at it now! It was terribly complex because of alleged risks. In the old days he used to give blood quite happily.

Mr. NASH drew attention to the virtual abolition of thoracic surgeons' waiting-lists by the advent of effective chemotherapy. (The CHAIRMAN supposed that was a risk of therapy for thoracic surgeons.) Surgeons, continued Mr. NASH, had higher risks of litigation than physicians. Fear of this was not wholly bad. The surgeon must protect himself, of course, but not at the cost of terrifying his patients.

Dr. ASHER spoke of the risk of the patient's finding out what was wrong with him. Patients should not generally be told when they had a hopeless prognosis. In his experience this led to misery and distress. Hope should be given even where there were no grounds for it. Mr. NASH said his opinion and experience on this matter were exactly the reverse of Dr. Asher's.

Other risks discussed were those of self-treatment by patients. Haematemesis from aspirin, renal stone from alkali treatment of peptic ulcer, and impotence from antihistamines were cited. Also the risks of quacks growing rich on patients who had been given a bad prognosis were grave: it was human nature not to give up hope, and human nature to exploit that fact. But the meeting could think of no practicable way of diverting this money to more deserving recipients.

More Geriatric Surgery Advised

Mr. R. P. M. MILES (Chichester) thought surgery in the very old often led to trouble; the patient was often "never the same man again." Mr. NASH disagreed. The more old people operated on the better. In fact they were often anaesthetized more safely, with their breathing being done for them, than they were walking about straining themselves. His advice was to get the hernia or the piles out of the way, so that they would not remain to complicate other diseases—prostatic enlargement, for example—making the patient worse off when he had to be operated upon. An efficient rehabilitation service was, of course, vital in geriatric surgery.

Dr. ASHER agreed. Old people wanted to live, or die; merely to exist in discomfort was useless to them. Surgeons should take more risks and not worry about spoiling a set of good operating figures. Dr. MCCONAGHEY said it was not surgery that did old people in, but hospitalization and being put to bed. Dr. ASHER said he could talk indefinitely about the dangers of bed. He had once even written an article on the subject.

The CHAIRMAN turned the attention of the meeting to diagnostic investigations, unnecessary use of which was condemned. Sometimes they caused more discomfort than the disease. Dr. ASHER said he would rather have pernicious anaemia than undergo a modern full-scale investigation to see if he had. Patients should be given hope and not be over-investigated, he said. But Mr. NASH repeated that they should be told the truth as well as not being over-investigated.

Ocular Emergencies

The other panel, whose subject was ocular emergencies, consisted of Mr. B. W. RYCROFT (East Grinstead) and Mr. A. G. LEIGH (London), under the chairmanship of Mr. E. C. ZORAB (Southampton). They discussed first acute glaucoma.

Mr. RYCROFT reminded the audience that acute glaucoma was a sick eye in a sick body, and that views on its cause were changing. It had been believed to be due to interference with the drainage of fluid from the eye, but now a centre in the mid-brain was thought to be responsible for the tension of the eye. As acute glaucoma could cause very rapid blindness, prompt diagnosis and treatment were imperative. There might be gradual loss of vision or the appearance of a halo round lights. Treatment was the use of eserine drops to contract the pupil, and acetazolamide ("diamox"), 250 mg. thrice daily by mouth, or intravenously if necessary. Mr. LEIGH stressed the importance and the difficulty of the diagnosis, which rested on the recognition of a steamy cornea in a red, tender eye with a dilated pupil. The pain was so severe that it could not be accurately localized and was sometimes wrongly diagnosed as due to abdominal catastrophes, etc. Surgery had now been almost completely supplanted by acetazolamide therapy, and it was very unusual for recovery not to ensue. If acetazolamide failed, then iridectomy was necessary.

Corneal Lesions

The panel then discussed lesions of the cornea. Mr. LEIGH recalled that corneal epithelium is capable of regeneration without scar. In an abrasion some of the epithelium was wiped off; it regenerated partly by pseudopodial migration from the edges of the defect, partly by mitosis. The defect could be covered within hours, but the repair was very delicate and the slightest further injury would remove the new epithelium. Diagnosis was made by instilling 2% fluorescein, which stained the injured part. Treatment was by pad and bandage; cocaine prevented healing. Adherence of the repaired defect to the upper lid caused stripping and recurrence the next day. Antibiotic drops and atropine were then required. To prevent regurgitant infection via the lacrimal ducts, pressure should be applied to the lacrimal sac; infection of a corneal abrasion could lead to loss of the eye.

Mr. RYCROFT said that dendritic ulcer was thought to be due to a virus. It often followed an excessively high fever. Treatment was difficult owing to recurrence and scarring. Cauterization with carbolic was the first line of treatment. Together with atropine, pad, and bandage; local hydrocortisone was definitely contraindicated. The condition usually lasted for three or four weeks. Mr. LEIGH said that, although some dendritic ulcers responded to cortisone, some would develop virus keratitis involving the whole cornea, so destroying sight. Mr. RYCROFT said that after one or two recurrences a deep lamellar graft was useful. Mr. ZORAB said that without a good light, magnification, and fluorescein, dendritic ulcers could easily be missed. They should be looked for in any sore eye.

Retinal Detachment

Mr. LEIGH said detachment of the retina could present as a sudden loss of vision, but usually only a shadow was noticed. Ophthalmoscopy was the only means of diagnosis, but the presence of blood might prevent a clear view. Treatment began with rest in bed. At operation diathermy was used after evacuation of the subretinal fluid. Results were improving because of the introduction of scleral resection and scleral buckling (which took only three hours to do). Mr. RYCROFT mentioned three important symptoms: a "curtain" in the field, flashes of light in one part of the field, and alteration in the quality of vision—for example, a lamp-post would have a kink in it. He suggested vitreous transplantation to push the retina back into place.

Mr. RYCROFT then considered acute infections of the lids and lacrimal apparatus. A red eye was often wrongly put down to conjunctivitis, he said; the one sure sign of conjunctivitis was stickiness of the lids. Itching was often

due to pinguecula, and irrigations used in the treatment of conjunctivitis usually made the irritation of pinguecula worse. Infections of the lacrimal sac in infants due to failure of canalization of the duct were treated by massage of the sac, and 95% would recover in six months. If not, then probing should be undertaken, a procedure possible at that age but more difficult later owing to the change in direction of the duct. In adults, obstruction was due to fractures or to nasal infection. Dacryocystorhinostomy was necessary. Removal of the sac was to be condemned.

Cross-examination of the Panel

Wing Commander E. H. LAMB asked how much retinal detachment made a case hopeless. Mr. LEIGH said that 60% of all cases treated were successful; but, once the macula was detached, visual acuity was never fully restored. Provided a small sector of retina remained attached, a good result could follow treatment.

Dr. J. L. STRUTHERS (Southampton) asked if corneal abrasions from vegetable matter were more serious than those caused by animal or mineral material. Mr. RYCROFT said that the most dangerous substances he had met were caterpillar hairs and cactus spikes. The danger depended upon the subsequent infection. Dr. E. GREY-TURNER (London) asked how long a recurrent corneal abrasion should be allowed to go on for. Mr. LEIGH replied that a lamellar corneal graft was the ideal treatment for the chronic case.

Asked what should put the practitioner on his guard against chronic glaucoma, Mr. RYCROFT said that a patient with failing sight should be examined by an ophthalmic surgeon and not only by an optician. An optician might ascribe the failure of sight to a small cataract, which he could see, but without dilatation of the pupil and examination of the fields the real cause of the reduced vision—namely, chronic glaucoma—could be missed. Mr. ZORAB emphasized that the painlessness of chronic glaucoma made it easily missed.

Using acetazolamide, was it permissible for a G.P. to hold an acute glaucoma for, say, eight hours? Mr. LEIGH said that, if the practitioner was able to judge the response to treatment by noting the cessation of pain, clearing of the cornea and contraction of the pupil, and diminished tension, then it was perfectly justifiable to hold such a case. Mr. ZORAB said it was now no longer necessary for the ophthalmic surgeon to get up in the middle of the night for acute glaucoma, thanks to acetazolamide, but it only gave a breathing-space. Mr. LEIGH mentioned that the chances of glaucoma starting in the second eye were very high, but tests were now available to tell in a given case if that was likely: if so, a preventive operation should be done. Mr. RYCROFT said that sedation was an important adjunct to treatment. The last question concerned vitreous haemorrhages, and Mr. LEIGH said that he found them very difficult to treat. He was doubtful if any treatment was of value.

The remarkable thing about this panel was that all three members were in agreement over everything that was said.

THIRD GENERAL SESSION

Saturday, December 6, 10.45 a.m.

As in the previous general sessions three invited speakers gave short discourses on unrelated topics. For the last of the general sessions, held under the chairmanship of Dr. I. D. GRANT (Glasgow), the speakers were Sir RUSSELL BRAIN (London), Dr. J. T. INGRAM (Leeds),* and Professor E. STENGEL (Sheffield).

Acroparaesthesiae

Sir RUSSELL BRAIN spoke on acroparaesthesiae, illustrating his observations with lantern slides. He said the term implied three things—namely, that the distal parts of one or more of the extremities were involved in a sensory

*Dr. Ingram's appointment to a new chair of dermatology at Durham University was announced last month (*Journal*, November 22, p. 1302).

disturbance which was not a mere lack of feeling but had some positive quality such as tingling which was usually of an unpleasant character. Within this definition there were different forms of acroparaesthesiae characterized by varying degrees of unpleasantness, which in severe cases amounted to pain.

In taking the history of a patient complaining of acroparaesthesiae it was important to get as full an account as possible of the quality of the abnormal feelings and of their distribution, whether the onset was related to any particular posture, whether they occurred only when the patient was lying in bed, and, if so, at what part of the night they came on. Paroxysmal acroparaesthesiae had a different pathogenesis from persistent ones. Their cause was reversible, a vascular factor probably playing an important part. If paroxysmal acroparaesthesiae became persistent, a change which for the time being at least had become irreversible must have taken place. The same was true of acroparaesthesiae which were persistent from the beginning.

All the commonest causes of acroparaesthesiae appeared to involve one or more posterior spinal roots or peripheral nerves in such a way as to lead to their direct compression or an interference with their blood supply, or both. When the pressure operated paroxysmally its effects were reversible, but if it was repeated sufficiently often, or was long-continued, pathological changes were likely to occur in a nerve root or nerve, initially oedema, and later, if the oedema was not relieved, fibrosis. Acroparaesthesiae most commonly occurred in the upper limb, where their three main causes were (1) cervical spondylosis, (2) drooping shoulders, and (3) compression of the median nerve in the carpal tunnel.

Two main types of acroparaesthesiae occurred as a result of cervical spondylosis. Involvement of a single spinal posterior root was likely to cause pain, tingling, and numbness within its cutaneous distribution, which was worse if the patient lay on the affected side in bed, and the numbness was usually constantly present. The other type of acroparaesthesiae consisted of more widespread sensations of painful tingling, numbness, stiffness, and swelling often involving the whole hand. These tended to awaken the patient at night after a few hours' sleep. The acroparaesthesiae associated with drooping shoulders were usually more troublesome during the day than at night, and were specially prone to affect the inner border of the forearm and hand. The low position of the shoulders was evident on examination, especially from behind, and a lateral radiograph of the cervical spine gave a clear view of the body of the first and often, also, the second dorsal vertebra.

When the median nerve was compressed in the carpal tunnel the acroparaesthesiae had the characteristic distribution of the sensory supply of the nerve to the thumb, index, middle finger, and radial side of the ring finger. These acroparaesthesiae were also prone to awaken the patient at night. They soon became associated with objective sensory loss over cutaneous areas of the digits supplied by the median nerve and some wasting and weakness of the outer thenar muscles. Pregnancy sometimes led to acroparaesthesiae arising from either the cervical spine or roots or, less often, the median nerve.

In the lower limb the sensory disturbances in meralgia paraesthetica were not strictly acroparaesthesiae, though they had a similar quality and pathogenesis.

All these benign sensory symptoms needed to be distinguished from paraesthesiae produced by organic disease of the spinal cord, especially disseminated sclerosis, subacute combined degeneration, and atheromatous ischaemia, and from disorders of cerebral origin.

Sir RUSSELL BRAIN, in reply to questions, suggested that rest gave most relief for acroparaesthesiae of pregnancy; there was no specific treatment. Pain from the carpal tunnel syndrome would sometimes affect the arm even to the shoulder. Exceptionally it was possible to have symptoms from cervical spondylosis with normal radiographs. This was due to a moving intervertebral disk. Manipulation of the cervical spine, after heat and without an anaesthetic, might give relief if there was muscle spasm.

"The Restless Skin"

In discussing "The Restless Skin," Dr. JOHN T. INGRAM (Leeds) said it was important for every practitioner to recognize the essentially dynamic nature of the skin. Too often the skin was regarded as something static. Our ideas derived from impressions gained from examining dead material under the microscope. The skin was not an inert envelope enclosing the living organism; it was at least as vital as other parts, if not more vital than most. It certainly participated in and commonly reflected all types of systemic activity, as, for example, the metabolic, endocrine, vascular, and emotional. It was rather like a vast sea, with its unfathomable depths resting upon an unseen bed which might influence its behaviour or erupt to the surface; in addition the surface waters independently might evolve mischievous antics of their own.

These inherent activities, which concerned all the elements of dermis, epidermis, and appendages, often working in harmony, constituted the communications of the individual with the world at large, his life. If we visualized this organ caressed by vascular elements and fine nerve fibrils, it was not difficult to be aware of the restlessness of the skin, and of the significance—and the value and danger—of that restlessness. Injury to the skin and the resulting lesion were important, but we tended to note the insult and too often forgot the sensitive patient and the immediate circumstances.

In local treatment it was rarely necessary to depart from the time-honoured and effective applications that were bland, non-irritating, and non-sensitizing, provided they were dispensed properly and applied properly. The services of a nurse were invaluable.

Where a persistent eruption was limited in extent, the doctor must never tire of seeking a local sensitizing contact. He should not be content with the label allergic unless prepared to find the allergen. Whatever the aetiological balance, however, it was always profitable, from the start, to help to restore general and dermatological calm by prescribing sedatives internally.

In reply to questions, Dr. INGRAM agreed that upon occasion effective treatment of a skin lesion might upset a patient physically or mentally. This was not likely to happen if treatment was directed to the whole patient in relation to his whole environment. He said that applications of hydrocortisone lotions and creams were of particular value in local, irritable, and eczematous affections such as otitis externa, affections of eyelids, and pruritus of the genital and anal regions. They were not of such value in thickened lesions or in widespread eruptions, which was perhaps fortunate, since hydrocortisone was so expensive. Asked about endocrine therapy in acne vulgaris, he said that, though endocrine factors clearly played an important role in its aetiology, treatment with hormones was unsatisfactory and sometimes harmful. Occasionally small doses of oestrogens helped girls, but they were not effective in boys. Gonadotropins had proved disappointing.

Suicide and Attempted Suicide

Professor E. STENGEL (Sheffield) said that there were many common misconceptions about suicide and attempted suicide. It was wrong to believe that people who threatened suicide would not do it. In fact many gave a warning of their intentions, thus allowing their "environment" to intervene.

Attempted suicide was not necessarily unsuccessful suicide; there were not two grades of suicide, the successful and the unsuccessful. That notion presumed that the only motive for the suicidal act was self-destruction. Like most human behaviour the suicidal act reflected the conflict between love and hate—the contact-seeking tendencies on the one hand and the destructive tendencies on the other. The outcome of the suicidal act depended largely on the relative strength of these tendencies. It was generally thought that the outcome of the act depended mainly on the method employed and the

seriousness of the intent. But it also depended on the reaction of the environment and on other imponderable factors. Suicidal acts had the character of a gamble, or rather of an ordeal.

Follow-up studies showed that people who commit suicide and those who attempt suicide form two different though overlapping populations. Only a small proportion of those who attempted suicide killed themselves and only a minority of those who killed themselves had attempted suicide before. Nevertheless the likelihood of suicide amongst those who had attempted it was much greater than in the general population. Suicidal acts were much more frequent in older people than in the young, contrary to a commonly held opinion; and poverty was not an important factor. Depressive illness carried the most serious risk of suicide.

Legislation against those who attempted suicide was a cause of much distress. The incidence of suicide was lower in Scotland, where suicide was not a criminal offence.

In discussion Professor STENGEL agreed that the motive was sometimes veiled aggression, the desire to inflict punishment on others. Considering the incidence of suicide in different Scandinavian countries he felt that prosperity, alcoholism, and industrialization were important influences. The social code of various classes differed and there was often a fear of decline in status. He did not think that referring a depressive patient to hospital was likely to cause attempted suicide; the patient was the best witness to that.

HOSPITAL DEMONSTRATIONS

The afternoon of Saturday was devoted to clinical demonstrations in the various departments of the Southampton hospitals. The demonstrations were illustrated by slides, diagrams, charts, and photographs on whose preparation a great deal of care and hard work had been expended. At the *Southampton General Hospital* thyroid disease was discussed by the physicians, and Crohn's disease in the Surgical Department. A full programme, largely devoted to the general-practitioner aspects of midwifery, was given in the Department of Obstetrics and Gynaecology; whilst the neurologists demonstrated the result of treatment of intracranial angiomas. Members of the Department of Anaesthetics discussed some problems of respiratory insufficiency and presented a case of tetanus under treatment in the Respiratory Unit. The problem of nursing the elderly, the treatment of deafness, and speech training after laryngectomy, as well as demonstrations of laboratory techniques in the Pathological Department, and a film on swallowing in the Department of Radiology, were other items on the programme.

At the *Royal South Hants Hospital*, besides clinical demonstrations in the Departments of Medicine and Surgery on endocarditis and peripheral vascular disease, respectively, the orthopaedic surgeons, the pathologists, and the physiotherapists all discussed problems arising in their specialties. The new rotating caesium telecurie treatment unit was also on show. Particularly well attended sessions were held by the dermatologists and the paediatricians.

At *Southampton Chest Hospital* cases were demonstrated to small groups of visitors, and aspects of thoracic surgery, cardiology, and thoracic medicine were discussed at the bedside. A film on closure of an atrial septal defect under hypothermia was shown. The Department of Anaesthetics held a discussion on the anaesthetist's role in thoracic surgery. The continuous demonstration at the *Southampton Eye Hospital*, which was limited to 30 visitors, was fully attended. The examination and discussion of patients with various ophthalmic conditions were carried out in small groups, and after this three films were shown.

SUNDAY VISITS

On Sunday morning visits were made to five centres of interest in the vicinity. Visitors to the Department of Daily Living at the *Royal Hampshire County Hospital* at

Winchester had the opportunity of first attending Matins in Winchester Cathedral, where places had been reserved for them in the choir. After this Dr. W. RUSSELL GRANT gave a fascinating demonstration of ingenious and simple gadgets and adaptations to the home, whereby those afflicted by disease or injury can lead an active life despite their disabilities. At *Odstock Hospital, Salisbury*, in the Department of Physical Medicine and Plastic Surgery, Dr. HUGH J. GLANVILLE and Mr. J. N. BARRON discoursed on treatment and subsequent rehabilitation after acute injury. This was followed by a visit to the Nuffield Department of Rehabilitation, where patients were seen regaining their working capacity on modified and adapted machinery. Both these demonstrations at Winchester and Odstock were followed by receptions given by the local Divisions of the B.M.A.

Another party visited the *Veterinary Artificial Insemination Centre* of the Hampshire Cattle Breeders' Society at Lyndhurst. The laboratory work undertaken in solving problems of breeding, cross-breeding, fertility, and the treatment and storage of semen was described. Mr. K. G. ELCOATE and Mr. D. H. MADDON included in their demonstration a visit to the bull pens, where semen was collected, and discussed some of the practical problems involved in artificial insemination.

A number of visitors made a tour of the *Port of Southampton*, where after visits to the King George V Graving Dock and the Ocean Terminal Dr. W. P. CARGILL gave a talk on some of the medical problems of a great port. Finally a party were shown round the vast *Esso Refinery at Fawley*, where Mr. COLIN SOUTHALL conducted the visitors on a tour of the various plants. Dr. A. WARD GARDNER described the special problems met with by the Medical Department, and took the party to see the new hospital wing of the Refinery, which is in his charge.

APPROVED NAMES

The last supplement to the consolidated list of "approved names" was published in the *Journal* of September 20 (p. 739). A new supplement, dated December, 1958, is printed below. Communications relating to "approved names" should be addressed to the secretary, British Pharmacopoeia Commission, General Medical Council, 44, Hallam Street, London, W.1.

Approved Name	Chemical and Other Names	Notes
Anisindione ..	2- <i>p</i> -Methoxyphenylindane-1:3-dione "Miradon"	Anticoagulant
Cloquinate ..	Chloroquine di-(8-hydroxy-7-iodo-quinoline-5-sulphonate) "Resotren"	Amoebicide
Dieldrin ..	Product containing 85% of 1:2:3:4:10:10-hexachloro-6:7-epoxy-1:4:4a:5:6:7:8:8a-octa-hydro-exo-1:4-endo-5:8-dimethano-naphthalene	Insecticide
Halopenium chloride	4-Bromobenzyl-3-(4-chloro-5-methyl-2-isopropylphenoxy)-propyl-dimethylammonium chloride	Antibacterial and antifungal agent
Isopropamide iodide	(3-Carbamoyl-3:3-diphenylpropyl)-methyl-diisopropylammonium iodide "Darbid"; "tyrimide"	Anticholinergic agent
Mestanolone ..	17 β -Hydroxy-17-methyl-5 α -androstan-3-one "Androstatone"	Protein anabolizing hormone
Methsuximide	<i>N</i> a-Dimethyl- α -phenylsuccinimide "Celontin"	Anticonvulsant
Noscipine ..	Narcotine "Cocopin"; "nicolane"	Antitussive
Poldine ..	2-Benziloyloxymethyl-1-methylpyrrolidine "Nacton" is the methosulphate	Treatment of peptic ulcer
Prampine ..	<i>O</i> -Propionylatropine "PAMN" is the methonitrate	Anticholinergic agent
Promethazine theoclate	<i>N</i> -(2-Dimethylamino- <i>n</i> -propyl)phenothiazine salt of 8-chlorotheophylline Promethazine chlorotheophyllinate "Avomine"	Antihistamine
Sulphamethoxy-pyridazine	3- <i>p</i> -Aminobenzenesulphonamido-6-methoxypyridazine	Sulphonamide
Sulphatolamide	"Kynex"; "lederkyn"; "midicel" <i>p</i> -Aminobenzenesulphonylthiourea salt of <i>p</i> -sulphamoylbenzylamine "Marbadal C"	"

To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in current use.

Tabs. ethinyloestradiol B.P.
Estigyn (British Drug Houses).
Eticyclin (Ciba).
Lynoral (Organon).

Ethinyloestradiol, a semi-synthetic oestrogen, is the most potent oral oestrogen, being about 20–25 times as active as stilboestrol, but costing more. The justification for the higher cost would be a smaller incidence of intolerance than is shown to stilboestrol; unfortunately this is by no means certainly the case. The indications for ethinyloestradiol are the same as those for other oestrogens: replacement therapy in hypo-ovarianism (dose about 0.1 mg. daily in 20-day interrupted courses) and in the climacteric (about 0.01 mg. or less daily, again in interrupted courses); treatment of menstrual irregularities of functional origin (daily dose about 0.1 mg.); suppression of lactation (no two people seem to have the same views on the precise regime for this, so it probably does not matter); and palliative treatment of prostatic carcinoma (daily dose 0.1 mg. and upwards, according to clinical response), and of some post-menopausal patients with carcinoma of the breast.

In general, it may be said that if stilboestrol is tolerated in doses which are adequate for the purpose there is no reason to use any other oestrogen; if it is not, ethinyloestradiol in equivalent dosage may be tried. Some patients will tolerate it better, but others will not.

N.H.S. basic price: all preparations, 0.01-mg. tablets or linguets (eticyclin), 100 for 1s. 6d.

Injection of cyanocobalamin B.P.
Anacobin (British Drug Houses).
Bitevan (Evans Medical Supplies).
Cobalin (Paines and Byrne).
Cobastab (Boots).
Cytamen (Glaxo).
Distivit B₁₂ (Distillers).
Duodecibin (Woolley).
Fermin (Richter).
Megalovel (Vitamins Ltd.).
Rubramin (Squibb).

Cyanocobalamin is of greatest value in the treatment of pernicious anaemia. In this disease there is a deficiency of it, so that instead of the normoblastic maturation in the bone marrow leading to the formation of normal red blood cells a megaloblastic reaction occurs, and pernicious anaemia develops. This faulty marrow response is corrected within a few days of adequate treatment with cyanocobalamin parenterally. It may be given in doses of: (1) initially, 250 µg. for two or three days in the first week, followed by 250 µg. twice weekly until the blood count is normal and symptoms of posterolateral sclerosis are minimal; then only should the dosage be reduced gradually until (2) a maintenance dose is reached, which may vary in different patients but is usually about 100–250 µg. weekly and then fortnightly. It is usually undesirable for prolonged maintenance therapy to be so infrequent as 50–100 µg. at monthly intervals. Some cases of tropical macrocytic anaemia and a few cases of sprue respond to treatment with cyanocobalamin.

N.H.S. basic price:—Six 1-ml. ampoules for injection, each containing 100 µg. cyanocobalamin: inj. cyanocobalamin. B.P., 2s. 7½d.; anacobin, 2s. 7½d.; bitevan, 2s. 7½d.; cobalin, 2s. 8d.; cobastab "viules," 2s. 7½d.; cytamen, 2s. 7½d.; duodecibin, 3s. 4½d.; fermin, 3s. 4d. Five 1-ml. ampoules of 100 µg.: distivit B₁₂, 2s. 2d.; megalovel, 2s. 6d. Rubramin, 5-ml. vial of 100 µg., 2s. 8d. Ampoules containing doses of different sizes are available.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

B.M.A. Clinical Meeting

SIR,—“Never a dull moment”—that is how a Southampton colleague described the B.M.A. Clinical Meeting as we came through the swing-doors of the Guildhall after the final general session. What a busy and enlightening experience the three days' meetings have been, especially for a member of an antipodean Branch, as I am.

From such a wealth of splendidly presented items it is hard to select any for special comment, and anyway individual tastes and interests differ. The colour televising of surgical operations from the Southampton General Hospital, the Transatlantic Clinical Conference, the clinical demonstrations at the hospitals—all were evidence of superb planning. And there was so much more.

The Annual Clinical Meeting has been well launched. Developing from this initial triumph, succeeding meetings in years to come will do much to assure the continued advancement of British medicine. All who contributed to this 1958 success have reason to be proud.—I am, etc.,

Adelaide, South Australia.

A. R. SOUTHWOOD.

Antibiotics in Acute Tonsillitis and Otitis Media

SIR,—I must take issue with Dr. Peter A. Walford (*Journal*, November 29, p. 1353) on this subject. To say that the rarity of rheumatic fever warrants the withholding of antibiotics in sore throats is as illogical as to say that because diphtheria is also so rare there is no point in continuing immunization. Incidentally I have yet to hear that the decline in diphtheria is attributed to a waning in virulence of the causative organism. Penicillin is just as specific a therapy for streptococcal sore throat as immunization is a specific prophylactic for diphtheria.

Since it is not refuted that acute nephritis and rheumatic fever follow streptococcal infections, it is logical to treat such infections as early as possible with the specific remedy. To withhold antibiotics for 24 to 48 hours, as Dr. John Fry did in his series of cases (*Journal*, October 11, p. 883), cannot, to my mind, give a true comparison between treated and untreated cases. The most striking results with penicillin in acute tonsillitis and otitis media are observed when the antibiotic is administered early in the infection, as is so often possible in general practice. Dr. Walford quotes a paper by Wilson¹ written in 1946, showing that after penicillin therapy there was some degree of hearing loss in 18% of his series of cases. However, the doses in use at that time would hardly be considered adequate by present-day standards. A more recent survey by Dixon² has shown that, in 114 otitis media infections treated with penicillin without myringotomy, there were only four cases of minimal hearing loss and there were no complications. The author concludes that this is a highly satisfactory result.

Dr. Walford asks for other practitioners' experiences of the incidence of acute nephritis and rheumatic fever. I can only say that in my own practice over eleven years (during which time I have used antibiotics extensively) I have seen no cases of either condition.—I am, etc.,

Twickenham.

DAVID WHEATLEY.

REFERENCES

- 1 Wilson, C. P., *J. Laryng.*, 1946, 61, 404.
- 2 Dixon, J. W., *ibid.*, 1958, 72, 227.

Resistant Staphylococci

SIR,—Dr. Mary Barber and her colleagues are to be congratulated on their efforts to clarify the problems associated with antibiotic-resistant staphylococcal infections (*Journal*, December 6, p. 1377). There are, however, two points on which further clarification might be possible.

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CORRESPONDENCE

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The first concerns the emergence of erythromycin-resistant strains. There is strong evidence implicating group III staphylococci as the principal offenders. The question remains, however, as to what extent the level and duration of erythromycin administration affected the outcome. Is it possible to compare the treatment of those patients infected with group III organisms and who did not eventually produce resistant organisms with the treatment of a similar group from whom resistant strains were isolated? This point is of particular importance, since erythromycin is probably the least toxic antibiotic in general use at the present time, and therefore increased dosage might be employed if it can be shown that such would prevent resistant strains developing.

My second point relates to their statement that ristocetin (trade name "spontin") has serious toxic effects, "particularly on the eighth nerve." Although this drug has undergone extensive clinical trial, and is used in day-to-day practice in the U.S.A., experience in this country is very limited. To my knowledge, out of several thousands of patients treated with ristocetin, there have been only two instances of deafness, and in neither case could it be definitely stated that the deafness was due to this drug, as other antibiotics were being currently used. If Dr. Barber has additional evidence on this point, I should be most grateful to hear of it.—I am, etc.,

Abbott Laboratories Ltd.,
London, W.1.

R. F. CRAMPTON.

Hula-hoop Syndrome

SIR,—In recent weeks I have seen an unusual number of children and young adults complaining of pain at the side of the neck associated with a pain in the upper abdomen. Both were aggravated by movement, and in the case of a neck pain it was severe enough to produce torticollis in a few. On examination, there was a varying degree of reduced movement of the cervical spine, especially of rotation, which was limited by pain, and there was spasm and tenderness in one or both sternomastoids, the cervical portion of the trapezius, and the paravertebral muscles in the cervical region. Abdominal examination revealed tenderness in the epigastric region and immediately below the costal margin. Pain was also produced in this region by straight-leg raising.

Having noticed the present fashion of the hula hoop in this area I started making inquiries from the parents of the sufferers, and so far in each case the attack followed a first indulgence in this sport. My diagnosis was confirmed the other day when a lady of 68 presented herself with this classical picture. Whilst thinking of a possible alternative diagnosis I made the remark that had she been a little younger I would have asked her whether she had been hula-hooping yesterday. To my surprise she replied, "As a matter of fact I did have a go yesterday at young Willie's birthday party."—I am, etc.,

Stevenage.

J. O. NEWMAN.

SIR,—The widespread popularity of the pastime recently introduced to this side of the Atlantic from America prompts me to report briefly the following case history.

A girl aged 7 years complained of feeling off colour and some frequency of micturition on November 28. By November 30 the frequency had gone, but she complained of pains all over and could not walk. When seen on December 1 her temperature was 102° F. (38.9° C.). Normally a very active child, she lay perfectly still in the bed. She had moderate neck rigidity, was unable to sit up unsupported, and her lower-limb movements were slow and painful. Her lower-limb tendon reflexes were diminished, but skin reflexes were normal. Her back muscles were tender especially in the mid-dorsal region.

She was admitted to hospital as a possible case of poliomyelitis. In hospital she was provisionally diagnosed as a case of benign lymphocytic meningitis. Both these were proved wrong by a normal cerebrospinal fluid, pathological centrifuged deposit in the urine, and a rapid recovery by the patient.

The reason for the "meningeal" signs was that the patient was given a hula hoop on November 29 and proved to be

very proficient with it, at both neck and waist level. It is tempting to postulate that the waist level activity may have converted a cystitis into a pyelitis.—I am, etc.,

Castleknock, Co. Dublin.

HALDANE G. NELSON.

Potassium Perchlorate Sensitivity

SIR,—We thought that there might be some general interest in what appears to be an unusual case of potassium perchlorate sensitivity.

In 1952 Wyngaarden *et al.*¹ demonstrated the inhibitory action of this drug on thyroid function. Since then it has been used effectively in the treatment of hyperthyroidism with minimal toxic reactions. Morgans and Trotter² treated 198 cases for periods of one to ten months, the side-effects noted being gastro-intestinal irritation in two patients. Godley and Stanbury³ treated 24 patients with doses between 600 mg. and 1,200 mg. daily with good effect. Perforation of a duodenal ulcer occurred in one patient whilst on potassium perchlorate and a further patient developed dyspeptic symptoms, but no other side-effects were seen. Smellie⁴ treated six thyrotoxic children effectively with the same drug and no side-effects occurred. In the case reported here potassium perchlorate appears to have been responsible for a drug reaction.

Mr. L. P., aged 37 years, first attended at our clinic on June 24 this year, when a diagnosis of moderate thyrotoxicosis was made on clinical examination. Treatment was begun with potassium perchlorate, 300 mg. thrice daily, with the intention of proceeding to thyroidectomy later. On July 14 he began to feel unwell and developed some bowel frequency. On the same evening he felt tight about the throat, had swellings on his neck, and an extensive macular rash. He was admitted to another hospital on July 17, when he was found to have a partially confluent macular rash over the whole of his body and a generalized, fleshy lymphadenopathy. A soft spleen could be felt about an inch (2.5 cm.) below the costal margin, and his throat and mouth were raw, with small areas of superficial ulceration. Apart from a pyrexia of 103° F. (39.4° C.), there were no other abnormal findings in a systematic general examination.

The rash began to desquamate and his temperature remained between 101 and 103° F. (38.9–39.4° C.) for four days, but then settled. On the tenth day after admission it rose again to 100° F. (37.8° C.) and reached this daily during the following week. Simultaneously he became oedematous in his arms, legs, and scrotum; and the skin of these regions became very fiery. Slowly the desquamation ceased and the other conditions settled.

Laboratory results were as follows: Paul-Bunnell test was negative. White cell count varied between 3,600 and 6,600/c.mm., with slight neutrophilia. E.S.R. 2 mm. in one hour. Stools showed no pathogens. Urine was normal. Serum proteins were 4.8 g./100 ml., with normal electrophoresis.

A skin test (superficial) with potassium perchlorate solution gave a positive vesicular eruption.

This man, therefore, seems to have exhibited an unusual sensitivity to this apparently innocuous drug.—We are, etc.,

B. J. FAIRHURST.

A. L. M. HOLLINGWORTH.

REFERENCES

- 1 Wyngaarden, J. B., Stanbury, J. B., and Rapp, B., *Endocrinology*, 1952, 52, 568.
- 2 Morgans, M. E., and Trotter, W. R., *Lancet*, 1954, 1, 749.
- 3 Godley, A. F., and Stanbury, J. B., *J. clin. Endocr.*, 1954, 14, 70.
- 4 Smellie, J. M., *Lancet*, 1957, 2, 1035.

Prevention of Lung Cancer

SIR,—It seems clear that those doctors who refer cases of carcinoma of the bronchus in heavy cigarette-smokers to the coroner do so in the hope that the general public will be warned of the danger of the habit. Such notifications are perfectly proper, but it appears that some coroners do not know what should be done. Thus, Dr. Ian Milne, one of the coroners for the County of London, held an inquest on such a case, in which a verdict of "natural death" was returned. Dr. Milne now writes (*Journal*, November 22, p. 1292) to say that "A verdict of accidental death is, clearly, inappropriate where the incidents are repetitive.

frequent, and undated, as in the case of the cigarette addict." But, as Dr. J. Shackleton Bailey points out on the same page, Sir Bentley Purchase recorded a verdict of "accidental death" in the case of a man who died of multiple skin carcinomata, after working with arsenical sheep dip for 40 years: here the incidents must have been repetitive, frequent, and undated.

These divergent views seem to support Dr. G. B. Forbes's doubts (November 1, p. 1104) as to whether the coroner's court is the proper platform for propaganda. Indeed, if doctors acquired the habit of referring similar cases to coroners, there might be some very comical results. One can imagine a conscientious practitioner referring a case of carcinoma of the penis to the coroner, stating that it was due to a persistent prepuce. It might then be difficult for an inquest verdict to avoid stating that the death was due to inattention in infancy, although, doubtless, the negligent parents will have passed out of the jurisdiction of earthly tribunals. Again, one can imagine a death certificate which stated that the immediate cause of death was carcinoma of the cervix, due to multiparity due to careless copulation. Could the (probably) ignorant husband be charged with having caused his wife's death? Such cases are just as silly as were the manslaughter charges against Christian Scientists and other anti-medical cranks. It is indisputable that an anti-smoking campaign is overdue, but it is equally certain that coroners, many of whom are not doctors, are among the least suitable propagandists.—I am, etc.,

London, W.1.

A. PINEY.

SIR,—We are grateful to Dr. R. Ian Milne (*Journal*, November 22, p. 1292) for confirming our view that a doctor who believes his patient has died from cancer of the lung, due to smoking, has the legal right to assert this belief on the death certificate, provided he is prepared to testify to this knowledge and belief on oath, and listen to contrary evidence in court. We also believe it is an ethical duty to do so.

We should like to clarify what we meant in our original letter (*Journal*, October 18, p. 980) by "in the appropriate case." Of the three main types of bronchial carcinoma, one, the adenocarcinoma, has no proved association with smoking and therefore we would not incriminate it, even if the patient were a heavy smoker. In the oat-cell or squamous type we would state that it was "due to smoking" only if there were no occupational risk from asbestos, arsenic, chromates, nickel or coal distillation. The elimination of these groups, however, would still leave the vast bulk—at least four-fifths—as being attributable. While clearly it is better to know beforehand the nature of the growth, lack of this knowledge need not prevent certification of a lung cancer death as due to smoking, for the coroner can order a post-mortem examination, as a result of which the exact histology would be established.

Atmospheric pollution is the other factor which can reasonably be incriminated, but the gross sex differences in incidence and the small variation between deaths in non-smokers in town and country strongly suggest that its role is not a major one nor comparable in importance to that of cigarette-smoking. In the heavy smoker with an oat-cell or squamous growth who has no particular occupational risk, it is reasonable to attribute the development of lung cancer to cigarettes. We consider it not only reasonable but necessary in the public interest to say so.

One further point requires attention—the feelings of the relatives of the dead patient. Naturally, due consideration should be given to these, and it is necessary to warn the relatives that the coroner may decide to have a post-mortem examination and an inquest may follow. Some will be upset; others will no doubt welcome the opportunity to establish the truth; but in neither case should their attitude be a factor which influences what the doctor will do as regards the death certificate; this has to be completed in accordance with the facts as he understands them to the best of his knowledge and belief.

Finally, we should like to endorse the view put forward by Dr. H. J. Pratap (*Journal*, November 8, p. 1165) that the psychiatric approach as to why people smoke is of prime

importance. More attention will have to be given to helping those who wish to give up smoking; for this we must obtain more information and study the various aetiological factors in their social context.—We are, etc.,

Stanmore, Middlesex.
London, W.1.NORMAN MACDONALD.
WILFRED LESTER.

SIR,—With respect to Dr. R. Ian Milne I do not think his letter (*Journal*, November 22, p. 1292) has altogether explained the logic of his quarrel with a doctor's use of the term "excessive" in relation to a smoking habit of 40 or 50 cigarettes a day. His objection to the term on a death certificate appears to be that it has no legal significance because it only amounts to a reason for the doctor's opinion that death from carcinoma of the bronchus was due to smoking. But surely we cannot omit consideration of degree where it is the determining factor in a cause of death. "Excessive" here is the operative word, and it would have been implied even if it had not been used at all. One might more easily sustain an objection to the word on the grounds that it was redundant. Obviously for heroin, alcohol, barbiturates, or radiation to cause death they must have been met with in excess of a safe amount whether this was over a long period or in the nature of a single lethal dose.

One cannot but agree with Dr. Milne that it was unfortunate that the use of the word "excessive" by the certifying doctor was trailed as a red herring across a case that has raised the really important question of the legal recognition of smoking as a cause of "accidental death." This especially when the medical evidence relating to causation was as conclusive as it is likely to be in any case of carcinoma of the bronchus until the correlation of smoking and cancer is less dependent upon statistical data. As I pointed out in my own letter printed below that of Dr. Milne, the real difficulty is that, whereas this correlation approaches something like certainty in the mass, the significance of the smoking habit in any specific death is entirely a question of probability based upon the excessiveness and nature of the indulgence in that instance. Whilst one could not quarrel with the opinion that 40 or 50 cigarettes a day were causative, what is one going to do about 20 or 30 or less? Similarly, where does the degree of probability cease to be significant in relation to pipe- or cigar-smoking?

Coroners are accustomed to accepting a balance of probability, as illustrated in my letter (*Journal*, November 22, p. 1293) by the case in which Sir Bentley Purchase returned a verdict of "accidental death" with no more than a statistical probability to prove that prolonged exposure to arsenic had been a cause of death from cancer. The exposure here of 40 years could be considered excessive by any standard, although I have no doubt that Sir Bentley appreciates how awkward it would be to be called upon to state exactly how many years less than 40 he would have been prepared to accept as sufficient to justify his verdict. Fortunately we medical coroners when in difficulties of that sort can always fall back upon the legal element in our calling which allows of a purely intuitive wisdom that cannot be questioned in this way. Nevertheless one does wonder when the increasing pressure of science and statistics will compel a more scientific and uniform outlook amongst us all.

Even in cases where contributory causes of death can be stated in terms of statistical probability there still remains the decision as to what degree of probability should suffice. One can hardly be content with the coroner's hunch as to what amounts to excessive exposure to arsenic, smoke, or radiation, even if he is well advised and versed in the general and particular scientific evidence relating to the case. Surely it is time that some official decision was taken in relation to death from diseases such as cancer and leukaemia which can be attributed at all to exposure to harmful environmental factors. This is not a purely academic matter with no practical significance. In the meantime, whilst it is bound to become more confused under the purely arbitrary authority that exists at present, I rather join with your third

correspondent, Mr. Leslie J. Temple (*Journal*, November 22, p. 1293), in hoping that, at least in cases where really excessive smoking has preceded cancer of the lung, we shall have some verdicts of "accidental death." Then, as usual in this country, pressure will come from the public and eventually official inquiry and guidance might lead to a wiser and more orderly attitude to this smoke menace to life and health.—I am, etc.,

J. SHACKLETON BAILEY,
H.M. Coroner, County of Norfolk (Diss District).

Medicine on Television

SIR,—Professor Roger Warwick's interesting letter about medical television programmes (*Journal*, November 29, p. 1354) draws attention to what is really a very important subject. Television, like radio, reaches a vast audience and its influence on the general public is tremendous, and is bound to become even greater in the future, whether we like it or not. It is therefore most important that both we of the medical profession and the B.B.C. make up our minds as soon as possible how future television programmes of this nature are to be handled. Discussions such as the one at the College of Surgeons recently (*Journal*, November 29, p. 1351) are merely scratching the surface of the problem.

What is needed is a proper committee appointed by the B.M.A. to thrash it out thoroughly and recommend a policy for the guidance of the producers. If properly handled it could be a golden opportunity for us to educate the public in health matters and help them to take a more sensible attitude to physical fitness and the prevention of disease. At present hypochondriasis is so widespread that it is almost universal. Patients are morbidly fascinated by disease and seem pathetically ignorant about how to keep themselves healthy. And why? Because they have never been educated in the simple elementary facts of healthy living.

If these future programmes concentrate too much on disease and not enough on health they will inevitably do harm. Cynics have dubbed the N.H.S. the National Disease Service—and with good cause; for we still devote most of our energies to curative medicine instead of adopting the more positive attitude that disease can and should be prevented by healthy living.

It must be confessed the recent pronouncement of Sir Ian Jacob that the B.B.C. has no intention of elevating its present standards and means to continue providing light entertainment most of the time is not very encouraging. Are the ideals of culture and education now to be taboo to the B.B.C.? If so, as a citizen I protest, and as a doctor I see little hope for future medical programmes. The I see little hope for future medical programmes. The hours of dreary drivel churned out by the B.B.C. sound programmes every day are the despair of those of us who like something interesting to listen to. Let us hope that the television will at least try to rise above such puerile mediocrity and not pander to those who merely look for sensationalism and gruesomeness in the future when medical subjects are being dealt with.—I am, etc.,

Merioneth.

CLAUD C. M. WATSON.

Fishbone Furunculosis

SIR,—In the *Journal* of October 18 (p. 978) Dr. Ian Martin-Scott referred to Dr. Peter Cook's letter regarding "fishbone furunculosis" (*Journal*, September 27, p. 797) and wondered if the condition described might be an atypical erysipelas. May I add to this interesting discussion that many North American fishermen themselves recognize two distinct clinical entities?—(1) the furunculosis type of infection, which they call "Bait Sores," and (2) the erysipelas type, which they call "Seal Finger," "Red-fish Finger," or "Mackerel Finger," because this type is more frequently seen in seal-hunters, bait fishermen using frozen mackerel bait, or fishermen or fish-handlers who prick their fingers on Red-fish bones.

The experienced port surgeon can usually clear up the furunculosis type quickly and then concentrate on the erysipelas. A streptococcal secondary infection causing

pronounced lymphangitis and axillary adenitis is not uncommon in the "Bait Sore" type of infection, but rather rare in the erysipelas.

The "Bait Sore" type, like basal-celled carcinoma, is quite easy to handle when superficial, but when it invades bone it is rapidly destructive. In the days when fishing schooners did not have engines, a Banks fisherman making port against a head wind would sometimes bring in a man with a late furunculosis type of infection which had penetrated to bone, which necessitated a rather grievous amputation. This, fortunately, is practically unheard of to-day.—I am, etc.,

Lunenburg,
Nova Scotia.

H. A. CREIGHTON.

Chloroquine in Rheumatoid Arthritis

SIR,—In "To-day's Drugs" in the *Journal* of November 8 (p. 1160) there is a note on chloroquine phosphate and its use in the treatment of rheumatoid arthritis and other diseases. A word of caution is added because of the risk of corneal deposits when using large doses. From the inquiries I have made I understand that this risk is very small, and I am hoping that this possibility will not have an adverse effect on research and the subsequent use of this valuable drug.

In my experience as a general practitioner I have had greater success in early cases of rheumatoid arthritis using chloroquine than with any other form of treatment. Two of my patients have been taking chloroquine sulphate for a year and have become almost free of pain, stiffness, and joint swelling, and in both cases the E.S.R. has fallen dramatically. I had previously watched a gradual deterioration in each one in spite of treatment with sodium aurothiomalate, phenylbutazone, and salicylates. The only evidence I have had so far of any toxicity has been nausea, with occasional diarrhoea. In cases where this occurs I now use hydroxychloroquine, and have found it to be well tolerated.

In dealing with a tragic and disheartening disease like rheumatoid arthritis, any remedy suggesting a possibility of relief is a ray of hope. Reports so far seem to suggest that this drug is safer than corticosteroids, less toxic than phenylbutazone and gold salts, and it is relatively cheap.—I am, etc.,

Kettering.

W. L. OGLE.

Drug Treatment of Parkinsonism

SIR,—Dr. Macdonald Critchley in his excellent article on the use of drugs for Parkinsonism (*Journal*, November 15, p. 1214) refers to those of the solanaceous group—i.e., atropine, hyoscine, and stramonium. He reminds us that these drugs may well be used when the more recent drugs are found unsuitable.

The visual disabilities which the former may cause can be largely overcome.¹ Often 10 times the pharmacopoeial dose of stramonium is given, resulting in very marked improvement in the Parkinsonian rigidity.² Many of the patients, however, complain greatly of their inability to read, and of being worried by bright lights, due to paresis of accommodation and dilatation of the pupils. Roughly speaking, the stramonium effect as regards accommodation for reading distance is counteracted by a +1.50 to 1.75 lens, and eserine and pilocarpine applied to the conjunctival sac seem to counteract the effect to the extent of 1½ dioptres. Thus those with normal refraction, who do not want to read much, can have their visual disabilities removed by miotics. Presbyopes and hypermetropes need glasses, the latter for constant wear. In children, or myopes, the use of miotics to prevent dazzle is found the best procedure. The problem is a definite one, as sometimes Parkinsonian patients have to continue with stramonium for the rest of their lives.—I am, etc.,

London, W.1.

THEODORE H. WHITTINGTON.

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- Worster-Drought, C., and Hill, T. R., *Lancet*, 1930, 1, 1225.

Insomnia

SIR,—Dr. A. H. Douthwaite's article on insomnia in the series "Drug Treatment of Disease" (*Journal*, November 29, p. 1347) is most helpful. Like many brainworkers who write and study too late, I have, during 40 years, endured many bouts of sleepless nights. For these I tried many drugs as well as methods of relaxation. Of all drugs chloral hydrate was the best. It acted rapidly and left no hangover as did the various barbiturates which were formerly prescribed to be taken every night. In my dermatological practice I met many patients who complained bitterly about the depression following these drugs.

During the 1914-18 war I was in France, and found how far in advance of us the Paris physicians were in ability to treat with electricity. I learned how to apply galvanism through the brain, and to this day I resort to that when the brain is worn and weary; sound sleep is certain to come that night. I have administered it to sleepless patients for many years with success. To-day, owing to the ease of applying diathermy in hospital clinics, the modern physiotherapist does not learn how to give galvanism from a portable battery. Like many other old and tried remedies, it has unfortunately gone out of fashion.—I am, etc.,

London, W. I.

AGNES SAVILL.

Physically Handicapped Children

SIR,—In the survey of pupils in schools for physically handicapped in London by Mr. W. T. Palmer and Dr. Denis Pirrie (*Journal*, November 29, p. 1326) there lies buried a fact which tends to be overlooked. Among the 1,325 children whose conditions are analysed there appear to be only 37 cases of spina bifida, and 24 cases of progressive muscular dystrophy. Those of us who are associated with residential schools for the physically handicapped supported by independent organizations are only too well aware of the fact that these two most handicapped groups have largely passed into the care of the voluntary societies, as indeed the survey points out. It is appropriate to call attention to the fundamentally greater difficulties facing those in charge of the residential schools. Running costs must necessarily be very much greater, and staffing arrangements need to be more closely related to those of hospitals.

I wonder whether the picture for London could be completed by the publication of figures showing the incidence of those "too severely handicapped for the special schools of the London County Council"? Presumably the existence and location of these children are known to the council, and it would give some indication of the trend of disability.—I am, etc.,

D. F. ELLISON NASH.

London, S.E.19.

Haemolytic Disease of the Newborn

SIR,—In the article by Dr. G. A. Kelsall and Mr. G. H. Vos and Mr. R. L. Kirk, entitled "Case for Induction of Labour in Treatment of Haemolytic Disease of the Newborn" (*Journal*, August 23, p. 468), certain conclusions are reached which do not seem justified by the evidence presented.

It would appear that the authors have been able to demonstrate a correlation between the titre of the maternal Rh antibodies, as determined by the indirect anti-globulin test, and the severity of the disease in the infant when born (see their Table I). It is, however, difficult to reconcile this apparent relationship with the fact that, using this method to prognosticate in 43 Rh-negative infants, 17 were thought to have a one-in-four chance of not surviving and five a three-in-five chance of dying. Moreover, "most of" these Rh-negative cases were induced, with one death occurring; it is difficult not to attribute this death to the method of treatment, and it should be included in the overall mortality rate.

The foetal loss rate occurring in those cases which the authors were able to treat as they wished is surely of

fundamental importance, but it is not possible to arrive at this figure from the data presented. The series is divided into two groups which are obviously not comparable; the "spontaneous" group is loaded with the great majority of the stillbirths, most of which, as the authors state, could not have been saved by their method of treatment (or indeed by any form of treatment). This "spontaneous" group also contains those less severe cases allowed to proceed to term. The induced group appears to consist of cases of intermediate severity. The overall foetal loss rate in the series (excluding the death of the Rh-negative infant) was 99 in 373 cases—i.e., approximately 26%. Thus, although a considerable number of cases in the series were treated by the authors' method (179+x, where x=the number allowed by design to proceed to term), the overall foetal loss rate does not differ significantly from that of the spontaneous series of Mollison.¹ This figure of the overall foetal loss appears to be the only one on which data is available in the article for comparison with other series.

If an attempt is made to construct the group treated by the author's method by adding to the induced group both the more severe cases (the stillbirths, which are called spontaneous) and the less severe cases—i.e., those with a titre of 1/128 or lower (spontaneous group, their Table IV) then the following figures are obtained:

Group	Stillbirths	Died	Survived	Total
Induced	4	19	156	179
Stillborn	48	—	13*	61
Spontaneous	2	1	62	65
Totals	54	20	231	305

* The number the authors thought might have been saved by their method.

This gives a foetal loss rate of 24% (not including the Rh-negative death), which is not better than the spontaneous series of Mollison. This artificially constructed foetal loss rate may not be correct, but is the nearest we can deduce from the available data. It seems difficult to find in the article, therefore, evidence supporting the view that artificial induction of labour and resultant premature delivery has favourably affected the foetal loss rate. Moreover, maternal complications of this method of treatment are not mentioned.—I am, etc.,

Royal Newcastle Hospital,
Newcastle, New South Wales.

WILLIAM F. HUNTER.

REFERENCE

¹ Armitage, P., and Mollison, P. L., *J. Obstet. Gynaec. Brit. Emp.*, 1953, 60, 605.

Excision of Atrial Myxoma

SIR,—Mr. J. R. Belcher (*Journal*, September 20, p. 742) says that a myxoma may be so friable that pieces may break off during its removal if pushed up from below. I tried in the article by Dr. F. R. Reid and myself (*Journal*, August 30, p. 531) to make it clear that this could not happen because the whole manipulation was so gentle. May I emphasize that the tumour during its removal is subjected to no more stress than before the operation? Its separation from the intra-atrial wall exerts no pressure on the tumour: the upper finger-nail cuts the pedicle across very much like peeling the skin of a banana, because the pedicle is composed only of endocardium and a thin layer of fibrous tissue. (A thick hard pedicle might cause difficulty in peeling off the tumour from the atrial wall: but such a tumour would not break up.) The myxoma then passes up into the auricle against the blood flow, but is held in the auricular incision mainly by the intra-atrial pressure and is only steadied by the lower finger. Its exit from the auricle occurs only when the auricular muscle is opened enough for it to slide out, most of the pressure coming from the blood itself, which, if anything, tends to blow fragments outwards.

In my own case, though the removal was relatively roughly performed, there was no evidence then or later of fragmentation.—I am, etc.,

Johannesburg,
South Africa.

L. FATTI.

Aspirin and Gastro-intestinal Haemorrhage

SIR,—Dr. L. Th. F. L. Stubbé, in his article on alimentary bleeding following aspirin therapy (*Journal*, November 1, p. 1062), seems to contradict himself in some of his statements. Using every means available to minimize the irritant effect of aspirin tablets on the gastric mucosa—giving them diluted with milk or water after meals, insisting that they be chewed or allowed to disintegrate in the mouth before swallowing, yet excluding in his main group any patient who suffered from dyspepsia—he still showed that approximately 70% had alimentary bleeding as judged by faecal occult blood tests applied with the most stringent precautions. Moreover, in 20 healthy volunteers one woman previously completely free of dyspepsia developed a gastric ulcer with severe indigestion within three weeks of taking 3 g. of aspirin per day, the symptoms abating completely within a few days of stopping it. Finally, he assessed the average blood loss in these patients who had aspirin bleeding (70% of those who took them) to be in the region of 120 ml. per month and possibly more—a greater loss than that occurring during normal menstruation.

In spite of this, he says that gastric haemorrhage and other complications "despite the frequent use of this drug have been rare," and "It is known that bleeding may occur in the stomach after a person has taken aspirin. But, considering the enormous quantities of this drug which are consumed and the frequency with which it is taken, such an occurrence may be regarded as an exception." We find it difficult to reconcile his findings and his opinions. If he meant by "gastric haemorrhage" frank haematemesis or melaena, then he is possibly on firmer ground, but even this seems unlikely.

In such an excellently controlled investigation as Dr. Stubbé's, we feel that it is a pity he did not include soluble calcium aspirin and aspirin substitutes such as N-acetyl-p-aminophenol ("panadol"), which we have found to have little irritant effect on gastric mucosa. On the other hand, buffered aspirin containing either glycine or alkali we have found, in common with other observers, to be just as irritant as ordinary aspirin.—We are, etc.,

Law Hospital,
Carlisle, Lanarkshire.A. MUIR.
I. A. COSSAR.

Malarial Chemoprophylaxis in Indigenous Populations

SIR,—The paper by Drs. L. J. Bruce-Chwatt and D. W. Horn (*Journal*, October 11, p. 869) raises several related questions of vital importance to the indigenous populations of areas like West Africa where malaria is endemic. These questions concern: (a) The propriety of advising anti-malarial prophylaxis for individual families in endemic areas. (b) The effects of chemoprophylaxis on malarial immunity. (c) The correct dosages and toxicity of potent antimalarials like chloroquine and mepacrine.

It has long been held by many that the institution of drug prophylaxis among indigenes of endemic areas is dangerous, because the loss of acquired tolerance to malaria which may result might ultimately encourage cerebral malaria in defaulters. This belief has been responsible for the hesitation of the medical profession in the past to advise the public in endemic areas unequivocally on the subject. Such a view assumes

(i) that once chemoprophylaxis is instituted it will have to be continued indefinitely;

(ii) that no build-up of immunity is possible where even limited drug prophylaxis is in progress, and that in fact what immunity was originally present is lost during chemoprophylaxis;

(iii) that most families in endemic areas are unlikely to follow instructions regarding prolonged chemoprophylaxis which has proved to be of such great value in expatriates.

Assumption (i) seems reasonable in the light of our present knowledge, but (ii) is far from proved, while (iii) it takes no notice of contemporary developments in the fields of education and health consciousness, especially in urban communities in

endemic areas, and minimizes the vast power of newspapers, radio, and other methods of mass education introduced into most of these areas in the past decade.

People who live in endemic areas know that there is no such thing as absolute immunity to malaria, because they suffer from overt attacks of malaria throughout their lives. The value of the immunity lies in preventing fatal complications of malaria, particularly cerebral malaria in the "immune" populations. This immunity is dearly bought with human lives, and at the fatal illness the blood of the child is literally packed with malaria parasites. Most of these lives might have been saved if the overwhelming malarial infections which lead to fatal complications could be prevented, without necessarily aiming at complete suppression.

The crucial questions are:

Is it possible by limited chemoprophylaxis to reduce drastically the incidence of overwhelming malarial infections (with their dangerous complications) without complete suppression of malaria? Is it possible for immunity to develop while limited chemoprophylaxis is in progress?

I believe that the answer to both questions is Yes. This idea has also occurred to others. For instance, Jelliffe,¹ after stating the other side to the case, says, "alternatively, it is possible to conceive of a new drug or one in current use but with a modified dosage which could act as a semi-suppressive preventing serious ill-effects, but permitting the development of immunity."

Here it is necessary to recall some known facts which may be relevant to the problem. First, there is the clinical phenomenon of the "break-through" when a person taking antimalarials develops an attack of malaria. This is recorded as a fact by Bruce-Chwatt and Horn and also Nicol.² Whatever the mechanism is, the attacks are usually relatively mild, fatal results are uncommon, and the blood often shows only scanty parasites. Break-throughs can usually be prevented by complete suppression of malaria by increasing the dose of the antimalarials, and insisting on their being taken regularly.

Another important fact is that, as recorded by Bruce-Chwatt and Horn, an increasing number of indigenes of endemic areas are taking prophylactic antimalarials. One point which they did not mention, however, is that many of us find that we need only a fraction of the recommended prophylactic dosage of antimalarials to keep away clinical attacks of malaria—e.g., 2 to 3 tablets of proguanil per week. If this limited chemoprophylaxis interfered with the level of immunity, we should have found that we need increasing doses of antimalarials over the years to keep away clinical malaria, which is not so. The inference is that this limited chemoprophylaxis is effective in preventing only severe attacks of clinical malaria, but, presumably, not subclinical parasitaemia, which helps to keep up the level of immunity.

Now there is evidence that babies born in endemic areas inherit some degree of immunity from their mothers. Their spleens are 50% heavier than those of expatriate babies.³ I believe that they too can be protected from overwhelming and fatal malaria by limited chemoprophylaxis (e.g., 1½ tablets of proguanil a week) without complete suppression. Such a dose might still permit some build-up of immunity while preventing overwhelming infection.

A possible objection to this form of prophylaxis would be that such doses might encourage resistant strains of malaria parasites. The answer to this is that in spite of the widespread and haphazard use of antimalarials resistance has not become a clinical problem in West Africa, and has shown no signs of increasing. This contrasts sharply with the ready development of resistance to penicillin, sulphonamides, and other widely used antibiotics by certain organisms in West Africa.

Even if further experience should show such limited prophylaxis to fall below expectation, there is still a strong case for the encouragement of routine malarial chemoprophylaxis in individual families in endemic areas in the towns and the increasing numbers in the rural areas who live near hospitals, provided that the possible drawbacks of the practice are explained to them. Much can be achieved through the midwives in maternity centres, who are in regular contact with the mothers in the towns and in many rural areas.

Malaria undermines health in West Africa from the cradle to the grave and is responsible for much ill-health, high infant mortality, prematurity, anaemia, and much lowering of resistance to other diseases. The justifiable jubilation over the health of expatriates is not paralleled in indigenous vital

statistics. Yesterday the alleged ignorance of these families made the advances in malarial prophylaxis seem like a mixed blessing. To-day, however, although much remains to be done, an ever-increasing proportion of the people are wide awake and will heed instructions given in matters pertaining to health. They should no longer be denied the proved benefits of malarial chemoprophylaxis.

Finally, I agree with Bruce-Chwatt and Horn that intramuscular mepacrine and chloroquine could be dangerous, but the danger is relatively small if attention is paid to dosages. For instance, the 100-150 mg. of mepacrine musonate given by the doctors cited by Bruce-Chwatt and Horn to children under 3 is in my opinion an overdose. They should receive 50 mg., which may be repeated in 2-3 hours if necessary. The corresponding dose of chloroquine is 30 to 50 mg. of the base, which is repeatable in 1 to 2 hours.—I am, etc.,

General Hospital
Enugu, Nigeria.

C. NWOKOLO.

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- ² Nicol, B. M., *Brit. med. J.*, 1953, 2, 177.
- ³ Bruce-Chwatt, L. J., in *Diseases of Children in the Subtropics and Tropics*, by H. C. Trowell and D. B. Jelliffe, 1958. London.

Hypothermic Myxoedema Coma

SIR.—The therapeutic programme of the three cases of hypothermic myxoedema coma reported by Dr. Donald W. Macdonald (*Journal*, November 8, p. 1144) included penicillin intramuscularly. Two died. I have for long been under the impression that allergic phenomena are more likely in people with low basal metabolic rates. Some 15 cases of hypothermic myxoedema coma have been reported in the last five years—that is, within the antibiotic era—and the mortality is high. Is it possible that a penicillin allergy is a cause of death in such cases, and might not an antibiotic with a less notorious allergic reputation be advisable in these instances?—I am, etc.,

Cape Town, South Africa.

M. GLASS.

Australian War Experience

SIR.—I have just read with interest the review by Dr. J. C. A. Dowse of the third medical volume *The Island Campaigns*, by Allan S. Walker, dealing with the Australian Medical Services in the war of 1939-45 (*Journal*, August 16, p. 432). I say with interest, particularly, because it emphasizes a criticism of this work which I had published in the *Medical Journal of Australia*.¹ You will note that the reviewer's remarks are correctly and interestingly written in accordance with what this volume contained, and thus his opening sentence, naming only the mosquito as a more deadly enemy than the conventional weapons of war, gives a very inaccurate (through no fault of the reviewer) overall picture of the medical hazards of the campaigns in question. Further along, the reviewer rightly states, "Much is told of the work of individuals in field ambulances and sections of those units; little of the work of the casualty clearing stations or general hospitals."

In order to place the medical hazards encountered in the South-west Pacific Islands in their proper perspective, may I refer your readers to my communication to the *Medical Journal of Australia* already mentioned? There they will see that, through unfortunate and unavoidable circumstances, practically all reference to skin diseases was omitted. Here I would again refer your readers to chapter 55, page 619, in the first volume of this series, *Clinical Problems of War* (also by Allan S. Walker), where it will be seen that for a long period skin diseases were a greater cause of manpower wastage than any other condition, including malaria. I have made a number of attempts to get the over-all Australian war historian to publish a short addendum to the third volume, to correct the very erroneous impression it gives in its present form as to the relative importance of the

various causes of manpower wastage, in case such wastage should ever become important at some future date. However, my efforts have, so far as I am aware, produced no constructive results.—I am, etc.,

Faculty of Medicine,
University of Sydney.

J. C. BELISARIO.

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- ² Walker, A. S., *Australia in the War of 1939-1945, Series 5, Medical*, Vol. 1, 1952, p. 619. London.

Foreign Body in Endotracheal Tube

SIR.—I note a letter from Dr. K. A. Stewart (*Journal*, November 15, p. 1226) describing obstruction of an endotracheal tube by a cork. I have always advocated routine inspection of the tube to be used, thereby on one occasion avoiding using a tube blocked by a piece of cotton-wool.—I am, etc.,

Newport, Monmouthshire.

K. S. THOM.

SIR.—The letter in the *Journal* of November 29 (p. 1357) by Mr. E. H. Rainer is one of several reporting blocked endotracheal tubes. No further letters need be written, thus saving valuable space, if a curved metal introducer is inserted into the tube before oral intubation.—I am, etc.,

London, W.3.

E. V. SLAUGHTER.

Fermented Liquors and Disulfiram

SIR.—Alcoholics on disulfiram ("antabuse") do occasionally accidentally ingest alcohol with the resultant toxic symptoms. This is usually the result of misguided friends "spiking" a soft drink. The following incident is unusual, and so far as I know has not been reported in the literature.

A middle-aged and co-operative female alcoholic had been in hospital for three weeks and had been on disulfiram for six days. She had had no side-effects, but one morning complained of nausea, vomiting, flushing of the face, palpitations, and of oppression in the chest. There was a distinct smell of acetaldehyde on her breath. Naturally, it was assumed that she had obtained alcohol in some form from a visitor. This was strongly and tearfully denied, and the searching of her locker failed to reveal any alcohol.

As well as the usual vitamin therapy she had expressed a wish for one of the proprietary malt preparations which she had been taking three times daily for about a week. On opening the jar of malt it was obvious that fermentation had taken place, and subsequent analysis confirmed the presence of alcohol.

This may be a hazard peculiar to hot countries, but it certainly indicates how careful patients on disulfiram must be to avoid accidental contact with alcohol.—I am, etc.,

Ndola, Northern Rhodesia.

DONALD WHITFIELD.

Rational Use of Drugs

SIR.—In common with other medical practitioners I have received a copy of the very helpful booklet¹ which sets out the relative cost of proprietary preparations and their equivalents. Recently, when wishing to prescribe a suitable preparation for threadworm infestation, I referred to the booklet to see whether there was any difference in cost between "elixir antepar" and the B.N.F. equivalent, elixir piperazine citrate. Discovering that the latter is considerably cheaper, I duly ordered that. However, the dispenser actually issued the proprietary, as that was the only preparation in stock. As a result, my earnest endeavour to play a part in the much-needed drive for economy was frustrated. What is the answer to this? I imagine that this is by no means an isolated example.—I am, etc.,

Halifax, Yorks.

MALCOLM B. BUTLER.

REFERENCE

- ¹ N.H.S. Pharmaceutical Services: Costs of British National Formulary and Proprietary Preparations, July, 1958.

Pharmaceutical Houses and the Doctor

SIR.—I am reluctant to contradict one of my respected teachers, but Professor S. J. Hartfall (*Journal*, December 6, p. 1411) is wrong when he says that the *British National Formulary* contains all that we require for our sick patients.

The *Formulary* is deficient in children's remedies. There is no liquid preparation of penicillin V, tetracyclines, or antihistamines, nor is there any oral streptomycin for gastroenteritis. Perhaps there are technical reasons for these omissions, but it is certainly in treating children that I use most proprietary medicines.—I am, etc.,

Bradford, 5.

G. B. HILL.

SIR.—While hesitating to criticize the opinions (*Journal*, December 6, p. 1411) of a member of the Joint Formulary Committee, I would like to put forward a point of view which other general practitioners may share. The *British National Formulary* is a first-class book, and 90% of my prescribing is based on it. Its amendments, however, are clumsy, and even the most recent one does not include, for example, tab. chlorothiazide, tab. mecamlamine, or a mist. kaolin. et neomycin. pro inf. We must be much more up to date than that, not only for our own prescribing, but to keep pace with the consultant who suggests that we use a proprietary drug previously unknown to us. *Prescribers' Notes* are no help here, and most doctors exercise enough judgment to be able to do without *Proprietary Medicines*. "To-day's Drugs," while written in a suitably critical manner, is difficult to file for easy reference, and "Drug Treatment in Disease" is out of date as soon as a new drug of proved value is produced.

Most of the pharmaceutical firms are doing a good job, as Dr. S. Bradshaw (p. 1411) says, and it is mainly in the method of distributing information that some of them fail us. The solution offered by Dr. J. A. Frai (p. 1412) is a nutcracking sledge-hammer. No, the whole answer has already been provided by Dr. J. D. W. Whitney in his article "Modern Pharmaceutical Advertising" (*Supplement*, July 13, 1957, p. 7). His scheme could be operated at far less than the cost estimated by Dr. J. Phillips (p. 1413). Although about 25 firms have already taken his remarks to heart, I am sure that quicker results could be obtained if the B.M.A., the Association of British Pharmaceutical Industry, and the Ministry of Health would discuss the matter together.—I am, etc.,

Walsall.

J. P. LESTER.

SIR.—May I reply to the letters on "Pharmaceutical Houses and the Doctor" in the *Journal* of December 6? I would like to inform Professor S. J. Hartfall (p. 1411) that the questionnaire I completed was in the form of a postcard brought into my surgery by a cheerful representative. I placed a few ticks in appropriate squares "for research purposes." As for writing letters to the *British Medical Journal*, the letter published on November 22 (p. 1291) was the first letter I have ever written in my life to any publishing body. I was writing merely as a general practitioner whose surgeries get more like commercial television every day. This week, on Wednesday morning, my surgery was interrupted four times by representatives who entered when I rang for the next patient. There I am—trapped—while my patients cool their heels and I champ at the bit. I know I could ease my lot by throwing all the literature unopened into the waste-paper basket and hang a "keep out reps" notice on the door—but is this really the right solution? Professor Hartfall says my patients will not suffer if I do this. Dr. S. Bradshaw (p. 1411) tells me that useful life-saving drugs will remain unrecognized for periods of time varying from 12 to 40 years. Who am I to believe? Yes, I repeat, I am "a simple family doctor," with an innate sense of courtesy, not a churlish, disagreeable cynic, an analytical scientist, a combine harvester made for sifting proprietary products . . . nor yet a social butterfly, flitting from cocktail parties to dances at the expense of time spent

in the surgery. (I have been to nine dances since 1945 and fewer cocktail parties, and on no occasion have I had a medical representative as an escort, charming though they may be!)

Of course, I use the *British National Formulary*. I am fortunate enough to receive every new edition gratis from the executive council. It is my best friend; I have a current copy on my desk, one in my case, one at the hospital, and another at the treatment centre. However, this does not stop the continual bombardment to which I am subject. I receive *Prescribers' Notes* too, but new drugs come out much faster than either of these.

My own experience tells me that if I prescribe certain products that are "freely prescribable on E.C.10s," according to the representatives, I would receive a letter from the executive council informing me that I shall have to pay the cost of the drugs out of my own pocket. Each locum I have engaged has unknowingly left me a legacy of such chitties and I am responsible for their payment. It is therefore with relief that I hear that final-year medical students are encouraged to write prescriptions and are to be proud possessors of a good pharmacopoeia. Whether it is *Martindale*, the *British National Formulary*, a special hospital pharmacopoeia, or a personal one compiled from one's own experience, it is invaluable and, I maintain, will contain much valuable material so neglected nowadays in the *British Pharmacopoeia*. I do not deplore the fact that G.P.s do not use the B.P. *per se*. I deplore the fact that we are being bogged by firms who change the name of the rose, wrap it in cellophane, and charge more for it.

As for Dr. Bradshaw's attack, I have already answered some points in his letter. I am not discussing my own remuneration or the price I have to pay for drugs. That is entirely irrelevant. My worry is that I am acutely aware of the fact that every single time I write a prescription I am spending other people's money, not my own. It is a heavy responsibility and I must not be too gullible or be misled by the glossy advertisements. (I object to the glossiness because it limits its domestic uses. They are more difficult to dispose of: some of them will not even burn.)

Advertisement psychologists are people who earn about four times as much as the average general practitioner, so I am told. They are used for increasing the sales of products.

Yes, I am in favour of research, but if you cannot afford to do all the vital research you desire, do not give so much away to charities or spend so much on advertising material or sending representatives so frequently to sit in our waiting-rooms. I am in agreement with exporting, but from my ever-increasing collection of foreign stamps I am wondering how many millions of pounds worth of drugs we are importing.

Finally, Dr. Bradshaw, my Utopias are dreamt up in my car in between the visits which are sometimes delayed by sorting through a heavy post or listening to the properties of a new wonder drug.

I agree with Mr. R. Merryweather Shaw (p. 1413). hospital pharmacists and local chemists are an invaluable boon to the busy doctor. They are not riding a hobby horse to increase the sales of any particular firm. They are keen on dispensing, not being shop assistants.

Dr. Geoffrey F. Baines (p. 1413) is right. It is difficult to sort out problems. I discovered that several proprietary products were cheaper than the *British National Formulary* equivalents. As a result I prescribed these preparations in an attempt to save national expenditure. When my drug bill was analysed, I was asked why I had prescribed proprietary products instead of *British National Formulary* equivalents. Professor Hartfall may be astonished to learn that I was also asked whether I always prescribed the drugs advised by hospital consultants when I have asked for a second opinion. General practitioners are working under difficult and exacting conditions; all we want is understanding, honest co-operation.—I am, etc.,

Birmingham, 30.

MARY M. RAYNER.

* * This correspondence is now closed.—ED., B.M.J.

Proper Use of Words

SIR.—Recently, in a Very Important weekly medical journal, a Very Important Cardiologist stated that a patient collapsed "following a large haemoptysis."

I remember a colonel who collapsed following a large tiger and a South American band-leader (obese and no

longer young) who collapsed following a large blonde. But why, I asked myself, should anyone follow a large haemoptysis? My first thought was that he was a "time-expired registrar" who intended to write a paper about haemoptysis: my second that "haemoptysis" was a misprint for "hippopotamus." Dr. H. M. Sinclair's letter (*Journal*, November 29, p. 1559) provides an alternative explanation. Could the Very Important Cardiologist have meant that his patient collapsed after a large haemoptysis? What a dull solution of a fascinating problem!—I am, etc.,

London, S.W.3.

RAYMOND GREENE.

SIR,—My old friend, Dr. Hugh Sinclair, very properly criticizes my style (*Journal*, November 29, p. 1559). However, not everyone would agree with him. My friend Lord Cohen has pointed out that Fowler¹ says:

"Firstly, secondly, lastly. The preference for *first* over *firstly* in formal enumerations is one of the harmless pedantries in which those who like oddities because they are odd are free to indulge, provided that they abstain from censuring those who do not share the liking. It is true that *firstly* is not in Johnson; it is true that De Quincey labels it 'your ridiculous and most pedantic neologism of *firstly*'; the boot is on the other leg now; it is the pedant that begins his list with *first*; no-one does so by the light of nature; it is an artificialism. Idioms grow old like other things, and the idiom-book of a century hence will probably not even mention *first*, *secondly*."

Dr. Sinclair ends his letter with an admonition in Greek which I fear few of your readers will understand, which is a pity, because the function of language is to convey meaning. "Physician heal thyself" is not easily achieved. A writer cannot remedy his own defects of style unless he himself recognizes them, or they are pointed out by others. Nowadays it is difficult to find the time to read meticulously what one has written. It is no criticism of you, Sir, to say that the Editor who unfailingly notes the kinds of faults which Dr. Sinclair notes is now, from similar causes, almost extinct. Good writing is not something whose decay one watches with equanimity. I bow my head to Dr. Sinclair's strictures. Would that the physician could heal himself.—I am, etc.,

University of Oxford.

G. W. PICKERING.

REFERENCE

¹ Fowler, H. W., *A Dictionary of Modern English Usage*, 1926. Oxford.

SIR,—In your issue of November 29 (p. 1359) Dr. H. M. Sinclair takes the Oxford regius professor of medicine to task for the misuse of words and lack of clarity in a recent address (*Journal*, November 8, p. 1117). The letter ends with this observation, "In the singular opinion of a former student of Sir George's who admires his addresses, we should all avoid unnecessary jargon and the improper use of words." Does this sentence mean that Sir George admires Dr. Sinclair's addresses or vice versa?—I am, etc.,

West Malvern.

W. G. SHAKESPEARE.

Women Police Surgeons

SIR,—Dr. Nesta H. Wells's account of her 27 years' service as a Manchester City police surgeon (*Journal*, December 6, p. 1404) is both interesting and informative. But I do not follow her reasons for supposing that women doctors (*per se*) are better suited for dealing with children. I have heard similar postulations applied in other branches of medicine—for example, in gynaecology—and I think the idea is both retrograde and old-fashioned. Surely the sex of a doctor is not so important as the innate qualities of kindness, patience, and understanding. Does Dr. Wells feel that male doctors are lacking in these?

Regarding the cases she describes, I submit that our chief concern should be in their prevention (rather than after-treatment or punishment), and that this starts in the home—for adults, as well as children.—I am, etc.,

Knowle, Warwickshire.

N. W. SARGENT.

Obituary

ERNEST SACHS, M.D., F.A.C.S.

Dr. Ernest Sachs, the eminent American neurosurgeon, died in hospital at New Haven, Conn., on December 2. He was in his eightieth year and had been ill for only a short time.

Having been professor of clinical neurological surgery at Washington University, St. Louis, from 1919 to 1946, Ernest Sachs went to Yale at the age of 70 as research fellow in physiology, and it was at New Haven he completed his *History and Development of Neurological Surgery*. Well known as a neurosurgeon, teacher, and writer on both sides of the Atlantic, he had many friends in Britain, for which, as one who had sat at the feet of Sir Victor Horsley, he had a particular affection. When the centenary of Sir Victor Horsley's birth was celebrated last year, Dr. Sachs contributed to this *Journal* some "Reminiscences of an American Student" (April 20, 1957, p. 916), paying this tribute to his mentor: "As I look back upon the years I spent with Victor Horsley, I feel he gave me the best possible insight into the life of a broadminded, generous scientist of his generation." Dr. Sachs's own students felt much the same about him.

Sir GEOFFREY JEFFERSON, F.R.S., writes: The death of Dr. Ernest Sachs means to many engaged in neurosurgery and neurology the passing of a warm and loyal friend. He has told the story of his life in a recent book, *Fifty Years of Neurosurgery—A Personal Story* (1958), and an important document it is, because it covers the whole period of the rise and development of the surgery of the nervous system from Horsley's day onward. Born in New York, the nephew of the famous neurologist Bernard Sachs, he graduated from Harvard and from the Johns Hopkins Medical School, where he was a pupil of Halsted and Osler and came to know Cushing. Ernest Sachs worked with Sir Victor Horsley for a twelvemonth 1907-08 at Queen Square and in his laboratory at University College on the structure and function of the optic thalamus. Sachs became the friend of the Horsley family and a permanent and devoted admirer of Sir Victor, of whom he has written generously.

Sachs will be remembered as a pioneer because, declining an offer to join Cushing, he accepted an invitation in 1911 to go out to the mid-West, to the newly founded Washington University in St. Louis, Mo. This was a courageous move, for at that date there was little specialized neurosurgery anywhere except in Baltimore, Philadelphia, and New York. When he was young there were scarcely a dozen neurological surgeons in the world; now there are over a thousand in the U.S.A. alone. Sachs's tremendous energy, his frank and attractively dynamic personality and complete scientific integrity ensured the success that came his way in plenty. It is impossible in a few words to convey a proper impression of the bubbling warmth of his abundant personality. He was a member of all and had been president of most of the important neurosurgical societies of America and of the American Neurological Association. He was a valued honorary member of our own British Neurological Society and of the Neurological Section of the Royal Society of Medicine.

After his retirement he moved to New Haven, where he helped with the teaching of Yale undergraduates. Sachs wrote several books which had a wide public: one arising from his famous clinical demonstrations to the students at St. Louis is very wise. All those who knew Ernest Sachs well—and if one knew him at all one was sure quickly to want to know him better—will feel sorrow now and sympathy with his charming wife, Maisie, his constant companion.

J. M. C. SPEER, M.D., D.P.M.

Dr. J. M. C. Speer, formerly medical superintendent of Roundway Hospital, Devizes, died in Dublin on October 20. He was 56 years of age.

James Millar Craig Speer was born in Co. Donegal on November 17, 1901. He proceeded from Foyle College, Londonderry, to the Queen's University, Belfast, where he graduated M.B., B.Ch. in 1924. In 1925 he was appointed an assistant medical officer at the Wilts County Mental Hospital, as it then was, and devoted himself to psychological medicine, taking his D.P.M. in 1928. He became deputy medical superintendent in 1934, and in the following year proceeded to the M.D. with a thesis on dysentery in mental hospitals. In 1947 he succeeded the late Dr. J. F. W. Leech as medical superintendent of Roundway Hospital. Four years earlier he was appointed to the commission of the peace for the borough of Devizes, and on the bench his special knowledge was highly valued. He was chairman of the Trowbridge Division of the British Medical Association in 1948-9.

J. O. D. writes: Millar Speer brought high professional abilities and personal qualities to all his life and work. He kept abreast of advances in psychological medicine and introduced new methods of treatment of mental illness. He undertook with quiet efficiency the heavy increase in both administrative and therapeutical work occasioned by the inauguration of the National Health Service. To all his work he brought knowledge and diligence, good judgment and imagination. Above all else he was a doctor, happier in a ward than in an office. He retired to Blackrock, Dublin, with his wife in 1957, to enjoy only eighteen months of quieter life. At Roundway Hospital his memory is cherished for the personal qualities that marked his relationship with staff and patients. Speer was a man of flawless integrity and an imperturbable temper. Essentially humble-minded, he was infinitely patient and gentle in manner. With his imaginative understanding and quiet humour he won the confidence and regard of everyone. In Millar Speer the injunction was abundantly fulfilled—"He that is chief among you, let him be as he that serves."

A. D. WALL, M.B., F.R.C.S.

Mr. A. D. Wall, senior surgeon at the Paignton and District Hospital, died at Paignton on November 25, aged 62.

Austin Darley Wall was born on August 1, 1896. From Oundle he went on to St. Bartholomew's Hospital, where he was awarded the junior and senior scholarships in anatomy and physiology, and won both the Harvey and Foster prizes. Qualifying in 1918, he graduated M.B., B.S. in the following year. After serving in the Royal Navy for a time he held a number of resident appointments at Bart's, and, deciding to specialize in surgery, he took the F.R.C.S. in 1921. A few years later he went out to Shanghai, where he became honorary surgeon to the Shanghai General Hospital and to the Lester Chinese Hospital. He was also medical officer to the British Consulate and to the Shanghai Municipal Police. Returning to Britain shortly after the outbreak of the second world war, he came to live in Paignton. Early in 1940 he joined the R.A.M.C. and served as a surgical specialist until 1945, being mentioned in dispatches. On demobilization he returned to Paignton, where he was in general and surgical practice until his death. He was elected President of the Torquay and District Medical Society this year. He leaves a widow and two daughters.

J. F. B. writes: Mr. Wall as a person was extremely kind, patient, and courageous. No one ever saw him flustered, nor heard his voice raised in anger, yet he was energetic and determined in all his activities. As a consultant surgeon he was always practical and helpful, perhaps because he

was also a general practitioner himself and understood the nature of a family doctor's problems, and he was not above doing the most lowly surgical chores—a necessary asset when running the surgical services of a general-practitioner hospital with no resident staff. To this last quality can be attributed the opinion of a patient who said that he liked Paignton Hospital and thought the staff very kind and efficient, particularly the house-surgeon—the house-surgeon in question being Mr. Wall. His modesty was outstanding, and he was endowed with a sense of humour which always seemed to manifest itself unexpectedly, but kept on appearing regularly. His devoted work at Paignton, and the high quality of that work, will be much missed; but mostly we mourn the loss of a much-loved man.

Medico-Legal

MOTHER'S ADOPTION OF ILLEGITIMATE CHILD

[FROM OUR LEGAL CORRESPONDENT]

On November 28 the Court of Appeal decided (*The Times*, November 29) for the second time that there was no good reason in principle why an order should not be made under the Adoption Act, 1950, by which an unmarried mother could adopt her own child. The court's previous decision had not been reported, because it was given *in camera*.

The matter arose on appeal from a refusal by a county court judge to make the order on the application of the mother and on a report by the L.C.C. Welfare Officer that the child was well cared for and adoption seemed to be in her best interest. The judge had taken the view that the Adoption Act, 1950, had not been designed or intended to remove the stigma of illegitimacy, and that if he made an order it would be a precedent which would soon become common form and result in the abolition of illegitimacy.

In his judgment Lord Denning said that it was plain from the terms of Section 1 (3), Section 2 (1), and Section 12 (2) of the Act that Parliament had contemplated the making of an order in such circumstances. There were many advantages for the child if an order were made, in the field of the inheritance of property for example and by using the registration in the adopted children's register instead of the entry in the register of births. The child remained illegitimate even if adopted, but by being adopted it became in law the child of its mother for all purposes and so suffered none of the legal disabilities which attached to illegitimacy. If the mother was a suitable person and the home and other circumstances were suitable, the fact that the order was sought simply because the child was illegitimate was no bar to it being made.

Lord Justice Hodson added that the exercise of the court's discretion was of course required to see whether the mother could look after the welfare of the child, since the welfare of the child was the paramount object of the Act.

MAINTENANCE WHERE SPOUSES PART FOR MEDICAL REASONS

[FROM OUR LEGAL CORRESPONDENT]

Recently the Divorce Divisional Court upheld the refusal of the Kingston-upon-Hull magistrate to make a maintenance order against a husband whose wife was living apart from him for medical reasons (*The Times*, October 30).

The parties were married in 1948 and things went reasonably smoothly till 1952, when after a very difficult confinement the wife became a voluntary patient in a mental hospital. There she stayed until 1956, when she went to live with her mother because she suffered from a neurosis which produced acute revulsion to sexual relations, and if she had returned to live with her husband she would have had a serious breakdown in health.

In his judgment the President said that on the facts the husband was not in desertion, nor had he agreed to maintain her as a separated wife, so that wilful neglect to provide reasonable maintenance for her could not be imputed to him. The true solution to this difficult case was for the National Assistance Board to ask for an order for the wife's maintenance under Section 43 of the National Assistance Act, 1948, which could be made without any "wilful neglect" on the husband's part being established.

Medical Notes in Parliament

MENTAL ILLNESS

Research Projects

Dr. DONALD JOHNSON (Carlisle, Con.) asked the Minister of Health on December 8 whether he was satisfied with the adequacy of the machinery for approval of mental health research; in particular, whether this was acting quickly enough; and if he would make a statement. Mr. D. WALKER-SMITH: Yes. The machinery provides for rapid and regular consideration by the Medical Research Council of proposals and of the advice tendered by the Clinical Research Board about them.

Dr. JOHNSON said that in spite of what the Minister said complaints were received that it took sometimes 18 months to obtain a definite answer, Yes or No, on a research project, and delays of that kind were frustrating. Mr. WALKER-SMITH said he knew of two cases in which there had been unavoidable delay for personal reasons connected with the gentlemen who were to be put in charge of the projects. In the ordinary way the machinery was designed to be rapid, and was so in practice.

Mr. A. BLENKINSOP (Newcastle upon Tyne, East, Lab.) said that recently a number of scientists and medical men doing mental research, especially on schizophrenia, had been lost to the United States, and there was some anxiety about this trend. Mr. WALKER-SMITH explained that in one of the cases the professor concerned had taken an appointment in the United States. That was the reason for the delay. But the action was taken for personal reasons, and general conclusions of the kind Mr. Blenkinsop had mentioned should not be drawn from it.

Local Authority Welfare Services

Mr. BLENKINSOP asked what additional local authority expenditure on mental health and welfare services has been approved for 1959-60 and 1960-1. Mr. R. THOMPSON, Parliamentary Secretary, Ministry of Health, said that included in the figures of relevant expenditure taken into consideration in fixing the proposed totals of general grant for the first grant period were estimated amounts for these services of over £900,000 for 1959-60 and over £1¼m. for 1960-1 above the estimated figures for 1958-9.

Mr. BLENKINSOP asked if he thought these figures would make possible any kind of start in developing local authority services to provide for the numbers who would be able to come out of mental hospitals and institutes. Mr. THOMPSON: Indeed I do. It is estimated that the rate of development for which these increases provide in each year is about two and a half times the annual development rate achieved in recent years. Mr. BLENKINSOP: The Parliamentary Secretary knows that during the last few years there has been hardly any development at all. Why try to confuse the House by talking about two and a half times a rate of increase that has been negligible? Mr. THOMPSON said he could not accept that what was now spent on these services was negligible. A rate of two and a half times greater was considerable by any standards.

Consequences of Ratty Case

Mr. N. DODDS (Erith and Crayford, Lab.) asked the Minister in view of the decision in the High Court on the

illegal detention of Miss Kathleen Ratty, which resulted in her discharge as a mental defective, and the subsequent review of those mental defective patients detained under the same section of the Mental Deficiency Act, 1913, how many patients had been discharged as a result of this review; how many were still detained under this particular section of the Act; and why they had not yet been released. Mr. WALKER-SMITH: 1,957 have so far been discharged; 3,078 are still detained because they are unfit for discharge or have nowhere suitable to go.

Mr. DODDS expressed his delight that nearly 2,000 people who had been wrongfully certified had now been allowed out. But was it not a terrible indictment of the country that 3,000 people should be detained who had never been certified, largely because there was no other place for them than mental institutions? He asked the Minister to undo some of the wrong which had been done. Was it possible to give them some special rehabilitation courses to smooth their way back into the community? Mr. WALKER-SMITH pointed out that they did not know that all these cases were similar to the Ratty case, because they did not know the facts that were before the court. The board was not in a position at any time to know the facts before the court at the time of admission. These were cases which appeared on the face of it to have some similarity, but he was sure that what Mr. Dodds had in mind was that the basis of the Ratty decision was on the construction of the words "found neglected." There was no doubt that many of these 3,000 people were in need of care and treatment for their mental condition. Mr. DODDS: Yes, but not in mental institutions.

Sir GODFREY NICHOLSON (Farnham, Con.) said the anxiety and shame expressed by Mr. Dodds were widely shared on the Conservative side. Mr. WALKER-SMITH replied that before he used those expressions he should study the facts and realize what was the basis of the Ratty decision.

Leucotomy Operations

Mr. K. ROBINSON (St. Pancras, North, Lab.) asked how many leucotomy operations had been performed in mental and mental-deficiency hospitals in England and Wales during each of the last 10 years. Mr. WALKER-SMITH said the only information available was as follows: The numbers of leucotomy operations performed in N.H.S. hospitals in England and Wales in each of the years 1949 to 1952 were, respectively, 1,442, 1,337, 1,308, and 1,355. A special inquiry showed that, in 1957, 728 operations were performed in regional hospitals with 100 or more beds.

"Persomnia"

Mr. F. NOEL-BAKER (Swindon, Lab.) asked what steps the Minister would take to place the tranquillizing drug "persomnia" on Schedule 4, in view of the widespread anxiety in the medical profession about its unrestricted sale to the public and the danger of addiction. Mr. WALKER-SMITH said the Home Secretary had informed him that the Poisons Board was not prepared to recommend this. At the Board's suggestion, the problem was being referred to the Interdepartmental Committee on Drug Addiction.

CONDUCT OF MEDICAL RESEARCH

Experiment on Children

Mr. S. SWINGLER (Newcastle-under-Lyme, Lab.) asked if the Minister had considered the report sent to him of a clinical experiment in which mentally defective children in hospital were used as matched controls; whether parental consent was obtained before the children were so used; and what assurances were given that no harmful effects would result.

Mr. WALKER-SMITH: I have seen the report, and I regret to find on inquiry that parental consent was not obtained as it should have been before the drug was administered. I am assured that a single dose as given in this case has no harmful effects.

Mr. SWINGLER recalled that in February, 1945, he had called attention to a similar case of children in hospital

being used as "guinea-pigs" for scientific experiments involving the injection of drugs without there being any parental consent. Was this not very wrong, and as a second case had occurred should not the Minister issue some guidance to hospital authorities? There were many people who had the strongest objections to children being used in this way, especially when adults could volunteer for the purpose. Mr. WALKER-SMITH replied that guidance had been issued in the form of the Medical Research Council memorandum, which had been published. With regard to adults, in this case the drug was first tried out on the doctors who were to carry out the trials on the children.

Regulation of Clinical Experiments

Mr. SWINGLER asked to what extent the regulations permit the use of children in hospital for clinical experiments with or without parental consent. Mr. WALKER-SMITH: Investigations of this kind involve medical and ethical problems which are not susceptible of control by regulations. It is, however, my view that parental consent should be obtained, and I will draw the attention of responsible officers of hospital boards to this matter again.

Mr. SWINGLER said it was regrettable that this case should have occurred. "Will the Minister now make this instruction very emphatic to hospital authorities, so that no further cases may occur?" he asked. Mr. WALKER-SMITH: I will certainly try to ensure that the requirement is brought to the notice of all concerned. Having said that, I reiterate that no harm was done and that this was a valuable and useful experiment.

Mr. C. MAYHEW (Woolwich, East, Lab.): While the Minister rightly agrees to look carefully at the point raised by Mr. Swingler, will he bear in mind that a number of very promising research projects involve free access to patients? While he will look carefully at the matter, may I ask that he will not prejudice the success of those important researches? Mr. WALKER-SMITH: My general policy, in harmony with that of the Medical Research Council, is that there should be the greatest possible freedom from detailed supervision of clinical research in hospitals, for the reasons Mr. Mayhew has given. I do not regard that as incompatible with abiding by the view I have expressed about parental consent for these cases.

Expenditure on Cancer Research

Mr. H. HYND (Accrington, Lab.) asked the Minister what new steps he was taking to tackle the disease of cancer; how much he had spent from public funds on research into this disease during the last 12 months; and what amount had been contributed from other sources for this research in institutions for which he is responsible. Mr. H. ATKINS (Merton and Morden, Con.) asked what was the total of public funds to be spent on cancer research in this financial year, including both the block grant to the Institute of Cancer Research and any part of the general grant-in-aid to the Medical Research Council which was used for this purpose.

Mr. WALKER-SMITH: In the current financial year the Council's estimated expenditure on cancer research from public funds is £472,470; in addition, it is estimated that some £26,500 from other sources will be expended by the Council, approximately half of which will be in the Council's own research units and groups. In addition to the Council's expenditure in this field, further research is supported from public funds in the N.H.S. in the course of the treatment of patients; and in various university and medical school departments from University Grants Committee funds. It is, however, not possible to make a separate estimate of this expenditure. Every effort is constantly being made to achieve a break-through in this very difficult field, and the Medical Research Council will continue to develop its programme and to follow up every promising new approach. Mr. HYND said he appreciated what was being done, but was the Minister happy about the appeals that had to be made for private charitable contributions to such an important project? Mr. WALKER-SMITH: I see nothing

improper or unacceptable about private organizations and private funds supplementing the public effort. Cancer research is the sort of thing that ought to attract private as well as public support, and there is close co-ordination regarding the common objects of research.

Mr. ATKINS said that this expenditure was an investment in the future and would pay extremely good dividends. Would the Minister so represent it when he asked the Chancellor of the Exchequer for an increased grant next year? Mr. WALKER-SMITH: The amount of money available is such that cancer research is not handicapped by lack of funds. It is the intractable nature of the disease which prevents progress being as fast as we would wish.

Adequacy of M.R.C. Funds

Mr. BLENKINSOP asked if the Minister was satisfied with the amount of funds at present available for medical research; and what action he proposed to take to improve the situation. Mr. WALKER-SMITH: Yes, over the last ten years expenditure by the Medical Research Council has been more than trebled. The Council's resources are reviewed sympathetically each year in the light of new developments and new needs.

N.H.S. ADMINISTRATION

Senior Registrar Appointments

Mr. ROBINSON asked the Minister for a statement on the present position regarding time-expired senior registrars, indicating what proportion had been recommended for and have received permanent appointments. Mr. WALKER-SMITH: I explained my proposals in regard to time-expired senior registrars in my reply on April 21. Hospital boards have so far formulated proposals for 24 designated posts of which two are about to be approved and 22 are under consideration.

Mr. ROBINSON: Is that not a very small proportion of the whole? Why is progress so slow? Does the Minister not appreciate that a very great deal of anxiety and hardship is entailed? Mr. WALKER-SMITH: It has always been envisaged that there would be only a limited number of designated posts. I used that phrase, or words to that effect, in my answer on April 21. In regard to slow progress, it is a fact that two regional boards and five boards of governors have not yet replied, but I have reminded them of the urgency of doing so. Mr. A. BLENKINSOP: Does the Minister not feel that the time must come in a registrar's career when he needs some kind of certainty about his future? Mr. WALKER-SMITH: A good many of us in other fields of activity want certainty about our future (laughter)—on both sides of the House. We do our best for these people.

Hospital Waiting-lists

Mr. BLENKINSOP asked what was the latest available figure for those waiting for admission to hospital; and how this compared with twelve months previously. Mr. WALKER-SMITH stated that at the end of June, 1958, there were 442,000 names on the waiting-lists of N.H.S. hospitals in England and Wales. This figure was about 1% higher than that for June, 1957.

Mr. BLENKINSOP said there was great anxiety about the fact that during the last two years there had been a steady increase in the waiting-list compared with experience during some years before. What action was the Minister taking to secure a correction of this disquieting tendency? Mr. WALKER-SMITH: It has not been a steady increase. The figures fluctuate somewhat. At March 31 this year, for example, the figure was slightly lower than in March, 1957. In regard to previous years, the figures are a good deal lower than when Mr. Blenkinsop was concerned with these matters.

Medway Complaints

Mr. PERCY WELLS (Faversham, Lab.) asked the Minister if he had considered the complaints made at the annual general meeting of the Rochester and Chatham Division of the B.M.A. concerning the shortage of beds for acutely ill

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

Medical News

Chair of Medicine, St. George's Hospital.—Dr. A. C. DORNHORST, reader in medicine at St. Thomas's Hospital Medical School, has been appointed to a new London University chair of medicine at St. George's Hospital Medical School. Dr. Dornhorst graduated in medicine from St. Thomas's in 1937, proceeding M.D.(London) in 1939. He obtained the M.R.C.P. in 1938 and was elected F.R.C.P. in 1955. During the second world war he held the rank of lieutenant-colonel in the R.A.M.C.

Carbon-monoxide Poisoning.—In a circular to local authorities, dated December 8, the Ministry of Health amends the scale of medical and first-aid equipment in the Ambulance Service to bring it into line with the Medical Research Council's recent recommendations on the treatment of carbon-monoxide poisoning (*Journal*, December 6, p. 1408). The circular states that the Minister "has been advised by the Medical Research Council that, for the purpose of first-aid treatment of carbon-monoxide poisoning, use should be made of 5% carbon dioxide in oxygen instead of pure oxygen. He is further advised that pure oxygen should be used in the treatment of asphyxia and anoxia."

Research on Mental Deficiency.—On December 16 a new diagnostic and research department was opened at the Fountain Hospital, Tooting Grove. Space for the department has been found by adapting and redesigning what was previously a ward and adding a biochemical laboratory to it. The unit includes a day room for the children and two small dormitories (for 8 and 4 beds). Research into the cause and treatment of mental deficiency has been actively developed at the Fountain Hospital under Dr. BRIAN H. KIRMAN, and the new unit will make it possible with less disturbance to investigate and treat selected groups of children. At present two groups of children are in the unit, one for a biochemical investigation of phenylketonuria and the other for trial of a pituitary treatment of mongolism.

Handicapped School-leavers.—The British Council for Rehabilitation has set up a Working Party under the chairmanship of Dr. ELFED THOMAS, director of education for the City of Leicester, with the following terms of reference: "To investigate the needs of the physically and mentally handicapped school-leavers; to study the means of meeting their difficulties and to make recommendations." The Working Party includes educationists; representatives of the medical services, voluntary organizations, the Trades Union Congress, and industry, and observers from Ministries and local authorities. The British Council for Rehabilitation (Tavistock House South, Tavistock Square, London, W.C.1) would welcome evidence relevant to the above terms of reference.

Ciba Fellowship Trust.—Ciba Clayton Ltd., Ciba Laboratories Ltd., Ciba (A.R.L.) Ltd., and the Clayton Aniline Company Ltd. announce that they have set up a Ciba Fellowship Trust "for the purpose of improving and increasing the interchange of ideas between scientists in the United Kingdom and on the Continent. The trustees are Sir ARTHUR HARVEY, M.P., Lord HIVES, C.H., and Sir ALEXANDER TODD, F.R.S.

Several fellowships will be awarded for tenure during the academic year 1959-60 at Continental universities or for research in chemistry, physics or allied subjects. They will be awarded to graduates of United Kingdom universities or those who graduate there. Basic awards will vary between £500 and £800 a year.

Further details may be obtained from the secretary of the Trust, Ciba (A.R.L.) Limited, Duxford, Cambridge. The closing date for applications is January 31.

Royal Society.—Among those elected at the anniversary meeting of the Royal Society on December 1 as office

holders for 1959 were Sir LINDOR BROWN as biological secretary; and Sir CHARLES DODDS, Professor WILSON SMITH, and Professor J. Z. YOUNG as members of the council. Under the Royal Society and Nuffield Foundation Commonwealth bursaries scheme awards have been made to Dr. P. R. DAVIS (Royal Free School of Medicine) and Dr. A. IGGO (Department of Physiology, Edinburgh University). The former is to study primate skeletal remains in Africa, the latter neurophysiological techniques at Canberra.

Royal College of Physicians of Edinburgh.—The office bearers for the ensuing year are: *President*, Dr. A. RAE GILCHRIST; *vice-president*, Dr. J. D. S. CAMERON; *members of council*, Dr. I. G. W. HILL, Dr. J. G. M. HAMILTON, Dr. J. HALLIDAY CROOM, Dr. T. ANDERSON, and Dr. J. LAURIE; *treasurer*, Dr. J. ALASTAIR BRUCE; *secretary and registrar*, Dr. R. F. ROBERTSON; and *hon. librarian*, Dr. JOHN RITCHIE.

Royal College of Surgeons of Edinburgh.—At a meeting of the College on December 10, with Professor JOHN BRUCE, the president, in the chair, the fellowship without examination was awarded to Professor G. J. ROMANES. At a meeting held the same day the following who passed the requisite examinations were admitted fellows:

B. C. Abernethy, R. T. Aldridge, B. Azer-Fam, G. W. Burgess, I. Cher, A. B. Chinnappa, T. B. Comins, K. S. Davies, K. J. Dennis, A. K. Deshmukh, M. J. Flood, R. L. Gadd, D. S. Gill, A. G. Graham, J. M. Gray, H. Green, W. A. Hanna, J. A. Hunt, V. C. James, K. M. Kalappa, D. M. King, P. A. H. Klocker, S. G. Leitch, D. B. Longmore, C. R. Lulham, D. H. McClymont, A. E. Mody, P. J. B. Murray, J. R. Pearson, W. S. E. Perera, I. H. Rathor, M. R. Rayman, C. J. C. Renton, F. O. Stephens, R. D. Stride, N. Swarup, K. P. Tamaskar, H. J. S. Waldeck, G. F. Walker, R. K. Wats, and R. W. Weinberg.

Royal Faculty.—At a meeting of the Royal Faculty of Physicians and Surgeons of Glasgow on December 1, with Mr. ARTHUR JACOBS, the president, in the chair, the following were admitted fellows, *qua* physician: P. Damodaram, T. D. Grant, I. R. W. Lominski, A. MacNiven, I. Ramzy, M. A. Shoke.

Sheffield University.—A special degree congregation will be held on the occasion of the opening of the New University Library by Mr. T. S. ELIOT, O.M., on May 12, at which the honorary LL.D. will be conferred on Professor ROBERT PLATT, P.R.C.P., and the honorary D.Sc. on Sir HANS KREBS, F.R.S., Whitley professor of biochemistry at Oxford.

Empire Rheumatism Council.—Dr. J. THOMAS has been awarded a research fellowship for work on connective tissue enzymes. The Geigy travelling fellowship has been awarded to Dr. EVELYN HESS, who will spend a year at the Texas Southwestern Medical School, and the Wyeth fellowship in pharmacology has been awarded to Dr. V. MOSES for work on salicylates and other antirheumatic drugs.

British Association of Plastic Surgeons.—The following have been appointed to office for 1959: *President*, Mr. RAINSFORD MOWLEM; *immediate past president*, Mr. J. S. TOUGH; *hon. treasurer*, Mr. R. P. OSBORNE; *hon. editor*, Mr. A. B. WALLACE; *members of council*, Mr. T. GIBSON, Mr. P. H. JAYES, Professor T. P. KILNER, Air Commodore G. H. MORLEY, Mr. E. W. PEET, Mr. MORTIMER SHAW, and Dr. STUART GORDON (overseas representative); and *hon. secretary*, Mr. C. R. McLAUGHLIN.

British Association of Otolaryngologists.—The following have been elected officers for 1958-9: *President*, Mr. C. GILL-CAREY; *immediate past president*, Mr. I. SIMSON HALL; *vice-president*, Mr. R. R. SIMPSON; *hon. treasurer*, Mr. J. C. HOGG; and *hon. secretary*, Mr. MYLES L. FORMBY.

Christine Murrell Fellowship.—The Medical Women's Federation invites applications for this research fellowship, value £150, from Women on the British Medical Register. Further details from the Federation, Tavistock House North, Tavistock Square, London, W.C.1. The closing date is April 30, 1959.

Deputy Chief Nursing Officer.—The MINISTER OF HEALTH has appointed Miss DOROTHY MARION WHITE to be Deputy Chief Nursing Officer. From 1955 to 1957, Miss White was assistant matron at the General Infirmary, Leeds. Since then she has been assistant nursing officer to the S.E. Metropolitan Regional Hospital Board.

COMING EVENTS

Joint Endocrine Meeting.—The Section of Endocrinology of the Royal Society of Medicine and the Society of Endocrinology, with other interested bodies, are holding a joint meeting on April 24 and 25 at the Royal Society of Medicine. Details from the Section Secretary of the R.S.M., 1, Wimpole Street, London, W.1.

1959 Health Education Conference.—The conference will be on "The Elderly in the Community," January 22, 1959, at B.M.A. House (fee £1). Details from the Medical Director, Central Council for Health Education, Tavistock House North, Tavistock Square, London, W.C.1.

National Association for Mental Health.—Residential week-end conference in London for A.M.O.H.s working in maternity and child welfare clinics, February 20 to 22, 1959. Applications (by January 12, 1959) to the Education Secretary, N.A.M.H., 39, Queen Anne Street, London, W.1.

Ninth International Congress of Paediatrics.—The Congress will be held in Montreal from July 19 to 25. Application forms from the Hon. Secretary, British Paediatric Association, c/o Institute of Child Health, Great Ormond Street, London, W.C.1.

Darwinism and the Study of Society.—Conference to mark the centenary of *The Origin of Species*, April 8 to 10, 1959, at Adam House, Edinburgh. Details from Dr. M. P. BANTON, Social Sciences Research Centre (Edinburgh University), 39, George Square, Edinburgh, 8.

Ophthalmological Society of the U.K.—Annual congress, April 9 to 11, 1959, at the Royal Society of Medicine. Details from the Ophthalmological Society, 47, Lincoln's Inn Fields, London, W.C.2.

Medical Education and Licensure.—55th A.M.A. annual congress on medical education and licensure, Chicago, February 7 to 10, 1959. Details from the Council on Medical Education and Hospitals, American Medical Association, 535, North Dearborn Street, Chicago, 10, Illinois.

British Association of Physical Medicine.—Annual meeting, April 17 and 18, 1959, at Guy's Hospital. Last date for papers, January 30, 1959. Details from the B.A.P.M., 47, Lincoln's Inn Fields, London, W.C.2.

Central Council for Health Education.—Seminar in London for M.O.H.s on "The Promotion of Health in Middle Age," February 24 to 27, 1959. Details from the Medical Director of the Council, Tavistock House North, Tavistock Square, London, W.C.1.

International Congress on Plastic Surgery.—The British Association of Plastic Surgeons is holding an international congress in London from July 12 to 17, 1959. Detailed information may be obtained from the Organizing Secretary, Mr. DAVID MATTHEWS, International Congress on Plastic Surgery, c/o Institute of Child Health, Hospital for Sick Children, Great Ormond Street, London, W.C.1.

Pneumoconiosis.—The pneumoconiosis conference of the South African Council for Scientific and Industrial Research will be held from February 9 to 24, 1959, in Johannesburg. Details from the Secretary-General, 18, London House, Loveday Street, Johannesburg.

Institute of Diseases of the Chest.—Clinical demonstrations (without fee) for medical practitioners, on Fridays at 5 p.m. from January 2 to March 20, 1959. Details from the Secretary of the Institute, Brompton, London, S.W.3.

James Yearsley Lecture.—Dr. KARSTEN KETTEL, of Hillerød, Denmark, will lecture at 5.15 p.m. on March 6, 1959, at the Royal Society of Medicine, on "Surgery of the Facial Nerve in Atraumatic Facial Palsies."

APPOINTMENTS

ASH, E. BAYLIS, M.B., M.R.C.P., Honorary Consulting Dermatologist, United Birmingham Hospitals.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—P. E. JACKSON, M.D., M.R.C.P., Consultant Physician, Peterborough and Stamford Hospital Group; J. W. JACKSON, M.B., B.S., F.R.C.S., Consultant Orthopaedic Surgeon, Ipswich and East Suffolk Hospital Group; A. BRYCE, M.B., Ch.B., D.M.R.D., Consultant Radiologist, North Cambridgeshire Hospital Group; F. L. F. INNES, M.B., Ch.B., F.R.C.S.Ed., Consultant Plastic Surgeon, Regional Burns and Plastic Unit, West Norwich Hospital; J. ZAMLER, M.B., B.S., Assistant Clinical Pathologist, Papworth Hospital and County Hospital, Huntingdon; J. A. MORZAN-HUGHES, M.B., B.Chir., Medical Registrar, Norfolk and Norwich Hospital; M. C. G. MANTILL, M.B., B.Chir., Anaesthetic Registrar, United Norwich Hospitals; B. S. KUMAR, M.B., B.S., Surgical Registrar, Memorial Hospital, Peterborough; J. W. SMITH, M.B., B.S., Surgical Registrar, West Norfolk and King's Lynn General Hospital; T. OSBORN, B.M., B.Ch., Registrar in Psychiatry, Fulbourn Hospital and Addenbrooke's Hospital.

ELLIOTT, FRANK A., M.B., Ch.B., F.R.C.P., Professor of Clinical Neurology in the Medical School of the University of Pennsylvania and Director of Neurological Research and Education at the Pennsylvania Hospital, Philadelphia.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—M. A. T. WATERS, M.B., B.S., M.R.C.P.Ed., D.P.M., Consultant Psychiatrist at Roundway Hospital, Devizes; D. R. TALWAR, M.B., B.S., D.A., Anaesthetic Registrar at Southmead Hospital, Bristol; A. J. NEWTON, M.B., B.S., Registrar in Orthopaedic and Traumatic Surgery to work at Torbay Hospital, Torquay, and Princess Elizabeth Orthopaedic Hospital, Exeter, on an exchange basis; F. W. WARD, M.B., B.S., Surgical Registrar at Cheltenham General Hospital.

WYLLIE, J. A. H., M.D., D.Phil., Research Bacteriologist, Department of Bacteriology, Brompton Hospital.

BIRTHS, MARRIAGES, AND DEATHS

DEATHS

Aikman.—On December 5, 1958, at his home, 72, Chelmsford Place, Fulford Road, York, James Hislop Aikman, M.C., M.B., Ch.B., D.P.H. Beatty.—On November 26, 1958, at Tunbridge Wells, Kent, John Colley Pounden Beatty, M.B., B.Ch., D.P.H. Blair.—On December 7, 1958, at Bridge Street, Helmsley, Yorks, Alexander Campbell Blair, M.D., aged 90. Boyden.—On December 5, 1958, Percy Hamilton Boyden, M.D., surgeon captain, R.N., retired, of 30, Outram Road, Southsea, Hants. Bryson.—On November 30, 1958, at Richmond, Surrey, Reginald Bryson, F.R.C.S.Ed., Lieutenant-Colonel, I.M.S. (retired), aged 86. Burrell.—On December 7, 1958, at Aberystwyth, Cards, Charles Milwyn Burrell, M.B., B.Ch., of 22, North Parade, Aberystwyth. Cardis.—On December 1, 1958, at 32, Street Lane, Leeds, Yorks, Joseph Cardis, M.D., aged 57. Clyne.—On November 29, 1958, at Wealdens, Ashurst, near Southampton, Hants, Charles Clyne, M.C., M.D., D.T.M.&H. Cremin.—On December 3, 1958, in hospital, Maurice Cremin, L.R.C.P.& S.I. & L.M., of 40, Heather Drive, Dartford, Kent. Curlls.—On December 11, 1958, Edgar Stuart Curlls, T.D., M.B., B.S., F.F.A. R.C.S., of Beaconsfield, Bucks, and Ealing, London, W. Devitt.—On December 8, 1958, at Bournemouth, Hants, Herbert Pye Smith Devitt, M.R.C.S., L.R.C.P. Lamb.—On December 9, 1958, in a nursing-home, Teddington, Middx, David Lamb, M.B., C.M., F.R.F.P.S., J.P., late of 70, Mount Annan Drive, Glasgow, aged 88. Lambkin.—On December 4, 1958, Ernest Charles Lambkin, D.S.O., M.B., B.Ch., Lieutenant-Colonel, R.A.M.C. (retired), of Liskilleen, Shankill, Co. Dublin. Meccredy.—On December 4, 1958, Emily Mary Spencer Meccredy, M.D., of 11, Devonshire Place, London, W., formerly of 148, Harley Street, London, W. Neill.—On December 1, 1958, at Northern General Hospital, Edinburgh, James Hood Neill, M.B., Ch.B., of 4, Blinkbonny Crescent, Edinburgh, formerly of Kenya and Uganda. O'Brien.—On December 7, 1958, William O'Brien, M.B., Ch.B., of 284, Brockley Road, London, S.E. O'Connor.—On November 23, 1958, at his home, Ashwood House, Swindon Road, Kingswinford, Staffs, William Albert O'Connor, L.M.S.S.A., D.P.M., aged 61. Philip.—On December 7, 1958, at Balbogie, Huntly, Aberdeenshire, Peter William Philip, M.B., Ch.B., J.P. Phillips.—On December 10, 1958, at 7, Kilgraston Road, Edinburgh, Joseph Evelyn Phillips, M.B., Ch.B., of Barbados, British West Indies, late of 49, Minto Street, Edinburgh. Rowlands.—On November 22, 1958, at 25, Wimpole Street, London, W., Richard Pugh Rowlands, M.R.C.S., L.R.C.P., aged 86. Smith.—On November 28, 1958, at Putney, London, S.W., Hoyland Smith, M.R.C.S., L.R.C.P. Southwell-Sander.—On December 6, 1958, at his home, 8, Old Bury Hill, Dorking, Surrey, Geoffrey Henry George Southwell-Sander, M.B., B.Chir., D.P.H., D.I.H., Surgeon Captain, R.N. Stansfield.—On November 18, 1958, in hospital at Stroud, Walter Stansfield, M.R.C.S., L.R.C.P. Taylor.—On December 6, 1958, Elizabeth Morton Taylor, L.R.C.P.&S.E.I., L.R.F.P.S., of Ormsbank, Dalkeith, Midlothian, aged 88. Wall.—On November 25, 1958, at Paignton, Devon, Austin Darley Wall, M.B., F.R.C.S. Watts.—On December 3, 1958, Edward Croft Watts, M.D., F.R.C.S.Ed., D.P.H., of Lothians, Milford-on-Sea, Hants, aged 86. Weatherhead.—On November 22, 1958, at a Folkestone nursing-home, Ernest Weatherhead, M.B., of 1, Grimston Gardens, Folkestone, Kent, aged 84.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Surgery for Diaphragmatic Eventration

Q.—Has surgery anything to offer in the treatment of diaphragmatic eventration in a patient of 64, whose symptoms are now becoming distressing on account of very considerable cardiac displacement to the right—the eventration being of the left leaf of the diaphragm?

A.—I assume that the patient has true eventration, a congenital defect in which the central tendon of the diaphragm is thinned and elevated but the muscle itself is intact and functional. The condition does not usually give rise to any ill effects but may cause gastric or cardio-respiratory symptoms. It may increase disability in an emphysematous patient with depressed pulmonary ventilation and vital capacity, not only by diminishing the total lung volume but also by allowing paroxysmal diaphragmatic movement. A thorough investigation of the cardio-respiratory system is essential in a patient of this age to ensure that the symptoms are not primarily cardiac in origin (it is unlikely that displacement of the heart *per se* will give rise to disability). Before any operation is contemplated all other means should be taken to increase pulmonary efficiency. If respiratory function is embarrassed by obesity, vigorous dieting is necessary. The patient should be advised to stop smoking. If, after all else has failed, there is good reason to suppose that pulmonary function would be significantly improved by restoring the diaphragm to its normal situation, then operation should be considered. However, this is a relatively recent development in thoracic surgery, and the results of treatment are not fully known.

Post-operative Bleeding in Hereditary Pseudohaemophilia

Q.—What is the treatment of post-operative bleeding associated with von Willebrand's disease (hereditary pseudohaemophilia)? Nillson *et al.*¹ suggest that a blood protein fraction is a specific. If injected at the time, it stops bleeding, or it can be given pre-operatively in known cases. Is this correct? Is the substance available in England; what is the dose; is it safe; and can it be used as a diagnostic test?

A.—The main haemostatic defect in von Willebrand's disease is a constitutional capillary abnormality. Coagulation defects may accompany the disease, but are, from the practical point of view, less important. When such a patient undergoes operation profuse bleeding from capillary vessels is the rule. If this bleeding is immediately arrested by firm pressure until clotting has occurred subsequent bleeding is not usually troublesome. But of course not all sites are susceptible to the application of firm pressure for five minutes. Thus a material which temporarily controlled the capillary bleeding would be a great advantage. The report of Nillson referred to is most promising and there is no reason to doubt the author's results. A similar, but not identical, material is made in this country by the Lister Institute. It has, so far as I know, not yet been used to control bleeding in patients with von Willebrand's disease and there is no guarantee that the material would have the effect described by Nillson. Moreover, there is no certainty that all patients classified as having Willebrand's disease have exactly the same defect. Again, the material, being prepared from fresh plasma, is in very short supply. Thus the questions of possible dosage, safety, and use as diagnostic material must await future research.

REFERENCE

¹ Nillson, I. M., Blombäck, M., Jörpes, E., Blombäck, B., and Johansson, S. A., *Acta med. scand.*, 1957, 159, 179.

Treatment for Petit Mal

Q.—What treatment can be given to a child of 3 years who has petit mal and who has not responded to phenobarbitone or to "mysoline" and "diamox"?

A.—A most useful drug in petit mal is "tridione" (troxidone). To a child of 3 it can be given as a tablet of 0.15 g., or as tridione solution, each drachm of which contains 0.15 g. An average dose would be 0.15 g. four times a day. If tridione does not control the attacks, "paradione" (paramethadione) is worth trying. This is made up as pills, each containing 0.3 g., or as a solution, 1 ml. of which contains 0.3 g. The dosage is the same as tridione. The danger of these drugs, particularly of tridione, is agranulocytosis. Accordingly total and differential white counts should be performed when patients are on these drugs.

Aetiology of Pyloric Stenosis

Q.—Is pyloric stenosis less common in babies fed "on demand" than in those fed at fixed intervals?

A.—Congenital hypertrophic pyloric stenosis diagnosed by palpating the tumour and confirmed by radiography or by demonstration of its presence at operation is a familial condition. Furthermore, the tumour itself may be present at birth. It has recently been described in one of conjoined twins. It seems likely, therefore, that the basic cause is genetic, and possibly no other factor is involved. It has, however, at times been suggested that a second factor is required to produce the muscular hypertrophy and that this might be connected with overfeeding or with some other form of feeding mismanagement. There is no real evidence for this. Neither is there any statistical evidence to show whether or not pyloric stenosis is less common in demand-fed babies than others, but it seems unlikely. "Pyloric stenosis" is sometimes diagnosed on less strict criteria, with the result that other causes of vomiting are labelled as "pyloric stenosis," and it is possible that claims for an emotional or functional origin of the muscle hypertrophy have been based on such cases.

Dermatitis in Dentists

Q.—What are the common causes of dermatitis of the tips of the fingers in a dentist?

A.—The commonest cause is allergic sensitiveness to contact with local anaesthetics, but all other contacts in dentistry should be considered, such as antiseptics, antibiotics, nickel, chrome, oil of cloves, amalgam, acrylic resin, etc. In a recent case of this type the problem was not solved until patch-tests had extended to the home field and incriminated a streptocarpus plant.

Collected Articles from the "British Medical Journal"

The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices, which include postage, are now the same for both inland and overseas.

Emergencies in General Practice (26s. 9d.).

Refresher Course for General Practitioners, Volumes 2 and 3 (26s. 9d.).

Clinical Pathology in General Practice (22s. 3d.).

Any Questions?, Volumes 2 and 3 (8s. 3d. each).

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 27 1958

THE THREE PILLARS OF CLINICAL RESEARCH*

BY

H. J. B. ATKINS, D.M., M.Ch., F.R.C.S., Hon.F.A.C.S.

Director of the Department of Surgery, Guy's Hospital; Dean of the Institute of Basic Medical Sciences

Despite its title, this paper is really addressed to surgeons. The message, if there be a message, may be applicable to other groups within the profession, but I am not qualified to expound on the difficulties met with or the foibles displayed by my medical, gynaecological, paediatric, geriatric, or other colleagues in the course of their clinical inquiries; and so it is to the surgical fraternity primarily that I address myself.

As surgeons, we handle a great deal of material which is properly the substance of clinical research, but I am afraid that in many instances we handle it clumsily so that the final product is uncertain and open to criticism. Moreover, we are unduly addicted to armchair theorizing, and are, for instance, in the habit of extolling a method of therapy which is little more than the creature of our contemplation and has never been subjected to the rigours of experimental trial. Why we should behave like this when the man who said, "Why think? Why not try the experiment?" was himself a surgeon, it is difficult to say. Surgeons started off as anatomists, then they became pathologists, so that thirty years ago it was still possible to quote the aphorism: "Know your anatomy, know your pathology (and you'll know your surgery)." To-day, surgeons are physiologists; to-morrow perhaps they will be scientists, and so, more than two hundred years later, arrive breathless at the summit reached with such easy mastery by John Hunter.

Imagine a surgeon dissatisfied with his present methods of treatment and conscientiously and hopefully thinking how he might improve them. He summons his anatomical, pathological, and physiological knowledge to his aid. "Placed there," he will say, "it will have a better blood supply." "Thus and thus the lymphatics will be more completely removed." "Done so, the acid will be less injurious; radiotherapy, if necessary, more efficacious; the anastomosis more secure; the respiratory excursions less impeded; the enzymes more fruitful"; and so a new operation is born. So far, so good, but in ten years there is found to be a snag and students ask plaintively, "What is this operation 'gastrorrhaphy,' mentioned so enthusiastically in my father's textbook?"

The Stochastic System

The pattern for research should be, first, the idea; second, and if suitable, its trial on the experimental animal; thirdly, its trial on human beings; and fourthly, its announcement in the surgical journals. In much surgical research the two middle steps are omitted. One of the reasons for this is that surgeons are unfamiliar

*A lecture to the Medical Faculty delivered at Queen's College, Dundee, on October 30, 1958.

with the idea, which is a commonplace for physicists, of the stochastic system. An example will serve to show what is meant.

If I am completely uncertain which of two courses to adopt, I might toss a coin and act according to the dictates of what befell. I should regard this then as entirely a matter of chance, but if I knew all the facts this would not be the case. If I knew, for instance, the exact weight of the coin, its size, the strength of the impetus imparted to it, and the site of impaction in relation to its centre of gravity, the temperature and humidity of the atmosphere, the distribution of densities in the coin in relation to its centre of gravity, the distance it had to fall, and perhaps other factors such as the stickiness and temperature of my fingers, I should be able to calculate whether the coin would come down heads or tails. If, that is, I knew what are called the "hidden parameters," tossing a coin would no longer be a matter of chance. The spinning coin is not transgressing the principles of causality, and whether it comes down heads or tails is governed by strict law.

We may contrast such a system with that obtaining inside an unstable atom such as an atom of radium. Sooner or later this atom is going to discharge an emanation and become degraded to radon. On analogy with the above example we might argue that if we knew all the processes going on within the nucleus we could predict exactly when the atom of radium would disintegrate and that it is only the complexity and minuteness of these hidden parameters which prevents us from doing so. This, however, is not the case; no amount of knowledge, however intimate, of what is going on inside the nucleus would help us to determine whether the radium atom would disintegrate in the next ten seconds or in the next ten years. Such systems where the reactions are not individually determined according to the principles of causality are called stochastic systems.

Now, the human body has so many hidden parameters that to work out from the armchair how it is going to behave after a certain operation is a most uncertain enterprise. These hidden parameters are so multifarious that we may for practical purposes regard the human body as a stochastic system; indeed, if we admit the principle of free will, and if I understand him aright *pace* Spinoza's "metaphysical determinism," it is a stochastic system.

Trying Out

It is therefore the number of hidden parameters or even the possible stochastic nature of the system with which we are dealing which makes the application of cybernetic principles to the human organism so chancy.

is to be preferred to treatment A. Furthermore, the figures give some indication of how much better the one treatment is than the other. There are, however, other equally important advantages of expressing results numerically.

Supposing the relation of treatment to a variable is being considered, then if the results of treatment can be expressed numerically a "scattergram" can be constructed and the relation, if any, established on inspection or by calculation. Fig. 2 shows a hypothetical investigation to determine whether the success of a certain treatment is dependent on the initial weight of the patient. The results of treatment are expressed as time in days before the temperature settles, and the scattergram shows, in a way more clearly than any amount of verbal description would have done, that there is such a relation and that fat people respond better to treatment than thin. For more accurate work an exact coefficient of correlation could have been calculated. Finally, where a numerical assessment of treatment can be

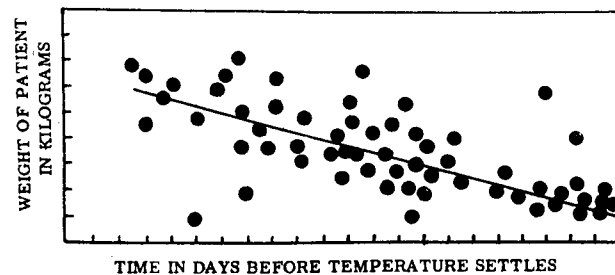


FIG. 2.—Scattergram relating weight of patient to the period of pyrexia.

provided the whole investigation is susceptible to statistical analysis, and extravagant claims which are really quite unwarrantable are not put forward.

When there are all these advantages of precise mensuration it is a pity that surgeons as a whole dislike figures and that this dislike is often so ingrained that they do the most illogical things with them if they have to use them at all, as, for instance, in marking examinations. In nearly all surgical examinations there is a desire to give more weight to one part of the examination than to others. It is usually "the clinical" which is singled out for this special attention. In the Treasurer's Gold Medal in Clinical Surgery at Guy's Hospital, for instance, it has been the practice from time immemorial to mark the papers out of 200 and the clinical out of 300. This of course has no effect at all, because as often as not candidate A, who is slightly better than candidate B in the paper, will get 155 marks to B's 150, and, being slightly worse in the clinical, will get 250 to B's 255, so that their total marks are the same and nothing has been achieved. What is clearly needed in order to add weight to one part of an examination is to increase the range of marking in this part of the examination and never mind about the maximum. The fact that this anomaly is by no means confined to Guy's Hospital, but invades Queen Square, whether it be under the aegis of the Royal Colleges or London University, and is in evidence in the examinations of many provincial universities as well, only serves to show how inexpertly medical men can behave when dealing with figures.

Another type of illogical error is exemplified in *Against the Law* by Peter Wildeblood (1957). There occurs there the following statement, with the so-called evidence which is intended to support it.

"It is, of course, perfectly obvious that only a very small proportion of this 650,000 is noticeably odd. It is equally evident that homosexuality is not, as some propagandists would have us believe, a kind of fashionable vice restricted to decadent intellectuals and degenerate clergymen. This idea is extremely useful to those who wish to influence public opinion against homosexuality, and it succeeds because the British people, on the whole, despise intellectuals and distrust the clergy. But it does not happen to be correct.

In a recent survey of 321 court cases involving homosexuality, it was found that the accused men fell into the categories shown in Table I."

TABLE I.—Categories of Homosexuals (Peter Wildeblood, 1957)

Shop and clerical workers	16%	Schoolmasters	4%
Artisans (factory workers)	15%	Agricultural workers	4%
Transport and Post Office	11%	Clergymen	2%
Unskilled labourers	10%	Mentally deficient	2%
Armed Forces	10%	Independent means	11%
Hotel and domestic servants	7%	Unclassified	11%
Students, trainees, schoolboys	6%		

This table, of course, means nothing unless we are at the same time given the percentages of "shop and clerical workers," "artisans," and so forth in the general population. Indeed, it is not inconsistent with the possibility that all members of the above categories are homosexuals.

Incommensurable Qualities

This inability to think clearly in figures is often rationalized by claiming that so many of the results of clinical experiment cannot be satisfactorily expressed numerically. Some qualities of human behaviour are, of course, quite impossible to measure—such qualities, for instance, as bravery or fastidiousness; but this does not mean that inquiry related to these qualities cannot be given a numerical expression. For instance, if the 1st Battalion of the East Loamshires won 3 Victoria Crosses and 2 Military Crosses in the last war, whereas the 2nd Battalion won no medals and had a sergeant and four other ranks shot for cowardice in face of the enemy, there is good reason on purely numerical grounds for presuming that the 1st Battalion had a better morale than the 2nd Battalion, although morale is essentially a quality which cannot be measured.

Clearly a passion for mensuration can be overdone, as the following charming quotation from R. E. Dickinson (1958) attests: "Lord Kelvin said that we can know nothing of a matter unless we can measure it. Psychologists braced with their success in giving numerical values to I.Q. are now hoping to measure feminine beauty in precise units. The unit proposed is the milli-helen, the quantity of beauty required to launch exactly one ship."

Such endeavours to express essentially incommensurable qualities by numbers must of course be undertaken with great care. Often, however, if it is reasonable to adopt it, this method shows up in a vivid manner differences and relations which might otherwise be obscured in a mass of verbiage. A particularly valuable method of mensuration devised originally by Walpole and Paterson (1949) is the mean clinical value. This method of giving a numerical value to the effects of treatment is applicable especially to those conditions, such as advanced cancer of the breast, where there are apt to be many manifestations and where these manifestations may respond in a different manner to treatment or respond at a different time.

The working of the system is very simple, and depends upon deciding whether, as a result of treatment, a lesion is better than it was before treatment began or worse than it was before treatment began, or whether the situation is doubtful.

Mean Clinical Value

Before treatment all lesions are accurately assessed—by measurement if they are palpable or visible, and by studying their dimensions or densities if they are radiological. Subjective symptoms are better ignored, but the "presence" or "absence" of pain may well be a valuable index of the effect of treatment. In this way a baseline is made and the treatment is started. The patient is seen at four-weekly intervals thereafter and each lesion is again assessed. If the lesion has improved it is given 2 marks, if worse 0 marks, and if stationary or doubtful, 1 mark. These marks are then added together and divided by the number of lesions to obtain an average. The average is multiplied by the factor 6 to bring the figure to a manageable number, which is the mean clinical value (M.C.V.). It will be seen that the maximum M.C.V. is 12, which implies that all the

lesions are improving. An M.C.V. of 0 means that all the lesions are worsening, and an M.C.V. of 6 that the condition is stationary. This last mark may be due to the fact that all the lesions are stationary, or that half are improving while the other half are regressing, and it indicates, therefore, the response of the patient as a whole. The M.C.V. may have any figure between 0 and 12, and a graph can be drawn of the progress of a patient under treatment. The state of the lesions is compared with their state before treatment began and not with their state at the previous visit, because it is more satisfactory to have one standard than to have an ever-changing standard which is apt to lead to swings on the graph that have no real meaning.

The effect of this, however, is that, when a patient who has for some time responded to treatment begins to deteriorate, this deterioration is not at once reflected in the M.C.V. because the lesions may still be better than they were before treatment began and often there is a somewhat precipitate drop in the graph before death. This is, in practice, only a very slight disadvantage, because, certainly in the case of cancer of the breast, when a patient begins to deteriorate she does so very quickly, and the delay in the drop in the graph from this cause is generally only a matter of one period or at the most two periods. As has been indicated, if there is any uncertainty over whether a lesion is changing, then it is given a mark of 1. By the next visit this uncertainty has usually been resolved, and a lesion which looked as though it might have improved but about which there was some doubt has now unequivocally improved and can confidently be given a mark of 2. All that has occurred, therefore, as a result of the possibly mistaken assessment of the lesion at the visit when it was given the "uncertain" mark of 1 is that the shift in the graph has been delayed by four weeks. Conversely, the same applies to a lesion which seems to be deteriorating but about which there is some doubt, and the whole graph is therefore given a sure and steady delineation which properly represents the course of the patient under treatment, albeit with a slight latent period or what the cyberneticist might call "a threshold-controlled stability."

Radiological factors are assessed at every third visit in order not to multiply the number of x-ray films taken, and the previous mark allotted to this factor is retained in the interval to compute the M.C.V. for those two periods. This again leads to some lag, as the x-ray picture may have changed in the meantime and this is not reflected in the graph until later.

With all these slight and largely theoretical defects, the M.C.V. has proved in practice to be a tool of the greatest value in research. Thus, in comparing two methods of treatment, as for instance adrenalectomy and hypophysectomy, for carcinoma of the breast, the individual M.C.V. charts of all patients treated by one of these methods can be congealed into one average graph and compared with a similar average graph for the other method of treatment (Fig. 3).

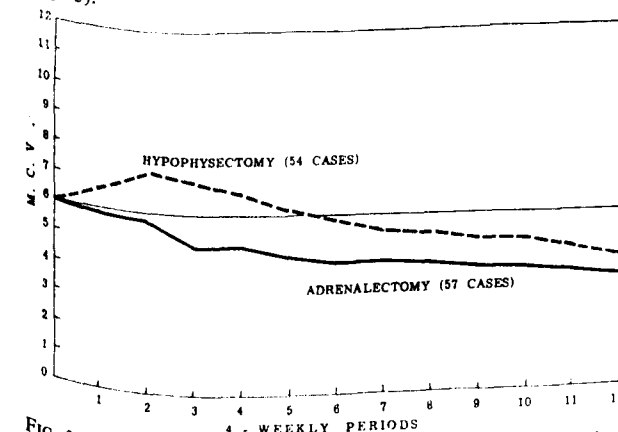


FIG. 3.—Response to adrenalectomy and hypophysectomy, taking the average M.C.V.s of all patients at four-weekly periods after treatment.

Again, by taking an average of all the M.C.V. records of a particular patient, a single figure can be made to represent the overall response of that patient to the treatment, and a table (Table II) can be made out which gives a good idea of the effect of this measure as a whole. By the use of

TABLE II.—Effect of Oestrogen on 94 Cases of Advanced Cancer of Breast, as Expressed by Average M.C.V. Per Case—i.e., 17 Cases Had an Average M.C.V. Between 8 and 12, 39 Cases Between 7 and 4, etc.

Average M.C.V.	12-8	7-4	3-0	Unable to take drug
No. of cases	17	39	31	7

the "average M.C.V." derived in this way it is also possible to construct scattergrams (Fig. 4) and so determine a relation or lack of relation between the success of treatment and such factors as age, mitotic-cell count, or what you will.

There is one flaw in the M.C.V. system so far practised that is a serious theoretical disadvantage, but which has been so unobtrusive in practice that its full implications have only recently been appreciated.

If we consider a case, for instance, of cancer of the breast with multiple skeletal deposits and multiple skin lesions and in which there are so many lesions that it would be impossible to exploit them all, then it has been the practice to decide arbitrarily how many skeletal lesions and how many skin lesions should be taken as representatives to act as factors in assessing the M.C.V. Usually the obvious ones or the readily mensurable ones have been taken and the others have been ignored. If all the lesions vary in the same way with treatment, then it does not matter very much how many are taken as indices. If, on the other hand, one system improves while the other deteriorates, then it is clearly important how many factors have been taken in each system. For instance, to take an extreme and very unlikely case, if two factors have been taken in the skeletal system which is deteriorating and ten factors have been taken in the skin which is improving, the M.C.V. is 10; whereas if ten factors were taken in the skeletal system and two in the skin, the M.C.V. would be 2, which makes nonsense of the whole method.

In order to repair the flaw in such unusual cases J. Hayward has suggested the following modification of the system which is now being put into operation. The lesions in each system are grouped and an average is taken of these; the mean of the grouped figures is then taken to compute the M.C.V. Thus, in the example cited above, the M.C.V. would be calculated from the fact that the skeletal system scored 0 and the cutaneous system 2, so that the M.C.V. would be $\frac{0+2}{2} \times 6 = 6$, however many or however few lesions were taken from either system. There is no method of computation which takes care of the case—on perhaps out of several hundred—where there are so many lesions in one system that a selection has to be made of representative factors, but where the lesions common to one system are behaving in a different way under treatment.

Stress has been laid on the defects of a system which in practice runs very smoothly. If a visitor to the breast clinic at Guy's Hospital, where this system has been used now for many years, is asked to give a mark—somewhere between

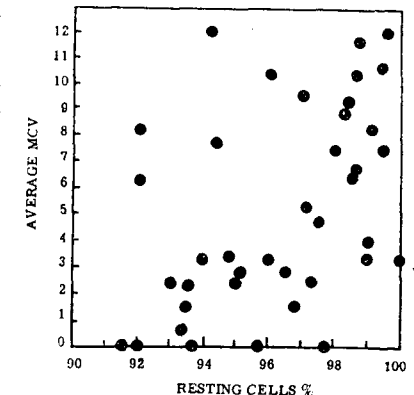


FIG. 4.—Scattergram relating M.C.V. to resting-cell count.

0 and 12—to the effects of treatment, and basing his opinion on a general clinical assessment, without recourse to exact measurement, it is surprising how closely his guess coincides with the computed value. To state that a patient has an M.C.V. of 9 is a quicker, more useful, and more vivid way of expressing the conclusion that this patient is responding in some degree to treatment and that it is worth while persisting with this treatment, but that not all the lesions are reacting favourably. Furthermore, the alternative is to fall back on the dangerous use of "clinical impressions" which has been productive of such fallacious conclusions in the past.

Recording Measured Data

If we now turn to another aspect of mensuration—namely, that of recording measured data—some consideration must be given to the punch-card system. Smyth and Bainbridge (1957a) have introduced an extremely useful system for tabulating punch-card records which enables the interrelation of a number of factors to be studied readily. The article in which this method was described concerned the interplay of a number of obstetric factors such as the relation between stillbirths and post-maturity, forceps delivery and the duration of labour, and so forth. It included a specimen table consisting in fact of 32 variables, and was so alarming at first sight that it probably dissuaded many readers, who would otherwise have found the system extremely valuable, from pursuing the matter further.

Table III is extracted from their more elaborate table, and for simplicity shows the interrelation of only six of their factors. To quote, with certain modifications, from the paper by Smyth and Bainbridge, this table is constructed as follows:

"The principal cells on the *main diagonal* show the numerical incidence (upper figures) and percentages (lower figures) of 6 factors. The cells in the *bottom left-hand half* show the numerical incidence of patients having the two factors named in the intersecting row and column. (Where these factors are mutually exclusive, as in 'Breech' and 'Occipito-posterior,' the cell is left blank.) The cells in the *top right-hand half* contain two percentages—that is, the number of patients having both of the appropriate row and column factors expressed as a percentage of the total incidence of (1) the *column factor* (upper figures) and (2) the *row factor* (lower figures)."

"To See if these Percentages Differ Significantly From the Means.—Taking the lower percentage only, subtract it from the percentage in the principal cell on the same row (or vice versa); compare the answer with the figures in columns B to E on the same row; observe how many patients are needed for this difference to be significant; lastly, examine the principal cell in the same *column* to see if that number of patients occurs."

"Column A shows the minimum number of patients required in the *column principal cell* for the test to be applicable to that row."

Thus all the statistical analysis is worked out beforehand and all the clinical investigator has to do to see whether his results are significant is to use a table no more complicated,

as the authors point out, than a mileage chart in the *A.A. Handbook*. For instance, by following these rules it will be found that manual removal will be associated with breech delivery in a highly significant fashion, whereas relative disproportion and toxæmia are not so associated.

The construction of columns A, B, C, D, and E is a simple statistical exercise which a friendly colleague with an elementary knowledge of these matters may undertake in a very short time by reference to the instructions contained in the original article and subsequent correction (Smyth and Bainbridge, 1957b). The figures given in columns B to E are simply twice the standard deviation.

To help in using this method, Garside (1958) has published a table for ascertaining whether differences between percentages are statistically significant, and the result can be picked out by little more than simple inspection.

Another technique for presenting results, which may be very valuable where three variables are involved, and which is much neglected by workers in clinical fields, is the three-dimensional graph. A good example of this taken from a paper by Skoog (1957) is shown in Fig. 5, where the effect

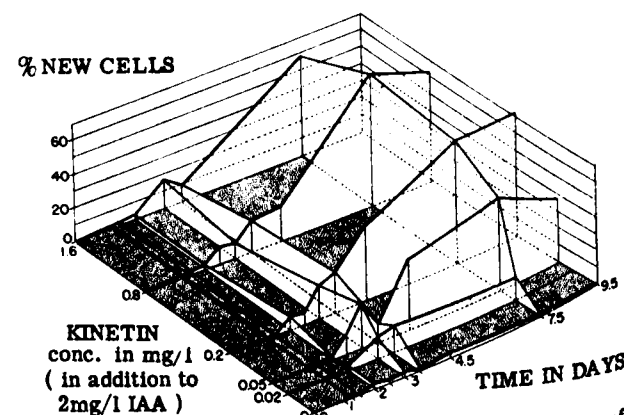


FIG. 5.—A specimen three-dimensional graph relating growth of cells in tissue culture to the concentration of kinetin in the medium. Reproduced by permission of the Editor of the *Journal of the National Cancer Institute*.

of kinetin in different concentrations on the growth rate of cells in tissue culture is beautifully shown in a manner which graphically reveals the relevant points. Having inscribed these enrichments on the capital of the second pillar (I trust they will not be regarded as excrescences), we must now proceed to the third.

ANALYSIS

By analysis we mean, of course, statistical analysis. There are those good practical men with no nonsense about them, for whom the word "statistics" is anathema, who quote

TABLE III.—Method of Recording of Dependent and Independent Variables from Smyth and Bainbridge (1957a)

	Forceps	Manual Removal	Toxaemia	Relative Disproportion	Breech	Occipito-posterior	A	B	C	D	E
							No. of Patients required for Valid Result	Significant Difference at 5% Level			
								1,000	500	100	10
Forceps	213 9.16	6.6 19	7.5 6.8	15.9 53	13.6 63	11.7 42	54	1.38	2.29	5.64	18.2
Manual removal	14	75 3.23	12 3.8	1 2	8 13	3 3	158	0.84	1.40	3.46	11.15
Toxaemia	16	9	234 10.06	4.3 16	1.3 6.5	2.6 10	50	1.44	2.38	5.89	18.98
Relative disproportion	34	1	10	64 2.75	5 7	17 18	180	0.78	1.30	3.20	10.32
Breech	29	6	3	3	46 1.98		250	0.66	1.10	2.73	8.79
Occipito-posterior	25	2	6	11		60 2.58	194	0.76	1.26	3.10	10.00

the tag that "statistics can prove anything." Unfortunately, statistics have got to be used in nearly all clinical research, and it is better that they should be good statistics than bad. There is no need for the research worker in clinical medicine to have a knowledge of statistics, but it is an enormous advantage if he has, even though his knowledge of this subject is not very profound. To be able to do these things oneself, however, adds immensely to the interest and value of clinical research. Nevertheless, for the amateur, it would be wise to have the results checked by an expert, because it is fatally easy to make a gross error in a field in which one has not been bred.

Finney (1956) has said: "That a high proportion of those whom I have broadly classed as experimenters should have a knowledge and appreciation of statistical principles is of great value to the progress of their science, but perhaps not so much because they are thereby enabled to do their own statistical work as because they understand better what needs to be done and what conclusions can reasonably be drawn."

Statistics have two roles in clinical research: they act either as a brake or as a headlamp. In the first role they prevent the experimenter from claiming as a consequence a result which may have emerged entirely due to chance—they prevent him, that is, from making a fool of himself. The most mistrustful cannot but applaud such an effect of a study which on the whole they view with suspicion.

Sometimes, however, statistics act like a headlamp and reveal a truth which could not have been apparent without such an analysis. When a result arrived at by a statistical analysis conflicts with common sense, then the statistics are probably wrong; when it conflicts with emotion, as in the relation between cigarette smoking and lung cancer, then this is not necessarily the case.

It must be admitted, however, that many research workers in the clinical field whose contributions are of great value have such an antipathy to manipulating the relatively simple formulae which the practice of statistical analysis demands that they must rely entirely on a professional statistician to do this for them. To get the best out of their results, however, they would be wise to plan their investigation in the first place in consultation with a statistician, one of whose qualifications is that he has mastered the science of the design of experiments. In this way material will not be wasted, and expense and labour will be saved.

"Analysis of Contaminants"

Granted all this, there is still one aspect of analysis which must be done by the investigator himself, and it is this operation which I have termed the "analysis of contaminants."

It must be presumed that in any investigation great care has been taken to avoid sources of error, but, however careful one may be, these are likely to creep in, and, having analysed the results, it is now necessary to go back over the sources of error and see how these may have influenced the conclusions. In describing a system for an analysis of contaminants or sources of error, I have discussed elsewhere (Atkins, 1957) the reasons for doing this at this stage, but it will be necessary to recapitulate some of these reasons here, because this part of the work can be done only by the investigator himself and cannot be left to the statistician.

If, for instance, we are investigating the effect of pregnancy on breast cancer in some primitive community, we would compare a series of women who had been pregnant with a series who had never been pregnant, in relation to the incidence of cancer. We will suppose that it is found that the incidence of breast cancer is higher in the "non-pregnant" series. In such an investigation three contaminants might be considered. The first arises because unmarried women might fail to reveal that they had been pregnant. This means that the allegedly "non-pregnant" series may have been salted, if that is the right word to use, with women who had in fact been pregnant. The effect of this contaminant would be to make the two

series more alike than they should be; it would tend to favour a negative result to the investigation, and on that account it is referred to as a *negative contaminant*.

Furthermore, we might suppose, in a primitive community for instance, and indeed in this country up to a few years ago, that the possession of children ensured that the mother would be supported in her old age and would be more likely to live long enough to develop cancer of the breast. This contaminant, tending to lessen the positive difference between the "non-pregnant" and the "pregnant" series in relation to cancer, would also be a *negative contaminant*.

On the other hand, the fact that pregnant women are more likely to have suckled, and assuming, for the sake of argument, that suckling protected a woman from cancer of the breast, this contaminant would increase the difference between the two series and would on that account exaggerate the positive difference, and is therefore known as a *positive contaminant*.

Thus, a contaminant which tends to increase the greater or to decrease the less is a *positive contaminant*, and one which tends to do the reverse is a *negative contaminant*.

In the investigation which we have been considering we have assumed that analysis has revealed a positive result—namely, a significant difference between the two groups. It will be observed that the negative contaminants have tended to mask this significance, whereas the positive contaminant has tended to exaggerate it. If, on the other hand, an analysis had failed to reveal any difference between the two groups and that a negative result to the investigation was implied, then the negative contaminants would have strengthened this view and the positive contaminant would have weakened it. From this we may derive the general rule that contaminants bearing the opposite sign to the conclusion tend to conceal the conclusion and are, on that account, known as *inhibitory contaminants*; those bearing the same sign as the conclusion tend to exaggerate its significance and are on that account known as *illusive contaminants*. For a full discussion of this matter the reader is referred to the article quoted above, but it will be seen at once that the *illusive contaminants* are the treacherous ones, as they tend to make the investigator think that his results are more significant than they really are.

A paper giving an account of a clinical investigation, from which sources of error of this sort are inseparable, should contain—following the analysis—a formal statement of the inhibitory and illusive contaminants together with those which it is assumed do not affect the issue one way or the other and are known as *neutral contaminants*. In this manner the reader is able to assess the degree of confidence which can be placed in the investigation as a whole.

We have now completed our tour of the foundations of this edifice—clinical research. To establish these three pillars firmly on a bed of rock and to build on them requires a little extra thought and a great deal of additional careful work, but I believe in the end it will save future generations much labour and will prove far more enduring than the erection of a papier mâché façade to house some colourful exhibition on a foundation of sand.

I am grateful to Sir Charles Symonds for his helpful criticism.

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DEVELOPMENT OF HIRSUTISM
AFTER PUBERTY*

BY

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[WITH SPECIAL PLATE]

The problem of the development of hirsutism after puberty is of great medical importance, and an understanding of its causes is therefore necessary. At the present time it seems that the condition may be divided into three main categories: (1) associated with adrenal cortical dysfunction of demonstrable proportions, such as that seen in the adreno-genital syndrome (Wilkins *et al.*, 1955) or in adreno-cortical tumours; (2) Stein-Leventhal syndrome; and (3) simple (idiopathic or constitutional) hirsutism. Much comment has been made on the last of these conditions (Dorfman and Shipley, 1956), whereas the Stein-Leventhal syndrome is much less known; even Stein accumulated only 75 cases in a period of 20 years (Stein *et al.*, 1949). The most popular view at present is that some androgenic substance may be derived from the ovary of these patients (Plate, 1951) and that theca luteinization is of importance in the ovarian pathology (Culiner and Shippel, 1949). In this communication emphasis is laid upon the problems of diagnosis and aetiology, including an examination of the biochemical features of the steroids found in the urine, both with and without stimulation of the adrenal cortex by corticotrophin.

Present Series

The cases here presented were all characterized by the development of hirsutism after puberty. Clinical analysis of the group (Table I) shows that it may be subdivided. The ultimate criterion for the diagnosis of the Stein-Leventhal syndrome was examination of portions of the ovaries after operation. In some instances the size of the ovary and appearance of the capsule were almost normal. Indeed, the impression is gained that only minimal enlargement, if any enlargement at all, need be present. In one instance the ovaries reached nearly three times normal size. Microscopically, persistent follicles were always identified,

TABLE I.—Diagnostic Classification of Cases of Post-pubertal Hirsutism

	No. of Cases
"Hirsutism" (? cause; previous encephalitis, 2)	32
Stein-Leventhal syndrome	9
? Stein-Leventhal syndrome	7
Adrenal virilism	1
Total	49
Adrenal cortical carcinoma	1

with a tendency to cyst formation, and proliferation and luteinization of the theca interna was present (Special Plate, Fig. 1).

Indications for laparotomy in these patients have been sterility or severe menstrual irregularity associated with

*Based on a communication given by F.T.G.P. at the Journée d'Endocrinologie de Marseille, May 9, 1958.

hirsutism, except in one instance where pain at menstruation was the immediate reason for operation. There have been clinical indications of at least a minor degree of ovarian enlargement. This evidence was obtained by vaginal examination with relaxation under anaesthesia, and confirmed, in all instances where it was done, by x-ray visualization after induction of pneumoperitoneum (Table II; Special Plate, Fig. 2). The dose of x rays involved is only 200 milliroentgens and has been considered negligible in the circumstances.

Examination of Table II will show that the patients with Stein-Leventhal ovaries were characterized by certain features, including the usual ones of sterility and menstrual irregularity. Ovulation, mental depression, and a family history of hirsutism were absent in comparison with the group designated as "hirsutism." This group of 32 patients

TABLE II.—Differentiating Features of "Hirsutism" and Stein-Leventhal Syndrome with Hirsutism

	"Hirsutism"	Stein-Leventhal Syndrome	? Stein-Leventhal Syndrome
Total cases	32	9	7
Irregular menses	8	9	6 (7)
Sterility	2 (8)	6 (6)	—
Ovulation (temp.)	4 (4)	0 (3)	—
Vaginal examination under anaesthetic: positive results	6 (13)	9	3 (5)
Pelvic radiograph positive	2 (5)	6 (6)	1 (4)
Mental depression	10	1	0
Family history of hirsutism	7	0	1

Figures in parentheses in this and subsequent tables indicate number of patients observed where this was less than total in group.

remained after deducting those patients with other diagnoses as indicated in Table I. The group of patients designated as likely cases of Stein-Leventhal syndrome did not have a laparotomy performed. They were separated on account of their lack of fertility and their menstrual history, and otherwise resemble the Stein-Leventhal group.

Among the "hirsutism" group ovulation tended to be present. Of the six cases with suspicious ovaries as shown by vaginal examination, four had irregular menses and in one case normal ovaries were found on laparotomy. This was the only instance where laparotomy has been performed with negative ovarian findings. Of the two cases with possible ovarian enlargement as seen radiographically, one had

TABLE III.—Features of Similarity in "Hirsutism" and Stein-Leventhal Syndrome

	"Hirsutism"	Stein-Leventhal Syndrome	? Stein-Leventhal Syndrome
Total cases	32	9	7
Severe hirsutism	11	2	1
Age of onset of hirsutism (years)	11-35 (Under 18 in 19 patients)	12-24	12-24
Obesity	15	4	4
Acne	5	2	0
Enlarged clitoris	1	0	0
Hypertension	4	0	0

irregular menses and the other was the patient mentioned with normal ovaries. Of the eight patients with irregular periods, two at least may have Stein-Leventhal ovaries, so that here is clinical evidence that even this group of patients may not be quite homogeneous. In Table III are presented the characters which appeared common to all groups. There was, and especially among the "hirsutism" group, a strong tendency for hirsutism to appear in the years just after establishment of menstruation. Somewhat surprisingly, obesity was equally distributed among the patients, and therefore seems not to be a useful indication of the possible presence of the Stein-Leventhal syndrome. It should be noted that one of the group of "hirsutism" patients had an enlarged clitoris, and this point will again be referred to below.

Studies of Urinary Steroids

Resting Excretion

The excretion of ketogenic steroids as determined by minor modifications of the method of Norymberski *et al.* (1953) was normal in all groups of patients. In the

TABLE IV.—Resting 17-Ketosteroids and Ketogenic Steroids

	No. of Patients	17-Ketosteroids (mg. per day)	Ketogenic Steroids (mg. per day)
"Hirsutism"	32	13.8 ± 0.61 (S.E.)	11.5 ± 0.83 (25)
Stein-Leventhal syndrome	6	10.5 ± 1.02 (P < 0.05)	8.9 ± 1.08
? Stein-Leventhal syndrome	7	10.1 ± 0.60 (P < 0.01)	11.4 ± 1.27

"hirsutism" group the mean 17-ketosteroid level was above the normal average of 10 mg., and significantly above the mean of the Stein-Leventhal group (P=0.05) and the "? Stein-Leventhal" group (P=0.01) (Table IV). It will be seen from the accompanying diagram that there was a wide scatter of 17-ketosteroid levels in the "hirsutism" group. These determinations were made by the techniques of Gibson and Norymberski (1954).

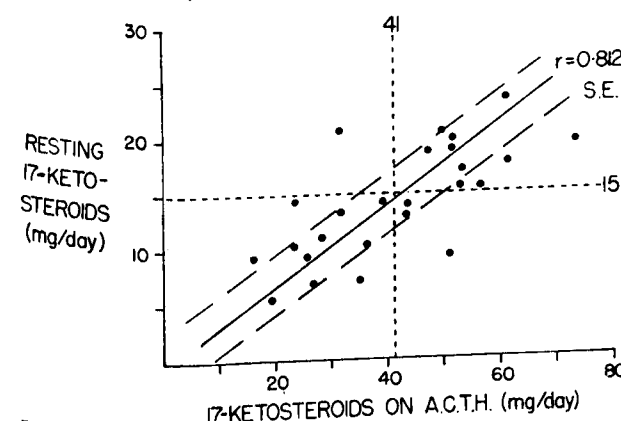


Diagram showing correlation between resting 17-ketosteroids and 17-ketosteroid response to four-day test with corticotrophin. The dotted lines indicate the upper normal ranges.

Response to Corticotrophin

Corticotrophin was injected in the form of gel in a dosage of 20 U.S.P. units intramuscularly twice daily for four days according to the method previously described (Prunty, 1956). Two batches of corticotrophin of known potency (89754 and P 80205) were used. The figures in Table V are the means of the highest figures reached during this test, usually those of the third or fourth day. The values for a control group of 15 women unaffected by hirsutism and of similar age are included. None of the patients under study differed from normal in the excretion of ketogenic steroids. The "hirsutism" group gave a mean for 17-ketosteroids significantly greater than normal (P < 0.01), and for the ratio ketogenic steroids/17-ketosteroids significantly less than normal (P < 0.01). The "? Stein-Leventhal" group gave a mean figure for 17-ketosteroids possibly significantly less than the "hirsutism" group (P = < 0.05), but this was not true of the Stein-

TABLE V.—Steroid Response to Corticotrophin

	No. of Subjects	Ketogenic Steroids (mg. per day)	17-Ketosteroids (mg. per day)	Ratio Ketogenic Steroids/17-Ketosteroids
Controls	16	68.7 ± 6.9 (S.E.)	22.3 ± 1.95	3.24 ± 0.30
"Hirsutism"	25	67.6 ± 5.0	40.4 ± 3.0	1.80 ± 0.17
Stein-Leventhal syndrome	5	74.4 ± 14.0	32.2 ± 4.8	2.31 ± 0.37
? Stein-Leventhal syndrome	6	65.2 ± 15.3	26.5 ± 3.2	2.36 ± 0.43

Levels of significance for ketosteroid means: hirsutism/controls, P = < 0.01; ? Stein-Leventhal syndrome hirsutism, P = < 0.05; Stein-Leventhal syndrome/hirsutism, P = > 0.05. For K.G.S./K.S. ratio, hirsutism/controls, P = < 0.01.

Leventhal group (P = > 0.05). It should be emphasized that both these groups are small, as can be seen from the Table. A significant correlation was observed between the resting 17-ketosteroids and the level after corticotrophin injection in the "hirsutism" group (see Diagram).

Fractionation of 17-Ketosteroids

The resting urines of selected patients were extracted and the 17-ketosteroids fractionated according to the method of Brooks (1958), who gave data on six normal females aged 21-30. For this group the excretion of androsterone plus etiocholanolone amounted to 4.7 ± 1.06 (S.D.) mg. per day. Three "hirsutism" patients excreted from 7.7 to 13.6 mg. per day, and two others 3.7 and 6.7 mg. per day respectively. Two Stein-Leventhal patients excreted 5.3 and 7.0 mg. and two "? Stein-Leventhal" patients 4.0 and 10.7 mg. per day. In spite of this elevation in some patients of all groups it will be seen from Table VI that the ratio of androsterone/etiocholanolone was within limits in all cases. Of the two Stein-Leventhal patients, in one the ratio was at the lower level of normal and in the other at the upper limit. The ratio 11-hydroxyandrosterone/11-hydroxyetiocholanolone was increased in the two patients with adreno-genital syndrome and in one each of those with Stein-Leventhal syndrome and suspected Stein-Leventhal syndrome. It is possibly increased (3.6) in one of the "hirsutism" patients. The separated 17-ketosteroids were divided according to their chromatographic properties into two groups—a less-polar and a more-polar group (Brooks, 1958). The former may be of extra-adrenal origin in part—for example, from the testes in men—and the latter comprise the 11-oxygenated ketosteroids of adrenal origin. In six normal females Brooks found a ratio of less-polar/more-polar of 4.89 ± 0.95 (S.D.). The values for the Stein-Leventhal patients were well within this range (Table VI).

The excretion of dehydroepiandrosterone was increased in at least two of the "hirsutism" patients and in the two with adreno-genital syndrome. The data in Table VI for these two latter patients are taken from that of the case herein reported and from a pre-pubertal case recently examined by us.

Pregnanetriol Excretion

Urinary pregnanetriol has been determined by the method of Bongiovanni (1954), and in some instances confirmed by paper chromatographic separation. It is readily estimated and the importance of its estimation is considerable, for it is excreted in large amounts in the adreno-genital syndrome. It has been estimated in a group of cases, for the most part severely affected by hirsutism, where the possibility of the

TABLE VI.—Fractionated Resting 17-Ketosteroids

	No. of Subjects	Androsterone/Etiocholanolone	11-Hydroxyandrosterone/11-Hydroxyetiocholanolone	Dehydroepiandrosterone (mg. per day)	Less-polar/More-polar
Normal	6	2.37 ± 0.96	2.1-3.6 (4)	0.4 ± 0.36	4.85 ± 0.95
"Hirsutism"	5	1.31 ± 0.45 (S.D.)	2.2; 5.3 (2)	0.7-1.7 (3)	3.0-5.2 (5)
Stein-Leventhal syndrome	2	0.4; 2.1	1.9; 7.7	0.2; 0.5	3.6; 3.7 (2)
? Stein-Leventhal syndrome	2	1.1; 1.4	3.0; 4.7	0.2; 0.7	3.0; 6.2 (2)
Adreno-genital syndrome	2	1.0; 1.7	6.0; 5.0	3.6; 3.2	3.0; 2.0 (2)

presence of the adreno-genital syndrome arose. In all three groups the values in some cases, when given corticotrophin, were above the level of 5 mg. per day which is tentatively considered to be the upper limit of normal. It is striking that in one of the "hirsutism" patients a level of 16.4 mg. was reached (Table VII).

In considering the interpretation of high levels of pregnanetriol the following points are of importance. In the adreno-genital syndrome the metabolic block in steroid synthesis leads to a deficiency of corticoid metabolites in the urine, with a parallel increase of pregnanetriol and related substances. Therefore under these conditions the ratio of pregnanetriol/corticoid metabolites will be very high in comparison with the normal. If the ketogenic steroid method here employed is used for the determination of the corticoid metabolites, pregnanetriol is also included in the estimate. Since the chromogenicity of this substance after oxidation is approximately 1, an idea of the amount of the corticoid metabolites (sufficient for our purpose) can be

TABLE VII.—Pregnanetriol Excretion (mg. per day)

	Response to Corticotrophin		
	Resting Pregnanetriol	Pregnanetriol	17-Keto-steroids
"Hirsutism": 4 patients	0.8-1.8	2.4-4.8	31-52
Stein-Leventhal syndrome: 2 patients	1.1-2.7	7.6-16.4	36-74
"Hirsutism": 2 patients	1.7-1.8	4.4-5.6	16-40
Stein-Leventhal syndrome: 2 patients	1.4-2.6	6.9-10.3	27-37
"Hirsutism": 2 patients	2.6	2.4-6.0	17-38

obtained by subtracting the value for pregnanetriol from the figure for ketogenic steroids. Under normal circumstances the ratio is 1/10, but we have found that in the adreno-genital syndrome the value for pregnanetriol can even exceed that for ketogenic steroids, giving an apparent ratio of infinity. On direct determination by chromatography the resting ratio pregnanetriol/tetrahydrocortisone in the case in Table VIII is 6/1. Under normal circumstances, from data given by Prunty (1956) and by de Courcy *et al.* (1953), it should be in the neighbourhood of 1/3. This finding is therefore in agreement with the above conclusion.

Returning now to the question of the high values observed for pregnanetriol in some of the "hirsutism" cases given corticotrophin (Table VII), determination of the ratio pregnanetriol/(ketogenic steroids - pregnanetriol) in response to corticotrophin shows the values to fall between 1/6 and 1/8, and for the Stein-Leventhal syndrome between 1/9 and 1/13. It is therefore justifiable to conclude that the production of corticoid metabolites was good in these cases in response to corticotrophin, and that the degree of any metabolic block, if present, is of a much lower order than in the true adreno-genital syndrome.

Adreno-genital Syndrome and Carcinoma of Adrenal Cortex

It has been stated that one of the series of 49 cases of hirsutism developing after puberty is considered to be a true example of the adreno-genital syndrome. The features of this case are given in Table VIII. Apart from these it was noted that the patient was short in stature and union of her bony epiphyses had occurred. The main features of her steroid pattern have been indicated above. The resting value for 17-ketosteroids and their response to corticotrophin, although elevated, lie within the limits of the patients with hirsutism. The raised value of the ratio 11-hydroxyandrostenedione/11-hydroxyetiocholanolone (Table VI) conforms with the metabolic block in corticoid synthesis, and the elevation of dehydroepiandrosterone in many of these cases is well recognized (Broster *et al.*, 1953).

The patient with adrenal carcinoma has been included as an example of a further cause for development of post-pubertal hirsutism, and data for this patient are also given

TABLE VIII.—Details of Case of Adreno-genital Syndrome and Case of Carcinoma of Adrenal Cortex

	Case of Adreno-genital Syndrome	Case of Carcinoma of Adrenal Cortex
Age	18 years	21 years
Onset	14	17
Menses	Regular	Regular
Clitoris	Enlarged	Enlarged
Ovary size	+	+
Obesity	Normal	None
Acne	Moderate	Moderate
17-Ketosteroids	14.8-20.8 mg. per day	29.8 mg. per day (β fraction 1.2 mg.)
Ketogenic steroids	10.6-19.0	11.7
Pregnanetriol	6/1	6/1
Pregnanetriol/tetrahydrocortisone	6/1	6/1
Response to corticotrophin:		
17-Ketosteroids	46 mg. per day	46 mg. per day
Pregnanetriol	54	54

in Table VIII. Here it is important to emphasize that elevation of the 17-ketosteroid level was not great enough to arouse high suspicion of the presence of carcinoma, and, as judged by assay of the β -ketonic 17-ketosteroid fraction, dehydroepiandrosterone excretion was not increased (data from Prunty, 1950; see also Dorfman and Shipley, 1956). By chance a definite pre-operative diagnosis of adrenal tumour was made possible by x-ray examination (Special Plate, Fig. 3); a small tumour with an accompanying calcified thrombus containing tumour cells was outlined above the left kidney simultaneously shown up by intravenous pyelography. The tumour, which weighed 23 g., was removed, but leaving some of the cells in the adrenal vein. Great improvement occurred in the patient's symptoms, and she is known to have survived longer than 10 years (Prunty, 1944).

The presence of enlargement of the clitoris in these two patients should be emphasized as indicating a greater degree of virilization than that occurring in the "hirsutism" group. It is true that one of the patients in this group (Table III) also had enlargement of the clitoris, but insufficient information was available at the time to establish whether she too had the adreno-genital syndrome; she showed a partial degree of improvement after subtotal adrenalectomy.

Gonadotrophin Excretion

Through the kindness of Dr. J. A. Loraine, of Edinburgh, quantitative estimations of the "total" gonadotrophin in the urine of two patients from each of the major groups has been made. The values reported in Table IX are expressed

TABLE IX.—Gonadotrophin Excretion (H.M.G. units per day)

	First Patient	Second Patient
"Hirsutism"	6	7
Stein-Leventhal syndrome	<10	6
? Stein-Leventhal syndrome	5	5

as units of the provisional standard H.M.G.-20A (1 unit equals 1 mg.). The method used was that of Loraine and Brown (see Loraine, 1958). All the values here reported are normal and do not differ from one another.

Discussions

From the clinical point of view the surprisingly high incidence of the Stein-Leventhal syndrome in the group of patients presenting with hirsutism is of special interest. The accompanying menstrual disturbance and sterility were important. Mental changes were much less frequent than in the other patients. The degree of ovarian enlargement in no case reached the dimensions given by Stein *et al.* (1949) as being commonly present. The importance of minimal ovarian enlargement must therefore be stressed.

Somewhat surprising was the normal menstruation of the patients with, respectively, adreno-genital syndrome and adrenal carcinoma; the former was also known to ovulate. The nature of the lesion in the adreno-genital case is of interest. The biochemical abnormality appeared to be that typical of the common pre-pubertal adreno-genital syndrome. However, menstruation, even with ovulation, is unusual in such patients when they reach puberty, and all the signs in our patients developed after puberty. It has been noted that the patient was short in stature, and this might possibly be the only indication that the adrenal condition could have been present before puberty. Recently Blizzard and Wilkins (1957) made brief mention of a case in which the condition apparently developed after puberty.

Many of the existing reports on hirsutism in the literature may be biased by the heterogeneity of clinical material and, in the case of observations on steroid metabolism, by the non-specificity of the methods used. In the present observations on steroid fractionation most of the necessary hydrolysis was performed by the use of glucuronidase (Brooks, 1958), so that artifact formation was minimized and specific chromatographic separation of the compounds was made. The levels of ketosteroids found agree with the elevation of values reported in some cases of hirsutism and with the majority of normal values in the Stein-Leventhal syndrome (Dorfman and Shipley, 1956; Jailer and Vande Weile, 1954). Ten of the 25 cases of hirsutism exceeded the normal range, both for resting 17-ketosteroids and in response to corticotrophin (see Diagram). This tendency for increased response to corticotrophin in 17-ketosteroid excretion is reflected in the low ratio ketogenic steroids/17-ketosteroids for the "hirsutism" group (Table V) previously reported by Prunty (1956), and has been commented on by Nabarro *et al.* (1958). It seems one indication that some alteration of adrenal androgen secretion might occur in these patients.

The ovarian secretion of an androgen such as testosterone, as suggested by Plate (1951), might be evidenced by changes in the ketosteroid fractions, although as testosterone itself, for instance, is a potent androgen the amounts secreted could perhaps be too small to affect the results very significantly. Administration of testosterone to human subjects has given widely varying results for the ratio of androstenedione/etiocholanolone (0.3-3.4), depending upon the conditions (Fukushima, Dobriner, and Gallagher, 1954; Fukushima, Bradlow, *et al.*, 1954; Rubin *et al.*, 1954), so that little may be deduced in this respect from these experiments. No definite abnormality has emerged from the present observations. The secretion of an androgen such as testosterone not metabolized to 11-oxygenated C₁₉ steroids should raise the ratio of less polar/more polar ketosteroids. This was not observed to occur in two patients with Stein-Leventhal syndrome. It has, however, been noted in two male patients studied by Brooks (1958), the values being 8.8 and 7.9 owing to an increased less-polar fraction. Calculation of the corresponding ratio from the data of Rubin *et al.* (1954) shows a similar ratio to ours for females, but there was no increase for males. The significance of changes in the ratio 11-hydroxyandrostenedione/11-hydroxyetiocholanolone has previously been discussed by Brooks (1958). Its increase is recognized in the adreno-genital syndrome and is to be expected. The significance of the rise in this ratio in the Stein-Leventhal and "Stein-Leventhal" patients requires further study.

The behaviour of pregnanetriol excretion in these patients resembled that of the "hirsutism" patients and not that of the adreno-genital syndrome. The results of the gonadotrophin assay do not lend support to the idea that there is a large increase of luteinizing-hormone production in the Stein-Leventhal syndrome. So far as they go the observations do not give support to the view that there is, by the methods used, a detectable increase of ovarian androgen in the Stein-Leventhal patients, but there are indications from the present work that alterations in adrenal secretion can also occur in this syndrome.

Summary

Clinical observations on a group of 49 women developing post-pubertal hirsutism indicate the importance of sterility and menstrual disturbance in the Stein-Leventhal syndrome. Ovarian enlargement may be minimal.

Further evidence for an increase in adrenal keto-steroid excretion in a large proportion of patients with hirsutism is presented, and the biochemical distinction of these cases from the adreno-genital syndrome discussed.

Limited observations have given no definite indication of increase of an ovarian androgen metabolized to 17-ketosteroids in the Stein-Leventhal syndrome, nor of any large increase of luteinizing-hormone production.

The somewhat unobtrusive occurrence of an adrenal cortical carcinoma as a cause of post-pubertal hirsutism and a probable instance of post-pubertal development of the adreno-genital syndrome are presented.

We are indebted to our colleagues in the Department of Obstetrics and Gynaecology, especially to the late Dr. K. Bowes, to Dr. J. W. McLaren, head of the Department of Radiology, and to Dr. R. G. Shorter, in the Department of Clinical Pathology, St. Thomas's Hospital, for their co-operation.

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The terms of reference of the Food Standards Committee have now been revised. The Committee was set up in 1947 to advise Ministers on regulations to control the composition of food for the protection of consumers. The revised terms of reference are as follows: "To advise the Secretary of State for Scotland, the Minister of Agriculture, Fisheries, and Food, the Minister of Health, and as respects Northern Ireland the Secretary of State for the Home Department, on the composition, description, labelling, and advertising of food, with particular reference to the exercise of the powers conferred on Ministers by Sections 4, 5, and 7 of the Food and Drugs Act, 1955, and the corresponding provisions in enactments relating to Scotland and Northern Ireland." The new terms of reference give the Committee more scope to consider and recommend on the control of food labelling and advertising; previously the Committee could deal with the labelling only of foods for which standards of composition were prescribed. Another change is that liquid milk is no longer excluded, but the Committee will not deal with any aspect of milk until the Committee on the Composition of Milk has reported.

RELIEF OF DEAFNESS BY STAPES
MOBILIZATION

BY

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[WITH SPECIAL PLATE]

One of the greatest advances in the whole realm of otology of this century has been the perfection of the fenestration operation for the relief of otosclerotic deafness, and an interesting twist in the history of medicine is the fact that this elaborate surgical ritual should have been largely replaced by a manipulation so obvious and so seemingly simple as to be deemed in some quarters an "office procedure." It is also of interest to note that our forebears of the last century, in their attempts to alleviate deafness, turned their attention first to the stapes, and it was probably Kessel who carried out the first mobilization in 1875. Kessel gives a fascinating description of how in one case he freed the stapes, with a gratifying improvement in hearing, but with no relief from the tinnitus which was the patient's main complaint. On the following day he divided the stapedius tendon, and ultimately it was found that not only had the hearing improvement been maintained but the tinnitus cured (Kessel, 1876). During the ensuing 25 years further attempts either to mobilize or to remove the stapes were made, and these pioneering operations were associated with the names of Miot (1890), Boucheron (1888), and Faraci (1899) in Europe and Blake (1891, 1892, 1893), Jack (1891, 1892, 1893a, b, 1894), and Burnett (1893) in America.

The usual method was to approach the middle-ear cavity by incising the tympanic membrane rather than by reflecting it. Illumination was poor, and to the best of our knowledge no use was made of magnification—an adjunct which is to-day considered essential to the proper execution of the later stages of the operation. Notwithstanding such severe handicaps, large numbers of these operations were performed—more, in fact, than is generally realized—and Miot alone in 1890 published no fewer than 200 cases. It is therefore rather a mystery that at the turn of the century the sun should have gone down on stapes surgery, not to rise again for 50 years. It might be assumed that post-operative infection was responsible for bringing the technique into disrepute, for there were no guardian angels in the form of antibiotics to protect the patient's life and the surgeon's reputation; but it would seem that even in the absence of antibiotic "cover" serious post-operative complications did not occur. It is possible that the fear rather than the actual fact of intracranial complications was partly to blame, for such complications, which occurred frequently in the course of chronic middle-ear suppuration, often defied all attempts at treatment and terminated fatally. The relentless progress of these grim complications from stage to stage was well known to the general public, and they acquired a sinister reputation which persists to-day in spite of their rarity. Moreover, at the end of the last century the attitude of several distinguished otologists was unfavourable to the natural development of temporal-bone surgery in non-infected cases, and it was indicted for numerous reasons, many of which were invalid.

Samuel Rosen in 1952 rediscovered the operation when testing the stapes for immobility under local

analgesia (Rosen, 1953). It is said that the discovery was accidental, and great credit is due to him for his observation and perseverance, and for launching a method of relieving deafness which was destined to have such an impact on otology.

Indications for Stapes Mobilization

(1) The operation is most commonly indicated in cases of otosclerosis in which fenestration would have been advised formerly, and the various criteria on which the decision for that operation was based have been repeated on numerous occasions during the last 20 years. To recapitulate briefly, the diagnosis of otosclerosis should be firm and the hearing loss reasonably symmetrical. Pure-tone audiometry should ideally show a 35-55 decibel loss of air-conduction for the critical speech frequencies, with a satisfactory air-bone gap (preferably at least 20 decibels). Amplification should be well tolerated, paracusis present, and Schwartz's sign absent.

(2) Early cases of otosclerosis which hitherto would not have been subjected to the fenestration operation on account of its magnitude are suitable for stapes mobilization. In the past it was the usual practice to examine these cases at intervals of six or twelve months with the intention of advising operation when the hearing reached a level low enough to render a major surgical procedure worth while. This management, however, was not entirely free from objections. Patients would move and become lost from the follow-up, or would be inveigled into purchasing a hearing-aid (usually unsuitable, unwelcome, and very expensive), or, worst of all, would arrive for audiometry at the appointed time only to show a serious and inexplicable hearing loss placing them in the category of late and unsuitable cases.

(3) Late cases of otosclerosis have in many circumstances been regarded as unsuitable for fenestration. The perceptible element of the deafness may reduce the possible theoretical gain in hearing to such a level as to necessitate the wearing of a hearing-aid post-operatively. Obviously, it is of dubious value to subject the patient to a major operation giving but little hope of dispensing with an appliance but at the same time producing an operation cavity in which it may be impossible to wear that appliance. Stapes mobilization, however, in the same patient is a different proposition. There is a chance that it may permit the instrument to be discarded, but in the event of failure an aid may continue to be worn, even in the operated ear.

Finally, there is the very late case in which a powerful aid gives insufficient amplification, and here also the stapes operation is feasible, for it may improve the hearing sufficiently to enable the patient to obtain benefit from an aid.

(4) Unilateral cases of otosclerosis with good hearing in the contralateral ear have seldom, in my opinion, justified fenestration. The over-all subjective improvement is disappointing when the hearing level of a deafened ear is raised, provided the other ear is normal, and, though a dramatic difference may be shown audiometrically, the patient is seldom enthusiastic. Nevertheless, it is certainly most desirable that the hearing in both ears should be symmetrical, and stapes mobilization is without doubt justified in an endeavour to achieve this state.

(5) Patients suffering from conduction deafness caused by adhesions following serous otitis media are suitable for exploration of the tympanic cavity by the techniques of Lempert and Rosen. For many years the management of this type of deafness consisted of repeated politizerization or eustachian catheterization, involving the patient in great loss of time and not a little suffering, the net result being in most cases a minor and transient improvement in hearing. In recent years these methods of treatment have been used less and less, partly because their limitations are appreciated, and also for the reason that conduction deafness due to causes other than otosclerosis is seen less frequently than

hitherto owing, no doubt, to the increased care of the upper respiratory tract in childhood and to the introduction of antibiotics. Nevertheless these cases are seen in moderate numbers, and the technique of stapes surgery opens a new vista in their investigation and treatment.

(6) Lastly, the techniques referred to provide a direct and safe method for inspecting the tympanic cavity and for carrying out curative procedures in obscure cases of deafness the precise diagnosis of which may be in doubt prior to operation. These include such conditions as round-window otosclerosis (McLay, 1957) and traumatic ossicular dislocation (Gisselsson, 1958).

Technique

Anaesthesia

The operation is most commonly performed under local analgesia, which carries distinct advantages. The hearing may be tested at all stages, and the achievement of a mobile stapes is immediately verified by the hearing improvement obtained, thus obviating any manipulation which might be unnecessary and traumatic. Many persons in Great Britain, whilst being perfectly happy to undergo general anaesthesia, thanks no doubt to the high degree of perfection to which the latter has been raised by anaesthetists. It is my belief that such patients should not be denied the operation, but should be given a general anaesthetic, under which extremely good results may be obtained. Some surgeons, in fact, prefer general anaesthesia as a routine, as it gives them freedom of movement and freedom of speech (!) (Venters, 1958).

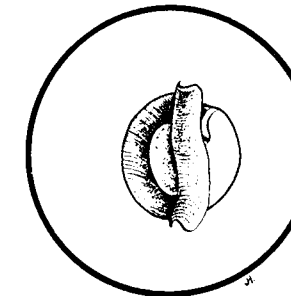
Premedication consists of pethidine, 100 mg. intramuscularly, and atropine, 1/100 gr. (0.65 mg.) subcutaneously, and is given 45 minutes beforehand. No shaving of hair or other local pre-operative preparation is necessary, but the meatus is carefully inspected on the day before operation in order to ensure the absence of cerumen or any inflammatory condition. After swabbing of the meatus and pinna with flavine 1:1,000 in 50% spirit, "xylotox" 2% with adrenaline 1:80,000 is injected at several points under the skin of the meatus at the junction of the osseous and cartilaginous parts of the latter. Only 1-2 ml. is used, and the extreme degree and widespread analgesic effect of this small quantity is surprising. It has not yet been my experience for the patient to complain of pain at any stage of the operation, apart from the initial needle prick. (Special Plate, Figs. 1 and 2.)

Operative Details

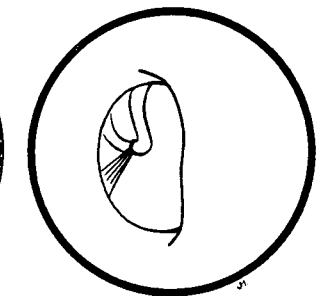
The incision is derived from that of Lempert for tympano-sympathectomy (Lempert, 1946), but differs slightly in position, being made from 12 o'clock to 6 o'clock in the skin of the posterior meatal wall. Its upper and lower extremities are 2 mm. from the edge of the tympanic membrane, but its centre portion is at least twice this distance. (Special Plate, Fig. 3; Text Fig. 1.) The most useful instrument for making the incision has proved to be one of Rosen's bone spoons which is sharpened before each operation until a knife-edge is obtained. This was suggested to me by McKenzie (McKenzie and Rainer, 1957) and has also been mentioned by Simson Hall (1958).

The collar of skin medial to the incision is now gently raised from the underlying bone until the edge of the tympanic membrane can be lifted from its sulcus, exposing underlying mucous membrane. The latter is pierced with a sharp seeker, which serves to divide it in the line of

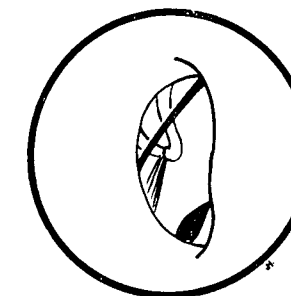
the annulus tympanicus, and at this stage a large air-bubble invariably appears from the middle-ear cavity (Special Plate, Fig. 4; Text Fig. 2.) The posterior part of the tympanic membrane may now be folded forwards across the manubrium of the malleus, exposing the middle-ear cavity (Plate, Fig. 5; Text Fig. 3.) This first stage is very laborious, and must be executed with extreme caution in order to avoid tearing the tympano-meatal flap at the junction of the tympanic membrane with the delicate skin of the posterior



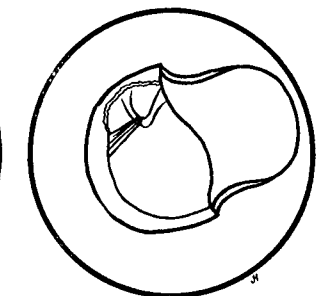
TEXT FIG. 2.—Entry into tympanic cavity.



TEXT FIG. 3.—Incudo-stapedial joint and stapedius tendon.



TEXT FIG. 4.—Incudo-stapedial joint, stapedius tendon, chorda tympani, and round-window niche.

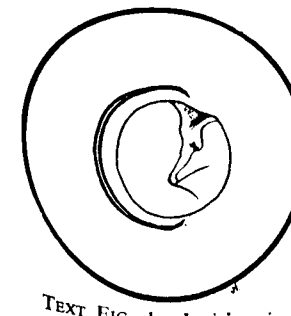


TEXT FIG. 5.—Removal of part of tympanic ring.

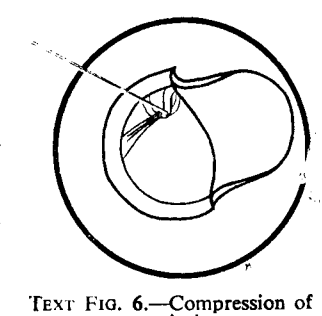
meatal wall. In many cases the incudo-stapedial joint is now clearly seen, with the stapedius tendon and chorda tympani (Plate, Figs. 5 and 6; Text Fig. 4), but in some cases these structures are partly hidden by overhanging annulus tympanicus, which must be removed with Rosen's curette or Lempert's fenestration curettes (Text, Fig. 5).

At this juncture it is desirable to employ increased magnification if, as is often the case, the first stage has been carried out with the aid of a binocular loupe magnifying two diameters. The Zeiss operating microscope gives a large choice of magnifications, but for the preliminary steps in mobilization 10 or 16 diameters are adequate.

The stapes may now be tested for mobility, after which mobilization should be attempted, starting with manœuvres as atraumatic as possible, and in the event of failure passing on to manipulations involving greater forces. The reason for this orderly sequence is that the degree of fixity of the stapes varies from case to case, and it is obviously better to achieve mobilization with the minimum risk of trauma to the middle and internal ear structures. The first and least traumatic manipulation, which is perhaps most closely parallel to normal physiological movement, is the transscudial method advocated by Goodhill (1955), House (1957), and Scheer (1958). The point of the seeker is firmly planted in the tip of the long process of the incus and pulsating pressure is exerted towards the oval window, compressing the stapes from head to footplate (Text Fig. 6). In a



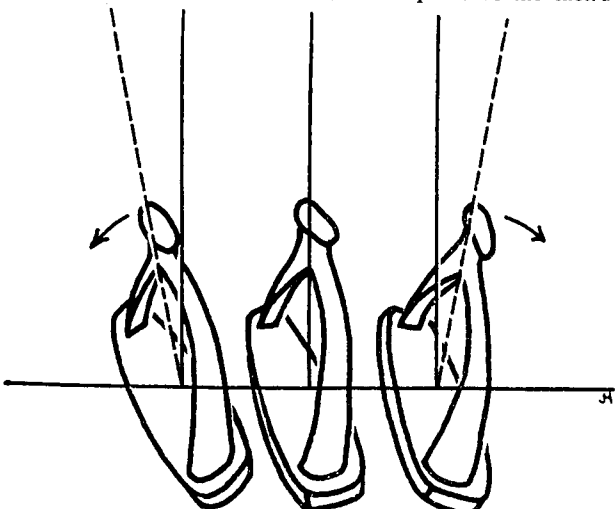
TEXT FIG. 1.—Incision in meatal wall.



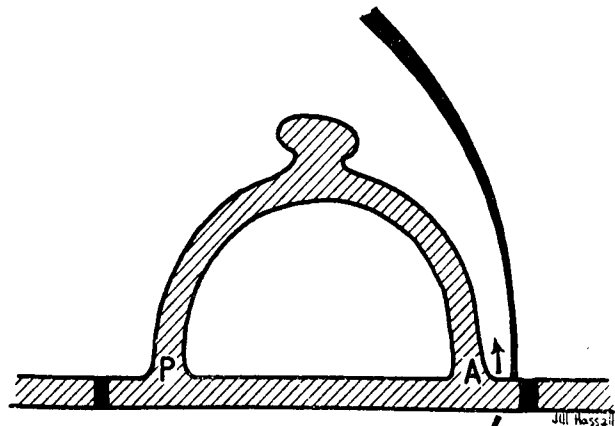
TEXT FIG. 6.—Compression of stapes via incus.

small proportion of early cases mobility is effected, but only minimal pressure may be permitted or the stapedia crura might be fractured or driven through the footplate, and it is usually necessary to pass on to the second manoeuvre. (Text Fig. 7). This consists in attempting to rock the stapes from side to side in the axis of the long diameter of its footplate and is advocated by McKenzie and Rainer (1957); but the forces acting here are at right-angles to those when Rosen's original method of pressure on the anterior aspect of the stapedia neck is employed. My third manoeuvre is to attempt mobilization by downward pressure on the small lip of footplate which sometimes projects well in front of the anterior crus (Text Fig. 8); and, fourthly, to endeavour to prise the footplate loose in the manner described by Rosen (1955).

If all these methods fail, it is probable that further attempts at mobilization would fracture the stapedia crura, and it is advisable to proceed to Rosen's method of footplate fenestration (Rosen, 1956). The point of the instru-



TEXT FIG. 7.—Stapes rocking about axis in long diameter of footplate.



TEXT FIG. 8.—Downward pressure on footplate of stapes anteriorly.

ment used, which resembles a crochet hook, is inserted with extreme care through the footplate to a depth of not more than 1 mm., and on withdrawal brings away a small portion of bone, permitting the escape of a little perilymph. It is needless to stress that the footplate technique requires movements of precision which can be safely controlled only under high magnification.

In the conscious patient the hearing is tested from time to time, and there is usually little doubt when mobilization has been achieved, for the hearing improvement is sometimes dramatic and is enhanced by replacement of the tympanic membrane. "Gelfoam" provides a suitable dressing, and may be retained in position by a strip of $\frac{1}{4}$ inch (6.4 mm.)

ribbon gauze. Simson Hall (1958) places a small piece of oil-silk in contact with the tympanic membrane in order to lessen the risk of perforation—a method which would seem to be most advantageous, as the oil-silk may be left for a considerable time should a healing perforation be suspected, and will act as a perfect splint.

Post-operative Care

As a rule no particular sedation is required; the ribbon-gauze strip is removed after two to four days, and the patient is usually discharged on the fourth or fifth post-operative day. Penicillin is given regularly during this time. It is often found that the immediate improvement in hearing is temporarily lost, and it is wise to warn the patient that this is merely due to an accumulation of debris in the meatal canal and that the initial hearing improvement will almost certainly return when this clears. The debris usually separates and is extruded without assistance, and manipulations should be avoided so far as possible at the post-operative attendances.

If at the time of operation a successful outcome is expected but post-operative testing reveals no improvement in the hearing, a further exploration with attempted mobilization may be made at a later date. There is no contraindication to a repetition of the same technique; in fact, the exposure is often achieved more readily the second time. In the event of repeated failure, fenestration is advised if the case is considered suitable for this operation, and the fact that the patient has been the subject of one or more attempts at stapes mobilization in no way impedes the fenestration technique or reduces the chances of a successful outcome.

It may be of interest at this stage to collate certain aspects of the two operations—fenestration and stapes mobilization.

	Fenestration	Stapes Mobilization
Usual sojourn in hospital	2-3 weeks	3-5 days
Length of operation	1-3 hours	1/3-1 hour
Anesthetic	General (in U.K.)	Local or general
Post-operative vomiting	Occasional	Nil
" vertigo	Variable	Rare
" pain	Occasional	Slight
" otorrhoea	Not uncommon. May be intractable	Rare
Indications	Limited	Wide
Possibility of repeating operation in the event of failure	Revision difficult and hazardous, and seldom meets with lasting success	Operation can be repeated on same ear two or three times. Ultimately possible to fenestrate ear
Post-operative attendances	May be frequent if operation cavity becomes infected	Occasional

Complications

A search of the literature reveals that very few complications are reported, the most common complication occurring during operation and consisting of a fracture of the anterior crus or of both crura of the stapes. This is met by abandoning any further attempts at mobilization and proceeding straight to footplate fenestration. Occasionally tears occur in the tympanic membrane, but these seldom result in permanent perforations. In the first 50 cases operated on at Westminster Hospital one small perforation persisted, but the tympanic membrane was subsequently repaired by myringoplasty. There were also in this small series four cases of acute otitis media which occurred after the patients had been discharged from hospital, but the infection responded rapidly to antibiotic treatment in each case. In some series transient facial pareses, which have cleared up completely as soon as the effect of the local analgesic agent has passed off, have been reported.

It might be thought that complications would be likely to follow invasion of the sanctum of the inner ear by the footplate manoeuvres described, but Rosen (1958) reports that in over 200 footplate fenestrations there was not a single instance of labyrinthitis or involvement of the facial nerve.

Results

It is notoriously difficult to depict the results of a procedure designed to improve the hearing. Pre-operatively the patients fall into different categories as regards their suitability for operation and the amount of improvement which might be expected to accrue therefrom, so it is obviously invidious to compare the results obtained in one group with those in another unless the original pre-operative category of the patient is borne continually in mind. Pure-tone and even speech audiometry sometimes give a misleading picture which does not in every case correspond with the subjective sensations of the patient. Finally, the terms used by surgeons in describing improvement or deterioration, success or failure, though having an exact significance to their authors, do not always convey the same meaning to their readers.

Scheer (1957) found that the operation had resulted in the restoration of practical and functional hearing in 36% of cases, but later (Scheer, 1958), by including the footplate techniques, was able to obtain an acceptable hearing improvement in 75-80% of cases. Rosen (1958) in an analysis of 254 cases states that a significant improvement in hearing was obtained in 77%. Venters's (1958) initial successes (including "very successful" and "moderate") reached 70%, and the number maintained for six months or more 53%. It would seem that many surgeons find that of all their cases subjected to operation approximately one-third obtain a great, and in some cases dramatic, improvement in hearing; approximately one-third are improved, but to a lesser degree; whilst the remainder are scarcely affected. Of the first 50 cases operated upon at Westminster Hospital (admittedly a small number), 29 have shown a useful, and in some cases very great, improvement in the hearing, 11 have been moderately improved, and in 10 cases the hearing has remained unchanged. It is likely that in the course of time a few of the 29 "very successful" cases of the first 50 will deteriorate and enter other categories, so the eventual ratio of great improvement: slight improvement: no change may not be very far from 1:1:1.

Of extreme importance is the problem of the duration of improvement in terms of years. Rosen (1958) states that over 95% of the improved cases have maintained their hearing improvement, without regression, for periods of up to five years, and it is worthy of note that his first case, operated on in April, 1952, had at the time of reporting maintained his hearing improvement for 4 years 10 months.

Summary

The history of stapes mobilization is traced from the 1870's. After a dormant period of half a century the operation was resurrected by Rosen in 1952.

The indications for the operation are given, and it is noteworthy that stapes mobilization is more general in its application than fenestration of the labyrinth.

The technique is described. Local analgesia is preferred, but is not obligatory. After the incudo-stapedial joint and surrounding anatomical structures have been displayed, manoeuvres aimed at freeing the stapes are carried out. If mobilization is found to be impossible, fenestration of the stapes footplate is undertaken. The progress of the operation is controlled by hearing tests at intervals.

The post-operative care is mentioned, and a comparison between features of stapes mobilization and fenestration shows that when such matters as length of stay in hospital and post-operative discomfort, etc., are considered the magnitude of the former operation is much less than that of the latter.

Results to date suggest that, of the patients undergoing the operation, approximately one-third may be expected to obtain a useful, lasting, and in some cases

great hearing improvement, one-third a slight improvement, and one-third no improvement. In cases in which the result is disappointing, the fact that the operation may have been performed several times does not preclude a patient from undergoing fenestration of the labyrinth at a later date.

I thank Dr. Peter Hansell and Miss Jill Hassell of the Department of Medical Photography of Westminster Hospital for the illustrations.

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FAMILIAL HAEMOPHAGOCYTIC RETICULOSIS

BY

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[WITH SPECIAL PLATE]

The title "familial haemophagocytic reticulosis" was given by Farquhar and Claireaux (1952) to an unusual disorder which affected the first two children of a family. Both infants had developed anorexia, vomiting, irritability, and pallor at the age of 9 weeks. Both had enlargement of the liver and spleen, and both had progressive anaemia, leucopenia with profound granulopenia, and thrombocytopenia. Smears of the peripheral blood always contained a high percentage of unrecognizable damaged cells and a small proportion of atypical mononuclear cells bearing some resemblance to those occurring in glandular fever. The first baby, a male, died at the age of 10 weeks. Clinical investigation of the second infant, a female, failed to reveal the cause of the pancytopenia. In particular, there was no evidence either of erythroblastosis foetalis or of exposure to drugs or poisons. The resistance of the red blood cells to hypotonic dilutions of saline was normal,

and the marrow was always richly cellular and normoblastic. Radiographs of the skeleton failed to reveal any sign of reticulo-endotheliosis. This infant appeared to respond temporarily to corticotrophin, but the improvement was not maintained and she died at the age of 22 weeks.

Necropsy revealed in both children a remarkable proliferation of histiocytes throughout the reticulo-endothelial system. This had not been apparent in the ante-mortem marrow smears. The histiocytes contained very many ingested red cells and less numerous white cells. The picture was not that of Letterer-Siwe's disease, and a suggestion that it might be identical with histiocytic medullary reticulosis was later refuted by Marshall (1956).

The third child of the family, a girl, was mentioned by the authors. She was normal clinically at birth, but smear cells were numerous in the peripheral blood films. A high percentage of atypical large lymphocytes appeared in the blood between the sixth and eighth weeks of life, and at the age of 10 weeks she developed severe anorexia. Neither liver nor spleen was palpable, but she had a mild anaemia, and the atypical lymphocytes persisted in the blood until she was 18 months old. She became no worse clinically, however, and when she was last examined at the age of 4 years 4 months the haemoglobin level and white-cell picture in the blood were found to be normal. She is now reported by her parents to be an apparently healthy 5-year-old.

The results of serological investigation of these children, the fourth child, the parents, and the paternal grandparents are given in the Table. Positive reactions to Coombs's test were reported in blood from Cases 2 and 3 and from the father. On the father Coombs's test on a later occasion gave a negative result. The paternal grandmother's test was in doubt, and she refused further investigation, possibly because she

Table Showing Results of Serological Tests on Members of the Family

Subject	Date	Genotype		Coombs's Test	Other Comments
		ABO	Rh		
Case 1	3/7/50	O	Negative	Negative	
Case 2	19/9/51	O	CDe/cde	Positive	
Case 3	12/9/51	O	Positive	Negative	
	25/9/51	O	"	"	Trace of cold agglutinating
	13/10/52	O	"	"	No evidence of cold agglutinins
	14/11/52	O	"	"	"
	18/3/53	O	"	Weak positive	"
Case 4	29/5/53	O	"	Negative	"
	16/3/54	O	"	"	"
	30/12/55	O	Negative	Negative	Well-marked platelet agglutinin
	5/5/56	O	"	"	"
	9/5/56	O	"	"	Post-splenectomy. Strong platelet agglutinins
Father	22/5/56	O	"	"	"
	29/5/56	O	"	"	"
	19/9/51	O	cDE/cde	Positive	
Mother	1/12/56	O	"	Negative	
	5/1/57	O	"	"	
Paternal grandfather	2/10/51	O	CDe/CDe	Negative	
Paternal grandmother	2/10/51	O	cde/cde	Doubtful weak positive	Refused further investigation

suspected the discovery of a discrepancy between the genotypes of her son and her husband (see Table) indicating that they were not blood relations. No abnormal antibodies against a wide range of known blood groups (including MNS, P, Lewis, Lutheran, Kell, Duffy, and Kidd) could be found in the mother's blood after the birth of the second child. Her serum was tested by the indirect Coombs method against the cells of the paternal grandparents with negative results.

Although the parents had asked that the third pregnancy should be terminated shortly after conception had taken place, and this had been refused, they were so encouraged by the apparent health of this child that they decided to have more children. The object of the present paper is to present the clinical, haematological, and pathological findings in the fourth child (Case 4), and to record the results of further investigations of the parents. On the basis of these new data an attempt is made to discuss the nature of the disorder.

Details of Case 4

The baby, a male, was born outside Edinburgh. His blood picture was normal and the result of Coombs's test negative. When 14 weeks old he developed anorexia and irritability followed by pallor. He was admitted to the Royal Edinburgh Hospital for Sick Children four weeks later (Fig. A). Both liver and spleen were firmly enlarged. His haemoglobin was 65% (Sahli; 100% = 14.8 g.) and the total white cell count was 2,500 per c.mm. The peripheral blood smear contained 20% neutrophil polymorphs, 64% large lymphocytes, and 16% damaged cells. There were only 32,000 platelets in each c.mm of blood (Fig. B). The marrow showed very active erythropoiesis, nearly 40% of the nucleated cells being normoblasts at various stages; many were polychromatic with only partly condensed nuclei. Neutrophil and eosinophil myelocytes were present in fair numbers, but there were few mature granulocytes. Small lymphocytes were normal. There were many large cells with pale nuclei and clear, light-blue cytoplasm. Some of them were primitive cells, with nucleolated nuclei and more basophilic cytoplasm; others had abundant pale

cytoplasm and appeared to be a type of monocyte or histiocyte. Phagocytosis was not seen, but occasional cells of this type had vacuolated cytoplasm. They may have been the marrow representatives of the atypical large lymphocytes found in later blood smears and in the smears of siblings. The result of Coombs's test was negative, but platelet agglutinins were demonstrable in the serum (see Table). The blood picture deteriorated. The spleen had been clearly demonstrated as a major site of erythrophagocytosis in previous siblings. In addition, autoantibodies had been detected in Case 2 and possibly in Case 3, and the presence of severe pancytopenia without the usual signs of



FIG. A.—The fourth child.

F. T. G. PRUNTY, R. V. BROOKS, AND D. MATTINGLY: POST-PUBERTAL HIRSUTISM



FIG. 1.—Theca proliferation and luteinization at edge of cystic follicle in ovary removed from patient with Stein-Leventhal syndrome. ($\times 96$.)



FIG. 2A

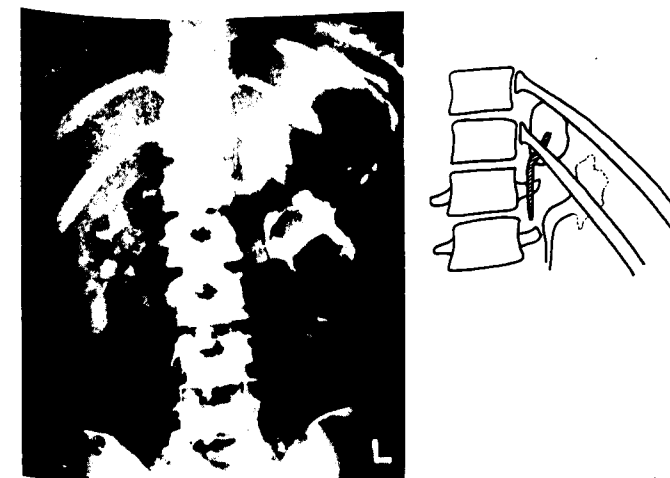


FIG. 3.—Radiograph showing left adrenal cortical tumour with calcified thrombus in left adrenal vein (case in Table VIII). Outline of tumour and thrombus is indicated above renal pelvis in accompanying diagram.



FIG. 2B

FIG. 2.—Radiographs showing ovarian shadows after induction of pneumoperitoneum. A, normal; B, from case of Stein-Leventhal syndrome.

J. W. FARQUHAR ET AL.: FAMILIAL HAEMOPHAGOCYTIC RETICULOSIS

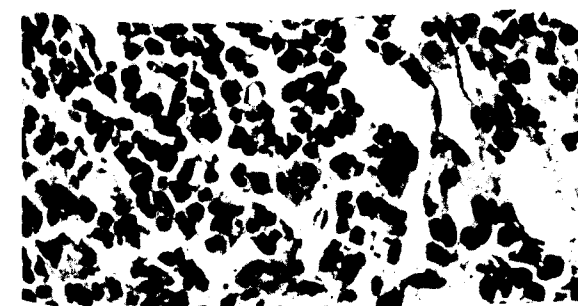


FIG. 1.—Biopsy of spleen showing phagocytes in sinuses containing numerous erythrocytes. ($\times 420$.)

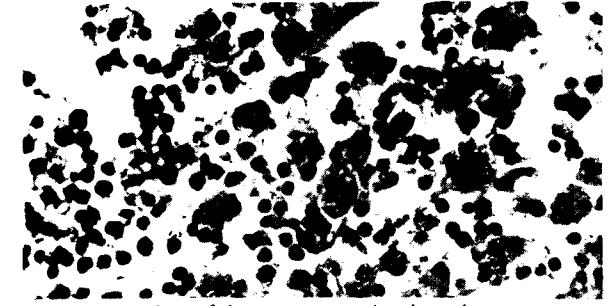


FIG. 2.—Section of bone marrow showing phagocytes containing erythrocytes and occasional nucleated cells. ($\times 420$.)

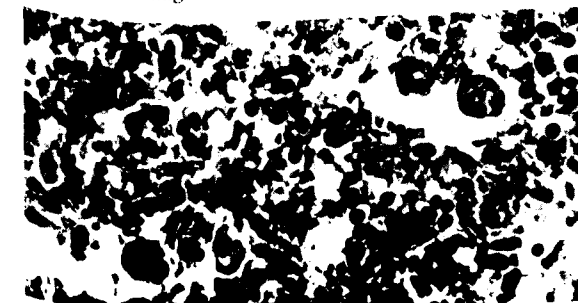


FIG. 3.—Section of lymph node showing phagocytes containing erythrocytes and nucleated cells. ($\times 420$.)

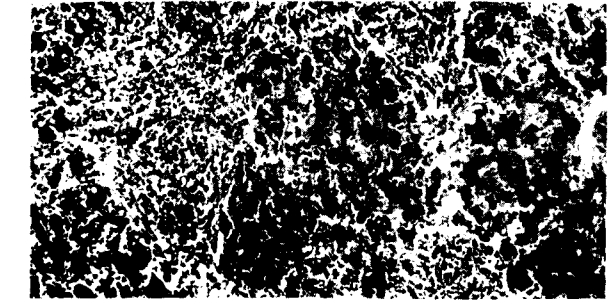


FIG. 4.—Section of liver showing infiltration of portal tracts by histiocytes. ($\times 64$.)

E. H. M. FOXEN: STAPES MOBILIZATION TO RELIEVE DEAFNESS



FIG. 1.—Right tympanic membrane.



FIG. 2.—Right tympanic membrane after injection of local analgesic.



FIG. 3.—Central part of the incision.



FIG. 4.—Entry into tympanic cavity.

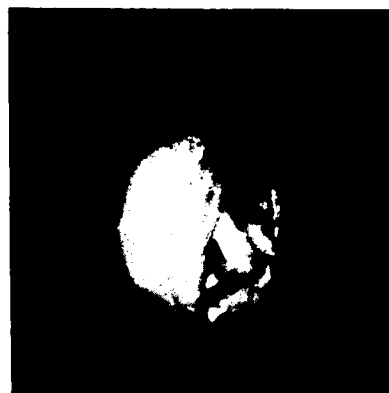


FIG. 5.—Incudo-stapedial joint and stapedius tendon.



FIG. 6.—Chorda tympani, stapedius tendon, stapes, round-window niche.



FIG. 7.—Mobilization completed. Tympanic membrane has been replaced.



FIG. 8.—Gel-foam dressing applied.



FIG. 9.—A left ear. Seeker is at foot of anterior crus.



FIG. 10.—Showing pool of blood in round-window niche.



FIG. 11.—Blood aspirated.



FIG. 12.—A right ear. Otosclerotic bone involving both crura of stapes.

W. R. M. ALEXANDER AND J. J. R. DUTHIE: REACTION OF L.E. SERUM WITH CELL NUCLEI



FIG. 1.—Blood film from healthy donor pretreated with normal serum. No nuclear fluorescence.



FIG. 3.—Skin from healthy donor pretreated with normal serum. No nuclear fluorescence.

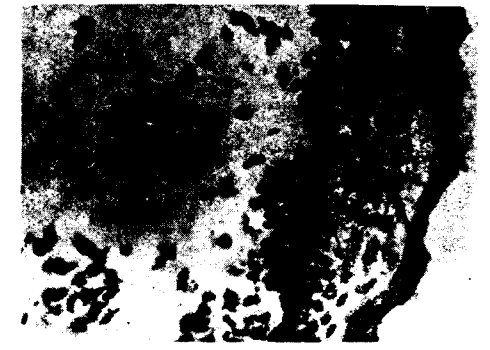


FIG. 4.—Field shown in Fig. 3 stained with Giemsa.

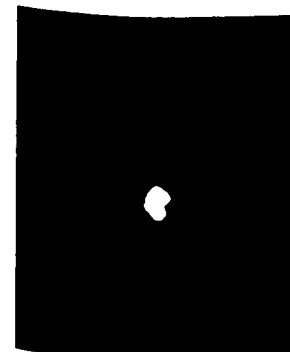


FIG. 2.—Blood film from same donor as Fig. 1 pretreated with L.E. serum. Nuclear fluorescence present.



FIG. 5.—Skin from healthy donor pretreated with L.E. serum. Nuclear fluorescence present.

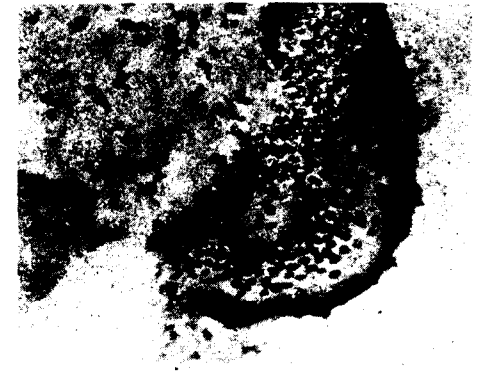


FIG. 6.—Field shown in Fig. 5 stained with Giemsa.



FIG. 7.—Skin from D.L.E. pretreated with autologous serum (Case 7). Diffuse fluorescence in epidermal cells, but nuclei not selectively involved.



FIG. 9.—Buccal mucosa from healthy individual pretreated with L.E. serum. No nuclear fluorescence. (Brightness of centre of field is due to optical properties of dark-ground condenser.)



FIG. 8.—Field shown in Fig. 7 stained with Giemsa.



FIG. 10.—Field shown in Fig. 9 stained with Giemsa.

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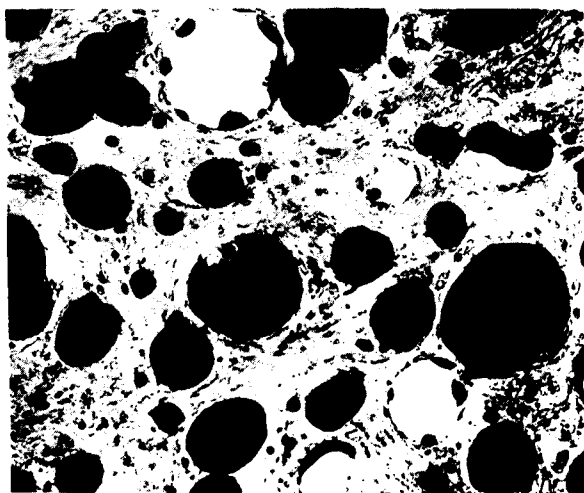


FIG. 1

FIG. 1.—Dense fibrosis of lung with honeycomb of fat-filled spaces, typical of a late stage of oil aspiration pneumonia. (Sudan IV. $\times 66$.)

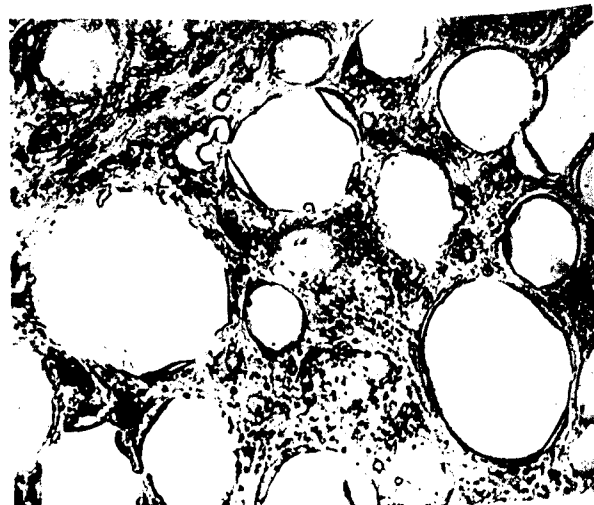


FIG. 2

FIG. 2.—Similar area to Fig. 1 stained with osmic acid and showing no reduction by fat. ($\times 66$.)

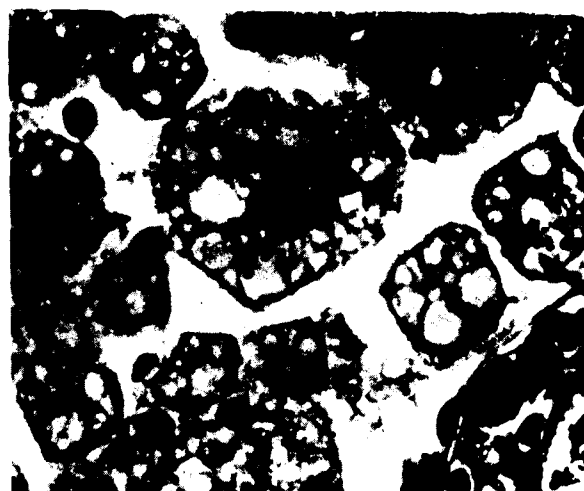


FIG. 3

FIG. 3.—Typical vacuolated lipophages of oil aspiration pneumonia lying in alveoli. (H. and E. $\times 264$.)

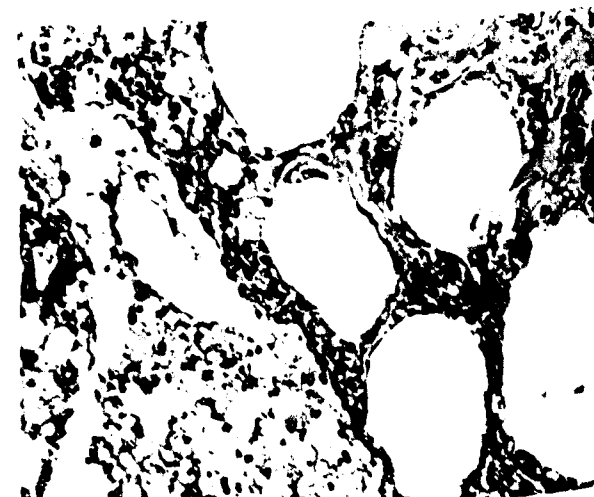


FIG. 4

FIG. 4.—Section of lung showing different stages in reaction to oil. On left are sheets of lipophages between which fibrous strands are beginning to insinuate. Farther to right, fat-filled spaces are enmeshed in fibrous tissue which is cellular in character. Still farther right, fibrous tissue is denser and much less cellular. (H. and E. $\times 66$.)

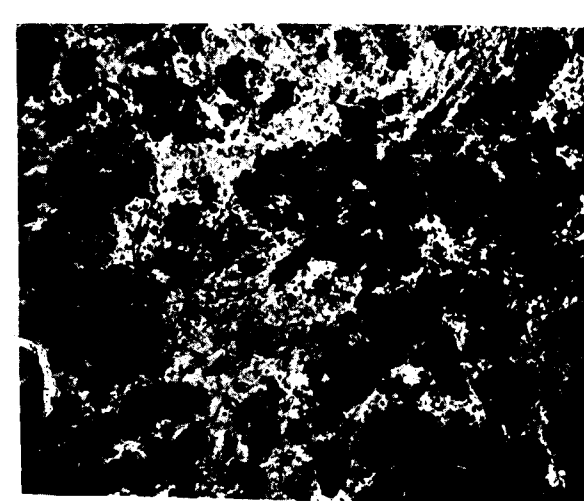


FIG. 5

FIG. 5.—Section of lung showing oil aspiration pneumonia in early stage of development. (Sudan IV. $\times 66$.)

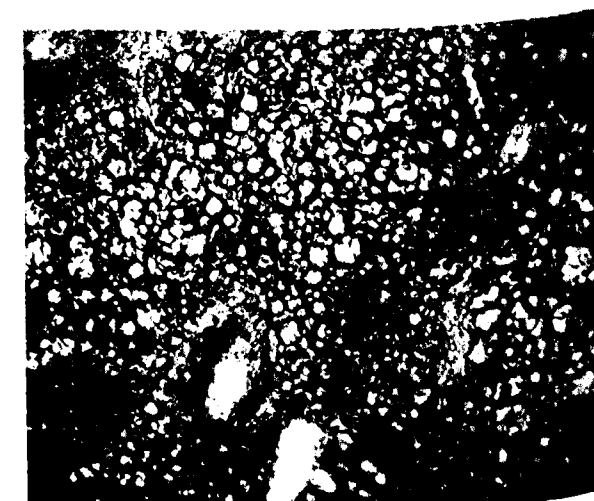


FIG. 6

FIG. 6.—Section from same area of lung as Fig. 5 stained with osmic acid. ($\times 66$.)

increased blood destruction despite a hyperplastic marrow might have been due in part to hypersplenism. Splenectomy was carried out six days after the patient's admission to hospital. The spleen was enlarged; it measured $10 \times 7 \times 3.5$ cm. and weighed 110 g.; it was of normal consistency and was free from adhesions. The cut surface was deep red and the Malpighian bodies were inconspicuous. On microscopic examination the principal feature was proliferation of endothelial phagocytes in the pulp sinuses and

been withdrawn within the previous six hours and which had proved compatible with the recipient's blood after most careful cross-matching. At the time of this procedure a sample of the infant's erythrocytes was labelled with radioactive chromium and reinjected with a view to measuring the red-cell survival time.

No improvement followed the exchange transfusion and the child died nine days later. During this period the haemoglobin level fell from 63% to 28%. Seven days after

chromium-labelled cells had been injected only 34% of the injected radioactive material was present in the circulation, and at the time of death (that is, Day 9) only 11% remained. It was calculated that 50% of the injected radioactive material had been eliminated in five days. (Mean finding in five normal individuals, 26 days. This is in agreement with the results of Mollison (1956).)

Pathology.—The necropsy was restricted by limitation of the incision to the abdomen. The body was that of a male infant weighing 6,155 g. The skin was moderately jaundiced and there were petechiae on the trunk and limbs. The mucous membranes and nails were pale. The abdomen was greatly distended and a transverse surgical incision on the left side was recently healed. The significant pathological observations were as follows. The liver was moderately enlarged and weighed 447 g. It was light brown, and both the external and the cut surface showed red spots which measured up to 3 mm. in diameter and were slightly depressed. The consistence was normal and no

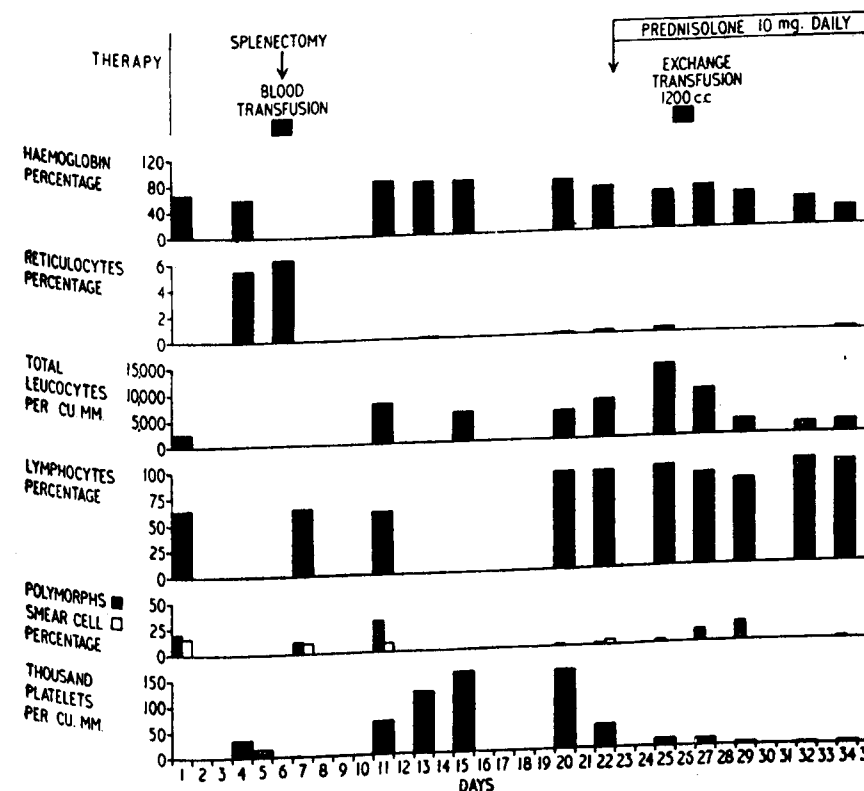


FIG. B.—Progress chart of fourth child.

fibrosis was detectable. Lymph nodes were not appreciably enlarged, but many were dull red or purple. The largest were in the upper abdomen. The bone marrow was deep red. Other macroscopical features were those resulting from anaemia.

On microscopic examination the outstanding pathological feature was the presence of many phagocytic histiocytes in various organs. They were conspicuous throughout the reticulo-endothelial system; in the bone marrow, lymph nodes, intestinal tissue, and liver; and also in the interlobular and interacinar stroma of the pancreas and among the disintegrated remains of the foetal cortex of the adrenal glands. The phagocytes were large cells, with swollen, often vacuolated cytoplasm, and in all the situations mentioned many of them contained erythrocytes in numbers varying from one to ten. In the bone marrow (Special Plate, Fig. 2) and lymph nodes (Plate, Fig. 3) nucleated cells had been phagocytosed, but it was uncertain whether these were normoblasts or lymphocytes. The phagocytes lay free in the bone-marrow spaces and in the sinuses of the lymph nodes. In the liver (Plate, Fig. 4) they infiltrated the widened and extended portal tracts and were found also in the sinuses, where they appeared to be proliferated Kupffer cells. This infiltration was not accompanied by any appreciable fibrosis. The depressed red spots noted macroscopically in the liver proved to be areas in which most of the epithelial cells had disappeared, leaving a network of wide sinuses.

In spite of the evidence of active blood destruction by phagocytosis, no deposition of haemosiderin was detected in any situation. The lymphoid tissue in all sites examined showed a reduction in the number of lymphocytes and absence of germinal centres in the follicles.

The infant's condition improved concurrently with a partial improvement in the blood picture (Special Plate, Fig. 1). Two weeks later, however, deterioration was noticeable. Although corticotrophin had failed to induce a remission in Case 2, a daily dose of 10 mg. of prednisolone was prescribed 15 days after splenectomy, and it was continued without benefit until the baby died.

Two possible explanations existed for the process being re-enacted in the fourth child. Either abnormality of his cells stimulated the proliferation of phagocytes in the reticulo-endothelial system, or the latter was of itself abnormal and engulfed blood cells indiscriminately. The appearance of the red cells was normal. No abnormal haemoglobin was present. It seemed reasonable to expect, however, that if the patient's cells were abnormal their replacement by normal compatible donor cells should be followed by a period of remission. On the other hand, if the patient's cells were normal and the reticulo-endothelial system was abnormal, then compatible donor cells should be removed as quickly as, or even more quickly than, those of the patient. Twenty-six days after admission a 1,200-ml. exchange transfusion was carried out with blood which had

Further Investigation of Parents (December, 1956—February 1957)

The father and mother were young and apparently healthy. They had not suffered from any significant illnesses earlier in life, but the father had vomited frequently in early infancy. There was no relevant medical history on either side of the family. In neither parent were there any abnormal physical findings, in particular there was no enlargement of liver, spleen, or lymph nodes.

The results of blood examination were as follows. Father: Hb 101%; R.B.C. 4,730,000 per c.mm.; C.I. 1.06; reticulocytes less than 1%. Mother: Hb 100%; R.B.C. 5,890,000 per c.mm.; C.I. 0.84; reticulocytes less than 1%. In films made from the peripheral blood the red cells, white cells, and platelets appeared normal. In both parents there was no increase of red-cell fragility in hypotonic dilutions of saline, the direct Coombs test was negative, the level of bilirubin in the serum was not raised, and there was no excess of urobilinogen in the urine. The father consented to sternal puncture. In smears made from the marrow aspirate the appearances were entirely normal.

The survival time of the parents' own red cells was then measured using radioactive chromium. In the mother 50% of the injected radioactive material had disappeared from the circulation in 27 days, indicating normal red-cell life. The life span of the father's erythrocytes, however, was significantly shortened, 50% of the injected radioactive material being eliminated within 20 days. Subsequently the fate of chromium-labelled cells from a healthy donor was studied, and it was found that their rate of elimination was also more rapid than in normal individuals, the 50% level of radioactivity being reached in 23 days.

Discussion

The apparent homochronous inheritance of a disorder which affected primarily either the blood cells or the reticulo-endothelial system, and which was responsible for the deaths of three siblings (two boys and a girl) and mildly affected the other, may be unique. In each of the fatal cases systemic upset developed in the third or fourth month of life, when each was found to have pancytopenia and enlargement of the liver and spleen. In Cases 2 and 4 the pancytopenia progressed in the presence of an apparently richly reactive, normoblastic bone marrow and in the absence of the usual evidence of haemolysis. Hypersplenism appeared to be a possible explanation of these features, but in the fourth child splenectomy failed to produce a haemopoietic response in keeping with the release of marrow inhibition. A temporary increase in granulocytes and platelets was not sustained. The main cause of the anaemia in each case appeared to be the excessive removal of red cells from the circulation as a result of erythrophagocytosis by histiocytes which had proliferated throughout the reticulo-endothelial system. Leucophagocytosis was also seen. Phagocytosis was never demonstrated in peripheral blood or marrow smears, although a proportion of large, atypical mononuclear cells was seen in both.

That the life span of the red cells was severely shortened was clearly demonstrated in the fourth child. No abnormality in either the appearance of the red cells or their osmotic fragility was found, and the presence of an abnormal haemoglobin was excluded. The occasional detection of autoantibodies in the serum of some members of the family strongly suggested that the excessive destruction of erythrocytes was due not to a red-cell defect but to extracorporeal factors. Had the last child survived for a longer period, a study of the fate of labelled corpuscles from a healthy donor would probably have confirmed this view, particularly as the haemoglobin level fell with great rapidity after exchange transfusion. Significant observations were, however, made in the father. Although he had at no time any abnormal clinical features, he was shown at one examination to be moderately anaemic, and an autoantibody was found in his serum. At a later date, despite a normal peripheral blood picture, the life span of

his own red cells and of donated corpuscles was appreciably shortened, indicating that he was suffering from a haemolytic disorder of extracorporeal type. It is reasonable to suppose that this was not a coincidence, but that the finding was a milder expression of the fatal illness encountered in three of the children. It would have been of great interest to make a fuller investigation of the surviving child, but red-cell-survival studies were not undertaken because of her age and because the parents had been encouraged to regard her as normal.

The familial incidence of some reticulo-endothelial disorders is well recognized. Thirty-five cases of familial leukaemia have been reported (Wintrobe, 1956). In eight families three or more members have been affected by Hodgkin's disease; it has appeared concurrently in identical twins, and on three occasions affected women have given birth to affected children. Leukaemia has affected as many as five of eight siblings in childhood and six persons in two generations. Wintrobe believes it likely that genetic factors do exert an influence in the aetiology of human leukaemia, but that the mode of inheritance is obscure. The so-called lipid reticuloses, Gaucher's and Niemann-Pick's disease, are familial, and Letterer-Siwe's disease has been reported in siblings.

The disorder which has been described in this paper presented in a lethal form in three children and as a relatively benign condition in the surviving child and in the father. If the condition was the result of a dominant characteristic, then one clinical picture might have been expected. It seems more likely that the condition was transmitted by a recessive gene, the lethal form being the expression of a homozygous state, and that the surviving child and her father are heterozygotes. Such a difference in the clinical expression of homozygous and heterozygous states is well recognized, as, for example, in thalassaemia, phenylketonuria, and mucopolysaccharidosis, where the heterozygotes may be shown to have a mild haemolytic process, an impaired phenylalanine tolerance, and an increased electrolyte content in sweat, respectively. Investigation of the mother of this family failed to demonstrate any abnormality, but the manifestations of recessive traits in carriers tend to be variable, and the absence of abnormality in the mother is not very unusual. The benign form might be phasic in character, as evidenced by the fluctuation in the condition of the father and of the surviving child. It is possible, therefore, that intermittently repeated examinations of the mother might yet have revealed some abnormality had she not expressed a wish to be excused from further investigation. In a small country community such as that in which the parents were raised the chance of a consanguineous marriage taking place is increased, particularly when the additional complication of illegitimacy is introduced, as in this case. The obtaining of a detailed family pedigree should form an important part of the investigation of further cases.

The disease appears to be a disorder of the reticulo-endothelial system characterized by the widespread proliferation of haemophagocytic histiocytes. The original title of familial haemophagocytic reticulosis appears to be an adequate description.

Summary

The clinical and pathological features of a further case of familial haemophagocytic reticulosis have been described, and an account has been given of investigations into the aetiology. The possible mode of inheritance is briefly discussed.

We are indebted to Professor R. W. B. Ellis for his helpful criticism of this paper, to Professor J. H. P. Jonxis, of Groningen, for the haemoglobin type of the fourth child, and to Dr. R. A. Cumming for the results of serological tests.

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REACTION OF LUPUS ERYTHEMATOSUS SERUM WITH NUCLEI OF CIRCULATING AND NON-CIRCULATING CELLS

BY

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[WITH SPECIAL PLATE]

Friou (1957) was the first to demonstrate that tissue cells brought in contact with serum from patients suffering from disseminated lupus erythematosus (D.L.E.) and exposed subsequently to fluorescein-conjugated anti-human-globulin (A.H.G.) serum showed specific nuclear fluorescence. This application of Coons's fluorescent antibody technique has been further studied by Friou, Finch, and Detre (1957, 1958) and by Holborow *et al.* (1957). In addition, it has been demonstrated by Mellors *et al.* (1957) and Holman and Kunkel (1957) that the inclusion bodies in L.E. cells fluoresce on exposure to fluorescein-conjugated A.H.G. serum.

These results provide strong evidence for the belief that the serum in D.L.E. contains a globulin with an affinity for the nuclei of tissues and leucocytes. It has been suggested that this globulin is identical with the factor responsible for the formation of L.E. cells. Friou (1958) has shown that the capacity of serum from cases of D.L.E. to induce both phenomena is abolished by absorption of the serum with nucleohistone.

In the studies referred to attention has been mainly directed to the reaction of D.L.E. serum with tissues derived from other sources than patients with D.L.E. With the exception of reports on fluorescence of L.E. cells exposed to fluorescein-conjugated A.H.G. serum, no comment on the effect of D.L.E. serum on D.L.E. tissue has been found in the literature. It seemed important to determine whether D.L.E. tissue differed from normal tissue on exposure to D.L.E. serum, and in this report the results of such a study are presented.

Materials

Human Sera.—Serum was obtained from eight patients suffering from D.L.E. In all cases L.E. cells had been found on more than one occasion. All patients but one (Case 3) were receiving prednisolone or cortisone at the time of investigation, the daily dose being shown in the Table. Control sera were obtained from healthy members of the hospital staff. Sera were not heated before use, and when necessary were stored at -15°C . In a preliminary experiment it was found that sera retained their reactivity on storage for periods of at least six weeks.

Leucocytes.—Blood was obtained by ear-prick, films being spread on microscope slides as for routine haematological examination. Films were not fixed, and were used on the day of preparation.

Skin.—Portions of skin were obtained by biopsy from two patients (Cases 4 and 7) and from two healthy donors of corresponding blood groups. One patient (Case 4) and one control were of blood group O, and all sera were tested on sections from these individuals. Within one minute of biopsy the skin was frozen in test-tubes dipped in solid

CO_2 -acetone mixture. Sections were cut at $4-6\ \mu$ in a cryostat at -20°C . The sections were then transferred to slides, thawed, dried by fan, and used on the day of biopsy.

Buccal Mucosa.—Squamous epithelium was obtained by gently scraping the buccal mucous membrane with a metal spatula. The scrapings were transferred to slides and allowed to dry at room temperature. As with blood films and tissue, the cells were examined on the day of preparation.

Fluorescein-conjugated Anti-human-globulin.—Commercial A.H.G. (Coombs's) serum was conjugated with fluorescein isocyanate by the method of Coons and Kaplan (1950). The conjugated serum was absorbed with sheep-liver powder to reduce non-specific precipitation in tissues.

Methods

Sections of tissue or preparations of cells were exposed to human serum in a moist atmosphere at 37°C . Except when otherwise stated, the time of incubation was 30 minutes and the sera were undiluted. The preparations were then washed in two changes of phosphate-saline buffer at pH 7.0 and covered with a few drops of undiluted fluorescein-conjugated A.H.G. serum. After 30 minutes at room temperature the preparations were again washed in buffered saline and mounted in buffered glycerol at pH 7.0. Cover slips cut from OY12 (ultraviolet-absorbing) glass were used.

The specimens were examined in the fluorescence microscope as described by Alexander (1958), with the exception that plain glass microscope slides were used in the present work. When required the preparations were photographed and the field plotted with the aid of the graduated mechanical stage of the microscope. The cover slips were floated off and the tissue fixed in undiluted methyl alcohol. The preparations were then stained with Giemsa's stain and mounted in balsam. Fields were identified and rephotographed using a source of visible light.

Results

In most experiments the presence or absence of nuclear fluorescence was readily recognized, and examples are shown in Figs. 1, 2, 3, and 5 on the Special Plate. Figs. 4 and 6, which correspond to Figs. 3 and 5 respectively, are included as an aid to identification of individual nuclei.

Nuclear fluorescence as seen in Figs. 2 and 5 was observed only in tissues or cells which were pretreated with L.E. serum. Pretreatment with serum from healthy individuals or the direct application of fluorescein-conjugated A.H.G. serum to the preparations invariably gave negative results.

Table Showing Nuclear Fluorescence in Tissues and Cells Pretreated with Sera from D.L.E.

Serum from Case No.	Reaction of Serum with				Daily Dose of Steroid (P = Prednisolone) (C = Cortisone) (mg.)
	Autologous Leucocytes	Group O Leucocytes (Healthy Donor)	Skin from D.L.E. (Group O)	Skin from Healthy Group O Individual	
1	—	+	—	+	62.5 (C)
2	—	+	—	—	5.0 (P)
3	+	+	+	+	15.0 (P)
4	+	+	—	—	5.0 (P)
5	+	+	+	+	50.0 (C)
6	+	+	+	+	5.0 (P)
7	+	+	—	+	30.0 (P)
8	+	+	—	+	

— Nuclear fluorescence present. — = Nuclear fluorescence absent.

The sera from eight patients suffering from D.L.E. were applied to autologous blood films, blood films from healthy donors, sections of skin from a patient with D.L.E., and sections of skin from a healthy individual. All but the autologous cells were obtained from individuals of blood group C. The results of this experiment are shown in the Table. Leucocytes from the healthy subject pretreated with all sera tested showed nuclear fluorescence when subsequently exposed to fluorescein-conjugated A.H.G. serum. Nuclei of autologous leucocytes fluoresced on pretreatment with six of the eight sera. Nuclei in sections of skin from a healthy subject

fluoresced when pretreated with six of eight sera, but nuclei in skin from a patient with D.L.E. (Case 4) showed fluorescence when pretreated with only three of the eight sera.

In view of the apparent diminution of affinity of L.E. serum for nuclei in L.E. tissue, skin obtained from another patient (Case 7) was examined. Pretreatment of this material with autologous serum gave an equivocal result, as shown in Fig. 7 on the Special Plate. Although diffuse fluorescence of epidermal cells was seen, selective fluorescence of nuclei did not occur. This finding cannot be explained by failure of autologous tissue and serum to react, as nuclear fluorescence was observed when tissue from Case 4 was pretreated with autologous serum. It was established by two experiments that the serum from Case 7 had not lost its potency. The serum was used to pretreat leucocytes from a healthy individual, and nuclear fluorescence was observed when the serum was diluted to 1:4,000. Undiluted serum produced nuclear fluorescence when applied to the cells for one minute.

The necessity for using fresh material in this type of investigation has been stressed by Holborow *et al.* (1957). The difficulty of obtaining regular supplies of tissue by biopsy is considerable, and it was decided to examine cells obtained by scraping the buccal mucosa. These could be taken as representative of fixed tissue cells as distinct from the circulating leucocytes. However, the nuclei of squamous cells from healthy individuals or patients with D.L.E. exposed to D.L.E. serum failed to show fluorescence on subsequent treatment with fluorescein-conjugated A.H.G. serum (Special Plate, Figs. 9 and 10). When, however, the time of exposure to D.L.E. serum was extended to 1½ hours nuclear fluorescence was observed in cells which had disrupted. As there was also evidence of diffuse bright fluorescence in structures thought to be of cytoplasmic origin, no conclusion can be drawn from these experiments. Further investigation with specific counter-stains for nuclear material is planned.

Discussion

These results confirm the findings of other workers that the nuclei of cells exposed to serum from patients suffering from D.L.E. adsorb a globulin detectable by application of fluorescein-conjugated A.H.G. serum. This property of L.E. serum is not apparently influenced by administration of steroid hormones.

It has been shown that the phenomenon is readily demonstrable in unfixed blood films. This technique, which avoids the need for preparing films from "buffy coats," would be useful in any large-scale investigation of the phenomenon in other diseases.

The observation that nuclear fluorescence is not present in tissue from cases of D.L.E. exposed directly to fluorescent A.H.G. serum, is in agreement with the findings of Mellors *et al.* (1957) in the D.L.E. kidney, and supports the hypothesis that absorption of L.E. globulin on nuclei occurs only *in vitro*. The fact that tissues and leucocytes derived from patients with D.L.E. appear to be less susceptible to uptake of globulin from L.E. serum may be explained by the relatively small number of patients available for study, but the anomalous behaviour of the serum from Case 7 toward nuclei in autologous skin and the nuclei in the skin of another patient is of interest. Recent experiments, which are still incomplete, suggest that the time of incubation of tissue and L.E. serum may have a considerable influence on the intensity of nuclear fluorescence and that individual sera and tissues may differ appreciably in the rate of reaction.

The results of experiments with squamous epithelium suggest that intact tissue cells resist invasion of the specific globulin in L.E. serum. It has been noted in examination of thick sections of skin that nuclear fluorescence may be apparent in the superficial layer, but not in deeper layers. Leucocytes, however, seem to be extremely susceptible to the specific globulin in L.E. serum, and this susceptibility may well be associated with their natural property of phagocytosis.

Summary

With the use of Coons's fluorescent antibody technique it has been confirmed that sera from patients suffering from D.L.E. contain a globulin which combines with nuclei of tissue cells and leucocytes. In a study of sera from eight cases of D.L.E. it was observed that nuclei of leucocytes from healthy individuals showed the greatest affinity for the specific globulin. No evidence of uptake of globulin in tissue from D.L.E. was found *in vivo*, but *in vitro* such tissue had less affinity for the specific globulin than tissue from healthy subjects. Nuclei of intact squamous epithelial cells pretreated with D.L.E. serum did not fluoresce on exposure to fluorescein-conjugated anti-human-globulin serum.

During the period of this investigation the Rheumatic Unit was in receipt of grants from the Nuffield Foundation, the Medical Research Council, and Boots Pure Drug Company Ltd.

We wish to thank Mrs. Betty Greenhill, A.I.M.L.T., and Mrs. Ruth Wallace for their skilled technical assistance.

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LIQUID PARAFFIN AS A CAUSE OF OIL ASPIRATION PNEUMONIA

BY

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[WITH SPECIAL PLATE]

Liquid paraffin has, for various reasons, been under suspicion at different times since it began to be used to any extent medicinally at the beginning of this century. It has been charged with preventing intestinal absorption of food in general, and of vitamin A and its precursor, carotene, in particular, and on this latter count there is some justification for the charge. Since liquid paraffin is a mixture of liquid hydrocarbons obtained from petroleum, the possibility that it might contain carcinogenic fractions has been investigated (Boyd and Doll, 1954). At one time there was a practice of instilling liquid paraffin into the peritoneal cavity with the avowed object of preventing adhesions. The result has been to produce, in a number of cases, an oil granuloma of the peritoneum (Bennett and Collins, 1952). Probably, however, the most common danger arising from the medicinal use of liquid paraffin is the production of oil aspiration pneumonia.

The pneumonia which results from aspiration of oils and fats has been dealt with extensively in American literature, but has not received the same attention in Britain, although its incidence in this country may not be any less. The diagnosis of the condition in life is not

easy, since similar lesions may be produced by other agencies, and fats and oils are not often considered as aetiological agents, because of a fairly general lack of awareness of their ability to produce such lesions and a failure to elicit, in consequence, the relevant facts in the patient's history. In the cases described in this paper aspiration of oil was not considered in diagnosis during life. The diagnosis at necropsy also presents some difficulty.

Classification and Predisposing Factors

Ikedo (1937) classified oil aspiration pneumonia into two types, which he called "adult" and "infantile." The "infantile" type occurs in debilitated children and adults as a result of the administration of food and drugs containing animal oils. This type is essentially a diffuse low-grade pneumonia, and one of the main grounds of distinction from the "adult" type is that it may undergo resolution. The "adult" type occurs only among the older age groups as a result of habitual self-administration of liquid paraffin, either orally or intranasally, in large total amounts. Animal oil is of little importance in the "adult" type, where the lesion is a chronic granuloma.

Among the factors predisposing to aspiration of oil into the lungs are the feebleness associated with early infancy and old age, the disabilities arising from affections of the central nervous system, debility, recumbency, dysphagia, and lesions of the mouth, throat, oesophagus, and upper respiratory tract. The character of the oil also is an important factor. Liquid paraffin is implicated as the causal agent in the great majority of cases. Its blandness would seem to be the reason for its known capacity to enter the bronchial tree without exciting any reflex action. The type of case in which oil aspiration pneumonia is most likely to be found is the chronic sufferer from respiratory infection who for long periods uses oral or nasal sprays of which liquid paraffin is an ingredient, or the sufferer from chronic constipation who seeks relief in a regular oral dose of liquid paraffin over long periods (Freiman *et al.*, 1940).

Pathological Changes

There cannot be said to be a typical naked-eye appearance. There are irregular areas of consolidation in the lung, varying in size from 1 cm. or less in diameter to that of a whole lung segment. The lesions, being fibrous, have a tough or hard consistence, and are grey or yellow in colour. On naked-eye examination and radiologically (Siddons, 1958) they have been most often wrongly diagnosed as neoplastic infiltration or as caseous consolidation of tuberculosis. Microscopically, different fields may show different stages of reaction. In some areas an accumulation of phagocytes may be found occupying the alveoli. They are large, foamy, and vacuolated in varying degree. Strands of collagen fibres may be seen insinuating between these lipophages. Giant cells formed by the coalescence of the lipophages are commonly present. In yet other areas there is dense fibrosis with circular lacunae. Appropriate stains show these lacunae to be filled with fat.

As might be expected, there are a number of complications which will each add its quota to the appearances described. Recurrent bronchopneumonia, bronchiectasis, abscess formation, and emphysema have been known to complicate the disease. Bronchogenic carcinoma has been suggested as a complication.

The crux of the diagnosis lies in the demonstration of fatty material in lacunae in the densely fibroid lung tissue. To distinguish between mineral oils on the one hand, and vegetable and animal oils on the other, use has been made of the reaction of osmium tetroxide, which is reduced by the animal and vegetable oils to give a black precipitate, whilst mineral oils have no such action. Some investigators have carried out chemical analysis of lung tissue (Jampolis *et al.*, 1953; Wagner *et al.*, 1955).

Case Histories

Case 1.—A woman aged 54 was admitted to hospital on January 17, 1956, with a diagnosis of bronchitis, bronchiectasis, and right-sided heart failure. There was a history of chronic cough since childhood. A radiological report at that time mentioned gross bilateral emphysema secondary to chronic bronchitis, with bilateral bronchiectasis in the lower lobes. Investigation for tuberculosis was negative.

On admission she had marked dyspnoea at rest. There were diffuse bronchospasm and expiratory and inspiratory rhonchi, with coarse crepitations at both lung bases. Jugular venous pressure was raised. There was oedema of the ankles and sacrum. Laboratory investigation of the sputum showed normal flora, and two specimens were negative for acid-fast bacilli. The urine was sterile on culture, and apart from a trace of albumin was not otherwise abnormal. Blood urea was 47 mg. per 100 ml. Haemoglobin 87% (Haldane). White cells numbered 10,400 per c.mm., with normal differential count. Chest x-ray report on January 26 was a repeat of previous findings, but in addition there was general enlargement of the heart, the appearances suggesting myocardial failure. The patient responded temporarily to treatment, but died on February 7, 1956.

At necropsy the main findings were as follows. The abdomen was distended and the ankles and legs were oedematous. The trachea and bronchi were filled with frothy mucus. Both lungs showed diffuse emphysema, with extensive areas of patchy consolidation, particularly in the lower lobes. There was marked prominence of the bronchi and bronchioles. The right ventricle was hypertrophied. The liver on cut surface showed a nutmeg pattern. The peritoneal cavity contained 2 pints (1.1 litres) of serous fluid.

Histological examination of the lungs showed the changes of chronic bronchitis and emphysema. In many areas the alveoli were filled with large, foamy, pink macrophages, many of which contained two or more nuclei. In other areas there was a picture of extreme disorganization characterized by the presence of giant cells of bizarre shape, suggestive of foreign material in the lung tissue. In yet other areas were large collections of lymphocytes and plasma cells. There were also extensive areas of fibrosis, in the meshes of which, on staining with Sudan IV, were revealed a number of oil globules of varying size. These globules were found not to reduce osmium tetroxide. It was therefore concluded that the findings disclosed the presence of an oil aspiration pneumonia, in both acute and chronic stages, due to liquid paraffin.

Subsequent inquiry yielded no information as to the source of the aspirated oil. It was surmised that it was probably an oral or nasal spray containing liquid paraffin.

Case 2.*—A man aged 55 years, a universal grinder in a steel foundry, died suddenly on November 1, 1957. For several years he had been under the care of his doctor on and off because of pains in the chest, shortness of breath, and chronic cough; he had, in fact, been treated for bronchitis. Three weeks before his death he was seen by his doctor because of an attack of "influenza," and he had never fully recovered.

The main findings at necropsy related to the chest. There was a quantity of mucus in the trachea. In the lower lobe of the left lung were two dense fibrous masses, each about 1 in. (2.5 cm.) across. A similar mass was present just above the hilum of the right lung. There was no significant emphysema. The heart was substantially dilated and hypertrophied on the right side. Pulmonary fibrosis was present, and an important point was whether it was of industrial or non-industrial origin.

Histological examination revealed varying degrees of fibrosis throughout the lungs. In many areas the appearance was of a honeycomb of clear spaces, which by staining with Sudan IV were shown to be filled with fat (Special Plate,

*This and the following cases were the subject of necropsies undertaken on behalf of H.M. Coroners for the City of Sheffield and the County Borough of Rotherham.

Fig. 1). Osmium tetroxide was not reduced by this fat (Special Plate, Fig. 2). The framework of the honeycomb was of fibrous tissue, but this varied in appearance from area to area. In some areas this framework was of wide, dense, relatively acellular fibrous tissue, and here the clear spaces were largest in diameter. In other areas the fat-filled spaces were smaller and the fibrous-tissue framework was more slender and relatively cellular, the cells being a mixture of fibroblasts and vacuolated macrophages, also shown to be filled with fat. Occasional giant cells were to be seen in this fibrous framework. In some areas the normal alveolar pattern was to be seen, many of the alveoli containing numbers of the large macrophages in various stages of vacuolation, which we have learned to associate with lipid pneumonia (Special Plate, Fig. 3). Here and there throughout the lung fields were collections of lymphocytes and plasma cells. The basement membrane of the bronchi was thickened. No evidence of silicosis or tuberculosis was noted. There was dramatic narrowing of the branches of the pulmonary artery, with marked medial thickening. This was seen to a lesser extent in areas of lung tissue only slightly affected by fibrosis.

The cause of death was cor pulmonale due to pulmonary fibrosis following lipid pneumonia. In view of the findings an effort was made to trace the source of the aspirated oil, and it was found that the deceased had been in the habit of taking liquid paraffin as a purgative. This was the only ascertained source from which the lesion could have arisen.

Case 3.—A man aged 78 who had worked in various coal-mines all his life. Since the age of 70 he had had at least two strokes, from which he had made substantial recovery. For a number of years he had had shortness of breath, cough, and chest pains. By July, 1957, when he was admitted to hospital for a minor condition, he could do little more than totter about owing to senility. He was kept in hospital because of the difficulty of home nursing, and during his stay a chest radiograph was reported as showing nodular opacities in both lungs due to pneumoconiosis. On December 11, 1957, while sitting in the ward, he had sudden pain in the left leg, and examination elicited all the signs of arterial blockage in this limb. Gangrene of the limb developed, and he died on December 13.

Necropsy was undertaken to determine whether pneumoconiosis was the cause, or a contributory factor in the cause, of death. He was found to have died of bronchopneumonia due to gangrene of the left leg caused by femoral-artery occlusion and arteriosclerosis. An incidental finding was that in the lower part of the middle lobe of the right lung there was a fibrous honeycombed area, which was not pigmented and the appearance of which suggested that it might be an oil granuloma. Histological examination of this area showed that three stages of reaction could be distinguished (Special Plate, Fig. 4). In some fields the alveolar septa could be made out, and within the alveoli were collections of cells showing various degrees of vacuolation, most of them being, in fact, of signet-ring shape. Sudan-IV staining revealed them to be filled with fat. Their nuclei and cell membranes were in various stages of disintegration. Fine fibrous strands were just beginning to make their appearance, insinuating amongst these lipophages. In other fields the alveolar pattern was obliterated, and there were sheets of these signet-ring cells, distended in varying degree with fat, interspersed here and there with not very large clear spaces, which also proved to be filled with fat. In this type of field fibrous bands were more obvious and giant cells were also present. In yet other fields the picture was of a honeycomb of large clear spaces of varying size, shown to be filled with fat. Osmium tetroxide was not reduced by this fat. The framework of the honeycomb was dense fibrous tissue.

So far as the relatives knew, he had not been in the habit of taking liquid paraffin. He was described, however, as being always constipated and taking remedies for that condition. It may therefore very well be that he was in the habit of taking liquid paraffin unknown to his relatives.

Case 4.—A widower aged 79, retired pattern-maker, died suddenly on February 14, 1958. He had for some time been in failing health, and had been under the care of his doctor in the recent past, having had two attacks diagnosed as cerebral thrombosis, but at the time of his death had not been seen by his doctor for some weeks.

At necropsy he was found to have generalized arteriosclerosis, with two areas of old softening in the left cerebral hemisphere. The lungs showed bronchopneumonic change, and indeed the cause of death was bronchopneumonia complicating arteriosclerosis and cerebral thrombosis. In the lower lobe of the right lung a patch of consolidation was discovered, which was larger and had a much harder consistency than the surrounding patches of bronchopneumonic consolidation. Histological examination of this area revealed a picture similar in essentials to that described in Case 3. Sudan-IV staining showed the area to contain a large amount of fat (Special Plate, Fig. 5), which failed to reduce osmium tetroxide (Plate, Fig. 6).

Discussion

For practical purposes the agent responsible for oil aspiration pneumonia in adults is liquid paraffin. It gains access to the lungs most easily by its use as an ingredient of nasal or oral sprays. Some years ago it was commonly found in such sprays, and we cannot but feel that there must exist a considerable number of oil granulomata of the lung arising from their use. The evidence suggests that, once in the lung, liquid paraffin remains as an inert foreign body for many years, and probably permanently. From inquiries we have made it appears that the tendency now is for nose drops and sprays to be made up in an aqueous medium. A substantial proportion (about 20%) is, however, still being manufactured in a medium containing liquid paraffin, and we feel that their manufacture in an oily medium should be stopped. It is also clear that liquid paraffin gains access to the lungs as a result of oral administration, even in those who suffer no disability. A bland oil introduced by catheter into the pharynx of a healthy adult whilst asleep on his back was shown to be present in the lung the following morning (Pirie, 1932). It appears that there is still in Great Britain a steady sale for liquid paraffin as a laxative, and in our opinion its use for this purpose requires reappraisal.

Oil granuloma of the lung is largely preventable. Its presence is known to dispose to recurrent respiratory infection, and in these days when our lungs have to contend with so many other noxious substances this is one lesion which, however small, we can well afford to be without.

Summary

Four cases of oil aspiration pneumonia are described, two in which it was a contributory cause of death and two in which it was an incidental finding.

The pathogenesis and pathology of the condition are discussed.

The use of liquid paraffin as an ingredient of nasal and oral sprays, and also as a laxative, is criticized.

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DISPENSABILITY OF POST-OPERATIVE PENICILLIN IN SEPTIC-HAND SURGERY

BY

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The aim of this work was to evaluate the common use of penicillin after operations upon septic lesions of the hand. Localized infections only were considered, and attention was focused principally upon the rate of healing of abscess cavities following the evacuation of pent-up pus. Patients were treated in a special clinic, for Webster (1947) and other workers have obtained improved results by centralizing the treatment of hand sepsis.

Wilkes (1954) emphasized the economic importance of sepsis with a large series of hand infections where the average time lost from work was 24 days. A Ministry of Pensions and National Insurance digest for 1953-4 shows that the number of spells of certified incapacity due to cellulitis and abscess was 6% of the total from all causes. Although falling, this figure leaves no room for complacency, and close inspection of the methods of dealing with this type of lesion, with revision of these therapies where necessary, is constantly indicated.

Scope of the Investigation

All patients required surgery and were treated as out-patients. Children under 10 years were excluded. Each patient was assigned without bias to one of three categories—those dealt with by surgery alone, by surgery plus oral penicillin, or by surgery plus depot penicillin. There were 42, 34, and 27 patients respectively in each of these categories who had received various forms of chemotherapy elsewhere before attending the hand clinic.

The diagnostic classes were: (1) *Paronychia* of any degree, except with pus deep to the nail. (2) *Onychia*: pus under the nail (a) tracking from an adjacent focus such as a terminal abscess or paronychia, or (b) developing *in situ*—for example, an infected subungual haematoma. (3) *Pulp abscess* of the terminal pulp of the finger. (4) *Other abscesses*: (a) subcutaneous, on the volar or lateral aspects of a finger; (b) dorsal abscess of the hand or finger, often originating in an infected hair follicle; (c) web abscess; (d) palmar space abscess. (5) *Septic blister*: occasionally rectified if a subcutaneous extension was found at operation. (6) *Chronic infections* were those whose pre-operative duration exceeded 27 days.

When clinically indicated radiographs (of both hands) were taken.

At operation swabs were taken from the exposed infected tissues for culture and for sensitivity tests to penicillin and erythromycin.

The criteria of healing were a dry completely epithelized wound, full function of the affected member, and no need for further dressings or attendance. The healing-time was the number of days between operation and final discharge.

All the patients were seen by me pre- and post-operatively; some of the operations were done by colleagues with agreed uniformity of procedure.

Surgical Technique and Post-operative Treatment

Each locus of pus and the point of maximal tenderness were ascertained with patience and precision in the pre-operative planning of an approach to the lesion. The fore-

limb was thoroughly washed and upper garments were removed. All operations were performed under general anaesthesia (trichlorethylene, nitrous oxide, and oxygen) in a bloodless field obtained by elevation of the limb and applying a pneumatic tourniquet.

The planned incision, remote from pressure areas, of minimal length, and in the optimum position for drainage, was generally made in the line of a skin furrow (longitudinal or slightly oblique on the antero-lateral aspect of a finger or transverse on the dorsum). Sometimes an undesirable site where the abscess pointed had to be used.

The roof of a septic blister was removed and a collar-stud extension sought. In paronychia a formal flap was raised and an appropriate portion of the nail-base removed; a unilateral incision sufficed for less extensive cases. For onychia, only nail undermined by pus was removed; this was occasionally combined with a unilateral paronychia incision or the opening of a terminal abscess. Web-space abscess was opened by an antero-posterior incision.

Pus and slough were removed by gentle mopping or excision and the abscess cavity was inspected by direct vision. Loculations were opened, avoiding unnecessary interference with healthy tissue. The skin edges, always in a precarious state of vitality, were never forcibly retracted or held by coarse instruments. Only the corner of a small portion of tulle gras was slipped between the lips of the incision or under the paronychia flap. Early in the investigation it seemed beneficial to avoid too much tulle gras, so just enough was used to keep the wound edges apart or to cover a raw area with a little circumferential overlap.

A generous dressing of gauze and cotton-wool was firmly applied, the tourniquet released, and the limb elevated during the recovery period. The arm was kept in a sling and daily exercise periods were advised. Codeine compound tablets were prescribed. Two days after operation a simple dry dressing was applied, and also at later inspections at two- or three-day intervals, an infrequency which reduced the chance of cross-infection, the expenditure of materials, and the strain on the dressings staff.

Oral penicillin was given at the makers' recommendation of 1,200,000 units of "crystapen" daily in divided doses. A printed dosage schedule was included with each supply of tablets and a few patients suspected of not adhering to it were excluded from the series irrespective of their clinical progress.

Depot penicillin was given by intramuscular injection as "seclopen," 1 ml. containing 300,000 units of procaine benzylpenicillin and 100,000 units of sodium benzylpenicillin, morning and evening until the inflammatory reaction had subsided and the wound was virtually healed. Serum levels of penicillin were estimated in each of three blood samples obtained by venepuncture on successive post-operative days before the morning injection in 42 patients of this group.

Results

Of the 357 patients treated, 16 (4.4%) failed to return for dressings, 15 (4.3%) had chronic infections, and 6 (1.7%) had complications. No case of erysipeloid was seen. A patient with acute suppurative tenosynovitis and another two with septic interphalangeal arthritis were referred for in-patient treatment. Both cases of palmar abscess were superficial to the aponeurosis.

Table I shows that in the "depot penicillin" treatment group the overall average healing-time was 0.23 day less than in the "no chemotherapy" group. Shortening of the average healing-times in the depot category for onychia, pulp abscess, other abscesses, and septic blister was 0.2, 1.0, 0.4, and 0.6 day, respectively; paronychia took 0.02 day longer. In the "oral penicillin" category the healing-times were shorter in onychia, pulp abscess, and other abscesses by 2.1, 1.2, and 0.4 days respectively, but in the paronychia group healing took 1.6 days longer.

TABLE I.—Results of Treatment

Type of Lesion	No Chemotherapy		Oral Penicillin		Depot Penicillin		Total No. of Patients	Average Healing-time (Days)
	No. of Patients	Average Healing-time (Days)	No. of Patients	Average Healing-time (Days)	No. of Patients	Average Healing-time (Days)		
Paronychia ..	39	8.46	34	10.06	29	8.48	102	9.00
Onychia ..	13	8.92	10	6.80	31	8.19	54	8.19
Pulp abscess ..	20	11.10	31	9.90	31	10.13	82	10.28
Other abscesses ..	31	10.06	32	9.69	31	9.65	94	9.80
Septic blister ..	3	6.00	3	6.00	5	5.40	11	5.73
Overall ..	106	9.42	110	9.50	104	9.19	320	

TABLE II.—Overall Results for Patients not Receiving Preoperative Chemotherapy

Post-operative Treatment Group					
No Chemotherapy		Oral Penicillin		Depot Penicillin	
No. of Patients	Average Healing-time (Days)	No. of Patients	Average Healing-time (Days)	No. of Patients	Average Healing-time (Days)
64	9.07	76	9.25	77	9.67

Patients who received no chemotherapy before operation were assessed separately (Table II). The overall average healing-time in the "depot" group was 0.4 and 0.6 day more than in the "oral" and "no chemotherapy" groups, respectively.

Chronic cases were placed on the same rota as acute cases and treated similarly; 13 (87%) were paronychia and 10 (66%) had received previous treatment by incision or penicillin or by both. The average healing-time was 12.3 days, although the average preoperative duration was 83.3 days, as Table III shows. Two (16.6%) gave cultures of *Staphylococcus aureus* sensitive to penicillin and erythromycin, 7 (58.3%) produced no growth, and 3 (25.1%) gave *Staph. aureus* resistant to penicillin but sensitive to erythromycin.

Bacteriological results are shown in Table IV. Of the 260 swabs taken from acute infections 220 (84.6%) produced growths of *Staph. aureus*, 37 (14.2%) gave no growth, 2 (0.8%) gave *Staph. albus*, and from 1 (0.4%) a strain of yeast was isolated. Of the cultures of *Staph. aureus* 183 (83%) were fully sensitive to penicillin, and 37 (17%) were penicillin-resistant. All were sensitive to erythromycin.

Penicillin Blood Levels.—Of the 42 patients whose blood samples were examined 34 (81%) had bacteriostatic levels of penicillin. The specimens from 4 (9.5%) patients were contaminated or destroyed and 4 (9.5%) had no penicillin or very small amounts.

X-ray films revealed no bone infections.

TABLE III.—Chronic Cases

Type of Lesion	No.	Duration (Days)	Healing Time (Days)
Paronychia ..	13 (87%)	85.2 (average)	12.7 (average)
Onychia ..	1 (7%)	112	12
Subcutaneous abscess ..	1 (7%)	30	8
Overall ..	15	83.3	12.3

TABLE IV.—Bacteriological Results

	<i>Staphylococcus aureus</i>				Other Growth	No Growth	Total Cultures
	Penicillin-sensitive	Penicillin-resistant	Erythromycin-sensitive	Total			
Acute infections	183 (83%)	37 (17%)	220 (100%)	220	3	37	260
Chronic infection	2 (40%)	3 (60%)	5 (100%)	5	—	7	12

Complications.—Six patients had prolonged healing-times due to factors summarized in Table V—namely, inadequate surgery in three cases; a yeast infection, refusal to rest the part, and general uncleanness in the others. Each had a deviation from the treatment method of its original category, perforce or through not attending, and therefore could not be legitimately included in one treatment group. However, an analysis including these cases, except No. 1, in their original categories showed no significant difference between the overall average healing-times of the different treatment groups.

An allergic reaction occurred in a patient who had a palmar abscess. While taking oral penicillin he developed a generalized irritative rash and swelling of the lips which was relieved by 50 mg. of diphenhydramine hydrochloride three times a day for a few days.

Occupation.—Table VI shows that more than half of the patients were unskilled workers, jute-workers, or housewives; groups which account for a high proportion of the population of Dundee. The remainder were distributed amongst engineering trades, miscellaneous skills, farm- and wood-workers, building and contracting trades, electricians,

TABLE V.—Complications

No.	Diagnosis	Healing Time (Days)	Details
1	Pulp abscess	189	Depot penicillin group. Yeast infection. Admitted for antibiotic and operative treatment. Large loss of pulp substance but good flexion finally.
2	" "	19	No chemotherapy group. Misdiagnosed and treated as septic blister. Given seclophen two days after operation. Discharged spontaneously.
3	Palm "	30	No chemotherapy group. Misdiagnosed as septic blister. No extension seen at operation but further incision and seclophen given 5 days later.
4	Paronychia	21	No chemotherapy group. Single incision inadequate. Double incision and removal of nail-base 10 days later.
5	"	45	No chemotherapy group. Robust farmer, declined to rest limb or attend for regular dressings. Repeatedly superinfected.
6	"	50	Depot penicillin group. Double incision and removal of nail-base adequate. Personal hygiene very poor.

TABLE VI.—Occupational Incidence

Occupation	No.
Unskilled worker	73 (20.4%)
Jute-worker	73 (20.4%)
Housewife	55 (15.4%)
Housewife with other occupation	19 (5.3%)
Unemployed and school children	45 (12.6%)
Engineering trades	34 (9.5%)
Unclassified skills	29 (8.2%)
Farm-worker	12 (3.4%)
Wood-worker	11 (3.2%)
Building and contracting trades	3 (0.8%)
Electrician	3 (0.8%)
	357 (100%)

and schoolchildren. The low occurrence of electricians, 0.8%, is surprising in view of their frequent handling of small, sharp-pointed instruments and wire.

The preponderance of unskilled workers suggests that occupational interest and skill may be associated with personal attendance to cleanliness and well-being, whilst the hazards of the home or the housewives' degree of selflessness may be of a high degree.

Discussion

Penicillin assistance to localization in infections of the hand is generally accepted and has been supported by Gordon (1951) and Robins (1952). Post-operatively its value is not clear. Curr (1945) found the results of administering intramuscular penicillin to a few cases not encouraging;

Harrison *et al.* (1949), in a detailed study, concluded that systemic penicillin produced a significant reduction in the healing-time in pulp infections; Bolton *et al.* (1947) noted benefit in bony felons but not in simple pulp abscesses; Pilcher *et al.* (1948) questioned the best application of penicillin to infected hands, although acknowledging the antibiotic's general benefits; and a reduction in healing-time of acute paronychia, effected by intramuscular procaine penicillin and particularly by benethamine penicillin, has been shown by Williams *et al.* (1956). Bentley (1950) has advised post-operative penicillin for several days in infections of the hand. Bailey (1952) suggests intelligent selection of cases for chemotherapy rather than routine penicillin cover, and the use of the newer antibiotics if penicillin-resistant strains of *Staph. aureus* continue to increase. These conflicting opinions prompted the investigation.

Part of the solution to the epidemiological and surgical problems posed by the continued emergence of resistant staphylococci is suggested by the work of Clarke *et al.* (1952), who found that the greatest numbers of resistant staphylococci were in environments where most antibiotic treatment was given, and by the investigations of Blowers *et al.* (1955), which showed that where the routine administration of penicillin was stopped the proportion of resistant strains declined. These findings strengthen the belief that excessive use of penicillin is an important factor in reducing its value and that this may be restored by limiting administration to essential cases.

To deny a patient the possible benefits of penicillin demands sound proof of its dispensability. The reduction in the overall average healing-time of less than a quarter of a day in the "depot penicillin" group as compared with the "no chemotherapy" group, under the conditions of this investigation, does not justify the administration of penicillin post-operatively without a special reason.

The argument that the uncontrolled factor of preoperative chemotherapy in this series might selectively affect healing times is invalidated by the figures in Table II, which closely correspond to the overall figures (Table I) of the whole series, upon which a statistical analysis was carried out.

The distributions of the observed healing-times about the means are not symmetrical, and in order to justify the application of conventional tests of significance to the data the transformation factor $y = \sqrt{x+1}$ was applied, where x was the healing-time in days. This brought the distributions closer to normality without selectively affecting the variance. An analysis of variance on the transformed data showed that the small differences in healing-time between the treatment groups could have arisen by chance on more than one occasion in 20 and thus did not achieve significance. However, the "depot penicillin" treatment effects for web abscess were significant at the 5% level, but there was no significant difference between the healing-time in the "no chemotherapy" and "oral penicillin" groups. The numbers in the dorsal (5), palmar abscess (2), and septic blister subgroups were too small for separate comparison.

TABLE VII.—Results of Treatment of Web Abscess

	No Chemotherapy	Oral Penicillin	Depot Penicillin
No. of cases	4	5	6
Average healing time (days)	11.5	12.2	7.3

Where $p < 0.05$.

Table VII shows the results of the treatment of web abscess. The reduction of four days in the average healing-time of the "depot penicillin" group may be due to the laxity of the tissues in the web spaces, permitting ready access of a blood-borne antibiotic which an increase in tension, such as would occur around an abscess in a digit, might be sufficient to reduce. Even in these cases, however,

the high blood levels obtained twice daily with seclophen seem to have been essential, and more cases are required to give confidence in the findings.

The success of surgery in chronic infections was striking. Although the average healing-time exceeded that of acute infections the results in this small series warrant further investigation into the timing of surgical intervention and the extent of drainage required, particularly in paronychia.

The six complicated cases clearly portray the consequences of misdiagnosis or mistimed surgery. In the most favourable circumstances Cases 2, 3, and 4 might have been saved one or two weeks of disability each. The presence of these three patients in the "no chemotherapy" group must be regarded as coincidental when the progress of the 106 others in this group is considered. The prolonged healing-time is readily explicable in each case by the factors outlined in Table IV. Lessons learned from these cases were usefully applied in the management of others, particularly at the stage of planning the incision.

Summary and Conclusions

A study of the post-operative care of 357 cases of sepsis of the hand is described. Three unselected treatment groups were obtained, receiving either no chemotherapy, oral penicillin, or intramuscular penicillin. The respective healing-times were 9.4, 9.5, and 9.2 days.

Careful clinical examination, accurate diagnosis, and precise surgery are of greater importance than routine chemotherapy. Indications for chemotherapy are suggested.

Some observations on infecting organisms, chronic lesions, and occupational incidence are made.

Routine post-operative penicillin does not hasten healing in septic lesions of the hand which require surgical treatment, provided that a careful technique is based upon anatomically accurate diagnosis.

Penicillin has been safely excluded from the post-operative environment of uncomplicated acute infections of the hand, and this may be a more fundamental counter to the emergence of resistant organisms than recourse to other antibiotics.

Possibly web abscess and threatened infection of the structures that move or support the hand are the only firm indications for chemotherapy, which will not act as a cover for misdiagnosis or inappropriate surgery.

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CLINICAL TRIALS WITH BEPHENIUM HYDROXYNAPHTHOATE AGAINST HOOKWORM IN CEYLON

BY

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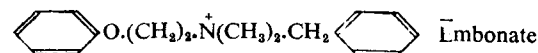
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Copp, Standen, Scarnell, Rawes, and Burrows (1958) showed that members of a series of new quaternary ammonium compounds were active against a broad range of parasitic nematodes in laboratory and domestic animals. One of the most active compounds, bephenium embonate (benzylidimethyl-2-phenoxyethylammonium embonate), was shown by Rawes and Scarnell (1958) to be of value in the treatment of nematodiriasis in lambs.



The demonstration of high activity of bephenium salts against *Ancylostoma caninum* in dogs and cats (Copp *et al.*, 1958) led naturally to preliminary trials in London against hookworm infections in man. We are indebted to Professor A. W. Woodruff, of the Tropical Diseases Hospital, and Drs. D. H. Garrett and M. J. Andrewes, of the Dreadnought Hospital, for carrying out these trials. The results were encouraging and justified more extensive trials against heavier hookworm infections in Ceylon.

Tests in laboratory animals, including monkeys, showed that the toxicity of salts of bephenium was low. The less soluble salts, such as the 2-hydroxy-3-naphthoate and embonate, were poorly absorbed when given by mouth to human volunteers (Rogers, 1958).

Materials and Methods

Experiments with *A. caninum* in dogs and cats (Burrows, 1958), *Nippostrongylus muris* in rats, and *Nematospiroides dubius* in mice (Copp and Standen, 1958, in preparation) showed that bephenium halides, although more irritant, were appreciably more active against these organisms than were the less soluble hydroxynaphthoate and embonate. It was also found that equivalent anthelmintic activity was obtained when a proportion of the dose of halide was replaced by hydroxynaphthoate. On the basis of these observations, bephenium bromide, hydroxynaphthoate, and mixtures of these salts were selected for trial. The almost insoluble embonate was also tested.

Bephenium bromide and mixtures of bromide and hydroxynaphthoate were given as tablets, prepared so that they would disintegrate in the stomach within a few minutes of administration. The hydroxynaphthoate and embonate were given as tablets or as a sweetened and flavoured suspension in water. As a control group a proportion of the patients were treated with tetrachlorethylene. According to the general practice in Ceylon, it was administered together with a saline purge (Maplestone and Mukerji, 1939).

Faecal specimens were collected in ice-cream cartons. Patients whose stools contained hookworm ova on examination by direct smear were selected for treatment. Intercurrent infections with roundworm and whipworm, as seen by direct smear, were recorded. The number of

hookworm eggs per millilitre of faeces was determined before treatment by the dilution-count technique as described by Stoll and Hausheer (1926). Four days after treatment a further specimen was collected and examined by direct smear. If positive for hookworm ova, a dilution count was made. If negative, the specimen was examined after concentration by the M.I.F.C. method (Sapero and Lawless, 1953; Blagg, Schloegel, Mansour, and Khalaf, 1955). All counts were made in duplicate.

The effect of treatment was assessed by calculation of the percentage reduction in egg count. An arbitrary figure of 200 eggs/ml. was awarded to those specimens which were negative on direct smear but positive on concentration.

In some instances the stools passed after treatment were washed through a No. 60 sieve and the hookworms recovered for identification of species.

Patients were treated at the General Hospital and Lady Ridgeway Children's Hospital in Colombo, and at the General Hospital in Negombo. A group of Tamil labourers and their children were treated under field conditions at the Sapumalkande rubber estate, Dehiowita. Patients were selected for treatment with the different preparations of bephenium by a random method. A special group of children with infections which had proved resistant to successive treatments with tetrachlorethylene were given multiple doses of bephenium hydroxynaphthoate ("alcopar") at Ragama Convalescent Home.

Bephenium salts were given early in the morning on an empty stomach, and no food was allowed until at least two hours after the dose. No purge was given after the dose. One group of patients were given three doses on one day; the second and third doses were spaced between meals. Patients in hospital were treated with piperazine citrate syrup ("antepar") on the day before administration of a bephenium salt. Estate labourers were given no pre-treatment with piperazine. Throughout this report all doses of bephenium salts are expressed in terms of base: 1 g. of bephenium base is contained in 1.31 g. of bephenium bromide, 1.73 g. of bephenium hydroxynaphthoate, and 1.75 g. of bephenium embonate.

The weight of infection with hookworm before treatment varied greatly among the 284 patients treated. An analysis of the distribution of egg counts (Fig. 1) shows that patients admitted to hospital had a significantly higher mean rate of infection than the labourers at the rubber estate. The random selection of patients for the separate treatment groups resulted in fairly evenly distributed proportions of heavy, moderate, and light infections.

Effect of Bephenium Salts in Treatment of Hookworm Infection

Bephenium Hydroxynaphthoate

The first few patients were treated with small doses of bephenium, the size of the dose being adjusted in accordance with body weight. It soon became apparent that the less soluble salts had no toxic side-effects even when given in doses as large as 200 mg./kg. It was also clear that the small doses administered to children on the mg./kg. basis had no appreciable effect on the egg count. As a result of these preliminary tests it was concluded that a single dose of less than 2 g. in the child and in the adult was insufficient, and subsequently a standard dose of 2 to 3 g. of bephenium

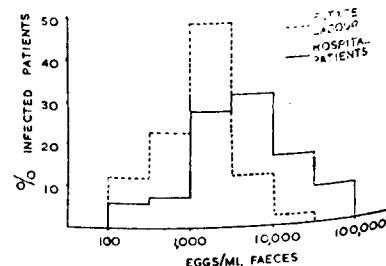


FIG. 1.—Distribution of the number of hookworm eggs/ml. of faeces from 132 estate labourers and 109 hospital patients in Ceylon.

base was administered to all patients irrespective of weight and age. The drug has a bitter taste, but was accepted by both adults and children. Table I shows the results obtained with patients in hospital who were given single doses of bephenium hydroxynaphthoate. Hookworms were recovered from the stools of patients given as little as 1 g.

TABLE I.—Effect of Single Doses of Bephenium Hydroxynaphthoate or Tetrachlorethylene against Hookworm (*Necator americanus*)

	Bephenium Hydroxynaphthoate*			Tetrachlorethylene	
	0.5-1.5 g.	2 g.	2.5-3 g.	5 m. (0.3 ml.) Children	30-40 m. (1.8-2.4 ml.) Adults
No. of patients treated	6	16	29	5	11
" in whom degree of infection was reduced	3	14 (88%)	27 (93%)	2	9 (82%)
" in whom infection was reduced by	1	11 (69%)	13 (45%)	0	8 (73%)
100-75%	1	3 (19%)	11 (38%)	1	0
74-25%	2	2 (12%)	5 (17%)	4	3 (27%)
24-0%	3	2 (12%)	4 (14%)	5	1
Initial weight of infection (eggs/ml.)	37,000-1,200	44,000-200	44,400-200	6,400-400	31,700-100
Mean reduction in count	28%	78%	64%	12%	70%

* Dose in terms of base.

of bephenium even if the subsequent egg count showed no significant reduction. All hookworms isolated from the stools were identified as *Necator americanus*.

Twenty-seven patients were given 2 g. of hydroxynaphthoate three times on one day. The results are shown in Table II.

A group of children aged from 4 to 10 years were treated with multiple doses of bephenium hydroxynaphthoate. All had been admitted to hospital in a critical condition, suffering from malnutrition, anaemia, severe gastro-enteritis, and hookworm infection. Before treatment with bephenium their general condition had been improved by intravenous fluids, iron, and vitamins, but they were still passing several fluid stools each day. Some of the children had already received one or more treatments with tetrachlorethylene, but their stools still contained hookworm ova. Because of their precarious fluid balance, others were regarded by the physician as being too ill to be given tetrachlorethylene and subsequent purgation. In view of the persistent intestinal hurry, it was considered rational to administer more than one dose of bephenium. Doses of 2 g. were

TABLE II.—Effect of Multiple Doses of Bephenium Hydroxynaphthoate against Hookworm. Three Doses Each of 2 g. (Base) were Given on One Day

Sex	Age	Hookworm Eggs/ml. Faeces		
		Initial	Final	Reduction (%)
M	Adult	27,000	14,400	48
M	"	24,300	1,900	92
M	"	22,800	1,700	93
F	"	15,700	200	99
M	Adult	15,200	2,800	82
M	"	15,100	1,300	91
M	"	15,100	800	95
M	"	15,100	800	95
M	"	8,000	1,800	100
F	"	7,600	0	97
F	"	6,700	200	100
M	Adult	5,000	0	100
M	"	3,700	0	75
M	"	2,000	500	100
M	"	1,700	0	82
M	"	1,600	300	100
M	"	1,300	400	67
M	"	1,200	2,500	Failure
M	"	1,000	200	75
M	"	800	200	72
M	"	700	200	100
F	"	600	0	100
M	"	400	0	100
M	Adult	300	0	Failure
M	"	200	300	Failure
M	"	200	200	100
M	"	100	0	100
M	"	100	0	100
No. of patients treated		27		
" in whom degree of infection was reduced		24 (89%)		
" in whom infection was reduced by		21 (78%)		
100-75%		3 (11%)		
74-25%		3 (11%)		
24-0%		1 (4%)		
Initial weight of infection (eggs/g. faeces)		27,000-100		
Mean % reduction in count		79		

given daily for four successive days; those who still retained some degree of infection and were still in hospital were given a further seven-day course of treatment. The results are given in full in Table III.

The effect of four 2-g. doses on the faecal egg count of one 6-year-old child is shown in Fig. 2. This child had advanced cirrhosis of the liver (confirmed by biopsy) and gross ascites. He was considered by the physician to be unsuited for treatment with tetrachlorethylene. Bephenium greatly reduced the egg count, and no toxic side-effects of any kind were observed. After treatment, hookworms were recovered from the stools. Examination of this child 10 weeks after treatment showed that the stools were free from hookworm ova.

In order to study the effectiveness of bephenium hydroxynaphthoate under field conditions, trials were carried out in a group of 132 Tamil labourers and their

TABLE III.—Effect of Multiple Doses of Bephenium Hydroxynaphthoate against Hookworm in Children. Doses of 2 g. (Base) were Given Daily for Four Days; Some Patients Received an Additional Course of Treatment for Seven Days

Sex	Age Years	Hookworm Eggs/ml. Faeces			
		Initial	After 4 Doses	After a Further 7 Doses	Total Reduction (%)
			Final	Count	
M	6	62,800	6,900	89	
F	10	50,000	800	98	
M	4	14,800	0 conc.	100	
M	7	11,800	1,000	92	
M	6	9,000	+ direct (no count)	0 conc.	100
F	7	8,400	200	95	
M	5	7,700	900	86	
F	7	6,400	900	82	
M	7	5,000	2,800	40	
F	6	4,700	2,400	87	
M	4	3,200	300	90	
M	4	3,000	1,900	32	
M	6	2,800	0 conc.	100	
F	4	2,400	0 conc.	100	
M	10	2,400	0	75	
M	8	1,600	400	300	82
F	4	1,200	200	83	
F	8	1,200	3,300	0	
M	8	700	900	600	14
No. of cases		18			
No. in which infection was reduced		16 (89%)			
No. reduced by		14 (78%)			
100-75%		2 (11%)			
74-25%		2 (11%)			
24-0%		1 (4%)			
Mean reduction in count		75%			

"0 conc." indicates negative on concentration.

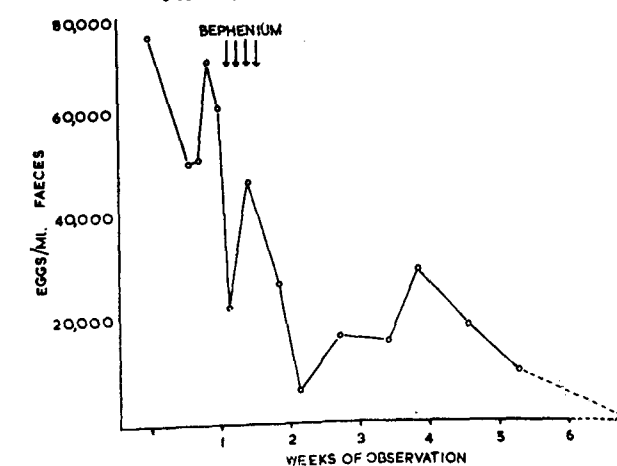


FIG. 2.—Effect of four doses each of 2 g. (base) of bephenium as hydroxynaphthoate on the faecal egg count. The drug was given to a child with heavy hookworm infection, advanced cirrhosis of the liver, and ascites.

families employed at the Sapumalkande rubber and tea estate near Dehiowita. The patients were divided into six treatment groups, which were given: (1) 3 g. of bephenium alone, as a suspension in water; (2) 3 g. of bephenium, as suspension, one hour after a dose of 1 oz. (30 g.) of magnesium sulphate in water; (3) 3 g. of bephenium, as suspension, together with the saline purge; (4) 3 g. of bephenium together with 1 fl. oz. (28 ml.) of piperazine citrate syrup; (5) 1 g. of bephenium, as suspension, daily for

majority of stools examined by direct smear were seen to contain numerous ova. No attempt was made to evaluate the number of roundworm ova per millilitre of faeces, and the effect of the drug was assessed by the presence or absence of eggs in direct smears at follow-up examinations.

Table V shows the results obtained against the inter-current *Ascaris* infections in the patients treated for hookworm with bephenium. Whilst a marked effect was seen against roundworm, there was no significant action against whipworm following a single 3-g. dose of bephenium.

TABLE IV.—Effect of Bephenium Hydroxynaphthoate or Tetrachlorethylene against a Series of 132 Hookworm Infections in the Field

	Bephenium Hydroxynaphthoate*					T.C.E.
	3 g.	3 g. Preceded by Purge	3 g. with Purge	3 g. with Piperazine 1 fl. oz. (28 ml.)	1 g. Daily for 4-5 Days	30 m. (1.8 ml.) with Purge
No. of patients treated	28	20	19	32	15	18
in whom degree of infection was reduced	24 (86%)	17 (85%)	15 (79%)	27 (84%)	14 (93%)	14 (78%)
No. in whom infection was reduced by	16 (57%)	10 (50%)	5 (26%)	20 (62%)	11 (74%)	10 (55%)
100-75%	7 (25%)	5 (25%)	6 (32%)	8 (25%)	2 (13%)	3 (17%)
74-25%	5 (18%)	5 (25%)	8 (42%)	4 (13%)	2 (13%)	5 (28%)
Initial weight of infection (eggs ml.)	6,600-100	22,300-200	14,500-200	11,500-100	7,200-400	11,900-200
Mean reduction in count	66%	67%	41%	74%	72%	61%

* Dose in terms of base.

four or five days; (6) 30 minims (1.8 ml.) of tetrachlorethylene together with the saline purge. The results are shown in Table IV.

Bephenium Bromide

This salt has an extremely bitter taste, and was administered with difficulty because of its nauseating properties. Of the seven patients who were given 1.25 g. to 2.5 g. of the drug as tablets, two vomited almost immediately. Reduction of egg count in the stools was observed in only three of the patients, and the mean reduction for the series was 25%. The use of this salt was discontinued.

Mixtures of Bephenium Bromide and Hydroxynaphthoate

Small groups of patients were treated with doses of 2 to 2.5 g. of mixtures of bephenium bromide and hydroxynaphthoate in the proportions of 2:1, 1:1, and 1:2 respectively. The effectiveness of the dose was directly proportional to the amount of hydroxynaphthoate in the mixture. With a mixture containing 2 parts of bromide to 1 part of hydroxynaphthoate the mean reduction in egg count was 55% (4 cases); with equal proportions of salts this figure was 64% (5 cases); with a mixture of 1 part of bromide to 2 parts of hydroxynaphthoate the reduction was 70% (5 cases), a figure which is similar to that given by the hydroxynaphthoate alone. Mixtures containing the bromide caused nausea, and since they offered no advantage in effectiveness their use was discontinued.

Bephenium Embonate

Bephenium embonate was the least soluble of the compounds investigated. It was tested at doses of 0.75 to 5 g. in a series of 18 patients whose egg counts ranged from 83,800 to 200 eggs/ml. There was no correlation between anthelmintic effect and dose. Twelve of the patients (67%) showed a reduction of egg count, and the mean reduction for the series was 55%. The proportions of patients with reductions in egg counts of 100-75%, 74-25%, and 24-0% were 50%, 17%, and 33% respectively. These results compared unfavourably with those obtained with the hydroxynaphthoate.

Effect of Bephenium Hydroxynaphthoate Against Roundworm Infections

A high proportion of the persons at the Sapumalkande estate selected for treatment with bephenium for hookworm were intercurrently infected with roundworm and whipworm. Most of the roundworm infections were very heavy; the

Discussion

Tetrachlorethylene has been used for many years in the treatment of hookworm infection. It is cheap and effective and the toxicity is low. It is best administered in the morning, following a saline purge the night before. Two hours after the dose, a second purge is given to remove the tetrachlorethylene and thereby avoid absorption. This procedure rarely fails to remove most of the hookworms. For mass treatment in the field, in out-patient departments, and in crowded hospitals in the tropics with limited nursing staff, these optimal conditions for

treatment are often impracticable. Maplestone and Mukerji (1939) introduced a method in which the tetrachlorethylene is given together with the saline purge in a single dose; this is the method most widely used at present in Ceylon. Mass treatment for many years by this practical method has led to a considerable decrease in weight of infection in estate labour.

Tetrachlorethylene is unpleasant to take and often produces dizziness and nausea. These side-effects and the necessity for abstinence from food until the purge has taken effect usually involve absence from work on the day of treatment. In addition, roundworm infection is often

TABLE V.—Effect of Bephenium Hydroxynaphthoate or Tetrachlorethylene against a Series of 101 Cases of Ascariasis in the Field

Treatment (Dose in Terms of Base)	No. of Patients Positive on Direct Smear		
	Before Treatment	After Treatment	% Cleared
3 g. bephenium alone	22	5	77
3 " " preceded by saline purge	16	7	56
3 " " together with saline purge	13	6	54
3 " " 1 fl. oz. (28 ml.) piperazine citrate syrup	24	11	54
1 g. bephenium daily for 4 or 5 days	10	1	90
30 m. (1.8 ml.) tetrachlorethylene together with saline purge	16	12	25

found in association with hookworm. Tetrachlorethylene has little anthelmintic value against roundworms, although it stimulates them and may constitute a danger when massive infections are present.

In patients suffering from heavy hookworm infection with severe anaemia, malnutrition, and diarrhoea the condition of the circulation is sometimes such that it is inadvisable to endanger the precarious fluid balance by giving a saline purge. Treatment with tetrachlorethylene must be withheld until the condition of the patient can be improved. This is an important consideration in the treatment of children, and the small dose of tetrachlorethylene which can be given safely is often valueless for the expulsion of the hookworms (Table I). These characteristics of tetrachlorethylene have stimulated the search for new remedies. The results obtained in the present clinical trial with bephenium hydroxynaphthoate show that this drug overcomes many of the disadvantages associated with the use of tetrachlorethylene. However, in view of the bitter flavour of bephenium it is desirable to withhold treatment from patients with severe vomiting and dehydration until the fluid balance has been restored by intravenous infusion.

Table I shows that a single dose of 2 to 3 g. of bephenium hydroxynaphthoate was at least as effective as 30 to 40 min. (1.8 to 2.4 ml.) of tetrachlorethylene, the dose used for treatment in Ceylon hospitals. Adult male patients weighed about 100 lb. (45.4 kg.) and were given 40 min. (2.4 ml.); adult females weighed about 80 lb. (36.3 kg.) and were given 30 min. (1.8 ml.). The larger dose of 60 min. (3.6 ml.) recommended by Maplestone and Mukerji (1939) was not used because previous experience in Ceylon had shown that it often caused dizziness and other unpleasant side-effects. The children recorded in Table I were 5 to 6 years old and weighed between 17½ and 26 lb. (7.9 and 11.8 kg.). They were given 5 min. (0.3 ml.) of tetrachlorethylene, which was ineffective.

When three doses of bephenium hydroxynaphthoate, each containing 2 g. of base, were given on the same day to a group of 27 patients, the effect was similar to that produced by the single dose containing 2 to 3 g. when assessed by the mean percentage reduction in egg count. Some of the patients were children who were passing several fluid stools a day, and the three-dose treatment had a greater effect upon their hookworm infection and general condition than would have been expected from a single dose.

The results in Table III were obtained with 18 children who were also suffering from chronic diarrhoea. Most of the children had been given treatment with ineffective doses of tetrachlorethylene on several occasions. After four successive daily doses of 2 g. of bephenium hydroxynaphthoate, 16 (89%) showed considerable reduction in egg count. All the children were passing formed stools, and their general condition had much improved. Five of the seven children who remained in hospital showed a further reduction in egg count after an additional course of seven doses of 2 g. One child, who was still passing hookworm ova in his stools, subsequently had a recurrence of diarrhoea. This was controlled by a further course of treatment of three doses of 2 g. in one day, which reduced the egg count to insignificant proportions.

It is doubtful if the result in this group of children could have been achieved with any treatment other than bephenium. Multiple-dose treatment with bephenium would appear to be particularly advantageous in hookworm infection associated with intestinal hurry; it is reasonable to suppose that greater opportunity for contact of the drug with the worms is provided by a succession of doses. The effect of bephenium in controlling the diarrhoea of patients infected with hookworms is of special interest because the drug sometimes caused looseness of the bowel when given in equivalent doses to normal volunteers in England (Rogers, 1958).

Table IV shows that when a saline purge was given one hour before a dose of 3 g. of bephenium as hydroxynaphthoate the results obtained were the same as those after the drug was given alone. On the other hand, when the purge was given together with the bephenium the results were much less satisfactory. It is likely that the drug was removed from its site of action before it had exerted its full effect. It is possible that the purge induced conditions similar to those in children with diarrhoea (Table III) and reduced the opportunity for contact of the drug with the worms.

The results obtained when a dose of 1 g. of bephenium was given daily for four to five days were similar to those recorded for a single dose of 3 g.

In earlier experiments with *N. muris* in rats it was observed that piperazine exerted an effect antagonistic to the anthelmintic action of bephenium halides. It was not known whether this antagonism would occur in hookworm infections in man. In the group of patients treated with bephenium hydroxynaphthoate and piperazine (Table IV) it was clear that the activity of bephenium was unimpaired.

It has been shown (Table V) that bephenium hydroxynaphthoate has a marked effect against roundworms. No additive effect was observed when it was given together with piperazine.

For assessment of results in these trials one duplicate egg count was made before and after treatment. It was appreciated that daily egg counts in any individual would show a marked variation, and that comparison of counts at two points several days apart might be suspect. In trials of drugs of doubtful efficacy against hookworm the arbitrary selection of two points in the daily variation sequence may lead to erroneous conclusions (Goodwin and Standen, 1958). This would be true if results of treatment related to single or small numbers of cases, but where overall reduction can be achieved in a series of reasonable length the anthelmintic effect becomes apparent.

Our results show quite clearly that bephenium hydroxynaphthoate is highly effective in the treatment of hookworm infections. This is most apparent in those cases where very heavy infections were cured, or the egg count was reduced to insignificant proportions. However, the effect of drug treatment is not shown so satisfactorily in cases where the infection is light and where only partial reduction in egg count has been obtained. Daily variation apart, this is largely due to the fact that any dilution egg-count technique is insufficiently sensitive to provide accurate information where the number of eggs in the faecal suspension is small. It has been shown by Beaver (1955) that 200-500 ova per ml. of faeces may be produced by not more than two female *N. americanus*. When such small numbers of worms are present the opportunity for variation in daily egg count is much increased. In these instances the application of a multiplication factor of 100 or 200 to the number of eggs seen in a small measured volume affords too wide a margin of error for accurate conclusions to be drawn.

Summary

Bephenium, a new anthelmintic, was compared with tetrachlorethylene in the treatment of 284 cases of hookworm infection in Ceylon.

Bephenium hydroxynaphthoate was selected as the most suitable salt. A single dose of 2 or 3 g. of base, or multiple doses given on successive days or three times on the same day, compared favourably in effectiveness with tetrachlorethylene.

No toxic side-effects were observed when large doses of bephenium were given.

Bephenium hydroxynaphthoate was particularly suitable for the treatment of patients with advanced anaemia, diarrhoea, and heavy hookworm infections because of its low toxicity and because no purge was necessary.

Bephenium hydroxynaphthoate was also effective against roundworm, which was present as a concurrent infection in 85 of the patients treated with this drug. Tetrachlorethylene was ineffective against roundworm in 16 patients treated.

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EXCRETION OF BEPHENIUM SALTS IN URINE OF HUMAN VOLUNTEERS

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Goodwin, Jayewardene, and Standen (1958) have shown that bephenium salts were effective for the treatment of hookworm in man. Of the various compounds used for clinical trials in Ceylon, bephenium hydroxynaphthoate ("alcopar") was the most active, the embonate and bromide being considered unsatisfactory for clinical use. No toxic side-effects were observed when large doses of the hydroxynaphthoate were given. The present paper describes the urinary excretion rates of bephenium salts in volunteers in Britain.

Determination of Bephenium in Urine

The concentration of bephenium in urine was measured by means of a modification of the methyl orange dye-lake procedure. This method was supplied by Dr. S. R. M. Bushby, of the Wellcome Research Laboratories, Beckenham.

Reagents.—*Ethylene dichloride*:—the solvent was shaken with activated carbon, filtered, washed with 1/5 of its volume of N/1 NaOH and then washed twice with an equal volume of distilled water; it was then filtered to remove residual water. *Methyl orange solution*:—a saturated solution of methyl orange was prepared in 0.5 M boric acid, and washed with an equal volume of ethylene dichloride. *Acid alcohol*:—2 ml. of concentrated HCl was added to 100 ml. of absolute ethanol. *Solid sodium chloride*. 40% w/v *Sodium hydroxide solution*. Glassware was washed in very dilute detergent, well rinsed, washed in dilute HCl, and then in distilled water. Acetone was not used for drying glassware. Failure to observe these precautions resulted in high "blank" values.

Procedure.—1 ml. of urine was pipetted into a tube and 300 mg. of solid sodium chloride was added. The tube was shaken to saturate the solution and 8 ml. of ethylene dichloride was added. The tube was stoppered, the contents were shaken for 10 minutes and then centrifuged; 6 ml. of the lower (solvent) layer was removed into a clean tube. 0.4 ml. of the methyl orange reagent was added and the tube shaken thoroughly. The excess of methyl orange solution was removed with a Pasteur pipette after centrifuging; 5 ml. of 40% sodium hydroxide was added and mixed by a brief shaking. The tube was centrifuged and 4 ml. of the upper (solvent) layer was removed into a clean tube. 0.4 ml. acid alcohol was added and the absorption was measured in an absorptiometer at 540 mμ. "Blanks" were prepared, using water instead of urine, and treated in the same way. A standard curve was prepared with solutions of bephenium hydroxynaphthoate of known strength, and the basic substances excreted in the urine were expressed as bephenium.

Excretion of Bephenium after Oral Administration in Man

The preparations used were: bephenium bromide as compressed tablets each containing 500 mg. of base, and

bephenium embonate and hydroxynaphthoate in the form of sweetened and flavoured emulsions containing 500 mg. of base per fl. dr. (140 mg. per ml.).

The volunteers were healthy normal adults. For each excretion study the subject was given the dose orally, followed by 100 ml. of diluted orange squash. Urine was collected at each emptying of the bladder, and the volume and time were noted. The urines were refrigerated until used for analysis; no preservatives were added. The Table shows the percentage of the dose recovered.

Figs. 1 and 2 show the cumulative excretion rates of the drug and its metabolites after doses of bephenium bromide, embonate, and hydroxynaphthoate. Fig. 3 shows the excretion rates of bephenium hydroxynaphthoate after the administration of 2.5 g. base daily on successive days. It will be seen that the excretion of bephenium and its

Dosage and Percentage Excretion of Bephenium in Human Volunteers

Sex	Age	Compound	Dose in g. Base	% of Dose Recovered in 24 Hours
M	29	Bromide	1	0.79
M	25	"	1	0.72
M	51	"	1	0.59
F	19	Embonate	1	0.04
M	19	"	1	0.06
M	26	"	3	0.05
M	27	"	3	0.06
M	40	"	3	0.52
M	32	Hydroxynaphthoate	1	0.25
F	25	"	1	0.18
M	43	"	3	0.22
M	38	"	3	0.44
M	39	"	3 doses of 2 g. in one day	0.21
M	36	"	"	0.23
M	28	"	"	0.05
M	32	"	2.5 g. daily for 4 successive days	1st day 0.12 2nd " 0.10 3rd " 0.26 4th " 0.26
M	46	"	"	1st " 0.14 2nd " 0.27 3rd " 0.19 4th " 0.23
M	44	"	2.5 g. daily for 3 successive days	1st " 0.05 2nd " 0.14 3rd " 0.06

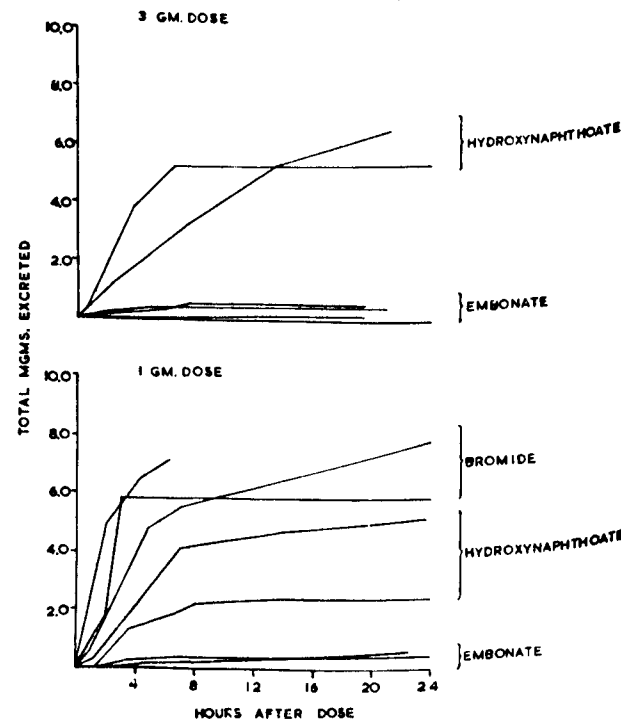


FIG. 1.—Cumulative excretion rates of bephenium bromide, embonate, and hydroxynaphthoate in human volunteers after a single dose.

metabolites in man is low. The bromide, which is soluble to the extent of 30% in water, was excreted in larger amounts than the less soluble hydroxynaphthoate. The almost insoluble embonate was excreted in still smaller amounts.

As found by Goodwin *et al.* (1958) in Ceylon, the bromide gave rise to nausea and vomiting. Side-effects from the hydroxynaphthoate and embonate were slight; mild diarrhoea sometimes occurred after a single dose, and some volunteers complained of borborygmi. The same effects occurred daily after repeated doses of hydroxynaphthoate. Some subjects did not complain at all, and the intensity of side-effects was not correlated with the amount of drug excreted in the urine. Side-effects ceased completely 24 hours after the dose. It is interesting to note that no

side-effects were observed after treatment with embonate or hydroxynaphthoate in Ceylon, where many of the subjects were already suffering from gastro-enteritis. This might perhaps be explained by dietary differences; the digestive tracts of those accustomed to hot curries may well be less sensitive than those of subjects who partake of less-stimulating foods. It is also of interest that no such side-effects were encountered among mentally defective children in an institution in Britain where the drug was tested for its action on whipworm infection.

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Medical Memoranda

Thrombocytopenic Purpura Apparently Due to Tablets Containing Salicylamide and Mephenesin ("Arthropax")

A woman aged 64 was seen by me on October 16, 1958, suffering from widespread purpura with subcutaneous ecchymoses and haemorrhages into the tongue. The rash had begun to appear ten days before and had gradually increased in severity. On inquiry it was found that she had been taking two tablets of arthropax three times daily for about three weeks on account of a painful arthritis of the left knee.

Apart from the haemorrhages physical examination was negative, and there was no previous history of important illness. The blood count was as follows: total red cells 2,977,000 per c.mm.; haemoglobin, 56% (8.3 g./100 ml.); colour index, 0.94; total white cells per c.mm., 6,900. Differential count: polymorphonuclears, 63.5%; lymphocytes, 30.0%; large mononuclears, 6.5%; eosinophils, nil; basophils, nil; aniso- and poikilocytosis, slight; nucleated red cells, nil; platelets, less than 10,000 per c.mm.

The patient, who was ambulant, was told to stop taking the tablets and sent home to rest. When the result of the blood count was received a few hours later her doctor was warned by telephone to report at once if her condition deteriorated, so that she could be admitted immediately. In fact the patient made an uninterrupted recovery; no new haemorrhages appeared and the existing ones gradually resolved.

On October 30 she was well except for some breathlessness on exertion. The blood count then was: total red cells, 2,730,000 per c.mm.; haemoglobin, 58% (8.6 g./100 ml.); colour index, 1.04; total white cells, 6,300 per c.mm. Differential count: polymorphonuclears, 61%; lymphocytes, 29%; large mononuclears, 10%; eosinophils, nil; basophils, nil; aniso- and poikilocytosis, fairly marked; nucleated red cells, nil; platelets, 173,000 per c.mm.

On November 28 the blood count was as follows: total red cells 3,740,000 per c.mm.; haemoglobin 70% (10.4 g./100 ml.); colour index, 0.94; total white cells 5,900 per c.mm. Differential count: polymorphonuclears, 70.0%; lymphocytes, 23.5%; large mononuclears, 5.0%; eosinophils, 1.5%; basophils, nil; aniso- and poikilocytosis, nil; nucleated red cells, nil; platelets, 179,000 per c.mm.

Arthropax tablets contain salicylamide 5 gr. (0.32 g.), mephenesin 1 gr. (65 mg.), aluminium glyciolate 1½ gr. (0.1 g.). The dose of both drugs is well within that which is considered to be safe, and the makers tell me that they have not heard of similar cases.

The question arises whether mephenesin or salicylamide was responsible, it being assumed that the patient had some idiosyncrasy. Both drugs contain a benzene ring. An orthopaedic colleague has told me of a case of purpura following mephenesin administration some years ago, but

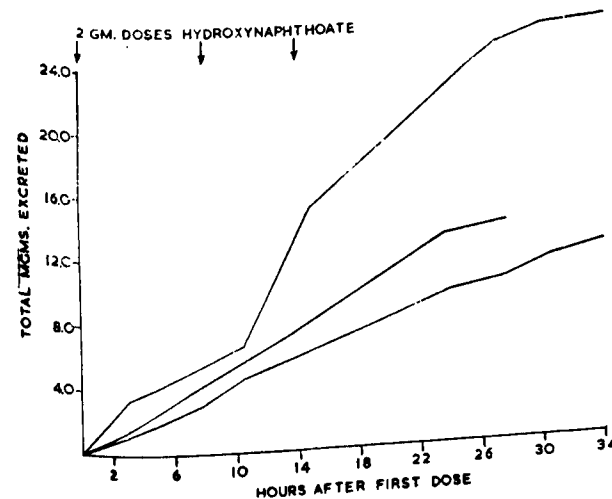


FIG. 2.—Cumulative excretion rates of bephenium hydroxynaphthoate in human volunteers after three single doses in one day.

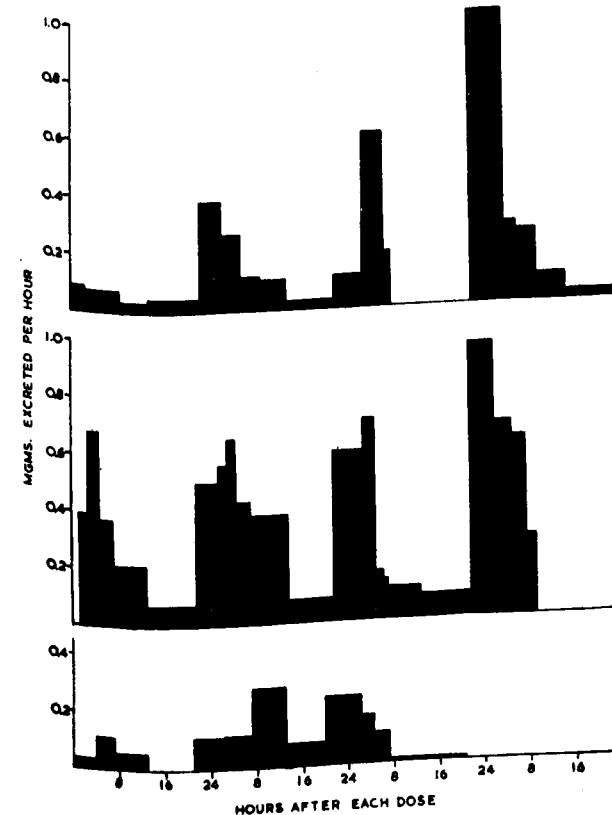


FIG. 3.—Hourly excretion rates of bephenium hydroxynaphthoate in human volunteers after successive daily doses.

was unable to give details. Salicylates are known very rarely to cause thrombocytopenic purpura. It is assumed that in this case a mild inhibition of red-cell production also occurred and accounted for the anaemia. Although no studies of haemolysis or liver function were made, the case seems worthy of a brief report so that prompt action may be taken in similar cases before platelet counts are reduced to such dangerous levels.

ROBERT PLATT, P.R.C.P.,
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Traumatic Fore-quarter Avulsion

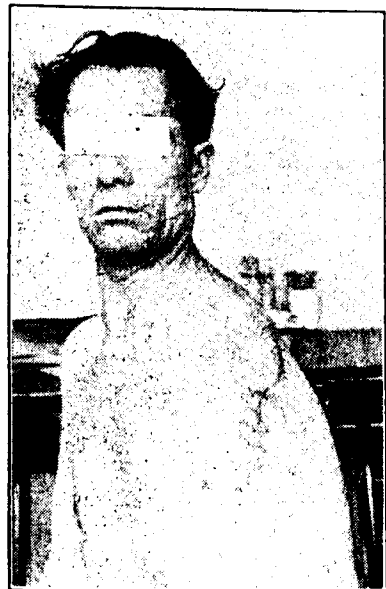
Avulsion of the entire fore-quarter with survival is uncommon enough to justify the record of the following case.

CASE REPORT

At 3.30 a.m. on February 21, 1951, the sleeve of a Polish mine-worker aged 43 was caught in the conveyer belt and the left arm torn off. He was brought to hospital at about 5.30 a.m. in a pulseless condition due to shock. He was bleeding a little, but did not appear to have lost nearly as

much blood as might have been expected. He was admitted to the wards, and after resuscitation at 6.30 a.m. the blood pressure was found to be 110/70 mm. Hg. At 9.30 a.m. he was given an anaesthetic and taken to the operating theatre.

On removal of his clothing the left upper limb was found to be missing from a large skin envelope. The wound, which extended from the middle line of the back from the level of the sixth cervical spine obliquely



downwards to the outer side of the left nipple and for an inch or so below, was explored, and it was found that the clavicle had been fractured about its centre and the outer half of the clavicle, the entire scapula, and the left arm had been avulsed. All the muscles had retracted and the bony thorax was bare. The brachial plexus was not seen, but the subclavian vessels were sought for and ligated. The subclavian artery had been torn at about the spot where it becomes the axillary artery, and bleeding had been arrested by clotting and retraction of the vessel. The rough end of the fractured clavicle was trimmed and the wound closed with a continuous stitch after providing for drainage. There was some doubt about the viability of the skin, and as much as possible was retained in case of sloughing. From the time of admission until 6.15 p.m. 3 pints (1.7 litres) of blood were administered. At that time there was only minimal oozing and the blood pressure was 134/80, and the pulse rate 100. Apart from a little sloughing of the skin, which required trimming on March 12, the patient's progress from this time was uninterrupted. On the day following the accident it was noticed that he had a Horner's syndrome. On March 29 the wound had healed and he was discharged.

D. S. PRACY, F.R.C.S.Ed.

Unusual Length of a Plasmodium ovale Infection

Relapses of *Plasmodium ovale* infection are known to occur up to two years. A case has been reported by Jeffery *et al.* (1954) in which relapses with the Donaldson strain of this malarial parasite continued up to three and a half years. In the following case a relapse due to *P. ovale* occurred 52 months after possible exposure.

CASE REPORT

The patient, an Englishman aged 31, was admitted to hospital on June 24, 1957, with a history of severe throbbing occipital headache, vomiting, rigor, and fever the previous day. He had been getting attacks of headaches periodically every fortnight or so during the previous four years. He served in the British Forces at Kaduna, Nigeria, from July, 1951, to February, 1953. In September, 1952, he suffered from an attack of malaria and was treated in the Military Hospital at Kaduna. He took prophylactic proguanil every day until he arrived home in February, 1953.

On physical examination he looked ill but his temperature was normal. Systematic examination did not reveal any abnormality. A day after admission his temperature rose to 104° F. (40° C.), initiated by rigor. A blood film showed a heavy infection with *P. ovale*. Some of the red cells contained two or three ring forms. With prolonged staining Schüffner's dots were seen. The schizonts contained 8 to 10 merozoites arranged irregularly. (Diagnosis was confirmed by Professor P. C. C. Garnham.)

After a full course of chloroquine phosphate the patient has become symptomless, except for migraine.

COMMENT

This patient's history excludes any possibility of reinfection with malaria during the 52 months he lived in the British Isles. There seem to be no clinical grounds for regarding the headaches which occurred at fortnightly intervals as other than simple migraine. The headaches which necessitated his admission to hospital were accompanied by rigor and fever, and appeared clinically to be the first attack of malaria since September, 1952. A relapse of *P. ovale* infection has been shown to be accompanied by 18 to 20 merozoites (Garnham *et al.*); in this patient they numbered 8 to 10. This fact, combined with the clinical evidence, seems to indicate a primary infection after a prolonged interval rather than a simple relapse. Whichever interpretation is accepted, 52 months is the longest period recorded.

I am indebted to Professor P. C. C. Garnham and Dr. E. C. Hutchinson for their advice and help.

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City General Hospital, Newcastle (Staffs).

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Jeffery, G. M., Young, M. D., and Wilcox, A. (1954). *Amer. J. trop. Med. Hyg.*, 3, 628.

The home population of England and Wales as at June 30, 1958, was 45,109,000, of whom 21,744,000 were males and 23,365,000 were females, according to the Registrar-General's latest estimates. The total is 202,000 more than in mid-1957. Within the conurbations there has been a continuation of the movement from the centre to more open residential areas outside. Thus the Administrative County of London lost 29,000 between 1957 and 1958, and other losses were in Birmingham C.B. (8,000), Liverpool C.B. (6,300), Manchester C.B. (5,100), Newcastle upon Tyne C.B. (2,700), Wolverhampton C.B. (2,100), East Ham C.B. (1,800), and Salford C.B. (1,700).

Reviews

THE REDISCOVERY OF NEOMYCIN

Neomycin: Its Nature and Practical Application. Edited by Selman A. Waksman. (Pp. 412+x; illustrated. 40s.) London: Baillière, Tindall and Cox, Ltd. 1958.

The curve of popularity of a successful antibiotic usually reaches its peak within two years of the drug's introduction, and to fall to a steady lower level when its limitations and perhaps its dangers become recognized. That of neomycin is unique in having a quite different shape. Originally commended for the treatment of tuberculosis, neomycin fell into disrepute because prolonged systemic treatment too often results in deafness and renal damage. In the eight years which have followed, other uses for it which obviate this risk have multiplied and there has been a slowly widening recognition of its valuable properties. These are its very broad "spectrum" of activity, its rapid bactericidal action, the fact that bacterial resistance to it rarely develops during treatment, and its apparent lack of sensitizing power. Staphylococci (but usually not streptococci) are as sensitive to it as coliform bacilli, and among the latter even *Proteus*, which often laughs at other broad-spectrum antibiotics, is highly sensitive. Because of its rapid action short periods of systemic treatment involving little risk of toxic effect are often successful, and these may be indicated in septicaemia, pneumonia, and urinary-tract infections. Other uses, involving no such risk, are local. These include oral administration, since little is then absorbed, whether for the treatment of enteritis or for the suppression of the bowel flora before operation, in which neomycin is more successful than any other drug. Application to infected skin and wounds, inhalation and instillation into infected cavities including the peritoneum, have also been successful.

Neomycin has assumed so important a place in therapeutics that an adequate work of reference on it has become a necessity, and this the discoverer himself with three editorial colleagues and no fewer than 32 other contributors have now provided. Earlier sections deal with laboratory aspects, and a final one with miscellaneous matters, including "formulation," uses outside the clinical field, nine pages of a list of proprietary preparations, a three-page list of manufacturers, and a bibliography of 691 items. The clinical sections deal fully with the main uses already mentioned and several others, among them the trivialities such as the suppression of axillary odours (is the use of a valuable antibiotic justifiable for this?) and some ingenious prophylactic applications in the urinary tract, including addition to pyelographic contrast media. There is some overlap and repetition among these chapters, particularly in regard to bacterial sensitivities, the effects of oral administration, and the risks of toxic effects. The chapter on urinary-tract infections makes no mention of the vital fact that neomycin is more active in alkaline than in acid media. Those authors who commit themselves seem agreed that systemic treatment with adequate doses in patients with good renal function can safely be given for five to seven days, and there are many situations in which this may be indicated. Clinicians who are not fully aware of the potentialities of this antibiotic except as a skin cream or an intestinal antiseptic will find much valuable information in these pages.

L. P. GARROD.

OPERATIVE SURGERY

Operative Surgery. Edited by Charles Rob, M.C., M.Chir., F.R.C.S., and Rodney Smith, M.S., F.R.C.S. Vol. 8. Part XVI: Neurosurgery (pp. 57). Part XVII: Eyes (pp. 83). Part XVIII: Ear, Nose and Throat (pp. 196). (Illustrated. £5 10s.) London: Butterworth and Co. (Publishers) Ltd. 1958.

The last volume of this big work deals with the operative treatment of conditions which affect the central nervous system, the eyes, ears, nose, and throat. The neurosurgery is mostly concerned with those emergency measures which

might have to be undertaken as a preliminary to transferring the patient to a special centre, but there are useful accounts of cerebral and cerebellar abscess. In the other sections of the book there are many operations which ought only to be performed by those with special experience; very skilful technique which only specialists gain is needed for corneal grafting, for dealing with a detached retina, and for performing a fenestration operation on the ear. All these operations and many others are well described and illustrated. The ending of a long and arduous task always brings a sense of relief even when the doing of it is to one's liking; we imagine the editors of this system will be relieved that the last volume has now been issued. We congratulate them on the completion of a remarkable and useful work.

ZACHARY COPE.

FUNGUS DISEASES

An Introduction to Medical Mycology. By George M. Lewis, M.D., Mary E. Hopper, M.S., J. Walter Wilson, M.D., and Orda A. Plunkett, Ph.D. Fourth edition. (Pp. 453+xvii; illustrated. £5 15s.) Chicago: Year Book Publishers, Inc. London: Interscience Publishers, Ltd. 1958.

In the earlier editions of this popular work the subject was presented mainly from the viewpoint of the dermatologist. In the new and enlarged fourth edition, however, to which two additional authors have contributed, the great progress in medical mycology during the ten years since the appearance of the third edition is fully reflected and a fairer balance is shown in the respective presentations of the superficial and deep mycoses.

The general plan of the original book has been followed, except that the fungus is now considered with the relevant disease and not in a separate section. The admirable half-tone illustrations, an outstanding feature of the earlier editions, have been increased to 650, in addition to two coloured plates of eight figures and numerous illustrations in the text. However, the new book is not just an atlas of fungus diseases. The chapters dealing with the systemic mycoses have been entirely rewritten and amplified, and this remark applies also to some of the chapters on the dermatophytoses, notably those on infections by *Trichophyton rubrum* and by *T. mentagrophytes* with its variety *T. interdigitale*. The sections dealing with immunology and allergy in superficial and deep mycoses are of particular interest, and the chapters on the fundamentals of elementary mycology and mycological technique, including diagnostic methods and the production of experimental infections in laboratory animals, should prove helpful to the pathologist and the clinician not versed in these matters. A new feature is a short account of fungus diseases in relation to workmen's compensation in the United States. The style is attractive, the descriptions are lucid and concise, and the book offers a simple and adequate introduction to the study of fungus diseases.

J. T. DUNCAN.*

COLLAPSE IN THE OPERATING ROOM

Cardiovascular Collapse in the Operating Room. By Herbert E. Natof and Max S. Sadove, M.D. (Pp. 197+xvi; illustrated. 45s.) London: Pitman Medical Publishing Co. Ltd. 1958.

"Death on the table" is no longer acceptable either as a diagnosis or as the inevitable price of surgery and anaesthesia. Interest has been growing in the varied mechanisms involved in these cases. Particularly does this interest centre on the influence which pre-existing disease may have on the liability to collapse in these circumstances. It is refreshing and most valuable to find the whole subject reviewed in a tidy and sober manner. The authors have studied what is now a very large literature, abstracted its essence, and set down the result against a background of their own experience, which covers 33 cases of "cardiac arrest" in 40,000 operations over a three-year period. It is gratifying that their own views on the prevention and treatment of these accidents conform closely to current

*This review was written shortly before Dr. Duncan's death

practice in Great Britain. Their style is characterized by brevity and by profuse references to literature. Some of the statistical information is presented in cartoon form, in an earnest desire to assist in their assimilation. If the result is not always a happy one, the reader is certain to be tolerant, for the importance of grasping the information is never in doubt. This book is a landmark in this field. It must surely become essential reading for anyone wishing to be knowledgeable about the many and varied aetiological factors which lead to collapse in the operating theatre, and wishing to contribute to the prevention and treatment of these calamities.

W. W. MUSHIN.

ADVANCES IN ALLERGY

Progress in Allergy: Fortschritte der Allergielehre. Volume V. Edited by Paul Kallos. Contributors: St. V. Boyden, L. Brent, M. M. Mayer, O. Ouchterlony, Z. Ovary, W. D. M. Paton, and B. H. Waksman. (Pp. 508+xxxix; illustrated. Sw. fr. 82.) Basel, New York: S. Karger, 1958.

This fifth volume of *Progress in Allergy* follows on similar lines to its predecessors and maintains the same high standards. It comprises a series of articles, each by an outstanding authority, reviewing comprehensively advances in various fields of endeavour all of which contribute to our knowledge of various aspects of the allergic reactions. Advances in the study of the serological properties of different kinds of antibodies and antigens are excellently described and reviewed by Ouchterlony, of Gothenburg, in his article on "Diffusion-in-gel Methods for Immunological Analysis." Boyden, of Copenhagen, also discusses important serological methods such as the Middlebrook-Dubois haemagglutination test and the "coated tanned red cell technique" in his article on the "Immunological Response to Antigens of the Tubercle Bacillus." Z. Ovary, from Johns Hopkins University, reviews the techniques of the sensitive methods developed by himself to demonstrate and measure antigen-antibody interactions in the skin of experimental animals and discusses cutaneous anaphylaxis and the Arthus phenomenon.

Brent, of University College, London, in an article on "Tissue Transplantation Immunity," points out that the grafting of skin has made a special contribution by the unravelling of the immunological factors which are involved. He reviews the evidence in favour of regarding transplantation immunity as related to tuberculin sensitivity and sensitization to simple chemical compounds. Professor Paton, of London, in an excellent article deals with "The Release of Histamine," and points out that to an important extent the physiology of histamine is now the physiology of the granules of the mast cells. In the group of auto-immunological disorders, Waksman, of Harvard Medical School, in an article on "Cell Lysis and Related Phenomena in Hypersensitive Reactions," reviews comprehensively the immunohaematologic diseases. The role of complement is dealt with by M. M. Mayer, of Johns Hopkins University, in his article "Studies on the Mechanism of Hemolysis by Antibody Complement." The introduction by Paul Kallos, the editor, reviews progress in allergy in general and with admirable comments. Each article has a very full list of references, and to all interested in these problems this book can be thoroughly recommended.

D. A. WILLIAMS.

BALLET PHYSIQUE

Ballet Physique, with Notes on Stresses and Injuries. By Celia Sparger, M.C.S.P., C.C.P.E. (Pp. 64; illustrated. 12s. 6d.) London: Adam and Charles Black, 1958.

The question of the relationship between physical form, anatomical structure, and artistic performance is one which has interested many observers, yet no acceptable conclusion has been advanced, and clearly no approach to a generalization can be arrived at unless each art is considered individually, so varied are they. In the case of the painter, for instance, provided he is not colour-blind or paralysed,

there is no recognizable physical characteristic; the underlying processes of production are psychological rather than physical. But what of the musical performer—the violinist, the pianist, the guitarist, and others? Here there is obviously a physical element, but it is one which is hampered only by rather gross anatomical defects: absence of a digit, fixity of joints, anaesthesia, and so on. There is no doubt that the essential mechanism is one of cerebral and neural activity producing the marvellous co-ordination of movement demanded for a perfect performance, and of course, behind all, an emotional driving force and determination. The great Paganini is represented in drawings of the time as tall and thin (as indeed he is known to have been), with long arms, thin hands, and fingers that fall well into the medical category of arachnodactyly. His technical abilities were so remarkable that for many years it was accepted that the typical hand and fingers of a great violinist should be long and thin. Yet many virtuosos of comparable technique since that time have hands which are quite podgy and muscular, as indeed might be expected from the constant exercise of the intrinsic hand muscles. Seemingly almost any normal hand would do as the executant mechanism provided the exceptional nervous control was present. It is recorded that one or two outstanding pianists of the last generation actually had the aponeurotic expansions of the extensor tendons of the ring fingers to the third and fifth digits divided to allow of greater individual freedom of movement. That the results were stated to be disappointing is perhaps not surprising, for individuality of finger movement is much more a question of brain and nerve than of tendons. We are thus left with the impression that instrumental virtuosity is generally a matter of nervous control rather than physical form.

The volume under review, however, deals with ballet physique, and in this form of art it is to be expected that physical attributes may be of greater significance. Miss Celia Sparger, from her extensive experience as physio-therapist at the Royal Ballet School, has attempted to find some correlation between physique, form, and performance, and especially to see if there are any characteristics of the young child aspirant which would enable the teacher to judge the future possibilities and thus save the unsuited much wasted effort, disappointment, and frustration. Of course there are definite deformities, such as spinal curvature, unequal limbs, hyperextension of the knees, hallux valgus, and so on, which make further training futile, but the impression we get from the rest of the book is that bodily form from the aesthetic point of view is much more important to success than structure and anatomy, provided that, as in the other arts, the nervous control is perfect. In the author's experience "the physical factor predominates very largely in those who fall by the wayside," and, although we cannot agree entirely with some of the opinions expressed, it would be an audacious reviewer who denied the truth of that statement. Indeed, Miss Sparger realizes how little dogmatism on such a subject is warranted, and we commend the opinion in her preface that "real artistry and the gift of movement will always weigh heavily in the balance against physical imperfections." As a guide to those who teach ballet, for whom it was primarily written, this book has both merit and value.

NORMAN C. LAKE.

A selection of the basic writings of Pavlov (*Experimental Psychology and Other Essays*; 653 pages, illustrated) has been published in Great Britain by Peter Owen, Ltd., price 70s. Included are papers on circulation, digestion, experimental psychology, sleep, hypnosis, and experimental psychopathology.

A collection of life tables and mortality tables have been constructed by R. A. M. Case and Joyce L. Harley, and they are issued under the title *Death Rates by Age and Sex for Tuberculosis and Selected Respiratory Disease, England and Wales 1911-1955* by the Chester Beatty Research Institute, Royal Cancer Hospital, London. Statistics are given for tuberculosis, bronchitis, bronchopneumonia, and lobar and undefined pneumonia.

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TOO SOLID FLESH

Twenty-five years ago obesity was generally held to derive from endocrine causes, known and unknown, so that any obese woman was suspected of Cushing's disease and too many fat boys were referred to consultants with a diagnosis of Fröhlich's syndrome. If an endocrine cause could not be proved—then some metabolic *mystique* was invoked, such as a lowered basal metabolism or some deviation in the individual handling of absorbed nutrients. Such superstitions were strongly attacked by Americans such as L. H. Newburgh,¹ J. W. Conn,² and E. H. Rynearson,³ who easily disposed of these false doctrines and emphasized the basic concept of an intake in excess of output as the cause of simple obesity. Prejudiced advocates of this hypothesis were sometimes even heard to deny that patients with Cushing's syndrome were really fat and the metabolic switch (gluconeogenesis) in this disease was conveniently ignored.

A more fruitful consequence of this rational approach was the inquiry into why some unfortunates eat more than they need. The psychologists investigated the personal and environmental background to obesity; and the animal physiologists made fascinating experiments in mice and rats to illustrate the hypothalamic control of appetite and the mechanism of satiety. It became apparent that the reasons why appetite was not correctly geared to metabolic requirements were exceedingly complicated in small animals and might well be not less complex in man. Simple obesity seemed to be not so simple after all.

At this time it was customary to deny the importance of daily activity in the prevention of obesity. Perhaps this was to be expected of a generation which had forgotten how to walk but had learnt to hike. And as for infrequent outbursts of violent exercise, it was said that the 300 calories

expended in half an hour's squash rackets were replaced by two dry Martinis. These opinions ignored earlier evidence⁴ that when activity is reduced appetite is sustained and weight is consequently increased. Meanwhile the statistics of the insurance companies showed that obesity constituted a hazard to both health and longevity; physicians and family doctors in their clinics and consulting rooms referred fat patients to dietitians or gave them printed diet-sheets accompanied by perfunctory warnings. The remission rate among those treated thus was moderately good but the relapse rate was high; and the weak-willed were assisted by an effective depressant of appetite—dexamphetamine. Food manufacturers, magazine-writers, the pharmaceutical industry, and the nutritionists introduced a great variety of slimming diets, and many books have also been written for the greedy public. All the diets advised, however described and no matter how much their minor differences are emphasized, are alike in prescribing a low intake of calories and carbohydrates.

There are signs that we are emerging from this period of clamour and confusion. There is an increasing awareness that what is now needed is the patient collection of more facts both by clinicians and by physiologists, not only to elucidate the deviations of the central and peripheral mechanism at work but also in order to correct these in the individual patient. J. Mayer⁵ and H. Bruch⁶ have recently published useful reviews of American work in this field, and it may not be chauvinist, even at Christmas-time, to point out that there has been much distinguished British work that they do not mention. Investigators here have been interested in the possibility that abnormal metabolic mechanisms were operating, whether primarily or secondarily disturbed. D. M. Lyon, D. M. Dunlop, and C. P. Stewart,⁷ by estimating respiratory quotients, showed that in undernourished obese subjects fat was converted into carbohydrate. A. Kekwick and G. L. S. Pawan⁸ have given patients iso-caloric diets containing varying quantities of protein, fat, and carbohydrate and shown that their loss of weight was most rapid when on a high fat intake and least rapid with high-carbohydrate diets. They concluded that the weight loss on the high-fat regime could not be entirely accounted for by loss of water, though R. Passmore, J. A. Strong, and F. J. Ritchie⁹ have shown that as much as 2-4 litres of body water may be lost in the first week when patients were put on diets with energy deficits of 2,500-3,000 calories. T. M. Chalmers and colleagues¹⁰ have detected a "fat-mobilizing substance" in the urine of obese patients given a diet of 90% fat or protein, but it disappears on a diet

¹ Newburgh, L. H., *Physiol. Rev.*, 1944, **24**, 18.

² Conn, J. W., *ibid.*, 1944, **24**, 31.

³ Rynearson, E. H., *Proc. roy. Soc. Med.*, 1951, **44**, 951.

⁴ Bruch, H., *Amer. J. Dis. Child.*, 1940, **60**, 1082.

⁵ Mayer, J., *Borden's Rev. Nutr. Res.*, 1958, **19**, 3.

⁶ Bruch, H., *ibid.*, 1958, **19**, 4.

⁷ Lyon, D. M., Dunlop, D. M., and Stewart, C. P., *Biochem. J.*, 1952, **26**, 1107.

⁸ Kekwick, A., and Pawan, G. L. S., *Lancet*, 1956, **2**, 155.

⁹ Passmore, R., Strong, J. A., and Ritchie, F. J., *Brit. J. Nutr.*, 1958, **12**, 113.

¹⁰ Chalmers, T. M., Kekwick, A., Pawan, G. L. S., and Smith, I., *Lancet*, 1958, **1**, 866.

¹¹ Booyens, J., and McCance, R. A., *ibid.*, 1957, **1**, 225.

¹² Dodds, E. C., *Proc. roy. Soc. Med.*, 1950, **43**, 342.

¹³ Strong, J. A., Passmore, R., and Ritchie, F. J., *Brit. J. Nutr.*, 1958, **12**, 105.

¹⁴ Sheldon, J. H., *Lancet*, 1949, **2**, 869.

¹⁵ Wolff, O. H., *Quart. J. Med.*, 1955, **24**, 109.

¹⁶ Mullins, A. G., *Arch. Dis. Child.*, 1958, **33**, 307.

¹⁷ *Boswell's Life of Johnson*, 1904, vol. 2, p. 491, Henry Frowde, London.

of 90% carbohydrate. This "substance" may be concerned in the observations of Lyon and colleagues made 25 years ago.⁷

J. Booyens and R. A. McCance¹¹ have recently investigated the basal metabolic rates of 36 normal subjects and reported that three of them had rates which were 30% below the average for the group. None of these three persons was overweight, so their appetite centres had apparently no difficulty in gearing their food intake to their low metabolic turnover. Can the B.M.R. be put into top gear to allow for the maintenance of a stable weight despite forced feeding? E. C. Dodds¹² reported that it can, but this observation has not yet been confirmed.

Other workers have been interested in the effect of exercise on obesity. J. A. Strong and colleagues¹³ point out that, while it is true that one hour's walking each day will expend only 350 calories, yet three hours' daily walking for a month will utilize 9 lb. (4 kg.) of fat. They persuaded their obese patients to take this exercise on a daily diet of 400 calories, with consequent weight losses up to a maximum of 35 lb. (16 kg.) in six weeks. Contributing to the natural history of the disease, J. H. Sheldon¹⁴ has described the obesity of pregnancy and the puerperium—maternal obesity; O. H. Wolff¹⁵ has shown that the increased height of obese children, and their early puberty, are the result of a food intake in excess of their requirement; and A. G. Mullins¹⁶ reported recently that one-third of the obese adults in an out-patient clinic were cases of persistent juvenile obesity, and that the failure in this group to reduce weight was associated with psychological factors, in particular low intelligence. Children of low intelligence are not only less active mentally but also more inert physically than their brighter brethren.

There is in some recent literature a disposition to decry the importance of attempting to reduce weight by dietetic restriction. In so far as this emphasizes the importance of increased exercise one can heartily agree with it; and when it represents the need for a more careful consideration of the patient's history, constitution, personality, and environment, it is a healthy reaction from the diet-sheet-over-the-counter policy. Diets must be low both in calories and in carbohydrate; they can be sufficiently high in protein to provide for the nitrogen needs of adults, and also of growing children. Ketosis does not matter, and high-fat diets may assist weight reduction.

But when all is said and done the modern nutritionist has done little more than dot the "i's" and cross the "t's" of the following robust conclusion of Dr. Samuel Johnson¹⁷:

"Talking of a man who was grown very fat, so as to be incommoded with corpulency, he said, 'He eats too much, Sir.' BOSWELL: 'I don't know, Sir ;

you will see one man fat who eats moderately, and another lean who eats a great deal.' JOHNSON: 'Nay, Sir, whatever may be the quantity that a man eats, it is plain that if he is too fat, he has eaten more than he should have done. One man may have a digestion that consumes food better than common; but it is certain that solidity is increased by putting something to it.' BOSWELL: 'But may not solids swell and be distended?' JOHNSON: 'Yes, Sir, they may swell and be distended; but that is not fat.'"

DEFECTS IN STERILIZATION

Hospital infection is now causing more concern than at any time since before Lister. Two recent contributions to the subject are therefore timely. The first is the publication of a report by the Nuffield Provincial Hospitals Trust,¹ the second is the holding of a conference by the South-west Metropolitan Regional Hospital Board at Southampton last week which is reported in the *Journal* at p. 1589.

How far is the spread of infection in hospitals due to major faults in aseptic technique, and in particular to failure in processes of sterilization? Those who would answer that such elementary faults must be highly exceptional and can have little to do with the present state of affairs may be compelled to revise their ideas when they read the new report.¹ It is an instructive and disturbing document which deserves the closest attention from all engaged in any way in the practice of surgery. This is only an interim report. An operational research team which had completed a report² on the organization of central syringe services was instructed to study the organization of central supply departments for all sterile materials. The first question to be answered was whether such departments are necessary, and this entailed a study of present sterilizing practice. The results of this were so disquieting that it was decided to publish them at once.

The six hospitals studied were a London teaching hospital, three in provincial cities, and two cottage hospitals. They are not named, and it is not clear how they were chosen, but they are said to be representative. The first part of the report deals with ward practice, and criticizes many features of "utility rooms." These were found to be liable to contamination from open windows, from excessive traffic through them (one contained the ward

¹ *Present Sterilizing Practice in Six Hospitals*, 1958, Nuffield Provincial Hospitals Trust, Nuffield Lodge, Regent's Park, London, N.W.1, price 5s.

² *The Planning and Organization of Central Syringe Services*, 1957, Nuffield Provincial Hospitals Trust, London.

³ *Brit. med. J.*, 1958, 1, 93.

⁴ Bowie, J. H., *Pharm. J.*, 1955, 174, 473 and 489.

⁵ *Brit. med. J.*, 1955, 1, 350.

⁶ Howie, J. W., and Timbury, M. C., *Lancet*, 1956, 2, 669.

telephone), and from the disposal of soiled dressings. Many sterilizers were unsatisfactory in various ways, particularly in not being fitted with a rheostat, and excessive scaling was observed in them and on utensils boiled in them. Nine different disinfectant solutions were found to be in use for storing instruments or for actually sterilizing them; in this and other matters practice varied from ward to ward in the same hospital as well as in different hospitals, to the detriment of nurses' training. Arrangements for treating soiled linen are strongly criticized: nurses are expected not only to disinfect this but to dry it before dispatch to the laundry, and this entails hanging up large numbers of wet sheets in sluice- and bath-rooms.

Bed-pan washing was unsatisfactory; 64 out of 166 examined still contained faecal material. Dressing drums were often battered and so damaged, as by actual perforation or ill-fitting lids, that their contents were directly exposed to contamination. They were often too tightly packed or lined with unsatisfactory material or (in 46 out of 150 examined) not lined at all. After autoclaving they were not always labelled as sterilized. One way mentioned of distinguishing between sterile and unsterile drums on the same trolley was "to feel them to see which were warm." When syringes were sent for autoclaving they were often packed in drums or other metal receptacles (a cake tin and old tulle-gras tins are mentioned) or in tubes tightly plugged and even sealed with adhesive tape, so that penetration by steam, particularly of an assembled and lubricated syringe, could never have taken place. There are many photographs of such defective apparatus and of ward scenes illustrating these difficulties and dangers. A notable and regrettable omission is that of any reference to methods of sterilizing apparatus used for lumbar puncture, for this is the most dangerous of all ward procedures when sterility is in any doubt, and a central supply service can perform perhaps its most vital function in catering properly for it.

Operating-theatres are only briefly considered. Some structural and ventilating defects are mentioned, and the report also criticizes inadequate washing of walls and the laying out of sterile equipment on trolleys too long before it is to be used. In one theatre "the staff had to wage continual war on cockroaches," and in one autoclave room drums were contaminated by bird droppings from a ventilator—these are picturesque but evidently exceptional features. It is also probably exceptional for new scalpel blades to be "sterilized" chemically without removal of their protective grease. Criticism is concentrated in this part of the report not on the theatres but on the autoclaves. Those familiar with

the revelations of J. H. Bowie^{4 5} and of J. W. Howie and M. C. Timbury⁶ are aware that antiquated autoclaves are still in use, the satisfactory operation of which is either impossible or unduly time-consuming or damaging. Only one of the 25 autoclaves tested here was found defective from "mechanical inefficiency and old age"; for eight others classed as inefficient, five of which failed either to convert the colour of Browne's tubes or to kill test spores, faulty installation or, more commonly, faulty operation was responsible. In three instances the chamber drain through which air must be discharged was kept closed throughout the run. Air filtration was unsatisfactory in four instances, and the fact that no less than 38% of swabs from the interior of drums yielded bacterial growth is attributed largely to recontamination during the drying stage. These were only some of many cultures made from supposedly sterile materials in wards and theatres: of the total, 17% were unsterile.

The report finally makes recommendations for the immediate improvement of sterilizing practice without any great extra cost. Ward practices should be standardized, syringes sterilized centrally, and reform introduced in the disposal of soiled dressings (paper bags are preferred) and dirty linen. The report considers that drums should be abolished and replaced by cardboard boxes. These are exactly specified and have been shown to be well penetrated by steam and yet to protect their contents from subsequent contamination. No doubt drums must go, but consideration might have been given to another alternative, universally employed in the United States—that of wrapping in a double layer of fabric. Material like cardboard is loaded with spores of *Clostridia*—as indeed has been confirmed by cultivating the material of these boxes—and, though the manufacturer promises pre-sterilization and they ought in any case to be sterilized in use, such material may seem out of place in an operating theatre. The most important recommendations concern the operation of autoclaves and the defining of responsibility for supervision, particularly of this operation, and of other tasks as well. Autoclave attendants, whose standards of aseptic discipline are severely criticized apart from their actual operation of their machines, were variously under the impression that they were responsible to the head porter, the theatre sister, the secretary, or the engineer. One "was inclined to feel that he owed allegiance to the matron, but this was mainly because he also drove the nurses' bus." It is abundantly clear that this vital task should be in the hands of a man who understands it, which means training and upgrading, and he should evidently be responsible to someone—

according to this report the bacteriologist—who should also conduct monthly tests of working efficiency.

Hospitals throughout the country will do well to inquire whether the graver shortcomings described here exist in their own practice. It is surely an elementary requirement in the campaign against hospital infection that materials supposed to have been sterilized by heat should in fact be sterile and remain so. In some other matters, particularly of ward technique and where chemical disinfectants are concerned, it still seems necessary to define optimum methods. What is at present largely left to the ward or theatre sister could benefit by attention from both bacteriologist and surgeon.

ONE HUNDRED YEARS OF CELLULAR PATHOLOGY

The doctrine of cellular pathology as first expounded by Virchow in his epoch-making book¹ published 100 years ago focused attention on the histology of diseased organs. It replaced the outworn ideas of humoral pathology by the conception of pathological changes occurring within the individual constituent cells of an organ. A natural consequence of the famous maxim *omnis cellula e cellula* was that the origin of disease must henceforth be sought in hitherto unexplored territory to be revealed by the microscope. The familiar gross morbid changes of a diseased organ were now proclaimed to be only the visible manifestation of reactions taking place at the microscope level of histopathology. Speaking of the influence of Virchow's teaching on contemporary thought, Lord Lister once said that it "had swept away the false and barren theory of a structureless blastema, and established the true and fertile doctrine that every morbid structure consists of cells which have been derived from pre-existing cells as a progeny. . . . Even those morbid structures which deviate most from the normal structure are known to be derived as a progeny from normal tissue—from normal cells, driven to abnormal development by injurious agencies."

The general effect of Virchow's teaching was to lessen the importance of "humoral" pathology and greatly increase the importance of "cellular" pathology, and it was many years before advances in immunology and endocrinology began to readjust the balance. The many different varieties of "humoral" antibody which we now know to be of such importance in relation to the process of

immunity were undiscovered when Virchow first propounded the doctrine of cellular pathology.

Yet though he took his stand almost exclusively on the basis of pathological anatomy he did not minimize the importance of pathological physiology, and the logical development of Virchow's cellular pathology has resulted in great advances both in pathological anatomy and in pathological physiology. This is shown conclusively by the series of articles contributed to the current number² of the *Journal of Clinical Pathology*, which commemorates the centenary of Virchow's *Cellular Pathology*. The first article, by Sir Roy Cameron, is a richly illustrated historical review of the mid-nineteenth century period and the setting in which Virchow lived. Then follow a series of articles on subjects which may be described as natural developments of the doctrine of cellular pathology. Of special interest is the review of modern concepts of cellular structure by Professor Robert Cruickshank and the authoritative account by Dr. Honor Fell of the astonishing developments in the field of tissue culture.

Another natural development of cellular pathology has been the concept of the cell as a complete nutritional as well as a structural unit. This becomes clear from Dr. J. W. Harman's stimulating article on the cytochemical aspects of cellular pathology. It is as if a vast panorama of subcellular structure and function has been opened up, permitting advance "beyond the cellular into the subcellular range of disease." One other paper in this special number of the *Journal of Clinical Pathology* deserves special mention, that by Dr. A. G. Everson Pearse entitled "Extension of the Limits of Cellular Pathology—the Role of Enzyme Histochemistry." This shows how, by the application of new histological techniques, the limits of cellular pathology drawn up by Virchow 100 years ago have been pushed forward in precisely the way he foretold. In particular the newer techniques of functional histochemistry have begun to transform descriptive analytical histopathology into a new science of functional cytopathology.

One of the results of recent developments in the field of enzyme histochemistry has been to show how misleading it may be to regard tissues as homogeneous. It seems now as if histologically identical cells may have entirely different enzymic composition. Looking forward into the future Dr. Pearse thinks that a further application of the new techniques he has described may be expected in the field of experimental pharmacology "where it may be possible to demonstrate the earliest effects of drugs

upon cells in section, smears, or tissue cultures, with obvious economy of effort." Dr. Pearse concludes by wishing that Rudolf Virchow were here to-day to describe for himself the possibilities for even further extensions of the science of pathology as it seems to be opening up before us to-day. Cellular pathology has become an "expanding universe."

YAWNING

J. Barbizet has done a useful service in reminding us how little is known about the everyday occurrence of yawning. In a short article¹ he concisely and clearly covers almost all that can be said about it from the physiological, psychological, and clinical points of view. The act of yawning is involuntary and unfolds itself in a fairly consistent way, beginning with an active inspiratory movement that is chiefly remarkable for the enormous dilatation of the pharynx. At the height of the inspiration there are associated facial movements and then very often generalized stretching of the limbs. This is followed by the third phase of passive expiration. Such movements are seen also in many animals, and there is possibly a connexion between it and, for example, certain movements of birds' beaks accompanied by the flapping of wings.

Drowsiness and boredom are the usual precipitating causes of yawning. It has been observed in some neurophysiological experiments but usually in association with sleep. No "centre" for yawning has been detected by direct stimulation, nor have the conditions been defined that will invariably produce it. Barbizet considers it likely to be related to the activity of the brain-stem reticular formation, whose function is intimately related to the level of wakefulness of the brain. In support of this is the fact that yawning is commonly observed in association with lesions of the brain-stem or lesions indirectly compressing it. It is among the sequelae of encephalitis lethargica, and is occasionally seen as an aura of epilepsy. However, A. P. Heusner² cites various authors who describe the complex yawning-stretching act in anencephalic infants, which would put the controlling centre, if it exists, at the level of the lowest centre of respiration.

The possible functional significance of yawning is unsettled. The movement may increase venous circulation to the heart, and as a result of increased cardiac output the brain might benefit, but direct observations of the effect of yawning on the cerebral circulation are missing. Heusner finds a systemic vasoconstriction and transient tachycardia, probably the same as that obtained by any deep inspiration.³

In many ways the most interesting and tantalizing aspect of yawning is its relation to psychological factors and in particular the way in which it seems to be infectious in a group. The act is part of the complex language of gesture that long preceded speech as a

means of communication in the prehistory of man, a subject greatly enlarged by the work of ethologists such as Lorenz and Tinbergen. In some unknown way animals are tuned to respond to significant signals of their own species. Yawning is a relatively simple signal, and the perception of its social meaning—boredom, presumably—may hardly require any learning by environmental experience. We seem to know more about the social significance of yawning than the part, if any, it plays in the homeostasis of the body.

BLOOD SUGAR IN CYCLIC VOMITING

Cyclic or recurrent vomiting or the "periodic syndrome" has been recognized for a long time as one of the more common psychosomatic disorders of childhood. Its exact pathogenesis has not yet been determined, but it is known to be prevalent among only children, usually of highly strung temperament and above average mentality, and to be related possibly to migraine in later life. It has also been held, in a few cases, to be a manifestation of epilepsy, on the grounds that abnormalities in the E.E.G. are not infrequent and that phenytoin in such cases is the most successful therapeutic agent.¹

A number of biochemical studies have been undertaken, particularly of the ketosis, but the findings have varied. Blood-sugar estimations and glucose-tolerance curves have also produced conflicting results; for, though there is general agreement that the glucose-tolerance curve is within normal limits, some authors have reported hypoglycaemia and others hyperglycaemia. These differences may well be related to the phase of the attack in which the estimation is made. The general statement in most textbooks is that cyclic vomiting is associated with hypoglycaemia, and the importance of this is evident in the differential diagnosis between cyclic vomiting and diabetic coma. W. W. Payne, however, in 1951² reported raised blood sugars in his patients, and more recently L. Salomensen and K. Harnaes³ have supported him. They quote a number of Scandinavian authors who have found hyperglycaemia at the onset of the attack and add two cases of their own in which the levels of blood sugar were 400 and 276 mg. per 100 ml. respectively on the second day of the attack.

As the condition is usually benign and readily recognized in any child after the cycle has been established it might be thought that discussions about blood-sugar levels were more academic than practical, but, because of the differential diagnosis, it is important to ensure that nothing has been overlooked. Apart from diabetic coma, which may indeed be the first indication of diabetes in a child, appendicitis and cerebral tumour are two other conditions which may present similarly—both conditions which require urgent diagnosis. A good physical examination will go further, and more quickly, in excluding the more serious conditions, and the family doctor is wise if, at the onset of each recurrence, he just makes sure that it is running true to form.

¹ Virchow, R. L. K., *Die Cellularpathologie in ihrer Begründung auf physiologische und pathologische Gewebelehre*, 1858, Berlin.

² *J. clin. Path.*, 1958, 11, No. 6.

¹ Barbizet, J., *J. Neurol. Neurosurg. Psychiat.*, 1958, 21, 203.

² Heusner, A. P., *Physiol. Rev.*, 1946, 26, 156.

³ Bolton, B., Carmichael, E. A., and Stürup, G., *J. Physiol. (Lond.)*, 1936, 88, 83.

¹ Livingston, S., *Advanc. Ped.*, 1958, 10, 137.

² Payne, W. W., *Proc. roy. Soc. Med.*, 1951, 44, 724.

³ Salomensen, L., and Harnaes, K., *Acta Paediat. (Uppsala)*, 1958, 47, 383.

TABLET TREATMENT OF DIABETES

Two recent reports,^{1,2} one from Germany and the other from Switzerland, review recent results with sulphonyl-urea derivatives in the treatment of diabetes. While presenting no new facts, these reports on the treatment of large numbers of diabetics over long periods help to confirm the opinions that have already been formed about existing oral antidiabetic drugs.³ Practically everywhere the original BZ 55 (carbutamide) has been replaced by D 860 (tolbutamide). Few side-effects after tolbutamide have been recorded, although the effective dose in grammes or tablets is slightly more than that of carbutamide. Among the older patients, mainly but not entirely in the category of obese, success in controlling glycosuria has been achieved in 80% or more. In contrast, there have been hardly any successes in younger patients (even up to the age of 40), and all the Continental writers agree that any patient on 40 units or more of insulin will not respond to treatment with tolbutamide. This confirms world-wide experience. Clinical symptoms of hypoglycaemia are rare, but one fatal case is reported.² German physicians now agree that strict dieting is necessary to control glycosuria during tablet treatment, and that patients taking tolbutamide tend to exert less self-discipline in restricting themselves to a diet than those taking insulin. As to the pharmacological action of tolbutamide, the Continental reports mostly concentrate on the theory that the beta cells of the pancreas are stimulated to secrete more insulin, which explains the failure of the tablets in severe diabetes and depancreatized animals.

HAZARDS OF MEPROBAMATE

Meprobamate ("equanil," "mepavlon," "miltown") was a late comer among the tranquillizers and has until recently been regarded as relatively innocuous compared with chlorpromazine and reserpine. Observations reported over the last few months indicate that this view can no longer be held; indeed, reports show that it can do serious harm. The drug has been shown to cause habituation,⁴ with a typical withdrawal syndrome including insomnia, vomiting, tremors, muscle twitching, anxiety, anorexia, ataxia, and, less frequently, hallucinations. In three out of four patients with the withdrawal syndrome grand-mal seizures developed. The risk of addiction was found to be especially serious in patients with a history of alcohol and other addictions.⁵ These observations are not invalidated by the outcome of a double-blind trial⁶ in which a group of elderly people failed to show withdrawal symptoms following eight weeks' administration of meprobamate. Evidence of the drug's toxicity has also been growing, and fatalities have been observed. Acute meprobamate poisoning is apt to produce stupor and coma up to complete respiratory and circulatory collapse. The usual analeptics proved effective antidotes in most cases. An average of one in 200 patients is believed

to show an idiosyncrasy to the drug.⁷ Its manifestations are urticaria, vomiting, fever, oedema, arthralgia, petechiae, bronchospasm, and headaches. Meprobamate has no longer a clean record with regard to suicide. L. W. Powell and his associates⁸ reported two cases of suicide following the ingestion of 12 g. and 20 g. respectively. Suicidal attempts with this drug have been observed not infrequently. Finally, a fatal case of aplastic anaemia due to meprobamate therapy has recently been recorded.⁹

It is not surprising that these reports come from the United States, where this drug has had a tremendous vogue, and they are worth bearing in mind over here. W. Sargent¹⁰ and others have found the drug of only limited value in the treatment of the neuroses compared with the much cheaper barbiturates, and there would seem to be rather few types of case in which benefit may be expected from it.

MEDICAL BENEVOLENCE

The advantage to be gained by subscribing to a charity under covenant is now well known: if a promise is made to make a payment for seven consecutive years recovery of income tax is then allowed at the standard rate on each payment, bringing substantial benefit to the charity without extra cost to the subscriber. The Charities Trust Fund of the B.M.A. has recently been recognized as a charity, and earlier this month the Chairman of Council, the Treasurer, and the Chairman of the Charities Committee urged members to give much-needed help to the medical charities by undertaking a covenant (*Journal*, December 6, p. 1410). They pointed out that appeals from aged and sick members of the profession and from widows and orphans are greater than ever, and because of the fall in the value of money the need keeps increasing. Those who do not already contribute independently, by covenant or otherwise, to individual charities will find on the form of application for the renewal of their subscription to the B.M.A. a "box" for indicating that they would like to undertake a covenant. The necessary forms will then be sent to them for completion. The fact that the renewal of subscription form comes at a time when there are many other demands for cash should not deter doctors from deciding to contribute to medical charities. In fact the New Year is an especially appropriate time to come to such a resolve. Particulars of individual charities are given on the back of the application form for the B.M.A. subscription. Each one attempts to fill a serious want, but those members who have no particular preference will find the B.M.A. Charities Trust Fund a very suitable object to support. As Dr. Wand and his colleagues explained in their letter: "The B.M.A. Charities Committee is a collecting body which advises the Council on the best method of distributing to other charities the money it collects in the Charities Trust Fund."

¹ Haizlip, M., and Ewing, A., *New Engl. J. Med.*, 1958, 258, 1181.

² Mohr, C., and Mead, B. T., *ibid.*, 1958, 259, 865.

³ Boyd, L. J., Cammer, L., Mulinos, M. G., Huppart, V. F., and Hammer, H., *J. Amer. med. Ass.*, 1958, 168, 1839.

⁴ Charles, N. D., *Arch. Intern. Med.*, 1958, 102, 584.

⁵ Powell, L. W., Mann, G. T., and Kaye, S., *New Engl. J. Med.*, 1958, 259, 716.

⁶ Meyer, L. M., Heeve, W. L., and Bortscher, R. W., *ibid.*, 1957, 256, 1232.

⁷ Sargent, W., *Brit. med. J.*, 1958, 2, 1095.

NOAH—AN ALBINO

BY

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Noah, with his wine, his ark, and the animals that came two by two, is probably the first vividly human figure in the Biblical account of the early days of man. In this he differs from the weak and gullible Adam, the milksop Abel, the stage villain Cain, and Methuselah, whose main distinction was not to have died young. Amongst Noah's shadowy progenitors his father, Lamech, has persisted as little more than a name. The birth of Noah is recorded in Genesis briefly, with an indication that he was called to a high mission¹: "And Lamech lived an hundred eighty and two years, and begat a son: And he called his name Noah, saying, This same shall comfort us concerning our work and toil of our hands, because of the ground which the Lord hath cursed." The subsequent account of the Flood and the emergence of Noah as the first boat-builder and sailor in the world's history reveals the nature of the mission to which he was born.

Enoch's Record of the Birth of Noah

A fuller account of the birth of Noah is contained in the Book of Enoch the Prophet, one of the more significant volumes in the Pseudepigrapha.² It appears to have been written in the second and first centuries B.C., and greatly influenced the writers of the New Testament, in which it is quoted by name in several passages. Possessing at first the weight of a canonical book, it gradually declined in importance and finally fell under a ban of the Church. It does not appear to have received much attention after the ninth century, and came to be regarded as lost till three manuscripts in Ethiopian were brought from Abyssinia by Bruce in 1773. The Book of Enoch, like the rest of the Apocalyptic literature, is heavy with primitive mythological and cosmological traditions. It relates in considerable detail of "the Watchers of heaven, who have deserted the lofty sky, and their holy everlasting station, who have been polluted with women."³ . . . And the women conceiving brought forth giants."⁴ The birth of Noah is recorded in similar mystical terms.⁵

After a time, my son Mathusala took a wife for his son Lamech.

She became pregnant by him, and brought forth a child, the flesh of which was white as snow, and red as a rose; and the hair of whose head was white like wool, and long; and whose eyes were beautiful. When he opened them, he illuminated all the house, like the sun; the whole house abounded with light.

And when he was taken from the hand of the midwife, opening also his mouth, he spoke to the Lord of righteousness. Then Lamech his father was afraid of him; and flying away came to his own father Mathusala, and said: I have begotten a son, unlike to other children. He is not human; but, resembling the offspring of the angels of heaven, is of a different nature from ours, being altogether unlike to us.

His eyes are bright as the rays of the sun; his countenance glorious, and he looks not as if he belonged to me, but to the angels.

I am afraid, lest something miraculous should take place on earth in his days.

And now, my father, let me entreat and request you to go to our progenitor Enoch, and to learn from him the truth; for his residence is with the angels.

When Mathusala heard the words of his son, he came to me at the extremities of the earth; for he had been informed that I was there: and he cried out.

I heard his voice, and went to him, saying; Behold I am here, my son; since thou art come to me.

He answered and said; On account of a great event have I come to thee; and on account of a sight difficult to be comprehended have I approached thee.

And now, my father, hear me; for to my son Lamech a child has been born, who resembles not him; and whose nature is not like the nature of man. His colour is whiter than snow; he is redder than the rose; the hair of his head is whiter than white wool; his eyes are like the rays of the sun; and when he opened them he illuminated the whole house.

When also he was taken from the hand of the midwife, he opened his mouth, and blessed the Lord of heaven.

His father Lamech feared, and fled to me, believing not that the child belonged to him, but that he resembled the angels of heaven. And behold I am come to thee, that thou mightest point out to me the truth.

Then I, Enoch, answered and said; The Lord will effect a new thing upon the earth. This have I explained, and seen in a vision. I have shown thee that in the generations of Jared my father, those who were from heaven disregarded the word of the Lord. Behold they committed crimes; laid aside their class, and intermingled with women. With them also they transgressed; married with them, and begot children.

A great destruction therefore shall come upon all the earth; a deluge, a great destruction, shall take place in one year.

This child which is born to you shall survive on the earth, and his three sons shall be saved with him. When all mankind who are on earth shall die, he shall be safe.

And his posterity shall beget on the earth giants, not spiritual, but carnal. Upon the earth shall a great punishment be inflicted, and it shall be washed from all corruption. Now therefore inform thy son Lamech, that he who is born is his child in truth; and he shall call his name Noah, for he shall be to you a survivor. He and his children shall be saved from the corruption which shall take place in the world; from all the sin and from all the iniquity which shall be consummated on earth in his days. Afterwards shall greater impiety take place than that which had been before consummated on the earth; for I am acquainted with holy mysteries, which the Lord himself has discovered and explained to me; and which I have read in the tablets of heaven.

In them I saw it written, that generation after generation shall transgress, until a righteous race shall arise; until transgression and crime perish from off the earth; until all goodness come upon it.

And now, my son, go, tell thy son Lamech,

That the child which is born is his child in truth; and that there is no deception.

When Mathusala heard the word of his father Enoch, who had shewn him every secret thing, he returned with understanding, and called the name of the child Noah; because he was to console the earth on account of all its destruction.

The version in Genesis, and that in the Book of Enoch, are thus supplementary. Both stress that Noah was born to a dedicated life, as is testified by his name, which is derived from the Hebrew verb signifying to comfort. The Book of Enoch, with its emphasis on his unusual appearance at birth, merely builds up a supernatural background to a worldly mission.

A Reconstructed Fragment

A totally different possibility is suggested by the deciphered fragment of Column II of a particularly badly preserved scroll from the Dead Sea caves (Qumran I), brilliantly identified by N. Avigad and Y. Yadin as a Genesis Apocryphon, and not the lost Book of Lamech as was first supposed. Their reconstruction of this fragment shows Lamech's preoccupation with his wife's faithfulness—a reaction noted repeatedly all through the ages in the literature on the birth of abnormal children to normal parents. It is only when Lamech is assured by his wife with considerable verbal emphasis that the unusual child is indeed his that he hastens to his father, Methuselah, and his grandfather, Enoch (who sojourns with the angels), to obtain a more complete explanation of an exceptional event.⁶

1. Then I thought in my heart that the conception had been from the Watchers and the ... from the holy ones or [?] the fallen angels.

2. And my heart was changed because of this child.

3. Then I, Lamech, was frightened and I came to BT'NWS, my wife, and [I said] ...

4. "[... Swear to me] by the Most High, the Lord of greatness, King of all worlds ..."

5. Sons of Heaven till thou tellest me all in truth if ...

6. [In truth?] Tell me without lies ...

7. By the King of all worlds till thou speakest with me in truth and with no lies ...

8. Then BT'NWS, my wife, spoke to me with vigour and with ...

9. And she said, "O my brother and O my lord, remember my pleasure ..."

10. the period, and my spirit into the midst of its sheath and I in truth all ...

11. And my heart then had changed within me greatly.

12. When BT'NWS, my wife, perceived that my countenance had changed ...

13. Then she suppressed her wrath and spoke to me and said, "O my lord and O my [brother] ..."

14. My pleasure, I swear to thee by the great Holy One, the King of H[eaven?] ...

15. that thine is this seed and from thee is this conception and from thee was the fruit formed ...

16. And it is no stranger's, nor is it of any of the Watchers or of the Sons of Heaven ... [What]

17. has so altered and blemished thy countenance and [why] is thy spirit so low? ...

18. In truth I speak with thee."

19. Then I, Lamech, hastened to Methuselah, my father, and I [told him] all ...

20. his father and he would of a surety learn all from him, for he was the beloved and [... with angels]

21. his lot was apportioned and to him they tell all. And when Methuselah heard ...

22. to Enoch, his father, to learn all in truth from him.

23. his will. And he went to ... and found him there ...

24. And he said to Enoch, his father, "O my father and O my lord, to whom I ..."

25. ... And I shall tell thee that thou shouldst not be angered that I have come hither ...

26. Fear ...

In the light of this fragment the account of Noah's appearance at birth, as given in the Book of Enoch, is clearly not that of a miraculous child but of an albino.

A body white as snow, hair white as wool, and eyes that are like the rays of the sun—these are the unequivocal physical features to be considered once the laudatory commendations are disregarded.

Origin of Noah's Albinism

The fragment also allows some conclusions on the mode of inheritance of Noah's albinism. On the strength of line 9, and their reconstruction of the last word in line 13, Avigad and Yadin hold that BT'NWS, Lamech's wife, was also his sister. If this were so—and such relationship was not particularly unusual in primitive societies—Noah becomes the offspring of an extreme type of consanguineous marriage, and his albinism would illustrate not only the antiquity of the affection, but also the fact that the first recorded case showed parental consanguinity. On this reading, Methuselah can now claim the additional distinction of being the first authenticated carrier of albinism—unless the distinction belongs to his anonymous wife (Fig. 1). Avigad and Yadin, however, point out that their reading is contradicted by the one other extant reference to Lamech's wife.⁷

The Book of Jubilees, iv, 28, refers to her as "Betenos the daughter of Baraki'il, the daughter of his [Lamech's] father's brother (or father's sister)." This would seem to show Lamech and his wife as first cousins—the common type of consanguinity in albinism—and would exclude Methuselah's wife as a carrier (Fig. 2). On either reading the consanguineous origin of Noah's albinism is beyond question. BT'NWS and Lamech not only produced Noah but also made genetic history. They deserve better than the oblivion that shrouds them.

The possibility that Noah inherited his albinism from a fallen angel need not be considered seriously. Such a supposition raises considerable genetic difficulties. One would have to postulate that BT'NWS and the angel were unrelated carriers of the gene at a time when it could not have been widely scattered, or, again, alternatively, and even less plausibly, that albinism in angels is

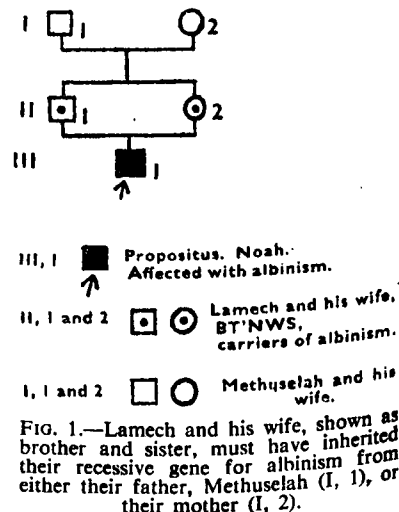


FIG. 1.—Lamech and his wife, shown as brother and sister, must have inherited their recessive gene for albinism from either their father, Methuselah (I, 1), or their mother (I, 2).

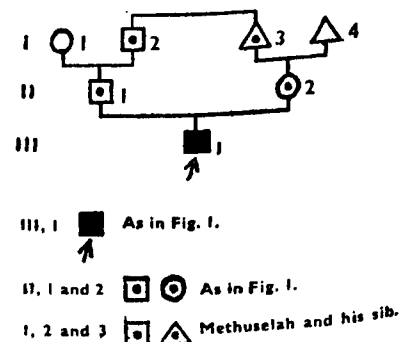


FIG. 2.—Lamech and his wife are shown as first cousins. Lamech must have inherited his recessive gene from his father, Methuselah, whilst BT'NWS inherited it from one of her parents, who is recorded as a sib of Methuselah.

dominant and not recessive as in man. Besides, it is not at all certain that albinism occurs in angels, other than seraphim. And clearly fallen angels are no seraphim.

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HOSPITAL STERILIZATION
CONFERENCE AT SOUTHAMPTON

[FROM A SPECIAL CORRESPONDENT]

On December 17 the South-west Metropolitan Regional Hospital Board held a conference on "Hospital Sterilization" at Southampton University. It was attended by over 300 representatives of the medical, nursing, engineering, and administrative staffs of the hospitals in the region and by members of hospital management committees.

Opening the conference, Dr. J. REVANS, the Board's deputy S.A.M.O., said they had with them Brigadier J. D. WELCH, the leader of the Nuffield team whose report on sterilization practice in six hospitals* was about to be published, and he would give them a first-hand account of the results of this investigation. The audience would well appreciate the importance of the subject in view of the recent outbreaks of post-operative wound sepsis in the area due to both staphylococcus phage type 80 and *Clostridium tetani*.

Nuffield Investigation

Brigadier WELCH said that, when the Nuffield Provincial Hospitals Trust's operational research team started its investigation they decided to carry it out in three phases. The first was to look into present methods of sterilizing in hospitals. The second was to investigate the working of central sterile supply services on the Continent and in the U.S.A. The last phase would entail experimental trial of a central service in selected hospitals in this country. So far they had completed only the first phase, which was what he would discuss.

Six fairly typical hospitals had been chosen—a London teaching hospital, three large provincial general hospitals, and two cottage hospitals. The team had studied nurses at their sterilization tasks, making time studies and taking swabs for culture from all sterile equipment, instruments, dressings, etc. They had also studied conditions in ward sterilizing and sluice rooms, and had examined ward sterilizers, the storage of dressings, and the conditions of drums. A fairly intensive study had also been made of existing hospital autoclaves, their functioning and siting, and the people who operated them. The results of their investigations disclosed a disturbing situation, which Brigadier Welch illustrated by means of a film. It showed how haphazard were many of the methods of timing the boiling of instruments. The results of swabbing showed that 18% of all ward equipment, and 12% of all theatre equipment, was contaminated, figures which, he said, were fairly typical.

Autoclaving Technique Condemned

Autoclave departments were singled out for particularly heavy attack, not only by Brigadier Welch but also by all the subsequent medical speakers. They all stressed that immediate action was needed to correct this most unsatisfactory state of affairs. Much was due to the total lack of training of the autoclave operators, who were usually porters with other hospital jobs, most of whom had little idea of to whom they were responsible.

*Present Sterilizing Practice in Six Hospitals, 1958, Nuffield Provincial Hospitals Trust. See also p. 1582 of this issue.

Brigadier Welch suggested the following short-term remedies that could be adopted immediately by hospitals at relatively low cost: (1) Improvement in the working of autoclaves. (2) Substitution of, say, steam-sterilized cardboard boxes for the present "iniquitous" hospital drums. (3) The introduction of central syringe sterilizing services. (4) Raising the standards of dressing techniques in the wards. (5) Better methods for the disposal of soiled linen and dressings. (6) The clear definition of responsibility in all sterilizing duties, particularly autoclaving.

Professor J. W. HOWIE (Glasgow), speaking on steam sterilization, discussed how a good autoclave should work. He preferred to discard the name "autoclave" and refer to the machines as high-pressure steam sterilizers. He called ward sterilizers "boilers," since they were not sterilizers: boiling did not totally destroy all forms of bacterial life, which was what sterilization meant. This could be accomplished only by exposing bacteria in dressings and instruments (both cutting and otherwise and including endoscopic instruments suitably protected) to dry steam or high-temperature steam under pressure. Provided this steam was at the high "phase boundary" temperature at which the change from water to steam occurred latent heat would be given out, and it was this which killed the bacteria. This vital fact was not generally appreciated. It was of the greatest importance that whoever was responsible for an autoclave should know the temperature reached in the chamber of the sterilizer. This information, which must be entered on the pressure-recording chart, was essential in order to assess whether the contents had been sterilized or not. Human errors were as much to blame for inefficient sterilization as mechanical, and modern over-reliance on antibiotics had led to a dangerous relaxation of standards.

The "Iniquitous" Drum

Professor C. A. WELLS (Liverpool), himself a surgeon, said that in the last few years surgeons had allowed themselves to become too complacent about post-operative sepsis. In any outbreak of sepsis responsibility should rest fair and square on the shoulders of the surgeons, who had been lulled into a sense of false security by the bacteriologists. Professor Wells then showed a film to illustrate faulty techniques in the wards, in autoclaving, and in the maintenance and storage of drums. He suggested the establishment of special "pre-operative wards," and supported Brigadier Welch's plea for the replacement of the "iniquitous" drum by the cardboard boxes, which would stand steam sterilization under pressure at temperatures high enough to kill any spores of *Cl. tetani*. The cardboard boxes could be used as an interim measure until the introduction of special individual packs.

Another Horrifying Survey

In the afternoon Dr. E. M. DARMADY described the control and supervision of hospital sterilization carried out to-day in hospitals in the Portsmouth area. He illustrated his talk with some excellent slides of the many horrifying conditions found in present-day sterilizing practice, even in hospitals with good nursing standards.

A team consisting of a doctor, a bacteriologist, and a senior bacteriological technician under Dr. Darmady's supervision had carried out a survey similar in type to the Nuffield investigation. This team had focused its attention on ward sterilization techniques and the conditions under which nursing staff were expected to perform their sterilizing and dressing duties. These conditions were both unfair to the nurses and dangerous: 20% of swabs from Cheatle's forceps were contaminated, 17% from syringes, 21% from instruments, 36% from bowls, gallipots, receivers, etc., and 24% from the contents of drums. Ward boilers were quite unable to sterilize efficiently, and this had been neatly demonstrated by attaching thermocouples to the instruments being boiled. Equally ineffective were the so-called antiseptic solutions used for cutting instruments. The proper cleaning of instruments by scrubbing them with soap and water before sterilization was important.

Ward Dressing Techniques

Ward dressing techniques in the different hospitals had also been studied, and in some they were antiquated and dangerous. Sometimes trolleys were laid out for as many as 15 consecutive dressings, a nurse merely covering them between dressings with a sterile towel from a dressing bowl on the trolley. Used dressings might be placed in uncovered bowls on the lower shelf of the trolley, remaining uncovered till the end of a long dressing round. A very high proportion of bed-pans had shown heavy contamination with faecal organisms after so-called cleaning either by hand or in standard bed-pan sterilizers.

Answering questions from surgeons on the sterilization of cutting instruments, Dr. Darmady said that exposure to steam at 190° C. for 1½ minutes would not blunt their edges. In a series of tests on "antiseptic" lotions used for storing such instruments all the solutions had grown *Cl. tetani* freely.

Mr. E. H. HURST, group secretary of the Portsmouth Hospitals, then gave the lay administrator's point of view. He said the "hidden costs" of the present methods of sterilization were enormous and not fully appreciated. They included the cost of maintaining and repairing ward boilers, apart from their high fuel consumption, and the large number of man-hours spent in operating and maintaining a series of autoclaves sited in different parts of a hospital. The only way for lay committees to deal with the problem was to take a lesson from industry and tackle it along the lines of work-study investigations. He agreed that the training and employment of autoclave attendants needed thorough revision. The present very low wage rates should also be reviewed so as to attract men of an altogether higher standard of intelligence.

A Matron's View

The last speaker was Miss DE LA COURT, matron of the Queen Alexandra Hospital, Portsmouth. She said that this was the first time in her 21 years as a matron she had attended a really tripartite discussion on the subject of sterilization. After hearing of some of the horrifying conditions still existing to-day, it seemed to her that we had gone back to the days before Florence Nightingale. One reason for the slackening in standards was the different teaching of nurses in different hospitals. One fact might be taught in the nursing schools and another on the wards. There was need for a uniform standard of teaching throughout the country. Regular "procedure" meetings, as at her own hospital, between matron, sisters, and staff nurses were helpful. Written reports of the meetings were circulated to all nursing staff and pinned up in sterilizing rooms.

Unfortunately there was no time for a general discussion. The conference was summed up by Mr. N. F. ADENEY (Bournemouth) and Dr. J. DOCKRAY (Isle of Wight).

Reports of Societies

HEBERDEN ORATION

PATHOGENESIS OF RHEUMATOID ARTHRITIS

This year's Heberden Oration was given by Professor CHARLES RAGAN, professor of medicine at Columbia University, New York, at the annual meeting of the Heberden Society on December 5. His theme was the role of hypersensitivity in the pathogenesis of rheumatoid arthritis.

Dr. Ragan recalled that four main theories had been advanced to explain rheumatoid arthritis. These were infection and focal sepsis; metabolic abnormality; endocrine abnormality; and hypersensitivity. His own working hypothesis of the pathology of rheumatoid arthritis was that it was primarily a vasculitis. In this context the theory of hypersensitivity was attractive, and the existence of the

rheumatoid factor—which was a gamma globulin and which might be described as "an antibody to an antibody when the latter exists as an antigen-antibody complex"—made the theory more tenable. However, there were a number of difficulties.

There was no animal in which induced hypersensitivity could lead to sustained arthritis and vasculitis. The presence of vasculitis did not necessarily imply hypersensitivity, since Rickettsiae and even viruses could produce a widespread change of this type. All connective-tissue constituents so far tried had failed to produce anything resembling rheumatoid arthritis when injected into animals, even when adjuvants were used. Transfusion of the rheumatoid factor in volunteers did not produce disease, and patients with agammaglobulinaemia could get something that looked like rheumatoid arthritis.

If the rheumatoid factor were an antibody it was species non-specific. However, so were the thyroid antibodies described in recent years in connexion with thyroiditis. One of the biggest difficulties was that about 5% of the population of temperate countries showed a positive test for the rheumatoid factor without having rheumatoid arthritis, and many patients with the disease did not have the rheumatoid factor. In a recent incomplete survey of the native population of Liberia by Columbia University, no example of rheumatoid arthritis was found. Nevertheless 15% of the subjects showed a positive reaction for the rheumatoid factor as measured by the FII tanned sheep-cell agglutination reaction. In contrast the frequency of rheumatoid arthritis in the negro population in the United States was similar to that seen in the white population. Nevertheless, until the possible pathogenic role of the rheumatoid factor was thoroughly and completely disproved, it provided the only support for the implication of hypersensitivity in the pathogenesis of rheumatoid arthritis. If its role were disproved we faced a long, hard struggle which could be solved in the foreseeable future only with great luck and a dash of serendipity.

TUMOURS IN CHILDHOOD

Basing his remarks on the first five years' experience of the Manchester Children's Tumour Registry, Dr. J. K. STEWARD addressed the Manchester Medical Society (Section of Surgery), on November 11, on "Tumours in Childhood." Thanks to the reduction in frequency and seriousness of bacterial infections in children, tumours were now, he said, the second commonest cause of death between the ages of 1 to 15 years.

Since September, 1953, the Manchester Children's Tumour Registry had been collecting information about children in the North-west Hospital Region suffering from tumours. During this period they had registered 460 cases, representing 90% of the children certified as having died from tumours. Analysis showed that about one-third of the tumours were derived from the reticulo-endothelial system and another third from the nervous system. The overall mortality was at least 70%.

Sixty per cent. of the children were in hospital within two months of the start of their illness. On average a general practitioner saw a child with a tumour only once in 20 years, so earlier reference to hospital was unlikely to be possible. After admission any delay in diagnosis was very rare. He thought, therefore, that earlier diagnosis could probably contribute very little improvement to the results of treatment. Among the reasons why so many of the children were beyond hope of a cure when their condition was first diagnosed was that 84% of the fatal cases had either reticulo-endothelial or intracranial tumours, or tumours arising in the posterior abdominal wall. The poor prognosis of reticulo-endothelial tumours affected patients of all ages and was not just a problem of childhood. Of the intracranial tumours about half arose in, or involved, the brain stem or the third ventricle. Tumours of the posterior abdominal wall needed to attain a very large size

(Continued at foot of next page)

To-day's Drugs

With the help of expert contributors we publish below notes on a selection of drugs in current use.

Prednelan-N Injection (Glaxo).—1 ml. of this sterile suspension contains 25 mg. of prednisolone acetate and 5 mg. of neomycin sulphate. Because of its local anti-inflammatory action it is intended as an intra-articular injection in cases of rheumatoid arthritis, traumatic arthritis, osteoarthritis, and other similar conditions; the dose varies according to the size of the joint injected. The neomycin is added as a safeguard against infection, but the writer's preference is to maintain a strict sterile regime rather than to inject an antibiotic into a joint prophylactically.

N.H.S. basic price: six 1-ml. ampoules, 36s.

Mycifradin Tablets (Upjohn).

Neomin Tablets (Glaxo).

Nivemycin Tablets (Boots).

These are tablets of neomycin sulphate. When this antibiotic is given by the mouth little is absorbed, and it is in fact the most efficient of all intestinal antiseptics. It is superior to streptomycin, which can be administered by this route with similar results, in its "broad spectrum," its greater activity against certain bacteria (notably staphylococci and *Proteus*, but not streptococci), and in that bacterial resistance to it is rare, not readily acquired, and unaccompanied by sensitizing capacity and the fact that it is rarely given systemically are other advantages. It is chiefly used for suppressing the intestinal flora before operation on the colon. Two days' treatment is usually ample, and a daily total dose of 3 g. has been found satisfactory when measures are also taken to reduce the bulk and solidity of the bowel contents. Neomycin has also been given for much longer periods to patients with liver failure, in which benefit results from diminished formation of ammonia in the bowel. It can be used for the treatment of acute infections of the intestinal tract (*Shigella*, *Salmonella*, or, in infants, pathogenic *Escherichia coli*), though it is difficult to assess the relative merits of this and other antibiotics for these purposes.

N.H.S. basic price: mycifradin, 20 tabs. 0.5 g., 65s.; neomin, 20 tabs. 350 mg., 67s. 6d.; nivemycin, 20 tabs. 0.5 g., 65s.

Correction.—A note on "marcoumar" and "marevan" (December 13, p. 1471) described these anticoagulants as preparations of warfarin sodium. Marevan is, but marcoumar is not, though both are coumarin derivatives. We regret the error. Some of the details given in the note, and in particular dosage, are incorrect for marcoumar, whose dosage is much lower. It will be the subject of a note in this column at a future date.

(Continued from preceding page)

before they caused symptoms. The main reasons for the high mortality for tumours in childhood were therefore, it seemed, because they were reticulo-endothelial in origin or else arose in a situation where removal was impossible or where symptoms occurred late.

If surgery and irradiation were the only possible forms of treatment, the future for these patients would be very poor. However, the increasing success of chemotherapy in leukaemia was very encouraging. The fact that on rare occasions some tumours in children might regress spontaneously suggested that there was a natural resistance to their growth. Dr. Steward demonstrated a retinoblastoma which had regressed in this way.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Carbon-monoxide Poisoning

SIR.—Carbon-monoxide poisoning is very important because it is so common. Nine people die of it, on average, every day in England and Wales and there are many more non-fatal cases. In 1957 carbon-monoxide deaths totalled 3,409¹—nearly three times as many as caused by all other kinds of poisoning combined. For every three deaths from road traffic accidents, which cause such public concern, there were two deaths from carbon monoxide.

The proper treatment of this condition is obviously a matter of great importance. For many years it has been accepted as being the inhalation of 7% carbon dioxide in oxygen (carbogen) which very greatly increases pulmonary ventilation and speeds clearance of carbon monoxide from the blood. It has long been recognized that the main life-saving application of this treatment is by first-aid workers, because severely poisoned patients will die, or be beyond recovery, by the time they get to hospital if carbogen treatment is not started by those who first reach them. Unfortunately, in this country carbogen was removed from ambulances and first-aid services several years ago on direction, privately circulated to authorities, of the Breathing Apparatus Committee of the Medical Research Council. The medical profession as a whole was not informed by publication in the medical press till four years later.² The official advice was then challenged.³ Now, after nearly four more years, the Council has just issued a statement (*Journal*, December 6, p. 1408) reversing its former advice and advocating restoration of carbogen.

The Council's statement does not set forth the evidence which has caused this change of mind. This is a serious omission, because restoration of 7% carbogen is not advised and it is said: "In the light of present knowledge the subcommittee do not consider that there is anything to be gained by the use of higher percentages [than 5%] of carbon dioxide in oxygen." It might seem that the difference between using 5% and 7% carbogen is unimportant. *In fact, it is a matter of very great consequence, because saving of life may be reduced to about one-third of what it might be.*

When carbogen first displaced oxygen, nearly 40 years ago, as the accepted treatment of carbon-monoxide poisoning, it was used in 5% strength. Later, it was found that 7% produced very much more vigorous breathing and should therefore be considerably more effective, because the speed of elimination of carbon monoxide is related to the pulmonary ventilation. It was shown that the curve of increased breathing in response to inhalation of carbogen mixtures of increasing strength in unpoisoned individuals rose gently up to 5% (the amount of carbon dioxide normally present in the lungs) and then very steeply from 5 to 7%. In these normal subjects 7% carbogen doubled or trebled the pulmonary ventilation produced by 5% carbogen and caused the volume of respiration to increase to about seven times the amount when air or oxygen alone was breathed.^{4,5} These findings needed confirmation in patients poisoned by carbon monoxide in case the poisoning should produce some radical alteration in response. The emergency conditions of very severe poisoning in human beings precluded strictly comparable experimental studies, but survival was regarded as being perhaps the ultimate criterion. A large-scale practical trial was carried out in New York⁶ by specially trained resuscitation crews over a period of eight years, during which 7,845 poisoned patients were treated. In the three years 1926 to 1928, 5% carbogen was used in treating 2,854 patients, and there were 234 deaths (82 per 1,000). In the next five years 7% carbogen was used for 4,991 patients, and 156 deaths occurred (31 per 1,000)—i.e., the deaths were reduced to almost one-third of what they would have been had 5% continued to be used. For the last quarter of a century 7% carbogen has been used in treating a very large number of patients all over the world.

The Council surely should not advise 5% carbogen unless it can quote evidence adequate to refute the New York experience. It is therefore pertinent to ask for the results of whatever experiments were done to compare the efficacy of 5 and 7% carbogen. If the Council still persists in giving advice contrary to accepted opinion, then, I submit with respect, the responsibility lies upon it to produce irrefutable evidence to support its attitude. It would not so much matter if its statement was just an expression of opinion, but it will be taken as *official direction* on which executive authorities will act all over Britain.

It would seem possible that the Council has not yet fully rid itself of the fear that carbogen may cause carbon-dioxide poisoning in cases of carbon-monoxide poisoning "in respiratory failure." This alleged danger was stressed in the Breathing Apparatus Committee's report,² but it was merely presumed from theoretical considerations and no direct factual evidence was presented. Now that some practical research has been done, the Council's statement admits that respiratory failure either never occurs in carbon-monoxide poisoning or is so rare and so brief as to have only academic significance. Most forms of asphyxia, other than carbon-monoxide poisoning, are accompanied not only by oxygen lack but also by obstruction to carbon-dioxide excretion, and in them, as the Committee rightly stated, oxygen alone should be used. This is not in dispute. But carbon-monoxide poisoning is a special, though very important, type of hypoxia in which there is massive bar to oxygen uptake but little or no interference with carbon-dioxide output.

7% carbogen causes very great increase in breathing within a few seconds of inhalation. Its speed of action is most urgently needed in severe cases because they are very near to dying from damage to vital organs by extreme oxygen deprivation. Fortunately, carbogen administration is simple for first-aid workers to carry out anywhere, given suitable portable apparatus, and easy to maintain in the confined space of an ambulance or mine. The increased pulmonary ventilation which 7% carbogen produces is very much greater than can be achieved by manual artificial respiration, though this may sometimes be needed to start carbogen inhalation in dying patients or in attempting to revive those who seem dead. First-aid workers need instruction in the use of carbogen and require particularly to be taught that its administration must be started instantly. They also need to be impressed that patients poisoned with carbon monoxide look *deceptively well*; they have a good colour and quiet breathing and may seem no more than confused, stuporose, or sleeping. Nevertheless, they need immediate carbogen treatment.

I am sorry, Sir, once more to write about this matter, and only do so because I firmly believe that many needless deaths will continue to occur if 7% carbogen is not restored. Medical officers who have the duty of determining the equipment of ambulances and other first-aid services might well weigh carefully their responsibility before they issue orders to re-equip with 5% carbogen instead of 7%. They and the rest of the medical profession should have the opportunity of examining evidence when official direction is contrary to generally accepted opinion.—I am, etc.,

London, W.1.

H. L. MARRIOTT.

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- ⁵ Heller, E., Killiches, W., and Drinker, C. K., *J. Industr. Hyg.*, 1929, 11, 293.
- ⁶ Drinker, C. K., *Carbon Monoxide Asphyxia*, 1938, p. 188. New York.

SIR,—The statement by the Medical Research Council and your annotation (*Journal*, December 6, pp. 1400 and 1408) on the use of carbon-dioxide-oxygen mixture in carbon-monoxide poisoning are interesting and of value in the first-aid treatment of gassing cases, but are lacking in practical guidance to those concerned in providing first-aid services.

It is all very well for the Medical Research Council to repeat that "it should not in practice be difficult for

first-aid workers to distinguish between these two groups of patients," when deciding whether the mixture or pure oxygen is the correct treatment, but what is implied is that the first-aid workers will have both carbon-dioxide-oxygen mixture and pure oxygen with them at the time. This means duplicating the resuscitation sets and cylinders.

The practice of carrying cylinders of the mixture in ambulances was discontinued and oxygen was substituted on the last recommendation of the M.R.C. on this subject, and in industry the same procedure was carried out. Have the ambulance services and industry now to carry both? This would mean a great increase in expenditure initially, and in maintenance, and is this really justified when the M.R.C. report states that "the differences in practice between the effectiveness of the two methods of treatment are almost certainly small"? Could we not have a more practical authoritative statement on this subject—as to whether first-aid services should have the added expense and upkeep of maintaining two types of resuscitation equipment, or whether, taking all factors into account, oxygen alone is not sufficient?—I am, etc.,

Sheffield, 10.

JAMES GREGORY.

Afibrinogenaemia after Transfusion

SIR,—Mr. James M. Moore's paper in your issue of November 15 (p. 1201) is doubtless of much value to those concerned with blood disorders. I would like to know why a young woman of 25, apparently in good condition, needed two pints (1.1 l.) of blood during and after a planned gastrectomy? Mr. Moore says her condition was good after the operation and that there was little blood lost—as one would expect. Why, then, transfuse her? Will Mr. Moore please tell us?—I am, etc.,

Worcester Park, Surrey.

H. J. FRIEND.

SIR,—I was particularly interested in the account of a fatal case of uncontrollable post-operative haemorrhage after incompatible transfusion by Mr. James M. Moore, which appeared in the *Journal* of November 15 (p. 1201). Some years ago I was concerned in an investigation into three similar deaths. All three followed major thoracic surgery. All three had been transfused with many pints of stored citrated blood over a short period of time—i.e., 3–4 hours. All three had a clotting defect, and in all three the type of haemorrhage was identical with that described—namely, a general oozing over the whole area of trauma. None of the three cases received any incompatible blood and none received any dextran. At the time of this investigation I made the tentative suggestion that future cases of uncontrolled concealed haemorrhage might be transfused with fresh heparinized blood, the advantage of heparin over citrate being that it can be neutralized *in vivo* if necessary.

I have reason to believe that this regime was adopted with considerable success by one of the leading teaching hospitals. I myself have only had the opportunity of observing the effects of such treatment on one case. This was a young man aged 28 who was admitted to hospital after a severe melaena. He was transfused with many pints of stored citrated blood over a period of about a week, but continued to bleed. After two pints (1.1 l.) of fresh heparinized blood the haemorrhage ceased and he was eventually brought successfully to operation. At operation he was found to have a large carcinomatous growth in the stomach which eventually killed him.

In Mr. Moore's case the operation was completed at 12 noon. During operation one pint (0.6 l.) of blood was transfused. "The patient's condition was good immediately after operation which had not been associated with significant loss of blood." A second bottle of blood was started at 12.30 p.m. I think it is generally agreed that if a patient requires only one pint of blood, then blood is not essential. One must therefore ask the question, Why any blood at all in this case and why a second bottle? Has not the time arrived when the medical profession generally should give serious consideration to the extravagant use of blood with all its concomitant risks in general surgery? Am I old-fashioned in suggesting that blood should only be transfused when it is essential to save life?

Although it was right and proper, it is particularly unfortunate in this case that it was necessary to draw attention to the somewhat doubtful evidence that dextran can produce a haemostatic defect, for it would appear that this was the ideal type of case where a little dextran would have been adequate to maintain this patient's condition. The dextran administered to this patient could have played no part in the result, since the coagulation defect was known to be present before it had been transfused. Furthermore, although some interaction between dextran and fibrinogen has been demonstrated *in vitro* at very low temperatures, this has never been shown to occur at body temperature or *in vivo*. If my memory does not play me false I believe it is correct to state that the only haemostatic defect which has been found in patients transfused with dextran has been a prolongation of the bleeding time, the cause of which was obscure. A number of such cases concerned volunteers with a normal blood volume who were transfused with 0.5 to 1 litre of dextran. It will be understood, therefore, that following transfusion the cardiovascular system of these volunteers was considerably overloaded. Such cases therefore bear no true relationship to cases transfused with dextran in order to combat hypovolaemic shock.

Dextran has now been used with success for the treatment of many thousands of cases of hypovolaemic shock either alone or in combination with blood. For this purpose it has proved itself to be a cheap, reliable, and very valuable therapeutic agent which is free from the many dangers associated with blood and plasma. It is suggested therefore that dextran could replace a great deal of the blood used to-day with benefit to all concerned.—I am, etc.,

London, N.W.3.

S. G. RAINSFORD,
Late Director of the Royal Naval
Blood Transfusion Service.

B.M.A. Clinical Meeting

SIR,—The perhaps faintly apologetic tone of the first paragraph of your leading article in the *Journal* of December 13 (p. 1457), commenting on the inaugural Annual Clinical Meeting of the Association, I confess disturbs me. From it I am to gather that, "not insensitive" to the critic who says that "an organization costing a quarter of a million pounds a year" is "spending too much of its energy on getting more money for doctors," those responsible for the conduct of B.M.A. affairs have, as a kind of partial answer, instituted this purely scientific and clinical meeting. It is doubtless purely lack of space which prohibited you, having once raised this question, from administering the full and final real answer to any such critic, which is historical.

Forty years ago the B.M.A. was urging better facilities for treatment, particularly for the poor. The Government's Dawson Report¹ (1920) resulted, abortive as regards any implementation. In 1930 the Association produced its *Proposals for a General Medical Service for the Nation*,² revised for a second edition in 1938: and then came the Beveridge Report³ (1942) and the Act of 1946.⁴

Now, Sir, as one privileged to be present at every debate by the Representative Body on all these Government or B.M.A. schemes from the first-mentioned to the last, I wish to emphasize that it was an outstanding and striking feature that all these annual debates confined themselves entirely to matters of fundamental principles in the endeavours to formulate schemes in the public interest which at the same time could, on broad principle, be acceptable to the profession: indeed, none of the above documents discuss remuneration except perhaps to say that arrangements would have to be made.

This feature of the Representative Body debates ever commanded my own admiration, though it was much criticized at our periphery. It was only when, faced with revolutionary governmental proposals, the profession at last reached the stage demanding public negotiation of remuneration for all that was to be required of it that Spens, in two main reports,^{5,6} hit the headlines in a matter of deep national concern. Hence, Sir, the unwonted prominence of the money questions to-day; and hence also the critics whom you cite, nearly all of them ignorant of

the Association's true record of quiet background energy expended in these matters for forty years, a record which, in fairness, cannot be too widely stressed.—I am, etc.,

Newquay, Cornwall.

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Inorganic Arsenic

SIR,—On several recent occasions I have seen and heard about arsenical keratoses, pigmentation, and multiple epitheliomata in adult patients. On inquiry, I am informed that in two recently observed cases the patients (both women) had received medicine containing arsenic over a period of time many years ago and that it is now known that arsenic, very gradually and perhaps after an interval of many years, may cause the epithelial disease noted. In fact, the content of the arsenic is greater in those sites in which superficial epitheliomata occur than in other parts of the skin.¹ In conversation I was informed that arsenic is still sometimes recommended as a dermatological remedy.

Is there, in fact, any evidence of even the slightest value in inorganic arsenic medication? I was somewhat alarmed to see in *The Extra Pharmacopoeia*, 1958, that there are still four preparations containing inorganic arsenic, and even in the *British National Formulary*, 1957, it says (p. 116):

"When Mist. Ferr. Arsen. is prescribed, Mist. Ferr. et Ammon. Cit. containing Arsenical Solution, 3 m. in each 1/2 fl. oz., shall be dispensed."

In view of the possibilities of remote dermatological disease of a serious nature arising from arsenic, given perhaps many years before, would it be wise to reconsider most carefully whether inorganic arsenic should be abolished from the *Pharmacopoeia*?—I am, etc.,

Department of Child Health,
University of Bristol.

A. V. NEALE.

REFERENCE

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Cancer Survival Rates

SIR,—I would like to draw attention to the situation that has arisen from the practice among some writers of attempting to correct the "crude survival rates" in ordinary use, by making use of the probability that some of those who died before the expiration of say "x" years died from some other cause than cancer. Dr. Percy Stocks¹ suggested that the factor p_0 based on vital statistics and introduced by Berkson in 1942 could be applied to the data in question. The application of this factor can result in the anomalous conclusion that a 10-year survival rate can exceed its associated 5-year rate.^{1,2} This seems devoid of common sense.

This is a matter of serious concern. Some of the hospital boards prepare annual reports about the results of cancer treatment, others are preparing to follow suit. The need for a method of presenting results in a manner free of anomaly is a real one. It is significant that the W.H.O. figures published periodically are expressed in "crude survival rates." Those coming from Radium Hemmet, Stockholm, are in the same form. It may be that there is a more essentially true form of rendering the data than this, but until it has been tested and agreed upon it is not desirable to continue with the crude rates?—I am, etc.,

Bognor Regis

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SIDNEY RUSS.

Antibiotics in Acute Tonsillitis and Otitis Media

SIR,—In the recent correspondence about the treatment of otitis media initiated by Dr. John Fry's most valuable article (*Journal*, October 11, p. 883) I have seen no mention of myringotomy, and wonder whether this has now been completely discarded. Recurrence of otitis media in cases which I had thought adequately treated with antibiotics led me this year to do a myringotomy as well in all but the mildest cases, and, although one can hardly judge the value of it yet, I find a definite note of "pus present" in 10 cases out of 27 and "thin fluid" in another two. Previously I should have treated all these patients with antibiotics alone, and can well picture the formation of a jelly-like mass as described by Dr. Peter A. Walford (*Journal*, November 29, p. 1353). After reading his letter I am all the more doubtful of using antibiotics in this condition unless a perforation is present, whether natural or artificial.—I am, etc.,

Hereford.

A. F. STALLARD.

Decline of Pertussis

SIR,—Professor A. D. Gardner's letter in your issue of September 13 (p. 688) headed "The Decline of Pertussis" has interested me. After being in general practice in England for many years, I have worked in Tanganyika for the last 1½ years as a Mission doctor in an up-country station. I have compared the incidence of whooping-cough in these two places. Here whooping-cough appears to be the most frequent of the infectious diseases of childhood, with a seasonal prevalence from September to December. It occurs most frequently between ages 2 to 6. In addition to its prevalence, its severity is very noticeable and is in great contrast to my experience of it in England. The attacks of whooping are very distressing to witness, the spasms so prolonged before ending in vomiting. The children have generally been ill many days before being brought to hospital. Fatality has occurred only amongst the younger children, but the incidence of resulting morbidity must be high in patients of all ages.

Up to the present no preventive inoculation has been used here. However, I have recently started inoculating a few children and hope to extend this work. Expense is restricting, but the belief which I share with your correspondent that inoculation is so worth while is encouraging.—I am, etc.,

Handeni, Tanganyika.

JESSIE E. PRINGLE.

Medicine on Television

SIR,—Everybody will agree with your correspondent Professor Roger Warwick (*Journal*, November 29, p. 1354), that medicine should not be turned into a "peepshow," but, judging from Mr. Dickson Wright's remarks at the meeting, it would seem that he lives in the world of fifty years ago. Surely the first thing to decide is what is the objective to be aimed at by bringing medicine before the public, by means of television, radio, lectures, newspaper articles, etc.? I suggest that the prime object should be to get rid of or at least diminish fear of disease.

To do this, all drama must be taken out of medical displays and talks. The slightest suggestion of the dramatic builds up the idea of "crisis," which leads to fear. In the old days the public had greater faith in their doctor, and to be told that there "was nothing to worry about" was sufficient. The days of the "High Priest" are gone, and to-day it is necessary to use a different technique—namely, to appeal to the common sense of the patient. Too many family doctors treat their patients as idiots. I realized this after lectures to the public (84 this year so far), when in conversation with members of the audience. For example, on more than one occasion it has been said, "I could not possibly talk to my doctor about cancer. I hate being laughed at." Many people have spoken in praise of the television series *Your Life in Their Hands*. There is much

still to be learnt about the best way of "putting it across" by these various publicity methods, and Dr. C. M. Fletcher is undoubtedly right in advocating more scientific surveys of the results.—I am, etc.,

MALCOLM DONALDSON,
Hon. Secretary,
Cancer Information Association.

Oxford.

Chlorothiazide in Epilepsy

SIR,—The clinical effects of "diamox" (acetazolamide) and "saluric" (chlorothiazide) on sodium and water metabolism seem to have some similarities. In addition the former has been found useful in the treatment of idiopathic epilepsy. In the hope that chlorothiazide might also be beneficial in control of idiopathic epilepsy, we tried this drug in six female patients suffering from this disorder.

Out of a ward of 50 epileptics, six patients who satisfied the criteria of suffering from chronic idiopathic epilepsy without any other disorder were selected. The average age of patients was 48 years and the average duration of hospitalization was 12 years. In three of them the main problem was frequency of fits (average of three fits a week) and in the other three it was the marked disturbance of behaviour (e.g., impulsiveness, constant quarrelling, physical violence, destruction of property, etc.). All had been tried on the well-known anticonvulsant drugs without much beneficial effect. During the trial these drugs and the patient's environment were unchanged. Each patient was given 500 mg. of chlorothiazide orally each morning, four mornings a week. Record of patients' behaviour and fits was charted on a specially designed item sheet consisting of 30 items, by the same observer throughout. After a trial of eight weeks no patient showed any appreciable change either in frequency of fits or behaviour disturbance; there were also no untoward side-effects noted clinically.

It is well known that acetazolamide has a marked generalized antagonistic effect on carbonic anhydrase, an action very feebly shown by chlorothiazide. In this may lie the explanation of the failure of chlorothiazide in epilepsy. It also appears that the salt-water depletion and diuresis brought about by both these drugs contribute little, if at all, towards amelioration of epilepsy.

The work was carried out at Cane Hill Hospital, Coulsdon, Surrey, and the drug was kindly supplied by Messrs. Merck Sharp and Dohme Ltd., Hoddesdon, Herts.

—We are, etc.,

Warlingham Park Hospital,
Warlingham, Surrey.N. H. RATHOD.
ANDREW SKARBK.**Toxic Psychosis after Atropine Eye-drops**

SIR,—Drs. J. P. Baker and J. D. Farley (*Journal*, December 6, p. 1390) have drawn attention to the psychiatric aspects of atropine intoxication, following prolonged topical exhibition of the drug in ophthalmic practice. Their suggestion, "that closer investigation might be made into the origin of states of minor emotional disturbance, usually attributed to psychological stress, in patients undergoing eye surgery with prolonged routine atropinization," merits comment.

In my personal experience the majority of cases of mental disturbance amongst ophthalmic in-patients occur after cataract extraction in the elderly, episodes of senile dementia coming on within two to four days of operation. Atropine may not have been exhibited at all, or, at the most, only as daily instillations since operation. Retinal detachment cases rarely show psychotic symptoms, as occurred in the case described by Drs. Baker and Farley; their reactions appear to be the responses of differing personalities to the extreme tedium of the post-operative regime, and they revert to normal promptly as soon as the patient is allowed more freedom, although topical atropine is continued.

Clearly atropine must be regarded in future in the same light as hyoscine, which is occasionally responsible for the sudden appearance of psychotic symptoms. The problem is one of idiosyncrasy involving a few patients only, and leaves untouched the larger issue of the management of senile ophthalmic in-patients.—I am, etc.,

Moorfields Eye Hospital,
London.

D. W. HILL.

Artificial Insemination

SIR,—Members of the Association will recall that the Annual Representative Meeting passed the following resolution:

310. **Resolved:** That this Meeting, while making no pronouncement on the non-medical aspects of A.I.D., authorizes the Council to submit evidence to the Government Committee on this subject from the medical point of view, if so requested.

A request has now been received by the Association from the Departmental Committee set up by H.M. Government to submit evidence, and the Council has decided to do so, within the terms of the foregoing resolution. The Science Committee has been asked to inform the Council on the medical aspects of A.I.D., and to enable it to do so it is anxious to collect as much up-to-date evidence as possible. As chairman of that committee, I am writing to seek the assistance of any practitioner who is in a position to provide it on a particular aspect of the problem. The committee is most anxious to obtain evidence on the subsequent psychological well-being, or otherwise, of any married couple who have availed themselves of A.I.D.—and, even more important, the subsequent effects on the child or children born as a result. May I ask any family doctor who has such a family under his care to supply the committee with written evidence bearing on this point? The committee will be most grateful for all such help, which will, of course, be treated as confidential in the highest degree.—I am, etc.,

B.M.A. House,
Tavistock Square,
London, W.C.1.J. R. NICHOLSON-LAILEY,
Chairman of the
Science Committee of the B.M.A.**Tuberculous Meningitis after B.C.G.**

SIR,—I wish to endorse the opinion of Dr. H. G. Calwell (*Journal*, November 29, p. 1356) regarding the paper on "Tuberculous Meningitis Following B.C.G. Vaccination" by Drs. Mary R. Kerr and J. M. Dunbar (*Journal*, October 25, p. 1019). In Dublin city 85,038 children and young adults were B.C.G.-vaccinated from October, 1948, to October, 1958, and in the whole decade no case of tuberculous meningitis and no death from any form of tuberculosis occurred in this large number of vaccinated personnel.

We have always adhered to Calmette's teaching, as expressed by Professor Robert Debré in his letter in the *Journal* of November 22 (p. 1292), and strict isolation periods have been observed in all cases that had exposure to home infection. In my opinion, the tuberculous meningitis case described by Drs. Kerr and Dunbar serves as a warning to all B.C.G.-vaccinators not to omit pre- and post-vaccinal isolation in these home-contact cases. When these isolation periods are observed, as in Dublin and Belfast, there is no incidence of tuberculous meningitis in B.C.G.-vaccinated personnel.—I am, etc.,

Tuberculosis Section,
Corporation of Dublin.

M. DUNLEVY.

Hospital Blankets

SIR,—Could not some contamination be avoided if blankets were put into zipped cotton cases? Blankets could be kept smooth by use of blanket pins or clips. Perhaps a bottom blanket could be replaced by the easily boiled cotton quilted pads used for this purpose in hospitals in the U.S.A.—I am, etc.,

Oxford.

K. F. BURN.

Coloured Signals

SIR,—Between October and December, 1957, there was a correspondence in *The Field* of considerable medical interest. Some contributors described the flash of green light seen just as the sun was rising or setting over the sea, and one suggested that this was due to the last yellowish rays blending with the blue of the water. But, arising out of this, another contributor described how, when driving behind another car at night, he had a momentary impression of green as its tail lights disappeared. And another, with memories of night operations in the first war, remarked that eye fatigue in the small hours was far from rare.

Might the eye tire for some colours faster than for others? Inquiry from an expert established that this phenomenon of apparent colour change is quite well known; he also stated that if a red light is observed through a moving screen it may appear green, the converse also occurring. Can we be certain, then, that a train driver seeing a light known to be red through the lattice work of a bridge, which lattice work was crossing his field of vision, might not report the wrong colour—red for green and green for red? And might not a fireman, after looking too long into the fire, have a momentary fatigue of the eye for red?—I am, etc.,

Hitchin, Herts.

G. C. PETHER.

Chloroquine in Rheumatoid Arthritis

SIR,—The article by Drs. H. Fuld and L. Horwich entitled "Treatment of Rheumatoid Arthritis with Chloroquine" (*Journal*, November 15, p. 1199) is a type of study that appears commonly in journals both in this country and in Great Britain. It is a type of study that is responsible for the multiplicity of drugs used in rheumatoid arthritis and for the many types of therapy which give in the hands of most practitioners only indifferent results.

Those of us who work extensively with rheumatoid arthritis know that it is subject to many influences: the emotional state of the patient, the season of the year, the barometric pressure, the weather, the financial status of the patient, the presence or absence of secondary infections, the presence or absence of epidemic upper respiratory infections in the community, and other factors which do not occur to me now or of which I am ignorant. Certainly one of the most important factors is the enthusiasm and friendliness of the attending physician. If he is dull and disinterested, but with little hope for improvement for the patient, his patients do not do well. On the other hand, should he be experimenting with a new medication, and should he have a spirit of enthusiasm and hopefulness, should he inquire with interest in all the symptoms of the patient, should he listen with care to their complaints, and should he examine their painful joints with more than usual devotion, the patient almost always responds by some degree of subjective improvement. We have seen this time and time again in a large metropolitan arthritis clinic.

Therefore, no study on the effectiveness of a drug or method of treatment of rheumatoid arthritis is of value unless it is combined with a controlled study of untreated patients. The doctor himself must not know which are the ones receiving treatment and which are the ones that do not. The number of cases in both the controlled and the treated groups must be statistically significant. Otherwise there will be no end to the types of treatment which enthusiastic physicians will recommend on the basis of various uncontrolled and superficially convincing reports.

I find the recommendation of chloroquine not especially disturbing, since, in our own experience with it, we found no serious toxic results, although it was of little benefit. The recommendation, however, of blood transfusions is very disturbing, since all transfusions carry a danger of homologous serum jaundice. I am unaware of any valid study which establishes the value of such a definitely hazardous method of treatment of rheumatoid arthritis.—I am, etc.,

Cedar of Lebanon Hospital,
Los Angeles.

R. R. MERLISS.

Christabel Pankhurst Memorial

SIR,—Last month will be remembered in our constitutional history as the one in which women first sat as members of the House of Lords. This event calls to mind the advance that women have made in status in recent times. In the nineteenth century they were regarded in effect as second-class citizens. But step by step during the last 50 years legal discriminations have been removed until to-day very few remain.

We recognize the debt we owe to the pioneers who pressed women's enfranchisement on reluctant Governments. Notable among them was Christabel Pankhurst, who as a young law student struck a new note of defiance by adopting

what later came to be known as militant tactics and thereby made "Votes for Women" front page news. During the nine years in which the conflict raged she displayed courage, political insight, and leadership to a high degree, and devoted the whole of her youth to obtaining the enfranchisement of her sex.

The older generation of doctors will recall that one of the Pankhursts' earliest supporters was Dr. Elizabeth Garrett Anderson, who suffered imprisonment in the cause. They will also recall the influential committee of doctors, headed by Sir Victor Horsley and Dr. Haden Guest, to bring pressure on the Government to stop the brutality of forcible feeding as done by prison authorities. Doctors, both men and women, were splendid in the assistance they gave to the suffragettes released from prison in shocking condition, and in dealing with injuries sustained when thrown out from political meetings.

Dame Christabel died a few months ago, and many people feel that a national memorial should be erected to her. We have therefore formed a committee, of which Lady Pethick-Lawrence is treasurer, to raise a fund for this purpose. This committee is representative of women prominent in all professions in life. Lady Astor, Miss Rose Heilbron, Dame Vera Loughton Mathews, D.B.E., Dame Sybil Thorndike, D.B.E., together with women M.P.s and old suffragettes, and with Dame Christabel's young cousin, Miss Goulden Bach, as secretary.

I am glad to be chosen to represent the women doctors, and I hope both men and women members of the profession will be staunch to-day in support of this memorial, and send their cheques to our Treasurer, at 11, Old Square, Lincoln's Inn, London, W.C.2. Our proposal, which has been approved in principle by the Ministry of Works, is the addition of a semicircular low wall to Mrs. Pankhurst's statue in Victoria Tower Gardens adjacent to the House of Lords. The wall will terminate in two piers showing on one a bronze relief of Dame Christabel, and on the other a replica of the Women's Social and Political Union prison brooch. The design appears to be particularly appropriate, for, inasmuch as Christabel and her mother jointly led the militant campaign, so should they be remembered together by future generations.—I am, etc.,

London, W.1.

A. LOUISE McILROY.

Onset Enuresis

SIR,—The statistics produced by Drs. J. D. Paulett and E. Tuckman (*Journal*, November 22, p. 1266) are impressive; but before we are tempted to conclude that onset enuresis results from raising the poor above their station it would be interesting to hear that it is less frequent in a poor population which has not been recently re-housed. The writings of some workers—for example, Spinley¹ and Kerr²—indicate that it is far from unknown.

We find it impossible to recollect, to a greater accuracy than plus or minus one year, the age at which our two sons, now aged respectively 8 and 14, became reliably dry at night. Has a scientific training made us less observant than the patients who contributed to Dr. Tuckman's third table, or more preoccupied, or just less willing to commit ourselves to a categorical statement?—We are, etc.,

KENNETH ULYATT.

FRANCES MARGARET ULYATT.

London, S.E. 27.

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- 1 Spinley, B. M., *The Deprived and the Privileged*, 1953, London.
- 2 Kerr, M., *The People of Ship Street*, 1958, London and New York.

POINTS FROM LETTERS

Hypnotherapy

Drs. GORDON AMBROSE and GEORGE NEWBOLD (London, W.1) write: Dr. William Sargant's review of our book *Hypnosis in Health and Sickness* (*Journal*, December 6, p. 1396) was very like the curate's egg. We would like to correct one or two points in the review. It is not made absolutely clear that (and here we quote from the preface) "... we felt the time was ripe for the publication of a work which would present to the public, so far as our limitations permitted, a reasonable picture of the place of hypnotherapy in modern medicine." Dr. Sargant recites a long list of subheadings from two chapters, and possibly implies that hypnosis is seen by us as a panacea for all ills. We have been particularly careful in all our writings to refute this claim.

Obituary

G. H. G. SOUTHWELL-SANDER, M.B., D.P.H.
D.I.H.

Surgeon-captain G. H. G. Southwell-Sander, who did much to improve working conditions in the dockyards and ships of the Royal Navy, died suddenly at his home near Dorking on December 6. He was 53.

Geoffrey Henry George Southwell-Sander was the only son of the late Dr. G. A. Southwell-Sander, who practised in Watlington, Kent. From Charterhouse he went on to Caius College, Cambridge, and then to St. Thomas's Hospital, qualifying in 1930 and graduating M.B., B.Ch. in 1931. He was house-physician at the Brompton Hospital, house-surgeon at the Royal Victoria and West Hants Hospital, Boscombe, and a resident medical officer at the sanatorium at Milford in Surrey. His interest in tuberculosis led him to a wider view of preventive medicine, and he took the D.P.H. at the London School of Hygiene and Tropical Medicine in 1933. After a short spell in his father's practice near Maidstone he entered the medical service of the Royal Navy late in 1933. Not long afterwards, to his great satisfaction, he was sent out to the China Station and spent some time up the Yangtze. On his return home he married Elsie (Jackie) Graham, daughter of Dr. James Graham, and worked for a time in London as a house-physician at the Postgraduate Hospital at Hammersmith. His one and only hospital appointment in the Navy was that of clinical pathologist at the R.N. Hospital, Bermuda, where he served from 1938 to 1941, carrying out his duties there with characteristic thoroughness, zeal, and ability. Later in the war he saw active service in the Arctic and elsewhere. His subsequent career was mainly in the fields of preventive medicine and industrial health.

R. L. G. P. writes: The sudden death of Geoffrey Southwell-Sander has come as a great shock and brought much distress to his many friends, both inside and outside the Service. His health had been far from robust for some years, but he did not allow this sombre handicap to interfere in any way with the high standard of work which he incessantly maintained throughout his life.

It was while serving in the Medical Department, Admiralty, from 1943 to 1944 that his interest in industrial medicine became enthusiastically stimulated. He obtained the D.I.H. in 1950, and there is no doubt that he put industrial medicine on the map so far as the Royal Navy is concerned. He emphasized the opportunities in this direction that arise in H.M. dockyards, H.M. aircraft repair yards, and last, but not least, in H.M. ships themselves. He fully appreciated the fact that preventive medicine is second to none in the practice of medicine, and he was constantly endeavouring to the best of his ability, which was considerable, to put this conception across to all and sundry. He was one of the original members of the Joint Services and Factory Committee on Occupational Health, which consists of Service members from the three fighting Services and civil experts in various fields of industrial medicine. He did good work in H.M. Dockyard, Singapore, and the Naval Base from 1950 to 1952, but it was while holding the appointment of senior medical officer, H.M. Dockyard, Portsmouth, from 1952 to 1955 that he achieved outstanding success. He reorganized the medical section of the dockyard, and was of the greatest help to the Medical Director-General during the period when the Home Dockyard Regulations were being revised and brought up to date. Old routine measures were dropped, and modern views were introduced, largely as the result of Geoffrey Southwell-Sander's personal experience in industrial medicine.

In 1955 he rejoined the Medical Department, Admiralty, as assistant to the Medical Director-General in hygiene, preventive medicine, and industrial medicine. A year

later he was elected president of the Services Group of the Society of Medical Officers of Health: his presidential address on "Preventive Medicine in the Navy" was written in his usual lucid and attractive prose, and was published in the journals of the Society of Medical Officers of Health and of the Royal Navy Medical Service. He also wrote a reference book on industrial health which was officially approved and circulated to all medical officers. A new comprehensive handbook for medical and dental officers is being prepared, and he wrote the section on industrial medicine and some of the portions connected with hygiene and preventive medicine. He also gave lectures on industrial health to newly joined medical officers at the R.N. Medical School, Alverstoke. His contributions in hygiene, preventive medicine, and industrial medicine have been outstanding during recent years not only in the Navy but also in the Services Group of the Society of Medical Officers of Health and in conference at the Joint Services and Factory Committee on Occupational Health. He was also Naval secretary of the Epidemiology Section of the Royal Society of Medicine, as well as being on the committee of the United Services Section. He was awarded the Gilbert Blane medal in 1947 and the Parkes Memorial prize in 1955.

Geoffrey was a very conscientious, zealous, and likable medical officer. Modest and very unostentatious, he had great ability and much administrative acumen. His judgment was true, and he was always friendly and pleasant. His demise is a great loss to the Service which he loved and for which he did distinguished work. At home he took an interest in church affairs and was certainly a true practitioner of the Christian faith. Our deepest sympathy is tendered to his wife and son.

A friend writes: If it is old-fashioned to set oneself high ideals and to live by them, then Geoffrey Southwell-Sander was old-fashioned. The traditional loyalties were much more than mere traditions to him: he set his course by them. He found in the Senior Service a career which suited him down to the ground, for he enjoyed life in the Navy not only for its obvious advantages—he loved travel, for instance, and sport, and good fellowship—but also because it met his need for professional endeavour in the field of preventive medicine. Wherever he went the health and welfare of the men for whom he was responsible mattered intensely to him, and he obtained great satisfaction from his later work as a specialist in occupational health. With all this he had an enviable capacity for getting the best out of life. Knowledgeable and enthusiastic about history, art, literature, and music, he was the ideal travelling companion. His light-heartedness was infectious and his steadfastness in difficult times vastly encouraging. Devoted to his family, Geoffrey Southwell-Sander was a home-loving man, and it is indeed sad that he enjoyed for such a comparatively short time the new home near Dorking which he and his wife had made so elegantly their own. He died at the height of his career, leaving a widow and son whose friends will share their grief.

P. W. PHILIP, M.B., Ch.B.

Dr. Peter W. Philip, the last general-practitioner surgeon in Aberdeenshire, died at his home in Huntly on December 7 after a long illness. He was 58 years of age.

Peter William Philip was born on November 14, 1900, and studied medicine at Aberdeen University, where he graduated M.B., Ch.B. in 1924—the record post-war year of the Aberdeen Medical School. After graduation he had no hope of a house job in his teaching hospital in competition with ex-Service men who had but recently commanded men in battle, and he went as assistant to the late Dr. John O. Wilson at Huntly. There his work in the Huntly Cottage Hospital impressed the late Mr. F. K. Smith, visiting surgeon from Aberdeen Royal Infirmary, and he made Philip his house-surgeon a year after graduation and gave him special operative experience. Thereafter he returned to Huntly, this time as a partner, and for more

than 30 years he served his people in the northern foothills of the Grampians. In that stormy rural area, 40 miles from Aberdeen, his undoubted skill as a surgeon saved many lives, but he was also a first-rate family doctor with a large practice.

His capacity for work and his zest for life gave him many activities outside his profession. He was a justice of the peace and an elder of the Scottish Kirk. A staunch conservative, he was vice-chairman of the West Aberdeenshire Conservative Association. In the medico-political field he was chairman of the Aberdeen and Kincardine Counties Division of the B.M.A. in 1951–2, a member of the local medical committee, and its representative on the Scottish Medical Services Subcommittee. He was a member of the local executive council since its inception. While he lifted trophies at bridge and bowls, his rarest pleasure was in fishing and shooting. As a raconteur he was in great demand at medical dinners, rotary clubs, and manifold societies. Unsparing of himself, he died in his prime, and our sympathy goes out to his widow, to his three daughters, one a doctor, and to his son.

D. G. G. writes: There was magic in the name of Peter Philip. Born a Buchan peasant—as pure a country stock as our Aberdeen-Angus cattle—lost as a student among so many ten-talented ex-Service men of the 1914–18 war, he yet blossomed forth to become one of the outstanding medical personalities of his generation in the North-east of Scotland. Stories of him were legion. He had become a legend in his own lifetime, and the legend will live for the rest of the century. His clothes the rough home-spun, his speech rich in his native Doric, his body strong to endure the long tramps through the snow-blocked roads, Philip of Huntly was loved by cottar and laird, both of whom he bullied impartially. Perhaps his best anecdote was of the patient who mistook a horse powder for a headache powder, and so often had he told it that it became a classic. But one he did not tell was of the case of post-partum haemorrhage in a lonely glen, when he took off nearly two pints of his own blood and transfused the patient. I remember when I was demobbed in the autumn of 1945 he came to stay a week-end with me to catch an Ythan salmon, and in his waders he had two bottles of Glenlivet, one for the ghillie and the other for his host.

The B.M.A. was dear to him, and he made a grand Division chairman. He relished his championship of the rural doctor and was a refreshing breeze among the cobwebs of St. Andrew's House in Edinburgh when he gave evidence before the jaded but delighted officials. Sir William Osler thought the lone figure in the gig, the rural doctor, the noblest figure in medicine: if Osler is waiting in the Elysian fields to welcome the country G.P.s, the front-line troops of the profession, then he will find in Peter Philip a common spark, and, who knows, there may be a Scottish burn there with deep salmon pools galore.

G. K. STRODE, M.D.

Dr. George K. Strode, formerly director of the International Health Division of the Rockefeller Foundation, died in the Memorial Hospital, Brattleboro, Vermont, on October 27. He was 72 years of age.

Sir ALLEN DALEY writes: The Old Guard of the Rockefeller Foundation of New York is dwindling rapidly as a result of death or retirement because of age. Within the past two years we have mourned the loss of Alan Gregg, the director of the Division of Medical Sciences, and of Pat O'Brien, a member of the same division. Now we learn of the death of Dr. George King Strode, the last director of the International Health Division. Just before he retired the Foundation had amalgamated the Divisions of Medical Sciences and International Health in a new division which it named the Division of Medicine and Public Health, with Strode as its first director.

Born in Pennsbury, Pennsylvania, George King Strode graduated in science from Haverford College in 1908 and in

medicine from the University of Pennsylvania in 1912. He was a Master of Public Health of Harvard. Soon after graduation he joined the staff of the state health department of Pennsylvania at Harrisburg. After seeing active service in France during the first world war he became, in 1920, a full-time officer of the Rockefeller Foundation. After his retirement in 1951 he lived in Whitingham, a remote spot in the State of Vermont. He worked for the foundation in Brazil until 1926 and from then until 1938 he was in charge of its medical and public health work in Europe, Africa, and the Near East, with headquarters in Paris. He was chairman of the Paris office from 1932 until he returned to New York in 1938. During the second world war he was a member of the American Red Cross Missions to Russia in 1941, Iceland in 1942, and North Africa in 1942-3. He had received decorations from many European countries, and was a Commander of the French Legion of Honour and an Honorary Fellow of the Society of Medical Officers of Health. A book on yellow fever which he edited was published in 1951.

Many Britishers retain happy memories of the warmth of the hospitality dispensed in their New York apartment by George Strode and his charming wife. He was a kindly and understanding man, beloved by all who had dealings with him. Wielding great power over the destinies of men and institutions of learning in many countries, he never let that go to his head or warp his judgment. George lived up to the motto of the Foundation, "The Welfare of Mankind throughout the World," and was always striving to achieve that aim somewhere. He guided the public-health work of the Rockefeller Foundation in the international field at a time when it was spending millions of dollars every year on its various and far-flung projects. The health and well-being of millions of people all over the world have benefited.

Medical Notes in Parliament

HOUSE OF LORDS

Injury from Nuclear Installations

The Nuclear Installations (Licensing and Insurance) Bill, which is intended to control in the interests of safety the building and operation of nuclear reactors and other fixed nuclear installations, completed its passage through the House of Lords on December 16. It authorizes, for this purpose, a system of licensing (excluding installations of the Atomic Energy Authority); and imposes on persons granted a licence to operate installations an absolute liability (similar to that of the A.E.A.) for all hurt to persons or damage to property caused by radiation, even though due to unavoidable accident. A licensee is obliged to take out cover, by insurance or other means, up to £5m. in respect of any one occurrence. The Bill as drafted also fixed the period within which claims for hurt or damage by radiation must be made at 10 years.

Objection was taken to this proposed time limit when the Bill was considered in committee, and Lord TAYLOR moved an amendment to delete it. Arguing that the Government were attempting to legislate for the unknown, he urged that the case against a 10-year limit was very strong. Diseases like leukaemia—bone sarcoma, aplastic anaemia, and aleukaemic leukaemia—were fatal, usually within a period of about five years. In many cases there was no known cause; but where there was a known cause the date of onset of a disease might be very much longer, and it was this latent period between the start of the cause and the development of the disease which was vitally important in connexion with the period in which a claim could be made. The principal hazard of a disaster in a nuclear plant was the liberation of radio-strontium, which could be picked up by the body and by a continuous process of radiation caused

damage to the bone marrow, and ultimately death. The half-life of radio-strontium was 28 years, and the effect of radiation on the bone marrow appeared to be cumulative. This was a field of great technical difficulty, presenting medical research workers with the greatest problem, because no one knew exactly what the situation was. There was a useful analogous argument from radium and x rays; the first harmful effects of x rays were recorded in 1896, but it was not until 1914 that the first x-ray death in a radiologist occurred, from aplastic anaemia. The interval between the onset of the first changes as a result of x-irradiation and the development of malignant disease was anything between three and 27 years. On this experience the proper time limit, if there was to be one, should be some 30 years. The arbitrary choice of 10 years was unrealistic and not related to existing knowledge. Lord Taylor mentioned also the group of changes that could be caused by radio-caesium on the sexual cells, and the M.R.C. Report of 1956 and the U.N. Scientific Committee's Report this year which spoke of "a 30-year genetic dose."

The Minister of Power, Lord MILLS, expressed some sympathy with the purpose of the amendment, but objected that it would put an unlimited liability on the licensee and on insurance. The longer a claim was delayed the more difficult it would be for medical evidence to establish whether an injury was caused by exposure to radioactivity from the licensee's reactor at a particular time, or by something unconnected with it. A 10-year period was favoured by other member countries of the Organization for European Economic Co-operation, and was likely to be adopted for the purpose of any European convention on the insurance of nuclear risks. This argument was not accepted as convincing, and eventually Viscount HAILSHAM, Lord President of the Council, agreed that the matter should be given further consideration.

The subject came up again on the report stage on December 16, when Lord MILLS brought in a Government amendment to provide a time limit of 30 years. The Opposition still found any time limit unacceptable, on the ground that they were dealing with a type of injury which even the most eminent scientists did not understand. They carried their objections to a division, in which a proposal by Lord SILKIN to remove the time limit altogether was defeated by 69 votes to 37. The Government amendment was then agreed to and the Bill given its third reading.

Adequacy of Mental Research Programmes

Lord STONHAM asked on December 11 if the Government were aware that only 2% of the Medical Research Council's budget was spent on research into the causes of mental illness, and whether, having regard to the statement in the Report of the Ministry of Health for the year 1957 that "psychiatrists are still a long way from a scientific understanding of most of the major forms of mental illness," they would take steps to increase facilities for such research.

The Lord President of the Council, Viscount HAILSHAM: "No, my Lords." The Medical Research Council's expenditure on research into the causes of mental illness had been steadily rising during the past few years, and in the present financial year would amount to some £130,000. This was over 4%, and not 2%, of the Council's annual budget. Arrangements had recently been made by the Council to undertake a full-scale review of research in this field with a view to considering its future development. In addition, a number of voluntary organizations and philanthropic trusts, such as the Mental Health Research Fund, the Ford Nuffield Foundation, the Wellcome Trust, and the Ford Foundation, made important contributions to psychiatric research. The Mental Health Research Fund, for example, spent about £36,000 during the financial year 1957-8, and their total expenditure since 1954 was estimated at £86,000. During the past five years the Nuffield Foundation had also spent a substantial sum on subjects relevant to mental disorder. The Leverhulme Trust and the Ford Foundation had made large block grants to the Mental Health Research

Fund; and the Wellcome Trust had made direct contributions to work in this field. As "observational" research might be an integral part of clinical practice, the work of those in psychiatric practice in teaching and mental hospitals should be included in the total sum of the nation's research, but this could not be measured in exact financial terms nor described as a specific research programme. Certain London teaching hospitals, for example, had active neuropsychiatric units to which research fellows, supported by endowment funds, were appointed by the hospitals themselves. Research of this kind was also supported at many other hospitals through regional hospital boards. Expenditure within the Health Service in this way was estimated at £25,000 for 1957. University psychiatric departments also made individual contributions to research in this subject.

QUESTIONS IN THE COMMONS

Hospital Building Programme 1960-1

Sir KEITH JOSEPH (Leeds, North-east, Con.) asked the Minister of Health on December 17 whether he was now in a position to make a further statement about the Government's hospital building programme. Mr. D. WALKER-SMITH: "Yes. It is proposed, subject to the voting by Parliament of the necessary funds, that £25½m. shall be spent on capital development in the hospital service in England and Wales in 1960-1, compared with £22m. already announced for next year, 1959-60." Hospital boards, said the Minister, were being informed of their individual allocations within this total for the modernization of mental hospitals, the replacement of obsolete plant, and ordinary capital expenditure. £10m. would be set aside for the programme of major projects which were financed centrally. This programme would be further expanded, and he was that day inviting boards to bring to completion the planning of a number of additional major projects. He hoped that they would try to complete the planning by 1960-1.

Mr. Walker-Smith went on to say that he had already authorized the arranging of an architectural competition which was in hand for the planning of the new Cardiff teaching hospitals; and he was also considering what dental hospital projects should be undertaken to increase the output of the dental schools.

The major new building projects now selected included the first phases of new general hospitals for north Tees-side and at Northwick Park for the Wembley-Harrow area; a further stage of the new Sheffield teaching hospital of which the out-patient department was now being built; the start of the reconstruction of Queen Mary's Hospital, Sidcup; a blood transfusion centre at Liverpool; and later stages of some new hospitals already in the programme. There would be new radiotherapy departments at Newcastle, Sheffield, and Birmingham.

In the sphere of large-scale extensions a large extension of the High Wycombe Memorial Hospital was proposed and a number of other hospitals were to be improved or developed. They were Crewe Memorial Hospital; the Mayday Hospital, Croydon; Queen Mary's, Stratford; the Royal Gwent Hospital, Newport; Southampton General Hospital; and St. Stephen's Hospital, Fulham Road. There was a new maternity wing at Billinge Hospital, Wigan, and a new maternity unit was included in proposals for expanding the Yeovil and District Hospital. Further development would be undertaken at the Good Hope Hospital, Sutton Coldfield, and at the Coventry and Warwick Hospital. He was also increasing the allocations made last year in order to allow development to take place at both Ilford and Barking, and to permit as the first phase of hospital development in Hull the improvement of the Western General Hospital. He was also asking for plans to be prepared for certain hospital development in Bradford, and details of this would be worked out with the Leeds Regional Hospital Board.

In the mental health field the Minister proposed to provide additional beds at the mental deficiency hospitals at Greaves

Hall, Southport, Cranage Hall, Holmes Chapel, and Oakwood Park, Conway; extensions to Borocourt (near Reading) and Little Plumstead (near Norwich) Mental Deficiency Hospitals; improvements at Fulbourne Mental Hospital, near Cambridge; and new long-stay annexes at Lynfield Mount Mental Hospital, Bradford. A psychiatric block was also to be provided at the new Welwyn Hospital which was now being built.

Hallucinogenic Drugs

Dr. DONALD JOHNSON (Carlisle, Con.) asked the Home Secretary if he was aware of the dangerous hallucinogenic properties of such new drugs as mescaline and lysergic acid diethylamide, and when he proposed to bring them under the Dangerous Drugs Acts. Mr. BUTLER stated on December 11 that he was informed there was no evidence that these drugs were addiction-producing. It would not therefore be appropriate to control them under the Dangerous Drugs Act, 1951.

Legal Actions in the Health Service

Dr. JOHNSON asked the Minister of Health if he would state the number of legal actions in which the Health Service, or any of its employees, had been defendant in each year since the inception of the Service. What had been the total cost to the Exchequer in settling such actions, including those settled out of court? Mr. R. THOMPSON, Parliamentary Secretary, stated on December 12 that the only statistics centrally available were the total amounts paid in compensation of all kinds by hospital authorities and executive councils in England and Wales, whether or not legal action was involved. These were as follows:

Period ended						£
March 31						
1949	..	..	..	..	..	7,560
1950	..	..	..	..	..	23,636
1951	..	..	..	..	..	38,556
1952	..	..	..	..	..	106,574
1953	..	..	..	..	..	152,590
1954	..	..	..	..	..	159,047
1955	..	..	..	..	..	91,535
1956	..	..	..	..	..	110,321
1957	..	..	..	..	..	116,136
1958	..	..	..	..	..	100,826

Nuclear Information Withheld from M.O.H.

Mr. W. COLDRIK (Bristol, North-east, Lab.) asked the Minister of Housing and Local Government why he had declined to supply the M.O.H. for Bristol with the whereabouts of the sources of various radioactive materials in the city. Mr. J. R. BEVINS, the Parliamentary Secretary, told him on December 9 that in supplying radioisotopes the Atomic Energy Authority acted as a commercial concern, and it was not normal practice to make known the full details of such transactions. The Department followed up deliveries and was able to ensure that any requisite statutory consent for disposal of waste was obtained from the appropriate authorities. The Minister had assured the M.O.H. for Bristol that there was no danger to public health from disposals of radioactive waste in his area.

Parking Meters in St. Marylebone

Sir WAVELL WAKEFIELD (St. Marylebone, Con.) asked the Minister of Transport and Civil Aviation what progress he had made in connexion with approving the establishment of a parking scheme for St. Marylebone. Mr. H. WATKINSON told him on December 10 that he had fully considered the St. Marylebone Borough Council parking scheme in the light of the objections made to it, the report of Sir Reginald Sharpe, who conducted a public inquiry, the report of the London and Home Counties Traffic Advisory Committee, and the results of the experiment in North-west Mayfair. He had decided to approve the scheme with some modifications: when these had been settled he would make the necessary Order and Regulations.

Vital Statistics

Accidental Deaths Increase

In the third quarter in England and Wales accidental deaths numbered 3,550, or 146 more than in the third quarter last year, according to the Registrar-General's return for the third quarter. A notable increase was deaths from coal-gas poisoning—from 68 last year to 114 this year. The total of home accidents in the third quarter this year, 1,234, was 44 lower than last. The accidental deaths in the quarter were as follows:

	Age		
	0-14	15-64	65 and Over
Home accidents	111	223	900
Transport	217	978	313
Other	160	490	158

They show that twice as many children were killed on the road as in the home, and three times as many old people in the home as on the road.

Week Ending December 6

The largest fluctuations in the notifications of infectious diseases in England and Wales during the week ending December 6 were increases of 1,472 for measles, from 6,910 to 8,382, 89 for acute pneumonia, from 407 to 496, 53 for scarlet fever, from 1,164 to 1,217, and 25 for whooping-cough, from 724 to 749; the largest decreases were 78 for dysentery, from 1,098 to 1,020, and 58 for food-poisoning, from 236 to 178.

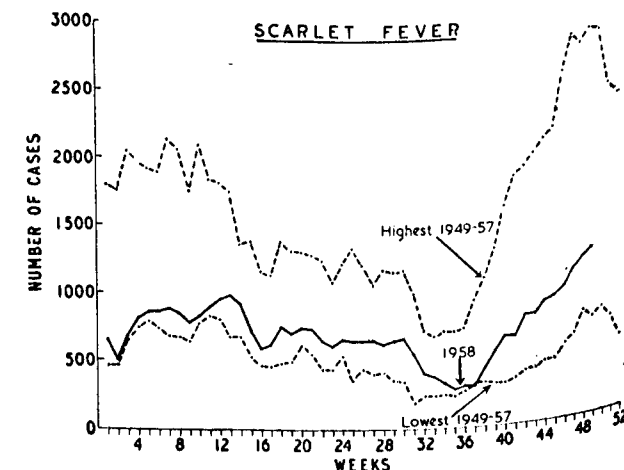
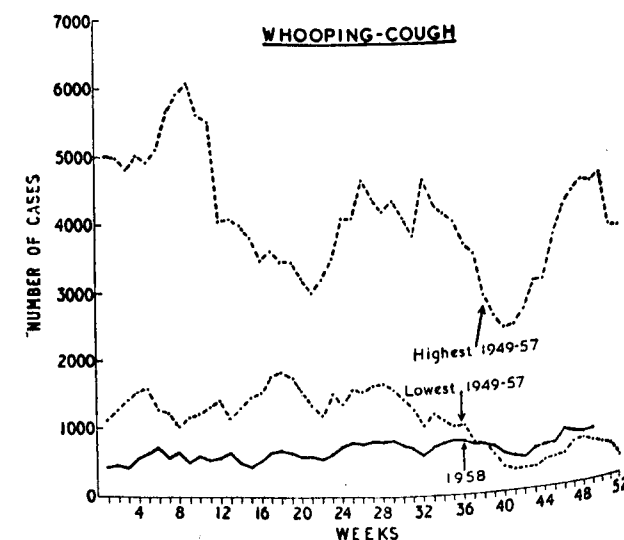
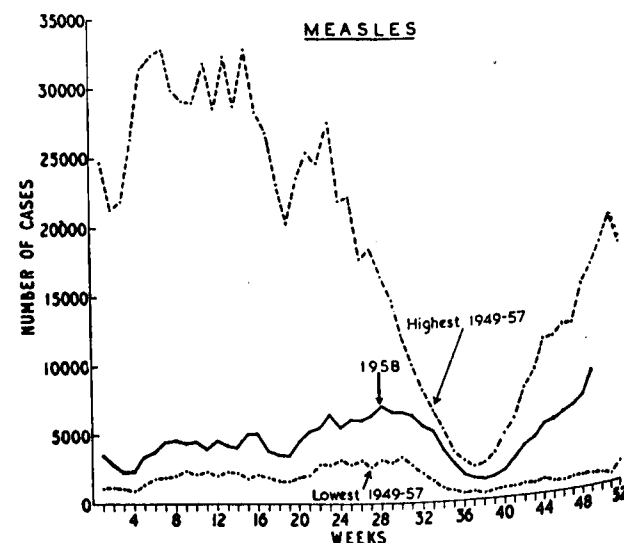
The largest rises in the incidence of measles were 188 in Lancashire, from 739 to 927 (Liverpool C.B. 136, Manchester C.B. 116), 163 in London, from 398 to 561 (Wandsworth 109, Hammersmith 84, Paddington 78), 161 in Staffordshire, from 209 to 370 (Newcastle-under-Lyme M.B. 75), 114 in Yorkshire West Riding, from 837 to 951 (York C.B. 188, Halifax C.B. 104). The largest rise in the number of notifications of scarlet fever was 34 in Essex, from 72 to 106. Only small changes occurred in the local trends of whooping-cough. 4 cases of diphtheria were notified, being 3 fewer than in the preceding week; no administrative area had more than 1 case.

The notifications of acute poliomyelitis numbered 53, and these were 9 fewer for paralytic and 7 fewer for non-paralytic cases than in the preceding week. The largest returns were Lancashire 9 (Manchester C.B. 4), London 7 (Islington 2), Yorkshire West Riding 7 (Huddersfield C.B. 2), Hampshire 5 (Southampton C.B. 4).

The largest falls in the incidence of dysentery were 56 in Yorkshire West Riding and 45 in Warwickshire. The chief centres of infection during the week were Yorkshire West Riding 120 (Leeds C.B. 73, Huddersfield C.B. 12), Glamorganshire 127 (Cardiff C.B. 63, Llantrisant and Llantwit Fardre R.D. 30, Rhondda M.B. 26), Lancashire 101 (Eccles M.B. 15, Liverpool C.B. 13, Nelson M.B. 13), Middlesex 95 (Hendon M.B. 79), London 88 (Battersea 19, Wandsworth 12, Kensington 10), Warwickshire 71 (Coventry C.B. 60, Birmingham C.B. 10), Essex 55 (Rochford R.D. 19, East Ham C.B. 16), Kent 40 (Maidstone R.D. 13, Royal Tunbridge Wells M.B. 11), Hertfordshire 39 (Welwyn Garden City U.D. 36), Northumberland 34 (Ashington U.D. 14, Newbiggin-by-the-Sea U.D. 12), Surrey 27 (Coulsdon and Purley U.D. 19), Yorkshire East Riding 25 (Kingston upon Hull C.B. 20), Durham 23, Hampshire 21 (Southampton C.B. 15), Bedfordshire 21 (Amphill R.D. 21), Staffordshire 21.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1949-57 are shown thus - - - - -, the figures for 1958 thus ———. Except for the curves showing notifications in 1958, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Medical News

New Hospital Board.—From April 1, 1959, the Wessex Regional Hospital Area is to be formed from what is now the western portion of the South-west Metropolitan Regional Hospital Area. A regional hospital board will be constituted for it (S.I. 1958, No. 2093).

Association for the Study of Medical Education.—The Rockefeller Foundation has made a grant of £10,000 to the Royal College of Physicians for use towards the general expenses of the Association for the Study of Medical Education during the first five years of its development.

Chemists' Federation.—The Federation has announced its dissolution as from December 31. This follows the recent judgment by the Restrictive Practices Court (*Journal*, November 15, p. 1236). The Federation comments in a statement as follows: "As a result of this judgment it remained open to the Registrar under section 20 of the Act to apply to the Court for an injunction restraining members of the Federation from giving effect to, or enforcing, or purporting to enforce the agreement. The Chemists' Federation council, after taking legal opinion, decided that the dissolution of the Federation was necessary in order to protect the rights of the individual member."

Prescribed Industrial Diseases.—A right of appeal from medical boards' decisions on whether or not a person claiming benefit under the industrial injuries scheme is suffering from one of certain prescribed industrial diseases is provided by new regulations made by the Minister of Pensions and National Insurance (S.I. 1958, No. 2112, H.M.S.O., price 3d.). These regulations will apply to decisions given by medical boards on or after January 5. Appeals will be decided by the same tribunals as already consider appeals against boards' assessments of extent of disablement.

Chief Medical Adviser, Nigeria.—Dr. C. M. NORMAN-WILLIAMS will succeed Sir SAMUEL MANUWA as Chief Medical Adviser to the Federal Government of Nigeria, on the latter's retirement on January 2.

Mr. B. W. Rycroft has been elected honorary member of the Ophthalmological Societies of New Zealand, Australia, and South Africa.

COMING EVENTS

"Alcoholism and Drug Addiction."—Week-end course (£3 15s.) arranged by the Institute for the Study and Treatment of Delinquency, January 2-4, at Avoncroft College, Bromsgrove. Details from I.S.T.D., 8, Bourdon Street, Davies Street, London, W.1. (MAYfair 3472.)

London Medical Orchestra Society.—Informal concert including works by Rossini, Beethoven, and Haydn, January 17, 7.30 p.m., at Quintin School, Marlborough Hill, London, N.W.8. Admission free.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Friday, January 2
ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At Royal Faculty of Physicians and Surgeons of Glasgow, 8.30 p.m., discussion: Management of Incurable Illness. Panel, Dr. W. F. Anderson, Dr. A. McCrone, Mr. J. L. Orr, and Miss A. Keen.

Saturday, January 3
MIDLAND THORACIC SOCIETY.—At Birmingham Medical Institute, 3 p.m., short papers by Dr. J. Aspin, Mr. E. G. Dolton, and Dr. J. Leahy.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Lindan.—On December 12, 1958, at Cleveland, Ohio, U.S.A., to Dr. Rosemary Lindan (formerly Jackson), and Olgiard Lindan, M.D., Ph.D., a sister for Nicholas and Christina—Camilla Elspeth.

Twidle.—On December 10, 1958, at Sheffield, Yorks., to Ruth Carol (formerly Wiltie), wife of Surgeon Lieutenant Robert S. H. Twidle, R.N., a son.

DEATHS

Wardale.—On December 7, 1958, at his home, near Haydon Bridge, Northumberland, John Dobson Wardale, M.B., B.S., aged 90.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending December 6 (No. 49) and corresponding week 1957.

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

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES	1958					1957				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	4	1	5	0	2	1	0	1	6	2
Dysentery ..	1,020	88	212	15	8	576	135	186	9	1
Encephalitis, acute	2	0		0		1	0		0	
Enteric fever: Typhoid	1	0	0	0		3	1	0	0	1
Paratyphoid ..	2	0	2(B)	0	2(B)	6	0	0	0	
Food-poisoning ..	178	24	16	2		146	18	23	0	
Infective enteritis or diarrhoea under 2 years ..				13	38				7	17
Measles*	8,382	561	139	46	550	2,214	44	36	30	24
Meningococcal infection ..	28	1	13	0	1	29	1	9	3	1
Ophthalmia neonatorum ..	27	7	2	0		14	2	4	0	
Pneumonia†	496	35	250	9	2	649	38	315	5	38
Poliomyelitis, acute: Paralytic	41	7		0	4	61	1		3	4
Non-paralytic ..	12	0		3		20	0			
Puerperal fever§	206	31	5	2		188	36	7	1	
Scarlet fever ..	1,217	94	104	20	30	723	50	59	13	16
Tuberculosis: Respiratory	489	54	115	14		510	53	97	15	
Non-respiratory ..	50	0	12	2		72	5	8	2	
Whooping-cough	749	14	81	85	67	575	24	64	4	21

DEATHS	1958					1957				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		1		0		0		
Encephalitis, acute		0			0	1				0
Enteric fever ..	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years ..	8	0	0	0	0	0	0	0	1	
Influenza ..	23	2	1	0	0	14	4	0	14	
Measles ..		0	0	0	0	0	0	0	0	
Meningococcal infection ..		0	0			0	0			
Pneumonia ..	613	47	19	22	7	71	33	15	11	
Poliomyelitis, acute	4	1		0	0	0		0	0	
Scarlet fever ..		0		0	0	0	0	0	0	
Tuberculosis: Respiratory	115	6	9	0	3	8	7	1	5	
Non-respiratory ..		0	0	0	0	2	1	0	0	
Whooping-cough	0	0	0	1	0	0	0	0	0	
Deaths 0-1 year	313	29	23	10	13	22	34	5	11	
Deaths (excluding stillbirths) ..	10,926	876	700	147	151	1090	638	135	186	
LIVE BIRTHS ..	13,696	1136	1003	235	287	1045	955	210	328	
STILLBIRTHS ..	325	30	35			26	20			

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

† Includes primary and influenza pneumonia.

§ Includes puerperal pyrexia.

Any Questions ?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Sequestrenized Blood for Transfusion

Q.—Is sequestrenized blood better for routine transfusions than citrated blood, and how is it prepared ?

A.—Sequestrene (Na_2 , ethylene diamine tetracetic acid) is accepted as the anticoagulant of choice in the preparation of whole blood or platelet concentrates for transfusion.¹ For this purpose the anticoagulant should be contained either in a siliconed bottle or in a plastic bag. The platelet transfusion may be given either as fresh whole blood, platelet-rich plasma, or as a platelet concentrate in its own plasma or saline. If transfused within a few hours after collection good results are to be expected. Where there is severe thrombocytopenia the platelets from 4 pints (2.3 l.) of whole blood should be given either as whole blood or as a concentrate. After such a transfusion it is not uncommon for there to be an improvement in the clinical state of the patient without any detectable rise in the number of circulating platelets.

Sequestrene solutions can be sterilized by autoclaving without loss of activity. The amount of sequestrene necessary to inhibit the coagulation of 97 ml. of blood is 3 ml. of a 4.5% w/v isotonic solution.² Alternatively 10 ml. of a 1% solution of sequestrene in saline may be used for 90 ml. of blood.¹ With small volumes of anticoagulant efficient mixing of the blood and anticoagulant at the time of collection is important. The ability of platelets to improve haemostatic function on transfusion is impaired after 12 hours, and after 24 hours' storage the platelets would appear to be quite inactive in this respect.

Sequestrene does not appear to have any advantage over citrate apart from its use in platelet transfusions. When mixed with dextrose it preserves red cells as well as acid citrate dextrose.³ While no toxic effects have been recorded in humans, it can be presumed, on the basis of rabbit experiments,⁴ that 7 g. administered to a 70-kg. human might produce tetany. This would represent approximately a 10-pint (5.7-l.) transfusion of blood collected in 4.5% sequestrene. If citrate intoxication is considered to be a danger, such as in exchange transfusion, heparin remains the anticoagulant of choice.

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Internal Medicine

Q.—What is the significance of the term "internal" as applied to medicine ?

A.—The word "internal" applied to the province of the physician in the vast field of medicine seems to have been introduced by the German schools early last century, when the term *Innere Medizin* was coined. It is not, perhaps, the most suitable adjective, but it seems to be useful and essential as a successor to the earlier term "practice of physic," which is still used in certain universities. The wide applicability of the word "medicine" is unfortunate. It may be applied to (1) a drug or remedy, (2) the entire field of the prevention and cure of disease, and (3) medicine as opposed to surgery. For centuries it was actually opposed, and the surgeon was a mere craftsman. When surgery, and also obstetrics, became a part of medicine or medical knowledge, and when there arose, besides these two, a large number of specialties which also belonged to "medicine," the need to distinguish all these facets of medical knowledge became

obvious, and there appeared forensic medicine, social medicine, preventive medicine—and internal medicine. Perhaps "internal" signified the diseases which were medical and incurable to distinguish them from diseases surgical and curable, as some wag once said. Internal medicine is a term now in general use, whatever the reason of the choice of adjective.

Mumps Orchitis

Q.—What is the latest form of treatment—prophylactic and therapeutic—of mumps orchitis ?

A.—Antibiotics are of no value in the treatment of mumps. If orchitis develops cortisone may be tried; 300 mg. should be given by mouth as the first dose, followed by 100 mg. every six to eight hours for two to four days. Sometimes the effect is dramatic, symptoms subsiding within 24 hours. Orchitis has, however, developed in the unaffected testicle during cortisone treatment so that there seems to be no grounds for the prophylactic use of the drug.

Control of Haemophilia

Q.—What specific therapy is of value in the prevention and treatment of bleeding episodes in haemophilia ? Is any other drug therapy of value ?

A.—Haemophilia is caused by a congenital deficiency in the blood of a factor (antihæmophilic globulin) required for normal coagulation. The only treatment which can prevent or cure bleeding is the replacement of this substance in the patient's blood. The substance may be supplied by the transfusion of whole fresh blood or fresh plasma. To be effective it is necessary to use large amounts of blood or plasma. For an adult patient haemostatic levels of antihæmophilic globulin are not achieved with less than a litre of fresh plasma, and most of the activity disappears from the patient's blood in 24 hours. For this reason it is most desirable to have a concentrated form of antihæmophilic globulin. Concentrated material from human blood is now made in small amounts by the Lister Institute in London, and has proved useful for dental extractions and relatively minor procedures. Antihæmophilic globulin made from animal blood has been made and used successfully for volunteers and for dangerously ill patients at Oxford,¹⁻⁴ and is now available commercially, but, like the human material, only to haemophilia centres.

It seems to be the general experience of medical workers that the egg-white preparation mentioned in the question has no effect on the coagulation defect in haemophilia.

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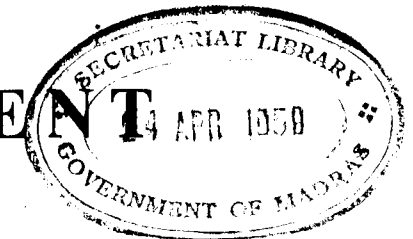
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VOLUME II, 1958

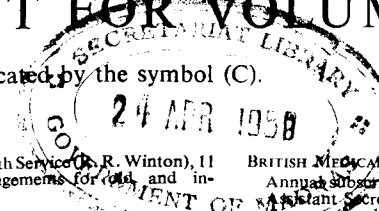
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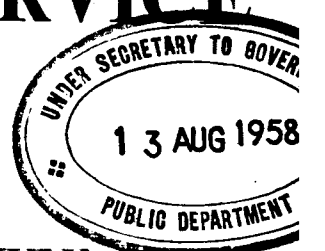
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NATIONAL HEALTH SERVICE

SPECIAL SUPPLEMENT

LONDON SATURDAY JULY 5 1958



A DECADE OF EXPERIMENT, JULY 5, 1948, to JULY 5, 1958

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THE B.M.A. AND THE N.H.S.

THE NATIONAL HEALTH SERVICE AFTER TEN YEARS

BY

H. GUY DAIN, M.D., LL.D., F.R.C.S.

Chairman of Council of the B.M.A., 1943 to 1949

Now that ten years' experience of the Health Service is available, there is considerable agreement that it is opportune to review the conditions, to discover where it has succeeded in attaining its objects, and what are its advantages and its deficiencies or defects.

From the point of view of the "consumer"—that is, every inhabitant of the country, whether Britisher or visitor—it has been an enormous benefit and success. In no other country, whether Welfare State or not, is it possible to have, on requirement, all the professional services that may be needed for the treatment of all kinds of illness or accident without fee or charge; consequently without any hesitation to call for help on account of the possible cost. Any Britisher who has had the misfortune to be taken ill while abroad, or on holiday in most countries overseas, will have discovered how costly medical care has become in these progressive days, with all their modern discoveries and developments. Accordingly, for the patients the Service has been a boon, and the knowledge that it is there and available has been a great comfort even at the time when you have

no need for it yourself. The absence of any financial barrier between doctor and patient must make the doctor-patient relationship easier and more satisfactory.

So far this is all to the good, and it is desirable that the scheme should be looked at critically in its working arrangements to discover where and why it is not functioning as well as it might.

As to the form of a National Health Service, it has to be remembered that in this country since 1911 a service, the N.H.I., had been in operation for general practice, and that on many occasions the Conference of Local Medical and Panel Committees and the Representative Body had asked for its scope to be extended to include the dependants of the workers. The fundamental principle of the Service was the insurance of the patient for the service of his doctor by the payment of an annual premium, the doctor averaging the risks (as in all insurance) over the number insured. Medical services in many countries have always been on a fee-per-service basis, or provided for the less well-to-do by salaried medical officers.

With this background we come to the time, about 1942, when the public and Parliament (all parties) were feeling that no one, however poor, should want for medical care on account of the cost.

The B.M.A.'s Proposals

The problem was offered to Sir William Beveridge as part of Social Security. He produced a report recommending a complete medical service for all, as well as the other "welfare" benefits. The B.M.A. had these problems well in mind, and in 1928 had produced proposals for "A General Medical Service for the Nation." These proposals were revised and published in 1938, and did recommend a two-way extension of benefits for some 90% of the population. Following from this, and in line with public thinking, the B.M.A. set up a planning commission which issued an interim report in 1942. This dealt with hospital as well as G.P. services, and doubtless had some influence on the findings of the Beveridge Report. The far-reaching proposals of this report were matters of great concern to the B.M.A., and it was only after long debate that, at a Special Representative Meeting in April, 1943, the following resolutions were passed:

"That the Government's invitation to enter into discussions without commitment be accepted.

"That a committee representative of the profession as a whole should, in response to the Government's invitation, now enter into discussions with representatives of the Minister of Health on 'a scheme for comprehensive health and rehabilitation services, for the prevention and cure of disease and restoration of capacity for work, available to all members of the community' (Assumption B of the Beveridge report), in the light of the following undertakings now given:

"(a) That, at the conclusion of the discussions and at the appropriate time or times during the discussions, but in any case before negotiations open and before any proposals are submitted by the Government to Parliament, the full machinery of the Association, including the Council, and its Committees, Groups, Panel Committees, Divisions, and the Representative Body, will be used to consider the Government's proposals and to decide the Association's view thereon.

"(b) That every practicable step will be taken to give all members of the profession, whether members or non-members of the Association, an opportunity to express their views and in particular that every practicable step will be taken to give to members of the profession on service an opportunity of expressing their views, to assess those views, and to present them to the meeting or meetings of the Representative Body called to consider any proposals by the Government."

With this authorization by the Representative Body, the Council started talks with the then Minister of Health, Mr. Ernest Brown (Liberal National), who produced the Department's ideas of a whole-time salaried general practice service, with doctors to be appointed by the Ministry to areas and blocks of patients without any option to either doctor or patient. The reaction of the B.M.A. representatives was so sudden and complete that Mr. Brown withdrew the scheme, and talks began.

This experience, however, showed the ideas of the Department. From this point, over the next four years, prolonged discussions continued, and gradually one after another essential conditions were established; the right of any doctor to take part in the Service if he wished, the right to practise where he liked, the right of doctor and patient to choose one another, the right of the doctor not to be dismissed the Service except after a Tribunal decision, nor his name removed from the Executive Council list.

The Government's Views

In 1944 Mr. H. U. Willink (Conservative) produced a White Paper which proposed, among other unsuitable points, to put the hospitals in the control of the local health authorities, whose health committees would be appointing the whole-time consultant staff. And so these discussions continued.

It was argued that when the Government was providing the greater part of a doctor's income it was not reasonable that he should be able to buy or sell the practice, and that the transference of "blocks" of patients from one doctor to another was undesirable. In the end the Government agreed to buy the goodwill, and pay compensation, ultimately fixed at £66 million. It is interesting to note that the transfer of blocks of patients is no longer improper now that it is done by the Service.

The Social Security idea that everyone must be provided for in the Service was opposed by the B.M.A., and it was only after much consideration at a Special Representative Meeting in May, 1945, that the 100% condition was accepted and the following resolution passed:

"That the Association, regarding the 100% issue as one for Parliament to decide, is willing to negotiate terms and conditions for such a 100% service, if such be decided upon, provided that ample safeguards are introduced to ensure that any member of the community, whatever his income, should be enabled to obtain his medical service, in part or in whole, privately, as for example by grant-in-aid provisions."

In 1945 a General Election had produced a Socialist Government with now a Labour Minister of Health (Mr. Aneurin Bevan). Negotiations had to be started all over again with a new Government known to be in favour of a whole-time salaried service. It was only after difficult negotiations and several Special Representative Meetings that the Minister agreed to provide that a whole-time salaried service could not be established by regulations but only by Act of Parliament, and he discarded the £300 a year basic salary proposal.

And so in July, 1948, the National Health Service Act, more or less as we know it to-day, came into force; a scheme much more liberal and to our liking than the proposals of Mr. Ernest Brown or Mr. Willink.

The Spens Committees

Both the Ministry of Health and the B.M.A., with thirty years' experience of National Health Insurance behind them, and the recurring acrimonious monetary disputes that had occurred, agreed that for the new service an effort should be made to find a method of fixing remuneration that would prevent the recurrence of financial squabbles. The result was the establishment of the two Spens Committees, both parties approving the idea, and agreeing on the members of the Committees. The decisions of the Committees were accepted and the start was made. In the result, in the ten years of the Service, the experiences have been dismally disappointing. Every Government, and every Minister since, has gone back on the idea and strenuously resisted putting "Spens" into operation.

To maintain our financial position, after much unpleasant wrangling, the Danckwerts tribunal was agreed and an award to 1951 values given.

Insecure Conditions

To-day we are awaiting the decision of a Royal Commission, set up to do just what we hoped "Spens" had accomplished, that remuneration should be adjusted to altered values, and varied with work done, without either the Minister or the B.M.A. being involved in bargaining. This experience is so disturbing, and so vitiates the smooth working of the Service, that the most serious consideration will require to be given to the question of whether the medical profession can continue in conditions of such insecurity.

What guarantee can be given that this or any future Government will implement the award of any Royal Commission or independent tribunal?

The Whitley machinery, set up in the Service, was expected to provide for the settlement of disputes, but the Minister has always refused to agree that either side should be able to take any unresolved question to arbitration. Whitley without agreement on arbitration is almost useless.

Then in 1955 the claim for an adjustment to take account of the altered value of money was met with a blank refusal. The Minister, this time a Conservative Government, the Chancellor, and the Prime Minister, in turn refused (it might be said, rudely) even to look at the claim. Continued pressure was required before, without any consultation, a Royal Commission was appointed.

In the day-to-day working, with the public taking full advantage of their benefits, and the doctors loyally looking after their patients, it was inevitable that some difficulties would arise. They have really been remarkably few. Both doctors and patients would seem to set a better value on a Service if some payment is made at the time. This points to the need to look at, and appraise, some of the Medical Services in other countries, where a fee-per-service system is in vogue, when considering future services in this country. In the meantime it would probably remove some disgruntlement if the doctor could make a charge (to be fixed) for late and night calls for visits. Experience of public medical services of earlier days showed that this provision protected the doctor from frivolous calls, and that the patient really in need did not grudge the fee; after all, the amount of money received was negligible. It would seem that it would be for the smooth running of the Service if the present complete freedom of access had a small deterrent.

For the general practitioner the transfer of the practice from his own hands to the Government has had a serious limiting effect in that it is now very difficult indeed for a doctor to change the area of his practice. It is interesting that in some countries, where a fee per service has always existed, goodwill is not bought or sold, the doctor making no attempt to find a successor. If, when the Government had bought the goodwill of practices, the transfer of lists had ceased, there would have been much more freedom of movement of doctors from area to area.

On the hospital side it has been most unfortunate that no proper estimate of cost or of development was made

in advance. With medical and surgical progress new methods and materials continually evolve and costs increase, but there is never the proper money to staff the hospitals, and still less the capital necessary to build new ones. It is humiliating to see the up-to-date new hospitals being built in many other countries, less materially well off than Great Britain, and to reflect that we have not been able to afford new buildings for nearly ten years. At the same time, no other country has felt able to pay for complete access to all drugs, or free-at-the-time access to all professional services.

Conclusion

The present scheme, which we can now look at critically after ten years, was our own method of choice as against a whole-time salaried service for G.P.s. It certainly has provided clinical freedom. The capitation payment is sometimes said to encourage a minimum service, but the way that private practice steadily diminishes is evidence of the efficient way that the G.P. gives his service, even if it is contended that a fee per service offers a greater incentive. Here is a useful subject for group discussion and perhaps a plebiscite.

Having regard to the great importance of the Health Service in the general welfare of the community, it is to be hoped that the matter of the control of the Service will be reconsidered. It requires a small body of knowledgeable people, mostly doctors, to be permanently in charge and able to provide continuity and outlook for development in these fast-moving times. The present Civil Service method under a Minister, who changes so frequently that if he is in office long enough to plan ahead a little he certainly will not be there to see his ideas carried out, is never likely to arrive at a proper integration of the many aspects of medicine—teaching, research, preventive medicine, occupational health, and hospital and general practitioner curative services.

What an opportunity for statesmanship.

THROUGH THE EYES OF CONSULTANTS

LESSONS FROM THE PAST

BY

LORD MORAN, M.D., F.R.C.P.

President, Royal College of Physicians, 1941 to 1950

Though the National Health Service was actually introduced by a Labour Government, its roots date back to the Beveridge Report which was submitted to the Coalition Government in 1942, when Sir Winston Churchill was Prime Minister. I remember Lord Waverley saying that if the Labour Party had not launched the Service the Conservatives would have done so when they took office. All three political parties were committed to provide a health service for the country. It was, in short, politically inevitable. Moreover, it was unavoidable on account of finance. The hospitals were, broadly speaking, bankrupt; they could not have carried on without large Government grants. The profession had the choice between a service set up by the Ministry of Health without any help or advice from doctors, and one shaped and moulded by their own hands. They chose the latter: they could do no other.

Do they regret that decision? If the consultants were asked at the present moment whether they desired to go back to the days of the old voluntary hospitals, where all the work was carried out without remuneration, I believe the overwhelming majority would prefer the conditions of to-day.

If I am right in this, then the consultants accept the nationalization of hospitals. Moreover, Mr. Aneurin Bevan's plan was on the whole more liberal than that submitted by Mr. Willink to the Tory Party. For if Mr. Willink had had his way, the doctor would have been an employee of the local authority.

Lord Radcliffe has lately compared medicine and the law. The law, he said, was not a progressive science; it is the same now as it was 50 years ago; whereas there have been revolutionary changes in medicine. They are such that the Dean of Harvard Medical School has said that in 10 years' time half of what we now know will be found to be wrong. And, alas, we do not know which half. It is perhaps rash to attempt to measure a progressive science of this kind, bounding forward all the time, by the footrule of the administrator. All the same, the Ministry of Health can claim a considerable administrative achievement.

Redistribution of Consultants

Before the National Health Service, consultants congregated in the great centres of population. It was economically difficult or impossible for many consultants to exist

a substantial subsidy from central Government funds—subsidies which they had learned to enjoy during the war years as part of the emergency hospital system.

In Great Britain we elected to try out a National Health Service, universal in its benefits and based on a small insurance premium common to all and collected by the State. In Australia and New Zealand the State contribution to the medical care of the individual took the form of a grant-in-aid for services rendered. The United States chose the system of voluntary insurance, and the growth of that system since 1941 has been spectacular. Thus to-day one hundred and ten million United States citizens are insured for hospital maintenance, ninety-four million for specialist fees, and fifty-eight million for general medical care. Side by side with this spontaneous voluntary effort the United States has expanded the medical facilities of the Veterans Administration in the form of a nation-wide hospital system entirely financed from the Federal Treasury.

Medical science cannot stand still. Diagnosis and treatment must be continuously advancing both in accuracy and in safety. The "precision tools" of the laboratories on which the practice of modern medicine is coming more and more to rely, are increasing in number and complexity. Medicine is already responding to the nuclear energy age in the diagnostic and therapeutic use of radioactive isotopes.

Thus we see the growing edge of knowledge on which the leading hospitals stand. They cannot retreat. If they are to go forward with confidence and enthusiasm they must be reassured that the sinews of war will not be withheld from them.

The National Health Service

The National Health Service, inside whose framework the teaching and non-teaching hospitals function, has now been on trial for ten years. Its three outstanding achievements are universally acclaimed.

(1) The unified hospital system created by the merger of the voluntary and local authority hospitals under one direction, thus eliminating old rivalries which in many areas stood in the path of progress.

(2) The establishment of the region as the planning unit. The teaching hospitals, of course, lie outside the jurisdiction of regional hospital boards, but in most parts of the United Kingdom there is the closest collaboration between boards of governors and regional hospital boards in the planning of clinical services.

(3) The distribution of consultants and specialists to smaller hospital centres where, before the National Health Service, no such skilled services were available. This is perhaps the great achievement of the three.

It is not surprising that now, at the end of a ten years' trial, the National Health Service is being subjected to a barrage of criticism from many different quarters. There are two recurring themes based on the ideas of extravagance as a whole or in particular fields.

The first is the fragmentation of the Service—the apparent failure to bring together in one unified and economical whole the three main sections—the general-practitioner service, the hospital services, and the local authority services. This criticism has been voiced in *The Times* in a leading article.¹ Co-ordination, or a merger of the three parts of the National Health Service under unified guidance, sounds attractive in theory, but there is no guarantee that such a system would result in major economies. In his responsibility for the three sections of the National Health Service the Minister of Health is in the same position as the Minister of Defence, and in this respect alone has an unenviable task.

The second criticism is that there is excessive expenditure on drugs, especially on the more costly types. The cure of this malady in the end must be left to the clinical teachers in the medical schools, who alone can introduce

¹ *The Times*, April 19, 1958.

a sense of responsibility and perspective in the education of the medical students of the future.

So much for overspending. On the other side of the picture is the criticism in relation to the hospital services that not enough money is made available (a) to rehabilitate obsolescent institutions; (b) to build new hospitals; and (c) to provide an ever-expanding income which will allow our leading hospitals to plan and experiment and so keep abreast of the advancing front of medical science.

During the past ten years we must recognize that within the restricted budgets allocated to regional hospital boards and boards of governors a great deal of hospital structural rehabilitation has been carried out—the modernization of kitchens; engineering services, laundries, and so on; and in many centres entirely new casualty and out-patient blocks and operating theatre units. The problem of priorities has been as difficult in the periphery as it has been at Whitehall. No Minister of Health, no board of governors, no regional hospital board, can expect to achieve universal popularity in their respective "constituencies."

In the early days of the National Health Service we had all hoped that the patching up of obsolescent structures would be a temporary affair, and that the epidemic of new hospital construction which has swept the North American continent, Scandinavia, Switzerland, and more recently France and Germany would spread to Great Britain. This has not happened, and we have been compelled to contemplate another long period of practising twentieth-century medicine in nineteenth-century structures. None the less it is twentieth-century medicine, and, despite our physical and financial handicaps, British medicine so far retains a position of leadership. But a sense of frustration prolonged indefinitely must in the end handicap progress by limiting the freedom to experiment which is the life blood of medical science.

Future Sources of Hospital Finance

We may now ask ourselves whether during the next ten years—the second decade of the life of the National Health Service—its adolescence—we can expect to see released from Central Government funds year by year sums which will enable us both to remedy the physical defects in our hospital services and to provide for the ever-expanding needs of scientific medicine. It is estimated that for 1958-9 the gross expenditure on health services will be £736m., of which £421m. will go to the hospitals. Will £421m. give us all that we need for our hospitals? It seems unlikely. If this sum or its inflated equivalent is to represent a "squeeze in perpetuity," what then? The difficult problem of deciding on priorities within scanty budgets will continue to dominate the picture. But there is a time limit to the enjoyment of such austerities. The Minister of Health, a harassed man whoever holds that office, in one of his latest pronouncements, has suggested that the upgrading of the non-teaching hospitals is an important priority. This may be good news for regional hospital boards but not so good for boards of governors, and for the universities, if they feel, as they should, an acute sense of responsibility for the structural quality of the teaching hospitals as apart from their staffs. In this matter it is my opinion that the universities have not always brought up their heaviest artillery to be pointed at Central Government. I make this statement as a deliberate challenge to the Vice-Chancellors, who are naturally more concerned with the physical extension of the universities which is proceeding apace.

We therefore face what to me is an inescapable conclusion: that for their special requirements in the future the hospitals must not only be set free but must be encouraged to seek additional sources of finance outside the Central Government budgets of the National Health Service. For the teaching hospitals this should be a welcome return to old practices and in keeping with their long heritage. In appeals to the community, to industry, and to philanthropic individuals they would thus behave as do the universities. Such efforts might enable us to see in the space of a few years several new teaching hospitals in this country, each

embodying completely novel features—i.e., hospitals designed specially for the purpose of teaching the undergraduate.

Like many others who have given thought to the problems of hospital design in terms of function, I have my own conception of the structure of the ideal teaching hospital. I give you this in broad outline for what it is worth. (1) The closer integration in each major clinical block of the needs of the patient with the needs of the student. That is to say, that wards, laboratories, teaching rooms, departmental libraries, and so on should be one integrated whole. (2) That the out-patient centre or polyclinic should provide such diagnostic facilities and amenities for patients as will reduce the need for the occupancy of expensive beds. (3) That within each main clinical block the university units should lose their geographical isolation, and, better still, their separate identity. This means that the scientific and academic facilities, research laboratories, and so on, which in most teaching hospitals, if not all, have been reserved for the professorial units, should in the future be so designed and sited that they are shared in common by both full-time and part-time university clinical teachers. In this way the medical, surgical, and other major clinical divisions of the teaching hospital would become the university units of the future. And so the concept of the university hospital which, alas, some of us failed to persuade the Goodenough Committee to accept in the spacious days not so long ago might one day come to exert a dominant influence in the structure of medical education. A university hospital would then have two financial godfathers at Central Government level, health and education. We have recently heard that £64m. is to be set aside for new university colleges to foster the applied sciences. Where do the teaching hospitals come into this picture? Do we see the way ahead clearly? Perhaps we need not be unduly pessimistic, but the nation must be told that we cannot be left high and dry if British medicine is to retain a position of world leadership.

THE INTEGRITY OF MEDICINE*

BY

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If the normal span of active professional life can be considered to be in the region of forty years, then I have been fortunately placed; by accident of age I have spent half of my life in the profession before the National Health Service was instituted and hope to spend the second half—indeed, have already spent half of that half—under the new regime. I am therefore not an old man looking back nor a young man looking forward, but I am one with experience of the old who is trying to grapple with the problems of the new.

Older members of the profession are familiar with the state of medicine as it existed before 1948, but, as a result of the introduction of the N.H.S. shortly after the termination of a long war, an entire generation of doctors has sprung up who are largely unfamiliar with medicine as it used to be practised.

Pre-war Medicine

The profession of medicine as it existed prior to the last war, and indeed for half a century before that, was a well-integrated profession in which each and every

*Presidential Address delivered to the Royal Medico-Chirurgical Society of Glasgow on October 4, 1957.

section of the profession was closely interrelated. As a result of this harmonious interrelationship or integration, doctoring was an honourable calling.

The general practitioner was regarded by his patients as the family doctor and friend. The consultants and specialists depended upon him for the bulk of their private practice. The local authority looked to him to implement its measures of public health. In many hospitals, both urban and rural, he played a useful part on the visiting staff, and even in the larger teaching hospitals he was a frequent and welcome visitor. As a result of this he was a highly respected member of the community. It should be remembered that he managed to maintain this position irrespective of the fact that in many instances a large proportion of his work was paid for by national insurance.

The consultant or specialist also commanded a share of the public esteem relative to the service which he offered the community through the family doctor and by the distinction he achieved in his hospital work, both as a healer of the sick and as a teacher of students. It is important to recall that an honorary consultant appointment in a large voluntary hospital, and in particular a teaching hospital, was not only the gateway to private practice but carried with it enormous prestige in the eyes of the public. To emphasize this point it may be remembered that a number of consultant posts were not honorary but were paid for by local authorities, and these posts held a much lower prestige value and were less sought after.

The ancillary non-clinical branches of the profession—the pathologists, bacteriologists, and medical officers of health—were less well integrated with the main body of the profession by the very nature of their work, which tended to segregate them in laboratories and offices. But the most notable members in these fields made their contribution to the general well-being not only by their teaching but also by maintaining a close liaison between ward and laboratory, or, in the case of the medical officers of health, between their office and the general practitioner.

Many of us will remember, for example, the solemn procession of the chief, subchief, assistants, and residents to the post-mortem room laboratory while Sir Robert Muir discussed the shortcomings of bedside diagnosis. Others will recall Carl Browning's journeys into the wards to advocate and control the greater use of aniline dyes and in particular acriflavine in the control of sepsis. These men showed by example how the clinician or field worker could be integrated with "back-room boy" or research worker.

In public health the greatest figures were those who remembered they were doctors first and challenged when necessary lay authority; men like Sir Alexander Macgregor of Glasgow, Buchan of Willesden, and Professor James Mackintosh, now of London, while ardent civil servants, were barriers against bureaucracy when it transgressed the medical field.

It was to some extent because of this integration and because of the respect and popularity in which the medical profession was held by the public that politicians of all parties were eager to make political capital out of what was already an effective service. Beveridge, the Liberal, Brown, the National Liberal, Willink, the Conservative, and Bevan, the Socialist, could not conceive a Welfare State in which the profession did not play a major part. In the end it fell to a Labour Government

to introduce legislation embodying much of what had been discussed and approved by *ad hoc* committees of all political parties, together with their professional and economic advisers.

The National Health Service

There is no doubt, and it would be foolish to deny, that the institution of the N.H.S. has effected many major improvements in the health facilities offered to the nation. As examples, one might cite the inclusion in the Service of that section of the population which, prior to the Act, was impoverished and uninsured. Many peripheral hospitals have been upgraded and expanded. There have been improvements in the mental health services. More attractive conditions have been provided for laboratory workers. These and many others are unquestionable advances. It would be wrong to think that these benefits could not have been achieved during the last ten years by any other means. Some would undoubtedly have evolved from the gradual expansion of the older voluntary schemes, the sources of which have now dried up. Private insurance would have looked after other aspects, as has happened in the United States. Local authorities would not have stood still on matters affecting the health of their community. Improvements would have certainly taken place. None the less, it is true to say that all the political parties were at the end of the war agreed that the Health Service should be taken over by the nation and financed by the nation, and as a result we have now had a National Health Service for almost ten years.

My purpose is to examine the effects of this Service upon the profession as a whole and to note whether any change has come over its component parts. For no matter how good the Health Service is to-day, and it is a good service, its future will depend essentially on the quality of the medical profession itself and the esteem in which it is held by the public.

No matter how excellent the administration, irrespective of the extent of the ancillary services (so-called) and regardless of the grants from the Exchequer, the health of the nation will depend upon the integrity, in its widest sense, of the medical profession. They represent the keystone of the arch upon which this mighty national edifice is supported.

To-day the Health Service is being maintained to a large extent by those who were trained and nurtured on ethical standards which existed before its introduction. I do not exclude from this group those younger doctors who, by example, precept, or natural inclination, have adopted similar standards. But while such members of the profession are bound to be affected by the revolution which has taken place, how much greater will be the effects upon those whose standards are based solely upon terms and conditions of the new Service. Let us examine the new situation and endeavour to ascertain, so far as is possible, how it affects the profession in the eyes of the public it seeks to serve.

The first fundamental consideration is that the general public feel that by their health contribution and by Exchequer grants they are paying for the medical service.

It is common knowledge that every member of the public to-day is entitled to the services of a general practitioner. The practitioner is paid according to the number of patients he may have to serve. Every patient is entitled to free hospital service, and these hospitals are manned by consultants and specialists, and specialists in training, who again are paid. The ancillary services—pathologists, bacteriologists, radiologists—are also the paid servants of the public. Thus there arises in the public mind a conviction that the services received have been paid for, and paid in full, and that such payment discharges further obligation to the profession. The profession cannot expect payment and gratitude in the proportion which was formerly given to it, for in former days gratitude was often all that doctors could expect.

Money and Medicine

Confused thinking about the relationship between money and medicine is not new. In 300 B.C. Aristotle, while defending just payment, pointed out that there were other considerations of imponderable value, and exemplified this by saying: "The quality of courage, for example, is not intended to make money, neither is this the aim of the general's or the physician's art, but the one aims at victory and the other at health." Indeed, this is an ever-recurring theme in the history of medicine. In 1903 Sir William Osler stated that in every age there have been Eliahs ready to give up in despair at the progress of commercialism in the profession (Osler, 1939), and himself quotes Garth in 1699 saying: "How sickening Physick hangs her pensive head. And what was once a Science, now's a Trade."

The regard of the public for the profession thrives upon deeper emotional roots than mere payment can satisfy. When men or women are sick they think in terms of human values rather than payment. The sick are frightened and we remove the fear; they are unhappy—we may bring some happiness. They are tiresome and exasperating to their relatives and even to themselves; we try to bring patience and understanding to comfort them. I should like to quote here from the great English poet John Donne in his "Devotions," which was written while he lay seriously ill during the winter of 1623; he wrote: "I observe the physician, with the same diligence as the disease; I see he fears, and I fear with him: I overtake him, I overrun him in his fear, and I go the faster because he makes his pace slow; I fear the more because he disguises his fear, and I see it with the more sharpness because he would not have me see it. He knows that his fear shall not disorder the practice and exercise of his art, but he knows that my fear may disorder the effect and working of his practice." These human values which the medical profession has to offer are perhaps its strongest contribution to society. If the enormous administrative machine which the N.H.S. has created or if other present-day attitudes cause decline in these human relationships, then the prestige of the profession will also fall.

We must, however, recognize that no profession maintains a static position. The teaching profession has suffered a change from the days of Oliver Goldsmith's rustics who, regarding the village teacher, "gazed and gazed and still the wonder grew that one small head could carry all he knew." There is little wonder left in the world to-day, and the teachers have, I think, less regard than is their due. Could this be the result of the absorption of their profession by the State machine? That interesting speculation must be left aside.

The position of the Church is more difficult to assess, for in the Ministry, considered as a profession, there is a vocational element even greater than in medicine. In the last century and the early part of the present one it commanded an almost universal respect. To-day it appears to have lost ground; whether this be due to internal schism or to the pressures and lures of advancing and applied science would be impossible to say, and again this problem would distract us from our own.

Practitioner-Consultant Relationship

Are there factors within our own profession to-day which might endanger its position? Let us examine such possible causes of disintegration, for if we are weak within we will be in no position to withstand assault from without. To take the relationship between general practitioner and consultant first. Is it what it was? Is there a cleavage here? Is there a possibility of disintegration arising in this field of medical relations? John Hunt (1957), in discussing the renaissance of general practice, makes reference to this question and concludes, "Family doctors and specialists have worked together, on the whole happily, for tens of thousands of years, and I believe they will continue to do so." His optimism may be justified,

but, as his observation was parenthetical to his main theme, he unfortunately adduces but slight evidence to support this view.

Unhappily, the mechanism of the schism is all too apparent. The general practitioner works under a totally different administrative structure from the specialist. The local medical committee has no counterpart amongst the consultants and specialists. The executive council, the immediate controlling and employing body, in the case of the general practitioner, is vastly different from the regional hospital board, the employer of the consultant, and again there is little or no liaison between them. This results in a division of the profession at the administrative level and in each side having little knowledge of the administrative problems of the other. There can be, and has been, disunity at the highest level when approaches are made to the Government: for example, at the inception of the Service the famous Presidents' letter to *The Times*, in which the Royal Colleges diverged sharply from the Negotiating Committee. Later, when unity has apparently and at least superficially been achieved, we see a separate and at least superficially achieved, we see a separate Danckwerts award to the practitioners. More recently still, divisions arise when negotiations break down and an exchange of letters between the President of the Royal College of Physicians of London and the Prime Minister still further divides the profession.

The policy of divide and rule which, as a political expedient, has been successfully employed by successive Governments in so many fields has not as yet been entirely successful in medicine. The credit for having withstood this assault and maintaining our integrity must accrue to those very leaders of the profession, both consultant and general practitioner, at whose heads so much criticism has been levelled by the rank and file. For when they have diverged and endangered professional unity they have until now quickly closed the breach. Divergence of opinion is inevitable and desirable in a healthy profession. Divergence in action, however, may lead to disintegration, and therein lies a danger of which we must be fully conscious.

If we examine still further the consultant-general practitioner relationship in its day-to-day aspects it is possible to detect a more insidious danger. I refer to the maintenance of a degree of private practice without or within the Health Service. If private practice perishes we have embarked upon a whole-time State salaried medical service, whether we like it or do not like it. Surely if such a salaried medical service is inevitable or desirable it should be imposed or accepted by a process of discussion and negotiation. If it were to arise simply as a result of the attrition of private practice, then later negotiations of the profession with the employing body would be from a position of weakness, and it is questionable whether medicine would receive much consideration from the controllers of the machinery of the State.

The maintenance of a strong practitioner-consultant relationship is essential to the survival of private practice on an ethical level. This exists to-day amongst the older general practitioners and consultants, but what of the young part-time consultants and senior registrars? How many young practitioners realize that their opposite number, the young specialist, is often part-time and that that part of his time which he lays aside for private practice can only be utilized by the general practitioner selecting suitable cases for him to see? It is easier and often quicker to recommend all patients without discrimination to hospital, but it is the sure way towards removing private practice from medicine and setting up a barrier between the practitioner and the consultant.

Association Through the Domiciliary Visit

Apart altogether from the angle of private practice, we have opportunities within the Act of associating consultants and practitioners through the medium of the properly conducted domiciliary visit. This excellent provision in the

Act has removed from the practitioner whose patient could not afford private care the need to ask a favour of the consultant. In the past these "favours" were freely given, and, as our Faculty states at the end of each of its minutes, "and the poor were visited gratis." Nevertheless, the practitioners who sought such help from a consultant might well feel embarrassed, and, as our American friends would say, unduly obligated to him. To-day that feeling no longer exists; the basis of consultation is on an equal footing. But consultation must take place. We are all aware that domiciliary visits are sometimes paid by the consultant in the absence of the family doctor. Such an occurrence is very occasionally unavoidable, but were it to become prevalent it would destroy the basis of consultation, and, to quote from John Donne once more: "When there is room for consultation things are not desperate. They consult; so there is nothing rashly, inconsiderately done; and then they write, they prescribe, so there is nothing covertly, disguisedly, unavowedly done."

We have managed to achieve great equality in the profession in this country, and that equality depends in no small measure upon the interdependence of the consultant and the general practitioner. It is by no means so in the so-called egalitarian countries where private practice is non-existent. There the hospital chief has a position of privilege and respect far greater than his fellow doctors—a curious paradox which has never existed in Great Britain. On this matter I should again like to quote from Hunt's Lloyd Roberts Lecture (it should be noted that he is not referring to private practice): "A specialist appreciates a general practitioner who uses him efficiently; and often there are no greater friends or more loyal colleagues than a general practitioner with a special interest and a consultant in that subject, be they neighbours or many miles apart. They speak the same technical language, and learn from each other every time they meet. Such close and friendly co-operation between general practitioners and consultants is possible in all branches of medicine, and is much to be desired."

The College of General Practitioners, recently founded, is a most encouraging move towards greater unity among doctors. In contrast to the British Medical Association, which embraces all branches of the profession and which nowadays is forced more and more to be concerned with administrative, financial, and negotiating duties, the College of General Practitioners is drawn solely from one section of the medical community, and could move either towards or away from its sister colleges and associations. All the indications, however, are towards union. No single agency could have done more than the College of General Practitioners to develop a proper liaison between the two great branches of the profession. Already they have in the West of Scotland instituted postgraduate courses and brought once more within the ambit of the hospital many doctors who would otherwise have been excluded.

Whole- and Part-time Consultants

Having touched on the relationship or integration of the two main branches of the profession, it might be of interest to turn for a moment to the specialists and consultants themselves—the teachers, the non-teachers, the basic research workers, the clinical research workers—and to observe to what extent this section of the profession is within itself integrated (I refer to the whole-time consultants and the part-time consultants).

One of the better features of the National Health Service is that the conditions allow the consultant to practise either whole-time or part-time. The value of this system is that it allows a consultant to choose the form of service which suits his own particular temperament and gives the patient a freedom of choice of specialists which would otherwise be unobtainable. As the relationship between consultant and patient should always be to some extent personal and humanistic, it follows that the advantages or disadvantages of one or other form of service (whole- or

part-time) will seem different to doctors of different temperaments. Thus there can be no uniformity of opinion on the relative advantages or disadvantages of the two methods.

Many influences serve to direct the doctor to a particular form of medical hospital practice: chance; a desire to pursue a specialty such as laboratory medicine where the posts are full-time; geographical conditions; domestic considerations; personal economics; or a liking for a particular type of life—all or any of these and possibly others enter into the decision. It is desirable that facilities should exist in hospital practice for each type of work. It would be entirely wrong to consider that one is "better" than another, or that all doctors should be expected to undertake their work under the same conditions. It is undesirable to imply that there is some fundamental difference between those who prefer whole-time and those who prefer part-time work.

Differences sometimes arise between those involved in original or basic research and those whose interests lie more particularly in the clinical field. Intellectual snobbery on the part of the basic scientist may lead him to denigrate the work of the clinical research worker, and much more so the clinician who has no aptitude for research but is yet none the less competent in the practical field. Equal and opposite is the sneering or patronizing attitude of some clinicians towards the "backroom boys." Both attitudes are deplorable, and the reputation of the profession is tarnished by such lack of sympathetic understanding. Osler (1897) puts it well when he tells us that medicine is seen at its best in men whose faculties have had the highest and most harmonious culture—the Harveys, the Pagets, the Jenners, the Gairdners. These and men like them have been the heaven which has raised our profession above the dead level of a business.

Our Clear Duty

If we turn now from the possibilities of disintegration of the medical profession from within we become conscious of many new trends which may affect us from without.

The profession to-day can be profoundly influenced by the actions of the new bodies concerned with the administration of the Health Service—regional boards, executive councils, hospital boards of management, and many other administrative committees, local, regional, and even national—upon which we as a profession have representation.

It is perhaps a truism to mention that our only title to sit on these various bodies is that we are members of the medical profession. The other members of these committees are widely chosen from every walk of life, and are mostly recommended representatives of other interested bodies, local authorities, universities, trade unions. Such lay representatives are usually drawn from people who have shown some aptitude for public service; they give of their time and service voluntarily. The impact which our representatives make upon this cross-section of the intelligent public can be immense for good or ill. We as a profession may well be judged, and often are judged, by the behaviour of our representatives upon these various committees throughout the country. Never before have our representatives had such a platform; never before has there been such potential for advertising the credit or bankruptcy of the profession. Therefore it is our clear duty to choose from ourselves those who most truly represent us. It is the duty of those chosen to serve, and, in serving, to realize the importance of the trust imposed upon them, not as individuals but as members of a learned and honourable profession.

Relations with the Press

If we wish to examine still further the impact of our profession upon the mass of the general public we would do well to consider our relations with the press. This new mammoth moulder of public opinion was described recently by the Moderator of the General Assembly of the Church of Scotland as follows: "Sensational newspapers are in-

creasingly mastering the minds of men to-day as much as kings mastered them in former times." There is no doubt that to-day the press and its close relations, radio and television broadcasting, are not only organs of opinion but often organizers of opinion. Properly utilized, they can confer considerable benefits on society as regards the medical education of the public. Improperly used, they can cause infinite harm by instilling fear and even panic, or by arousing antagonisms between professions or within professions themselves. We have only to recall their handling of such difficult problems as the availability of polio or Salk vaccines, not to mention their current campaign on influenza vaccination, to realize that they have an enormous power. Inflammatory references to a strike of doctors are examples in another field.

Our professional administrative bodies, and even our professional medical incorporations and associations, have perhaps paid too little attention to the importance of a proper public relations mechanism whereby the considered opinions of the profession as a whole are communicated in proper form to the public through the press. As a result the press will seize upon a story or a name and give publicity to some facet of medicine which is actually harmful to their millions of readers.

Of this wide subject, which will be debated at another meeting of our society, I should like to consider only one aspect—namely, medical anonymity. Anonymity has long been a bulwark of correct professional behaviour in this country, and when it is grossly abused can even be considered by the General Medical Council as infamous conduct. There are those in our profession to-day who regard medical anonymity as an anachronism in modern times. One learned professor bemoans the fact that he cannot have the publicity for his utterances that is accorded to those of Sir Mortimer Wheeler or Bertrand Russell—he surely forgets that to be a distinguished member of our ancient profession should be in itself sufficient reward and that if he is worthy of acclaim he will be accorded it by his peers and not by sensation-seeking journalists or impresarios of the stage, screen, or radio. If we look back to Aristotle, we find him saying in his examination of the problems of the reasons for and against sovereignty of the people—and this question of press publicity has just that element behind it—"He who can judge of the healing of a sick man would be one who could himself treat his disease and make him whole—that is, in other words, the physician; and so in all professions and arts. As then the physician ought to be called to account by physicians, so ought men in general to be called to account by their peers."

Make no mistake, certain sections of the press are anxious to break down professional anonymity. Adversity, in the shape of failure to obtain signed medical articles, makes strange bedfellows when we have Francis Williams, the left-wing editor of *Forward*, joining the Conservative contrailing and oddly anonymous "Pharos" of the *Spectator* in deploring medical anonymity.

The public, by and large, are incapable of assessing the worth of medical articles; it would be wrong to place upon them the further burden of trying to assess the worth of the various authors. Our American colleagues have been lax in this respect, and the increasing health hysteria of the American public can be partially accounted for by this lapse from medical wisdom and discretion.

Playing the Greater Part

It would be proper to say that in reviewing the integrity of the medical profession I have largely concerned myself with British medicine. We have a greater part to play in medicine throughout the world. We must strive to maintain high standards throughout the Commonwealth, and we must try to look on our Commonwealth as an opportunity to enlarge our unity. We must welcome our colleagues from abroad and must travel among them ourselves, conscious and proud of our common membership of a high

calling. We must try to encourage overseas visitors to study in our hospitals, to strive for our higher medical degrees. We would do well to spread the net even more widely by encouraging general practitioners from abroad to associate themselves for a period of time with the leading members of that branch of medicine in this country. For if our pro-

fession is healthy and active—and I believe it is—then Britain could become a Mecca of medical learning.

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SOME COMMONWEALTH COMMENTS

THE NATIONAL HEALTH SERVICE IN AUSTRALIA

BY

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Recently Mr. Malcolm Muggeridge, who is visiting Australia, broadcast over the Australian national network. Amongst other matters he referred to the Welfare State and commented: "This Welfare State is a kind of zoo, which provides its inmates with ease and comfort but unfits them for life in their natural habitat. Mangy and bleary-eyed, they grumble and growl as they walk up and down their cages waiting for slabs of welfare to be thrown to them at meal-times."

This was a considerable overstatement, and no doubt Mr. Muggeridge was quite conscious of that fact, but his comment contains enough truth to arouse suspicion about the Welfare State and its implications—suspicion which has been felt for a long time by a strong body of public opinion in Australia, and which has undoubtedly influenced the development of our National Health Service.

It is generally conceded that the complexities of our age place an increasing and often intolerable burden on the weaker brother in most communities, and society's sense of collective responsibility for him has grown. This is right and good. The problems arise when we debate how that responsibility should be discharged.

In Australia the view has prevailed that the benevolent but bureaucratic grandfather who presides over the Welfare State is not for us. Various social services provide for those with genuine needs, but a premium is still put on self-reliance and independence of spirit. This is especially so in the National Health Service. The position was well expressed by Sir Earle Page, then Commonwealth Minister for Health, in a speech in the House of Representatives in Canberra on October 26, 1955:

"Our programme has been carried out by the active, co-operative and intelligent partnership of governments, hospitals and staffs, doctors, chemists, insurance organizations and individuals. This partnership encourages and stimulates self-help, which helps the whole community. It dovetails together the various phases of the health organization which act and interact cumulatively on one another to secure the best results for the sick and other elements of the partnership. Each partner has defined functions and obligations with the aim, within its specific field, of implementing measures to cure disease, shorten the duration of sickness and to make the scheme pay more back to the community than it costs."

These words are still true in 1958. Despite certain defects, which will be mentioned later, the National Health Service in Australia is working well. It is

generally acceptable to the Government, to the people, and to those who have to work it, and, as we see it, favours the best interests of the community.

Principal Aspects of the Service

The National Health Service in Australia has many ramifications, but four aspects need special mention: (1) the provision of medical benefits, (2) the provision of hospital benefits, (3) the pensioner medical service, and (4) the free provision of certain essential drugs.

Medical Benefits

The essence of the medical benefits system is that the Commonwealth Government encourages the people to join voluntary insurance schemes run by non-governmental agencies. Members of these schemes have the choice of a number of contribution scales, corresponding to which are scales of benefits to be paid by the fund to the contributor should he incur medical expenses. The Commonwealth Government itself provides a benefit, there being a benefit for every type of service received. The voluntary insurance fund's benefit must at least match the Government's benefit, but the total benefit paid must not exceed 90% of the doctor's charge. The following points should be stressed: (1) The doctor charges the patient on the usual fee-for-service basis. (2) The Government and the benefits fund normally do not pay the doctor direct, but reimburse the patient; that is to say, no third party intervenes between patient and doctor. (3) The patient always pays part of the fee as well as contributing to the insurance fund. (4) The Government pays its share of the benefit through the fund, not direct to the patient. (5) The patient receives no Government benefit unless he is a member of a fund. (6) There is complete freedom of choice of doctor by patient, and of patient by doctor. (7) There is no State interference in where and how a doctor practises, provided he observes the usual ethical and legal requirements.

It is unnecessary to labour the fact that this system differs in both principle and practice from the British system. Its great advantages, in our eyes at least, are that it leaves intact the time-honoured doctor-patient relationship, it encourages self-help rather than dependence on the State, and yet it relieves the patient of much of the financial burden of medical treatment. At the same time the Australian doctor remains free of the bureaucratic control that appears to prevail in Britain.

Hospital Benefits

Hospital benefits are also managed according to contributory schemes, with the exception that a Government benefit is paid in every case, whether or not the patient belongs to a contributory scheme. However, the amount of the Government benefit is much greater if the patient is a contributor to a fund; and this, with the benefit from the fund itself, is usually sufficient (it may even be more than sufficient) to pay the hospital fee. An important advantage of this system is that it allows a patient of moderate means

to be treated in a private hospital by the doctor of his choice. If this, with or without the assistance of the benefit scheme, is beyond his means, he may still seek treatment at a public hospital; there medical treatment is free, whether the visiting medical staff is paid, as it is in Queensland and a few other places, or whether it attends on an honorary basis, as it still does in most places. In most hospitals, again with the notable exception of Queensland, a means test is imposed.

Pensioner Medical Service

For recipients of old age, invalid, and certain other pensions, which are governed by means tests, the Government provides free medical treatment, covering the usual general practitioner services, and a wide range of free medicines (basically those drugs listed in the current *British Pharmacopoeia* with certain additions). However, even here there is for all practical purposes free choice of patient by doctor and of doctor by patient; and although for convenience the doctor is paid direct by the Government on submission of a voucher signed by the patient, he is in fact only acting as the patient's agent and has no personal contract with the Government. Thus the doctor-patient relationship is maintained without intervention of a third party. Some time ago the Commonwealth Government liberalized the means test for the old-age pension and brought a large number of members of a higher-income group within its provisions. However, as a result of representations by the British Medical Association, this last group is not eligible for the free pensioner medical service and is encouraged to subscribe to a medical benefits fund. This no doubt has caused a certain amount of heartburning, but the profession has remained firm in its attitude lest the extension of this free service to a higher-income group should be the thin end of a wedge leading to a general free national medical service.

The fee paid by the Government for medical attendance on a pensioner is less than that normally charged by a doctor to his private patients. The profession has always emphasized that it is thus providing a service at a concessional rate. The Government justifies the lower rate on the grounds that the doctor is assured of payment, whereas in the past it was the custom to treat pensioners either free or for a very small fee.

Free Essential Drugs

Apart from the more extensive provision of free drugs for pensioners, a carefully controlled list of essential drugs is provided free for all patients on production of a doctor's prescription. These are usually described as "life-saving and disease-preventing drugs," although the list is a little broader than the description implies. It includes such things as the antibiotics and sulphonamides, insulin, a number of cardiac drugs, vitamin B₁₂, injectable analgesics, the main vaccines and antisera, and various others. It excludes compounded preparations. The list is strictly controlled, being determined by an expert advisory committee, the four medical members of which are appointed from a panel nominated by the British Medical Association. It is not intended to provide "free medicine" in any extensive way; so it does not encourage the prescription of useless bottles of medicine to please the patient, and it keeps the cost to the country within reasonable bounds. This, we understand, is in favourable contrast with the situation in Britain.

Other Provisions

Among other important though lesser provisions of the National Health Service are the free supply of milk to school-children and a liberal system of pensions for sufferers from tuberculosis, designed to ensure that they can commit themselves to adequate treatment without undue worry about the economic needs of their dependants.

Defects in the Service

Experience with the National Health Service in Australia has revealed or emphasized certain defects. Two are most important. The first is that the benefit schemes mostly exclude pre-existing chronic ailments from those for which benefits are paid. The second is that benefits are inadequate in certain cases, especially in relation to the catastrophic type of illness. These are serious defects, since they amount to the position that the service either does not provide or provides inadequately for certain of the groups in the community that most need help.

Both the Government and the organized medical profession are well aware of these defects and are anxious to overcome them. There is hope that at least a partial solution will be found soon, but any solution will inevitably mean greatly increased Government expenditure.

From the doctor's point of view there are two unsatisfactory aspects of the present hospital benefits system. The first is that the means test is not always enforced, so that the doctor gives honorary service to those who are quite able to pay. The second is that if a member of a benefits fund is treated in a public ward the doctor may not charge him a fee, and the benefit theoretically due goes unpaid. From the patient's point of view the hospital benefits system does not, of course, cover the cost of a bed in a more expensive private hospital.

The important point, however, is that these are all defects of detail. The principles of the scheme are, we believe, essentially sound.

Medico-political Background

The picture of the existing National Health Service is incomplete without some reference to its political and medico-political background.

In the 1940's the medical profession in Australia through the Federal Council of the British Medical Association engaged in prolonged negotiations and eventually in pitched battle with the Government of the day over the latter's proposed health service. This was essentially a nationalized service, unacceptable to the medical profession in principle and in detail. The profession's opposition was remarkably successful, and the Government concerned went out of office without putting its health scheme into effect. The outlook of the new Government was essentially different, and the new Minister for Health, Sir Earle Page, was a practising medical man fully appreciative of the profession's views. Under his guidance the present scheme was evolved and brought into use. On Sir Earle Page's retirement from the Health portfolio another practising medical man, Dr. Donald Cameron, took his place. It is hoped that he will find the remedy to the present defects of the Service, so that it will be politically unassailable.

The present Federal Opposition party has given much thought to the National Health Service, and to what it would do should it again assume control of the Government at a future election. A short time ago a sectional committee of the Opposition Party produced a plan for a National Health Service based very closely on the British Service. This was never officially accepted by the party, and it is understood that the plan has been abandoned, or at any rate shelved. However, nationalization is a major plank in this party's platform, and it would be unwise to attempt to prophesy its future health policy.

It should be mentioned in passing that the organized medical profession in Australia is not involved in party politics. It has when necessary opposed both right- and left-wing parties on matters of principle, and it is prepared, on the other hand, to co-operate in any satisfactory health scheme irrespective of the politics of the party in power.

The profession is wholly opposed to any health scheme which interposes a third party between the doctor and patient or which involves bureaucratic control and excessive

paper work. It dislikes capitation and salaried services, and is committed to maintain the fee-for-service method of payment so far as is practically possible. It is apprehensive about the abuses so often associated with completely free services. Its members are in general sincerely concerned that they should render a sound medical service to their patients, and, looking at the matter realistically, are unable to dissociate this from satisfactory working conditions and reasonable payment. They accept the present National Health Service as sound in principle, and look to see its defects in detail overcome.

As it happens, the profession is at present fortunate. Having one of its members as a Minister for Health is a tremendous advantage; but when it comes to a dispute the profession is still in a strong position. Practically all its practising members belong to the British Medical Association, which has in broad terms been conceded the leadership of the profession in medico-political negotiations. The profession also enjoys good social status in the community.

Traditionally, medical practice in Australia is free and its standard high. While the profession remains united there is little reason to fear any interference with this tradition.

The Australian and British Health Services

As we see it in Australia, our Health Service is fundamentally different from the British Service. Its great advantage is that it is sound in principle from the point of view of all parties; its defects are in detail. The British Service would appear to be unsound in principle, interfering with the freedom and so the effectiveness of medical practice, intervening in the doctor-patient relationship, and breeding an attitude of State-dependence. Frankly, we find it incongruous and depressing to contemplate, nourished as we are, perhaps more than any other Dominion, on the idea of Britain as the home of the free.

There may be advantages in the British National Health Service that we do not see, and it would be both odious and dangerous for us to be smug. Nevertheless, our scheme appears to be sound, and it should remain so while our politicians and the community generally continue to turn a deaf ear to the siren songs of the Welfare State.

HEALTH INSURANCE IN CANADA AND BRITAIN

BY

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With the rapid development of a universal hospital insurance scheme in Canada during the last year, it is tempting to make comparisons between the Canadian scene in 1958 and the British scene in 1948. Unfortunately, this is an impossible task, for the thought of a comparison on a national scale can spring only from an illusion, widespread in Britain and the rest of Europe, that Canada may be regarded as an entity for such a purpose. Now Canada has ten provinces, and it was long ago laid down that the health of the population should be a provincial and not a national matter. It is true that there is a Ministry of National Health and Welfare in Ottawa as a part of the federal Government, but it is mainly concerned with such matters as cannot be properly dealt with by provincial health ministries.

Thus at no time in the foreseeable future will there be a uniform pattern of health insurance across Canada; each province will decide for itself whether it wants a universal insurance scheme, what sort of a scheme it wants, how it is to be paid for, and how administered.

That is why the provisions of the new Bill 320, which governs hospital insurance in Canada on a basis of universal availability within a province and joint provincial-federal financing, have purposely been left vague. Each province must write in the details itself, and each provincial medical association must, if it can, negotiate such agreements as are necessary to work the scheme with its own provincial Government. And these Governments may of course be of a different political hue from the federal Government, which is at present overwhelmingly conservative. Indeed, many Canadian voters apparently see no inconsistency in voting for one party at provincial elections and another at federal elections.

Hospital Insurance

The present pattern across Canada varies greatly from province to province, although indications are that within the next few months all but one of the 10 provinces will be operating some hospital insurance scheme backed by federal and provincial money—some of course have already started. The one exception is the province of Quebec, where the inscrutable Mr. Duplessis, Premier of the province and an ardent champion of its independence, has not seen fit to inform the medical profession—or, for that matter, anyone else—on his plans for the future. Characteristically, he recently announced that he would construct health centres (presumably for diagnostic work), beginning with a pilot project in Montreal, but gave no clue to their administration or financing or staffing. At the other end of the scale is Ontario, where the Ontario Medical Association, the provincial division of the Canadian Medical Association, has a representative on the six-man commission which will administer the forthcoming compulsory hospital insurance plan.

But it must not be thought that this diversity implies a chaotic situation across Canada. Absence of the European passion for standardization has not affected the basic questions at all. As regards hospitalization, there are two questions that the Canadian citizen needs to know the answer to: (1) If I am indigent, can I still get hospital care? (2) If I am healthy and working, can I insure against any medical care in hospital that I may need in the future? Or, if I am out of hospital but handicapped (say by diabetes or degenerative heart disease) can I still insure against future hospital costs? The answer to the first question is that for many years the indigent have been able to get free treatment in any of the provinces. Sometimes the hospital or the physician has received a fee for such service; more often he has not. The answer to the second question is that within the near future this will be possible in all the provinces with the exception noted—and maybe the situation will change even there.

How the insurance money is collected is a secondary matter. It may be by a sales tax or by regular premiums deducted from a pay-roll, or by municipal or provincial taxes; or it may change from time to time (for instance, in British Columbia payment was at first by premium and later by a sales tax, which has now reached 5%). The method of administration is also secondary—it may be through a provincial hospital commission, with or without medical society representation, or even at the municipal level with a minimum of provincial supervision.

Attitude of the Profession

What has the attitude of organized medicine in Canada been to health insurance in general? I think it has been a more positive one than that of the British physician before 1948 was. The Canadian Medical Association began to study health insurance as early as 1934, and, after a decade during which it debated often and at length the issues involved, the Association formulated certain "Principles of Health Insurance" and thus gave its official blessing to the

concept of prepayment for medical care. In 1955 the General Council of the Association published a statement on health insurance acceptable to all its provincial divisions. Perhaps the most important thought in this was that prepaid health care should be introduced by stages, and that hospital care and diagnostic services should be the first steps. The Association also felt strongly that representatives of organized medicine should participate in the administration of insurance plans, and not only in an advisory capacity. This goal has not been achieved in most provinces. Within the last couple of years the Association has appointed a strong advisory committee to the federal Government, drawn from the officers and officials of the Association, and this committee has had an opportunity of putting the views of organized medicine before the Minister of National Health and Welfare in Ottawa, and also before the Prime Minister, Mr. Diefenbaker.

For a symposium on hospital insurance in Canada, prepared in collaboration with the C.M.A. Committee on Economics, the reader is referred to the May 15 issue of the *Canadian Medical Association Journal*, in which the present situation in Canada is discussed from many standpoints—organized medicine, the Government administrator, the hospital administrator, the prepaid-plan administrator, the teacher, and the surveyor of hospitals. This issue gives some idea of the views of physicians in various provinces which already have experience of a universal hospital insurance scheme.

Organized Medicine in the Various Provinces

It must be remembered that universal provincial hospital insurance began in Canada in January, 1947, when the Saskatchewan Government brought in the first compulsory hospital plan on the North American continent; this was followed by a British Columbia plan in 1949, and an Alberta plan in 1950. The Saskatchewan plan was first operated by a hospital commission, but is now administered by the provincial department of public health; and in the symposium referred to above Lloyd Brown (1958) notes that, while much valuable work has been done, "it has been difficult to maintain a healthy liaison between government and associated vitally concerned groups, who are allowed to function or contribute only from a substantial distance." He gives examples of the dangers of the present system, as in 1956 when the Government decided without prior consultation to include payment for all out-patient pathology studies at an arbitrary rate.

In British Columbia the relationship between the profession and the Government has been unsatisfactory. (An illustration of this is the somewhat tolerant attitude of certain legislators to naturopaths, chiropractors, and cancer quacks.) Watson (1958) points out that hospital insurance was foisted on an unprepared profession in 1949 without prior discussion, and that liaison between the provincial medical society and the Government was not obtained until six years later—even so, it is only an unofficial committee which binds the two together. The substitution of a sales tax for individual premiums seems to have diminished the responsibility of the individual citizen according to Watson. The most dangerous aspect of the scheme is that in 1952 hospital budgets and numbers of personnel and services were frozen, so that no improvement in services in the last six years has been financially possible.

In Alberta, where the patient is expected to pay two dollars (roughly 14s.) a day in a public ward for hospital care, drugs, operating-room fees, and diagnostic tests, Morgan (1958) reports lengthening waiting-lists for admission in some areas, due to an increase in admission for investigation, since the Government will not pay for out-patient investigations. He feels that an extension of the insurance programme to cover out-patient services is inevitable. The main concern of organized medicine in this province has been to maintain the radiologist and the pathologist as independent practitioners rather than employees of a hospital.

Newfoundland has long had a system of coverage for its cottage hospitals, which serve the community in the lonely outposts, and recently its energetic premier, Mr. Smallwood, burst forth with a scheme for free treatment of children under the age of 16 which took the profession by surprise. However, harmony seems to have been restored, and a satisfactory agreement has been negotiated between the provincial Government and the local division of the Canadian Medical Association to implement this unique service.

Five other provinces are in process of organizing their hospital insurance scheme. One might cite Nova Scotia and Ontario in particular as areas where the provincial medical association is involved in the planning of the Service. The Nova Scotia profession seems to be lending its Government much-needed help in clarifying some of the medical issues involved. The Ontario Medical Association has been very active in medical economics for some time. The Association presented a brief to its provincial Government, indicating that it favoured basic ward-care insurance for every citizen, administration of the insurance scheme by a commission (on which it now has a representative), separation of "hospital" from "physicians'" services in financing and administration, and payment of medical services by fee for service. Its brief was well received, and since the setting up of the Ontario Hospital Commission the Executive Committee of the O.M.A. has acted as a liaison body between organized medicine and the Government. On the advice of the O.M.A., the insurance plan is to include only in-patients at first.

Looking at Bill 320 or the Hospital Insurance and Diagnostic Services Act, passed unanimously by the Parliament of Canada last year, and providing for universally available schemes financed jointly by federal and provincial Governments, one can distinguish certain areas which have aroused and will continue to arouse great controversy. A vexed question is that of the distinction between "hospital" and "physicians'" services. Should a pathologist or a radiologist giving service to in-patients be regarded as giving hospital or physician's services? Ought he to be a salaried employee of the hospital or a man working on fee for service, or a combination of both? This situation is complicated by the fact that in some provinces some radiologists are on salary and others are not. In British Columbia the radiologist is a salaried employee of the hospital, so is the pathologist, but the anaesthetist is an individual practitioner using hospital facilities like the surgeon or physician. These difficulties are as yet unresolved. Again, the question of inclusion of out-patient facilities in insurance schemes has as yet no complete answer. If they are not to be included there is going to be a great deal of unnecessary utilization of hospital beds for investigations; if they are included, the question of remuneration of medical staff comes in to complicate the picture.

The question of deterrents to frivolous use of hospital beds is also unanswered. Payment of small sums by the patient each time he uses the hospital, as a deterrent, is not much in favour with politicians, though if the patient were made to pay for the first few days in hospital the costs of a scheme would be cut enormously. On the other hand, there is a distressing tendency, openly expressed in Manitoba recently, to make the doctor the scapegoat for excessive use of beds. British physicians will not need to be told how exasperating this attitude is; at the recent annual meeting of the Ontario Medical Association, the provincial Government was told plainly that the doctors would not be responsible for any consequences of overuse. It is the duty of the Government to arrange an educational campaign designed to remind citizens of their responsibility in these matters; with the present shortage of beds in Ontario, however, one doubts and fears.

Two Troublesome Problems

There are two other worrying aspects of hospital insurance which have not caused trouble in Britain. The first is the provision of teaching-beds. In Canada, in general, the

number of public-ward beds has gradually shrunk, and, conversely, the number of semi-private or private beds has increased, concomitantly with the spread of private insurance schemes. Since in the great majority of hospitals only the public-ward patients are used for teaching medical students, medical educators have been alarmed at the prospect of inadequate material. Their alarm was expressed in a brief to the Minister of National Health and Welfare last autumn, asking for safeguards in any legislation or regulations concerning hospital insurance to assure that every school of medicine should have enough beds under the control of the faculty of medicine (10 beds per senior student was recommended as a minimum). The solution to this will be to make available for teaching all patients admitted to hospitals connected with a medical school. This has been done in the comparatively new University Hospital in Saskatoon.

The other problem is that of hospital accreditation. For some years a joint commission of U.S. and Canadian representatives has surveyed hospitals in Canada at their own request, and either granted or refused accreditation in accordance with certain standards. The time has now come when Canada feels that it can be independent of the U.S.A. in this field. Accordingly, from January 1, 1959, a Canadian Commission on Hospital Accreditation, which has already been working through the older joint commission for five years, will take over sole responsibility for accreditation of Canadian hospitals. This commission is a fine example of the good work that voluntary bodies can do. It was formed when the Canadian Medical Association invited the Canadian Hospital Association, the Royal College of Physicians and Surgeons of Canada, and L'Association des Médecins de Langue Française du Canada to establish an accrediting body. In a pertinent article Kirk Lyon (1958) expressed the hope that provincial Governments would not see fit to exercise their rights under Bill 320 and establish ten governmental bodies in the ten provinces to enforce standards in the hospitals under their jurisdiction, with the principle of grants as rewards, or monetary penalties for failure to meet standards.

It is natural that Canadian doctors, faced with hospital insurance and the distinct possibility of Government-sponsored plans for medical care insurance outside hospital at some date in the foreseeable future, should look at the National Health Service in Britain with critical eyes. They recognize that the situation is very different in the two countries. The N.H.S. was introduced at a time when many British doctors had only just come back from a lengthy spell of national service, and had not yet been given time or opportunity to taste the fruits of peaceful private practice—at a time, too, when their country was facing poverty and bankruptcy. Health insurance is coming to a prosperous and expanding Canada with a philosophy very different from that of the Welfare State, and it would seem invidious to make any comparison between the two countries. Nevertheless, it may be helpful to quote the Past-President of the Canadian Medical Association, Dr. Morley Young (1958), a man who has given much thought to the subject and whose words would find a wide assent among informed Canadian physicians. He says: "May we be bold enough at this time to look at the British scene and say: (1) The whole scheme was introduced too suddenly; (2) somehow, somewhere, liaison with Government failed; (3) the medical profession did not appear to speak with one voice; (4) the general practitioner was denied hospital privileges."

It will have been perceived, from what has been written above, that Canada is trying not to make the mistake of biting off too much at once. First the hospital service, then the diagnostic service, then the out-patient service, then . . . ? Canadian medicine is also trying with all its might to retain close contact with Government both in Ottawa and in the provinces, being as helpful as it can in areas of agreement and as reasonable as it can in areas of disagreement. The Canadian Medical Association and its provincial divisions are striving to maintain at all costs the unity of the profession, and to negotiate with Govern-

ments through one and only one body, no matter what branch of the profession is involved. Lastly, there is now a widespread belief in Canada that general practitioners need hospital privileges of some sort if they are to function efficiently. To quote Dr. Young again: "... I have said that when hospital privileges are denied a medical practitioner, for any reason whatsoever, his standard of practice is at once lowered."

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THE SOCIAL SECURITY MEDICAL SERVICES IN NEW ZEALAND

BY

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To understand the social security medical services in New Zealand it is necessary to take a glance at the system which existed before their introduction, and also at the controversies that accompanied their development.

New Zealand never had a "panel system" like that of Great Britain after 1911. Medical practice remained mainly private practice for thirty years longer. Public hospitals, financed by local rates, government subsidy, patients' fees, and voluntary contributions, and administered by local boards, served all parts. Staffing was by skeleton interns, filled out by honoraries. There were many small private hospitals. The bulk of the wage-earning people obtained their domiciliary attendance through the friendly societies. Better-off people paid for themselves. The poor were assisted by hospital boards, and relied largely on the benevolent services of the doctors. Specialists were few and almost confined to the four cities. Hence doctors, generally, had to be prepared to deal with whatever turned up. As a consequence few, if any, countries had such a large proportion of men with senior qualifications in general practice. Over all presided, not very obtrusively, the first Government Department of Health ever set up in the British Empire.

Preparations for a Health Service

In the early 'thirties, during the hardships of "the depression," it became evident that a greater participation by the State in health matters was inevitable. Realizing this, the New Zealand Branch of the British Medical Association set up a committee to investigate, acquire data, and prepare plans. Over a period of two years this committee examined the needs of its own country and inquired into the systems of other countries. It was assisted by the Association in Great Britain, by the British Ministry of Health, and by travelling members of the Branch. At the change of government in 1935 the Branch offered its assistance to the Government of the day. Years of discussion followed.

Briefly paraphrased, the advice of the Branch was to proceed gradually by evolutionary stages, first making

improvements where most necessary and lightening burdens where they pressed most heavily. Emphasis to be on prevention and research. The costly parts of diagnosis—x-ray examination and laboratory and pathological investigation—to be made more accessible. Those unable to pay for medical services to receive them free, at cost of the State. The cost of maternity and hospitals to be lightened. Those with smaller incomes to be insured against sickness in the home on a contributory subsidized basis. Those with higher incomes to make their own arrangements, insurance being open to them. Essential and costly drugs to be made available, but not those that people customarily bought without prescription of their own preference.

Negotiation with the Government was not easy. Objection was made to our advice that it involved "discrimination," and the Government's own ideas were never fully disclosed. Very gradually it became clear that their mind was set on no evolutionary process, but on a universal revolutionary system by which, in keeping with the ideology of "State ownership and control," all medical service would be entirely under the Government, and all doctors would become virtually State employees. The State as paymaster struck at the root of the "patient-doctor" relationship, and the prospect of regimentation was seen. The Social Security Act was passed in 1938, and the profession drew itself together in defence of its freedom. The solidarity of the profession was remarkable. More than 90% stood firmly behind the efforts of the Branch.

The Government pressed on to "implement" its plans. Free mental hospital treatment was first introduced, followed by the offer of a free maternity contract. This was a crude, coercive plan at flat rate. Only a handful were prepared to accept it. On its failure the Minister invited the Branch to draw up its own scheme. This was done, the officers of the Department of Health participating. The Act was amended, and the maternity service so brought in has worked well ever since. Then came free pharmaceutical service. The Government had been well warned by the Branch that, without safeguards, this would become costly beyond commensurate benefit. The warning was brushed aside.

Introduction of Services

In spite of the fact that the war was now in full blast and at least a third of the doctors had been absorbed in military service, and were thereby voiceless, in quick succession came Free General Medical Service and Free Hospital Service. The latter involved only a change from the former honorary hospital appointments to a part-time, paid, surgical, medical, and specialist service in hospitals. The General Medical Service was more difficult.

At first there was a Government suggestion of "zoning": one doctor on State pay for so many people over such-and-such an area—like a milk-run. This idea had a short life, and has been forgotten. Next the Government offered a capitation contract of its own devising at 15s. per head per annum. A very few doctors accepted this, and some of them quickly made their fortune thereby, on account of huge lists. Over 90% stood firm and would not accept the contract; for capitation as a basis of medical service was repugnant, and still remains so.

On the failure of the capitation contract the Government introduced a "fee-for-service" system, at 7s. 6d. for consultation or visit, 12s. 6d. for consultation or visit at night and on Sundays and statutory holidays, and mileage for country visits.

Although the officers of the Branch saw in this the danger of the State interposing between patient and doctor and ultimate domination of the profession, the prospect of every service being paid for, with no bad debts, was so attractive that some members were shaken; but the Branch stood firm. At this juncture the Prime Minister intervened with the proposal of an alternative to the "fee-for-service" claim

on the Fund by every general practitioner. He suggested that those who preferred might charge the patient himself such fee as he thought fit, and the patient could obtain, on presentation of his receipted account, a refund equal to the fee-for-service payments. It was instantly seen that by this method the State did not come between doctor and patient, the patient-doctor relationship was preserved, and the doctor would not be in any sense a Government servant in his practice. The proposal was accepted on the spot. So there came into use two methods of practice—the one called "Fee-for-Service" and the other "Refund."

The Prime Minister was a man who, from early associations, interest in health matters, service on hospital boards, and, at one stage, as Minister of Health, had a far better appreciation of professional viewpoints than any of his colleagues.

The "Fee-for-Service" system was later amended to allow a doctor to charge an additional fee to the patient over that claimed from the Social Security Fund. This came to be known as the "Schedule System." Regulations and a Disciplinary Committee correct abuses.

Provision was made, on a salary basis, for the service of certain small isolated communities and for people living in scattered districts in which a doctor ordinarily could not make a living. This is the "Special Areas" plan.

Bursaries were established for the training of medical students. Those are under a bond of service to the Government so severe that it would not be tolerated by any trade union in respect of its apprentices.

Specialist service has been talked of; but there seems no great need. There are specialists on the staffs of the free hospitals, and the patients of private specialists get the ordinary refund on their accounts for each attendance.

Later, radiological, diagnostic, laboratory, and pathological services were established, with great lack of technicians. As in the case of the maternity service, the original radiological service failed, and the system now operating was devised by the radiologists themselves with departmental officers. It should be said that, however difficult some of the Ministers were found, the Health Department's officers were always reasonable and tactful.

Thus, by the end of the war, or shortly after, the Free Medical Service of the Social Security Welfare State was established in a way reverse from the advice of the British Medical Association. Research is still out in the cold, and other things we put first came last. By the end of the war there was in force a system by which the young men on demobilization could establish themselves in practice very readily.

What are the Results?

It would be invidious and impossible to assess how much of the present state of medical service in New Zealand is due to the Social Security system and how much to the progress of medicine itself. What follows must be taken in full context.

Medical services are available "free" to everyone from birth till death: "free," but paid for by taxation, which is heavy. The system is costly by former standards; yet the cost of general-practitioner service absorbs but a fraction more than one penny of the one-and-sixpenny Social Security tax. Medical service is efficient. People are living longer. Maternal mortality is one of the lowest in the world. Neonatal deaths have diminished. Rehabilitation from invalidism to work is quicker than it used to be. At the same time, in the advances of such things as thoracic surgery, cardiovascular, plastic, and neurosurgery, New Zealand keeps step, and has even bred some of the eminent workers in those. Doctors are fully employed. They can practise wherever they choose as freely as any quack. They can sell the goodwill of their practice as can the publican or pastry-cook.

With the general increase of medical knowledge, the many postgraduate courses held, the visits of travelling professors and of other teachers of distinction from abroad attending meetings of the Association and the Colleges, and the growth of local clinical societies, doctors have never been as well instructed as they are now: a great factor—due to the profession itself and not to Social Security. Without the impetus of medicine itself the Social Security Medical Services would have been as static and fixed as, say, the rules and procedure of the Stamps and Deeds Department.

It has been always the ideal of the Association that the medical service of the people should be a synergism between the privately working doctors and the local and general health authorities. Doctor and patient should do what they could together. When the position was one they could not cope with they should be able to call in the assistance of the local and general health organizations and collaborate in the patient's interest. This ideal has been almost realized. The invention of the Refund System made it possible, for those prepared to risk unpaid accounts, to practise, except

for increased documentation, almost as if State Medicine did not exist.

All is not beyond reproach. There is not the same amount of personal attention by doctors. It is more profitable to "see" six or ten patients than to spend the time in the examination and diagnosis of one, or to undertake minor surgery. So there is undue reference of patients to hospital for things the doctor should do for himself. Quantity rather than quality pays better. There is waste of drugs. In some cases there is a tendency to exploit the Fund by over-attendance. Specialism grows apace, and the tendency is to specialize immediately, without the invaluable training of a period of general practice. This change from the doctor of former days, comprehensive in his scope, to the modern who, though the facilities for diagnosis and treatment are so much better, refers more and more to hospitals and specialists, is leading to a change in the popular regard of "the doctor." He is losing his former prestige. There remains also the tendency, common to all governments, to take more and more control of the individual.

AN AMERICAN VIEW

AN AMERICAN REPORT ON THE NATIONAL HEALTH SERVICE*

BY

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If I have any qualifications for speaking on the subject that has been assigned me, they are the direct result of the seven months I spent in 1956 in England, Scotland, and Wales studying the British National Health Service. My purpose in making this study was threefold. First of all I wanted to get an accurate, fairly detailed picture of the Health Service in operation. Second, I wanted to inquire into some questions that had been raised—in some cases by my fellow-Americans—about the adequacy and efficiency of the Service. Third, I wanted to hear from the British people themselves—and particularly from general practitioners and patients—how they felt about their National Health Service after eight years of experience with it.

Just before we sailed for England last year a friend asked my wife how we expected to spend our time. When told that I was going to make a study of the National Health Service, she exclaimed: "Oh, socialized medicine! I hope he isn't for it!" My wife gave what I am sure was the perfect answer: "He isn't making a study for it or against it," she said; "he is making a study of it." That is precisely what I tried to do, and (so far as I am able to judge) succeeded in doing.

I think Mark Twain had the right idea about handling certain kinds of controversial issues, if we may believe a story so venerable that the younger members of my audience are unlikely ever to have heard it and the others will have had ample time to forget it. It runs to the effect that Mark Twain was a guest at a small dinner in the course of which a discussion arose as to the relative merits of heaven and hell. By and by one of the ladies turned to him, and said: "Mr. Clemens, you haven't given us your opinion. Won't you tell us what you think about the relative merits of heaven and hell?" "Madam," he replied, "I am silent of necessity. I have friends in both places."

*Presented to the International Insurance Conference at Philadelphia on May 22, 1957.

So far as the N.H.S. is concerned, I am in much the same position as that described by Mark Twain, in that I have "friends in both places"—British friends who praise the Service enthusiastically, and other British friends who criticize it with vigour. Following Mark Twain's lead, I have no intention of taking sides. My present task, as I see it, is to try to do a job of accurate reporting; and I shall stick as close as possible to the news columns and do my best to keep away from the editorial page. Having heard this, you will certainly not expect me to present "an American view" of the British Health Service, in the sense of presuming to make a personal appraisal of it. What you may depend upon getting is a plain, unvarnished account of what some British doctors and British patients told an American who was trying to learn all he could about their nation-wide system of medical care.

Development of the Service

I should like, first of all, to emphasize the fact, which is not too well known in the United States, that the National Health Service is not a scheme that was hastily thrown together but a piece of social provision which had its beginning some forty-five years ago and has been discussed almost continuously ever since; and that the Liberal Party, Labour Party, and Conservative Party have all played a part in its development.

British writers usually date the beginning of the Service back to 1911, when David Lloyd George, the Chancellor of the Exchequer, managed to put through Parliament the National Insurance Act, the country's first compulsory health insurance Bill. Contributions to this scheme were compulsory for all manual workers with annual incomes smaller than £160 (about \$775 at that time), and for all employers. An insured worker was entitled to "family doctor" care from a practitioner of his own choosing, and to free medicine, but not to specialist or hospital care; and a married worker's insurance did not cover his or her spouse or their children.

The scheme caught on; and in 1930, and again in 1938, the British Medical Association (which in 1911 had opposed the Lloyd George Bill) urged that health insurance coverage be extended to dependants, and that its benefits be expanded to include specialists, ophthalmic, dental, and full maternity care. In February, 1943, the Churchill Coalition Government accepted in principle the "Cradle to Grave" Report of Sir William Beveridge, which recommended, among other things, a national health service which would provide "full preventive and curative treatment of every kind for every citizen, . . . without an economic barrier at any point to delay recourse to it." A year later the Churchill Government published, and thus made available for public discussion, an 83-page White Paper describing a detailed but tentative proposal for a national health service which, in the words of Mr. Churchill himself, would "insure that everybody in the country, irrespective of means, age, sex, or occupation, shall have equal opportunities to benefit from the best and most up-to-date medical and allied services available."

The picture changed somewhat when, in 1945, the Labour Party came into power, and with it a new health scheme (the so-called Bevan Act) which for more than a year was discussed in public and debated in Parliament. While it was under consideration in Parliament the *Lancet* commented editorially: "Seldom has a Bill been presented after so full a canvass of those affected, or so wide an exploration of alternatives." The Bill was passed in 1946 by a vote of 261 to 113, to go into effect on July 5, 1948. Its actual operation—under a Labour Government from 1948 to 1951, and under the Conservatives ever since—has been marked by frequent arguments over details. But the principle of the National Health Service—free access for all to every kind of medical care—has been accepted by all political parties in Britain.

The Inquiry

And now I should like to report on the answers that doctors, patients, and others in Britain have given me in reply to specific questions. The information comes, so far as doctors are concerned, from 139 general medical practices, which (because many are partnerships) include 372 general practitioners who provide family-doctor service for about 850,000 patients.*

*Responsibility for the choice of participants in the survey is entirely my own. I neither sought nor received assistance in this matter. Lacking facilities for getting a sample of general practitioners that could be called statistically representative, I picked 14 centres of population; and, working out from these centres, I got "returns" from 48 English, Scots, and Welsh cities, towns, and villages—which included industrial, commercial, residential, resort, university, shipping, and other types of communities. In choosing specific doctors for interviews I used the N.H.S. general-practice lists found in post offices, selecting from them both one-man practices and partnerships of various sizes, and also practices in different parts of a city or town. I then interviewed the doctors in their surgeries; or, if a personal interview could not be arranged, left a questionnaire together with stamped envelope for its return to my Philadelphia address. The average number of patients per doctor in the practices surveyed was 2,283, which happened to be almost identical with the average for Britain as a whole. These doctors were requested to answer 31 questions, and co-operated most generously. For their many courtesies and invaluable help, so willingly extended, I am deeply grateful.

In seeking information from N.H.S. patients, I placed questionnaires for patients in the hands of 1,500 prospective participants, personally or by mail, aiming at and obtaining substantial diversity in location, age, sex, occupation, and economic status. Each questionnaire was accompanied by a printed explanation of the purpose of the survey, and by a stamped envelope directed to my American address, making it easy for those solicited to answer or not answer, as they preferred. Twenty questions were asked, and nearly all were answered. Patients were asked to preserve their anonymity by omitting their names. Returns from the 600 participating patients (40% of all who were invited) showed a wide distribution geographically (49 counties); occupationally (93 classifications, including skilled and unskilled workers, housewives, bank officers, business executives, sales people, retired persons, civil servants, professional men, and so on); and economically (stretching over ten income brackets running from a "low" of "under £250" (\$700) to a "high" of over £3,500 (\$9,800) a year). From the procedure used, it follows that the answers to my questions do not necessarily reflect the opinion of N.H.S. general practitioners and patients in Britain as a whole.

Some of the views on the National Health Service that have been expressed in both Britain and the United States have stated quite bluntly that the general practitioners in the Service were leading a pretty miserable existence because of overwork—that the Ministry of Health had given them an exceedingly heavy load of "paper work"; that their patients (because the Service was free) kept them busy attending to the most trivial ailments; that, in general, the doctors had so many patients they could not possibly give them proper care; and so on.

What do the doctors themselves have to say about these charges of overwork? How serious, for example, is the problem of paper work, which includes keeping medical records for each patient; issuing medical certificates of many kinds; and, indeed, handling any or all of the 43 "forms in general use by doctors," the mere listing of which fills two pages of the *Medical Practitioners' Handbook*? The fact is that some of these forms are used often, others seldom, and still others almost never. To my question: "Do you find the volume of 'paper work' very burdensome?" only 39% of my doctors said *Yes*, while the other 61% said *No*. Some doctors volunteered the information, which was later widely confirmed by others, that the increase in *certain kinds* of paper work has been largely, if not fully, offset by the almost total disappearance of one especially unpleasant type—sending out bills for services rendered to private patients. To-day, because of the N.H.S., such patients comprise less than 5% of the population.

It should be noted that the trend towards general-practitioner *partnerships* which has been apparent since the start of the Service in 1948 has helped to lessen the burdensomeness of paper work. A partnership of two or more doctors is often able to afford secretarial help, and thus is relieved of much of the handling of medical records and other office chores which are performed personally by many of the single-handed practitioners, as the British call them.

Patients' Visits

There is a fairly general agreement among British general practitioners that patients do sometimes make nuisances of themselves. (American doctors may have a similar feeling about their patients, but in the United States the patients are at least required to pay each time for the privilege.) In this connexion I asked the British doctors this question: "Do patients, often, occasionally, or almost never take up your time with very minor ailments?" Here are their answers: 49% said *often*; 30% *occasionally*; 21% *almost never*. From these replies it would seem that four-fifths of these doctors (those who said "often" or "occasionally") feel that part of their time is being spent on patients who need little or no medical treatment.

Having duly recorded each doctor's answer, I frequently pursued the matter a little further, asking, "What do you consider a very minor ailment?" The wide variety of reactions to this query suggests the improbability of being able to arrive at a workable definition which would enable the layman to know, in the absence of considerable pain, whether or not his condition warranted a visit to or from his doctor. Several doctors argued strongly that it is the doctor's job, and not his patient's, to decide whether there is need for treatment, and that patients should be encouraged to seek medical advice freely. One doctor put it this way: "A patient should see his doctor whenever he feels at all below par. If he doesn't, he will be worried about his condition. What many patients need most of all is reassurance."

Though very frequent office visits are commonly regarded as a nuisance, especially when, in the doctor's judgment, they turn out to be unnecessary, they are *not always* rated by him as "unproductive labour." "Do you think," I asked my doctors, "that requests for medical attention for very minor ailments lead often, occasionally, or almost never to the prevention of serious ailments or to their detection

while still in their early stages?" The answers were: *often*, 11%; *occasionally*, 60%; *almost never*, 29%. These replies are particularly interesting when considered side by side with the answers to the previous question. For against the gloomy conclusion reached by most of these practitioners, that some of their time is taken up by people with very minor ailments, can be set the countervailing consideration that their patients' ready access to medical service does sometimes lead to the prevention or early detection of serious ailments.

Quality of Medical Care

Are British doctors overwhelmed by having too many patients to look after? I decided to ask the doctors themselves. Those who took part in my survey have an average of 2,283 patients each: 53% of them have fewer than this average, 47% have more. A very few have maximum lists of 3,500 patients. Most of these doctors have at least two and often three office-hours (called "surgery-hours" in Britain) a day. Though an office-hour is nominally 60 minutes, it sometimes—and in the winter *very often*—runs to 120 minutes or more; and sandwiched in between these office sessions are visits to the homes of house-bound patients. British general practitioners are also subject to emergency calls at any time.

To these busy doctors I put the following question: "With your present list of patients, do you find it reasonably easy, or difficult, or almost impossible to give them what you regard as adequate medical care?" The answers may surprise you, as indeed they surprised me; for 58.8% said they found it *reasonably easy*, 37.8% found it *difficult*, and only 3.4% reported that it was *almost impossible* for them to do an adequate job.

In about two-thirds of these returns, the report "reasonably easy" came from doctors with fewer than the average number of patients, and the answer "difficult" or "almost impossible" from those having *more* than the average—as one might perhaps expect to be the case. However, 13% of the doctors who answered "difficult" or "almost impossible" had fewer than the average, and in two instances fewer than a thousand patients; while 18½% of those who had more than the average, and often the maximum or near-maximum number of patients, replied that it was "reasonably easy" to give them adequate medical care.

Problem of Waiting

The problem of "long waits" is understandably a matter of special concern to patients. Waiting of any kind is likely to be tedious business, and waiting for medical service is no exception to the general rule. Though medical attention is not always sought promptly, it is a type of service which, once it has definitely been decided upon, is usually wanted without delay. Waiting in doctors' offices and in out-patient departments of hospitals is an old story in Britain, but it increased enormously with the greatly expanded demand that followed the introduction of nation-wide medical provision in 1948, and much has been written and spoken (especially by persons unfriendly to the Service) about the interminably long waits to which the Health Service patients are said to be subjected.

Some of these waits are indeed long, but some are quite short, as I can testify from considerable experience. I think it highly probable that in 1956 I did more waiting to get *general-practitioner attention* than any other person in Britain. The attention that I wanted was interviews with the doctors, who granted them willingly and generously. I discovered that the simplest way to meet a doctor was to walk into his waiting-room, unknown, and unannounced, and join the patients who, true to the good old British custom of "queuing up," were waiting their turns to enter the consulting-room. By waiving my turn and waiting until the last of the bona-fide patients had gone in, I was able to talk to the doctor at once or to arrange for an interview

at his convenience; and meanwhile I could note approximately how long each patient had had to wait, and how much time each was given by the doctor.

From these "long waits" of mine—often repeated three or four times a day for many weeks—I learned that the time a patient spends in the doctor's waiting-room is long or short, depending upon such things as the hour at which he arrives; the nature of the ailments of the persons who precede him, for this will affect the amount of the doctor's time *they* take up; and the time of year, for waits are usually much longer in the busy winter season than in the relatively slack summer. Unfortunately, much of this information proved interesting rather than important, for it did not lend itself to useful generalization. The question which I finally asked the patients I interviewed was this: "How often, in the past year or so, have you had to wait as long as one and a half hours in the doctor's office before getting attention?" 6% replied that they *usually* had to wait that length of time; 15% said *occasionally*; 79% *almost never*.

A similar question, but one relating to waits in hospital out-patient departments, asked how often these patients had had to wait more than two hours before seeing the doctor with whom they had an appointment: 13% answered that they *usually* had to wait longer than two hours; 25% said *occasionally*; 62%, *almost never*. Reporting great improvement in the matter of out-patient waits, the Minister of Health stated last year that in the vast majority of hospitals the average waiting-time (that is, from the time of the appointment to the time when seen by the doctor) "does not now exceed 30 minutes, and is frequently less."

Hospital Service

Though more than half of the total annual expenditure for the National Health Service consists of hospital and specialist costs, there has always been, and continues to be, a shortage of hospital service, both in-patient and out-patient, and a long list of applicants waiting for appointments. For, despite the almost revolutionary improvements that were made in hospital plant and staff during and after the second world war, the unprecedented demand for hospital service which accompanied the adoption of the National Health Service in 1948 was one that was bound to outstrip supply for years to come. The latest published figures show that on December 31, 1956, there were in Britain 431,000 persons on hospital in-patient and out-patient waiting-lists. However, waiting-list figures show a decrease from a 1950 peak of 531,000 to the 1956 total of 431,000—a slow but steady decline, year by year, except for 1953, when there was an unexplained increase over the preceding year.

Among the people on waiting-lists are many kinds of illnesses and many degrees of urgency. Faced with a shortage of hospital facilities, the British follow the principle of first things first, and thus presumably ensure that patients whose lives might be endangered by a delay in treatment are cared for ahead of those whose ailments are of a less serious nature. The testimony of general practitioners seems to indicate that, in general, they can get hospital service for their patients when it is urgently needed. I asked the doctors: "When you refer patients to hospital for examination or bed-occupancy, do you have difficulty getting them admitted promptly?" 73½% said *No*; the other 26½% said *Yes*, frequently adding "unless very urgent," and explaining that their greatest difficulty was gaining admission for chronic invalids and for the aged, who are likely to be long-term inmates once they get in.

The notion—which had some currency in the early years of the Service—that "patients who genuinely require hospital treatment are *often* kept out of hospital because the beds are occupied by persons with minor ailments" found support from only 2½% of the doctors questioned; 20% said that this occurs *occasionally*; according to 77% of the respondents, it *almost never* happens.

To the short but important question, "Would it be correct to say that 'an emergency case can always get into hospital promptly'?" the answer from 98% of the doctors was an unqualified *Yes*.

Remuneration

The question of doctor's pay has been much discussed in Britain during the past year or so. The general practitioner has a "panel" (or list) of patients who have chosen him as their personal or family doctor. His chief source of income is a specified payment of so much a year—called a "capitation" fee—which he receives for each of his listed patients. This fee is 17s. (\$2.38) a year for each of a doctor's first 500 patients, 27s. (\$3.78) a year for each of the next 1,000 patients, and then back to 17s. each for the remainder.

A general practitioner with the average number of patients (about 2,300) receives in capitation fees a gross annual income of £2,455, which is equivalent to \$6,874 at the current rate of exchange. A doctor with a panel of the maximum size that is permitted (3,500 patients) is paid £3,475 (\$9,730) in capitation fees. After subtracting the necessary costs of running his practice (about one-third of the gross income), the doctor with an average panel will have left from his capitation fees a net income (before taxes) of £1,637 (\$4,584) and the doctor with a full panel approximately £2,317 (\$6,488). (Because consumer prices are lower in Britain than in the United States, these amounts in dollars must be raised about 25% if they are to reflect British purchasing power accurately. For example, an English general practitioner with a net income of £2,317 (\$6,488) can buy with this amount of money a standard of living comparable to that purchasable with \$8,110 in the United States.)

Doctors on the staffs of British hospitals differ widely in pay, with incomes running as high as £5,300 (\$14,840) a year for a small number of top-level "medical consultants," and as low as £1,100 (\$3,080) for first-year "senior registrars." The maximum basic salary for full-time consultants is £3,100 (\$8,680) a year; but the payment of "distinction awards" in recognition of special merit brings an additional \$1,400 a year to 20%, \$4,200 to 10%, and \$7,000 to 4% of the total number of consultants. Raising these dollar figures by one-fourth to make allowance for Britain's lower consumer prices, we see the possibility of 34% of the more fortunate British consultants getting salaries equivalent to American incomes of \$12,600, \$15,400, or \$18,550.

General practitioners and part-time consultants may also accept private patients, and may supplement their incomes in other ways that do not interfere with their giving proper service to their National Health Service patients. However, my survey showed that about four-fifths of the general practitioners were getting more than 90% of their income from Health Service practice, and that this pay was made up overwhelmingly of capitation fees.

In 1956, general practitioners with the average number of patients (but with no other source of income) were in the highest 2.4% of British income-getters. Those with the maximum of 3,500 patients were in the highest 1.4%, as were also all full-time consultants of at least three years' standing. Though these figures might seem to indicate that doctors as a class are doing relatively well, the fact remains that they have made frequent requests for increases but have had no boost in pay in the past six years. They have recently been pressing their demand in unusually vigorous language, insisting that the much-cited "Spens Reports" promised them money incomes that would keep pace with changes in the cost of living. According to the *British Medical Journal*: "Doctors are united in considering that the Government, by its apparent repudiation of the Spens Reports, has broken faith with the profession." The Government's stand has been that "in the present circumstances (the serious inflationary threat that the country is facing), it would not be right to give consideration to a claim for a general increase in medical remuneration." The Government has set up a Royal Commission to study the

whole situation, granted an interim pay increase of 10% to junior grades of hospital doctors and dentists, and implied that there would be interim increases for others as well. But there were no deafening cheers of approval from the doctors, by whom these actions were construed as tactics of delay.

It is all very confusing, especially to foreigners, who may not have followed closely the lively give-and-take that has marked negotiations between the Ministry of Health and the medical profession in the past dozen years. Americans, reading in their daily papers some months ago that the British Medical Association was making plans for a "selective withdrawal" from the Service in October, 1957, might have supposed that the very survival of the National Health Service was in danger. However, the *New York Times* reported on May 2, 1957, that the British Medical Association had voted "to defer indefinitely a decision on a plan for the progressive withdrawal of general practitioners from the National Health Service"; but added that "a spokesman for the Medical Association's Council made it plain that the withdrawal plan would be revived if the physicians were not satisfied with the findings of the Royal Commission appointed to inquire into the dispute." Predictions are always risky, but it is a fairly safe guess that withdrawal from the Service is not in the cards. Among the reasons for regarding a concerted (or even "selective") withdrawal by the doctors as unlikely are the difficulty of practising medicine outside the Service, the possibility of endangering the doctors' claims to valuable annuity rights and other highly prized benefits which are payable at retirement or death, and the widespread antagonism that withdrawal would arouse among the British people, with whom the Health Service is exceedingly popular, and who (as the *Lancet* points out) "do not readily understand how doctors justify an average 'wage claim' for an additional £10 a week, which is more than many of them earn altogether."

But no doubt the strongest of all deterrents to withdrawal would be the doctors' devotion to their calling. British doctors may be overworked and underpaid, as their representatives claim they are; but they believe in the importance of their job, and state with pride and a high degree of accord that under the National Health Service the medical needs of Britain as a whole are being better met than ever before. The dispute over pay may be sharp and even bitter, but surely not so explosive as to shatter or severely shake the great medical tradition that the patients' needs always come first. "Whatever is decided," concluded the *British Medical Journal* in one of its spirited bouts with the Ministry of Health, "the public may be assured—if such assurance is really necessary—that the sick and the suffering will be cared for as they have always been."

Reactions to the Service

What do the doctors who provide medical treatment, and the patients who receive it, like and what do they dislike about the National Health Service? Here is a quick and admittedly inadequate sketch of patient and doctor reactions to specific aspects of the Service, beginning with some of the things the patients do not like.

Patients' Dislikes.—(1) In general, they dislike waiting. Waiting in doctors' offices, though protested mildly, is usually taken pretty much in stride; but patients often speak rather heatedly about long waits they have in the past had to undergo as hospital out-patients. (The recent improvement in out-patient waits, announced by the Minister of Health, may be expected to lessen criticism on this score.) (2) They dislike the small amount of time given them in the consulting-rooms of some doctors, though many patients state emphatically that their own doctors give all the time that is needed. (3) A relatively small number of patients express profound dislike of the dental charges—maximum £1 (\$2.80) for "conservative" work—£4 3s. (\$12) for dentures—of the charge for spectacles—about £1 10s. (\$4.20) a pair—and even of the prescription charge—1s. (14 cents)—

per item. (4) They dislike having foreigners, while in Britain, getting medical care free. (According to competent authorities, abuse of this privilege by foreigners, though quite common in the early days of the Service, is no longer widespread.)

Patients' Likes.—Balanced against these dislikes are things which the patients say they like very much: (1) The fact that medical provision is now a matter of right and not charity. (2) The fact that medical care of high quality, formerly available only for the well-to-do, is now accessible to persons in even the lowest-income groups. (3) Confidence that the cost of a catastrophic illness will not wreck a family's financial programme. (4) The comprehensiveness of the Service and its nation-wide coverage.

General Practitioners' Dislikes.—These include the following. (1) The doctor's inability to sell his practice, which is no longer his personal property. (The compensation provided by the Government for this loss of the right to sell the "goodwill" in a practice is regarded by many practitioners as inadequate.) (2) The doctors dislike being unable to move readily to another area. (In the interests of having a better distribution of practitioners throughout the country, doctors are prevented from moving their practices into "over-doctored" areas, but are offered financial inducements to go to "under-doctored" parts of the country.) (3) As has been noted, the doctors are very unhappy that their pay has not kept pace with increases in the cost of living, and feel that the Government has not lived up to its promises in this respect. (4) The doctors dislike the requirement that private patients must pay for their medicine. Their objection seems to be twofold: first, they feel that this discrimination against private patients just isn't cricket; second, they regard it as a device designed to bring about the gradual but complete extinction of private practice in Britain.

Doctors' Gains.—There are, on the other hand, many things about the Service which the doctors regard as definite gains: (1) They like the ability they now have to prescribe the best medicines (regardless of cost) for even the poorest patient, knowing that a lack of funds will not prevent the prescription from being filled. (2) They like the privilege of visiting their patients as often as they think desirable, without being suspected of making frequent visits for financial reasons. (3) They like the annuity scheme, which puts 6% of their annual net income (together with 8% supplied by the Government) into a fund that provides a life annuity upon retirement. (4) They like very much the great reduction that has taken place in "out of bed" night early-evening calls when the introduction of the Health Service made it possible to have these home visits without charge. (5) As I have said, the doctors are happy to be relieved of the need to bill their patients, and to be freed also from bad debts; and they like (in a profession that is highly seasonal) the stability that is provided by having four equal payments of income per year. (6) Finally, the doctors take satisfaction in the fact—to which I shall refer again—that, in their opinion, the medical needs of Britain as a whole are now being better met than ever before.

Broader Aspects

I turn now from doctor-patient views on specific aspects of the Service to appraisals of a broader nature. "From your personal experience," I asked the patients, "do you consider the N.H.S. service better or worse than the service you got before 1948, or about the same?" 37% said *better*; 13% *worse*; 50% *about the same*.

To the very general question, "Do you feel that you are now getting satisfactory service of the several kinds provided by the Health Service?" 91% of the patients answered *Yes*; 9% *No*.

The "home services" supplied by the N.H.S.—specialist, midwife, home visitor, home nurse, and domestic help—have

proved popular. Slightly more than one-half of the patients in my survey had used one or more of these services, and 98% of the users pronounced them "quite satisfactory."

How well the seriously ill are cared for is a matter of grave concern to patients and their families. This fact led to the following question: "Have you or a member of your household ever had, under N.H.S., what the doctor clearly regarded as a serious illness?" One-half of the answers were *Yes*; and the illnesses that were named included pneumonia, thrombosis, ulcers, punctured lung, heart ailments, polio, diabetes, cancer, and a host of others. Many of these patients were treated at home, others were in hospital from a few days to a year or more. What I especially wanted to know was how the patients themselves appraised the care they received—whether they thought it excellent, good, fair, or poor. 76% reported that they had had *excellent* care; 18.9% said *good*; 2.9% *fair*; 2.2% *poor*. In general, these patients were loud in their praise of the hospitals, doctors, and nurses.

Seeking a professional appraisal of present-day British medical care, I asked the general practitioners this question: "Under N.H.S., are the medical needs of the country as a whole being better met, less well met, or cared for 'about the same' as before N.H.S.?" The answers were: *Better met*, 87%; *less well met*, 3%; *about the same*, 10%. I also put to the doctors a question about the permanence of the Service: "Do you regard the N.H.S., or something of substantially the same nature, as a permanent British institution—that is, is it here to stay?" 98½% said *Yes*; 1½% said *No*. When this question was put to Members of Parliament (Conservative and Labour), to journalists, to university professors, to business men, and others outside the field of medicine, the answer was again almost unanimously *Yes*.

I was not the only one in Britain in 1956 who was asking doctors and patients about the Health Service. I think you may be interested in two questions asked in a nation-wide poll taken by the British Institute of Public Opinion (the Gallup Poll) in June, 1956. The first, directed to general practitioners, read: "Suppose you had a chance to go back and vote on whether the N.H.S. should be started or not. How would you vote—in favour of starting it, or against starting it?" The answers: *In favour*, 67%; *against*, 31%; *undecided*, 2%. The second Gallup question was for the patients: "As far as you personally are concerned, how would you rate N.H.S.—favourably or unfavourably?" The answers were: *favourably*, 89%; *unfavourably*, 4%; *undecided*, 7%.

Conclusion

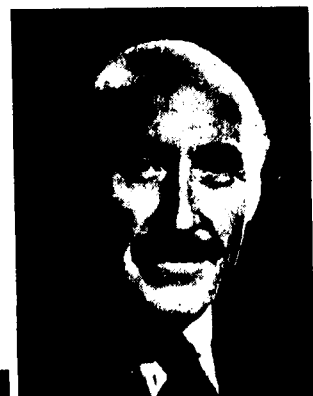
I found in Britain no tendency to claim for the National Health Service anything approaching perfection. I do not recall talking with anyone who did not mention the need for more dentists and nurses, more general practitioners and smaller "panels" of patients, more adequate health provision for the aged and mentally ill, more capital investment in hospitals, more emphasis upon preventive medicine, better integration of all parts of the Service, or some other shortcoming which I was told must one day be taken care of. On the whole, however, the British attitude seems to be one of restrained optimism, as is indicated by this observation from an administrative officer of a London hospital: "We know all too well the many problems we must solve," he said, "but we know, too, that we have something worth while, and we shall never stop trying to make the Service better until we have finally won through."

I close my report of British opinion on the National Health Service with a final word of appraisal from a Conservative Member of Parliament, who said to me: "We do not have a first-class, but only a second-class medical service. However, before 1948 it was only fourth-class. It has been improving ever since, and by and by we shall have a Health Service that is truly first-class."



Mr. Aneurin Bevan.
August, 1945-January, 1951.

MINISTERS OF HEALTH



Lord Crookshank
(formerly Captain H. F. C.
Crookshank).
October, 1951-May, 1952.



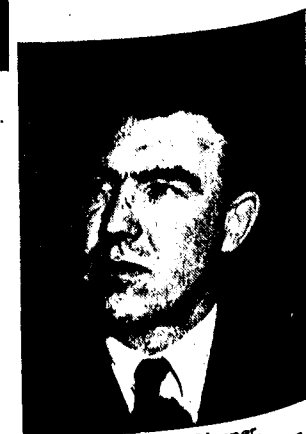
Mr. Iain Macleod.
May, 1952-December, 1955.

Acknowledgments
The photograph of Mr. Aneurin Bevan is by Hulton Picture Library. The remainder are by Camera Press.



Mr. Derek Walker-Smith.
September, 1957-

1948-1958



Mr. Dennis Vosper.
January, 1957-September, 1957.



Mr. Hilary Marquand.
January, 1951-October, 1951.

RESOLUTIONS OF THE REPRESENTATIVE BODY ON THE N.H.S.

Reproduced below are some of the resolutions adopted by the Representative Body of the B.M.A. on the subject of the National Health Service during the period 1944-57—that is, the four years of preparatory work and the first decade of the operation of the National Health Service Act.

Preliminary Events

In 1940 a Medical Planning Commission was set up by the B.M.A., with the co-operation of the Royal Colleges and the Royal Scottish Corporations, to "study wartime developments and their effects on the country's medical services, both present and future."

In November, 1942, before the Commission's suggestions had been fully discussed, Sir William Beveridge published his report and recommendations. He assumed—"Assumption B"—that there should be

"Comprehensive health and rehabilitation services for prevention and cure of disease and restoration of capacity for work, available to all members of the community."

The Government accepted Assumption B and invited the profession to enter into discussions on its implementation. A Special Representative Meeting in April, 1943, resolved:

That the Government's invitation to enter into discussions without commitment be accepted.

That a committee representative of the profession as a whole should, in response to the Government's invitation, now enter into discussions with representatives of the Minister of Health on "a scheme for comprehensive health and rehabilitation services, for the prevention and cure of disease and restoration of capacity for work, available to all members of the community" (Assumption B of the Beveridge report), in the light of the following undertakings now given:

(a) That, at the conclusion of the discussions and at the appropriate time or times during the discussions, but in any case before negotiations open and before any proposals are submitted by the Government to Parliament, the full machinery of the Association, including the Council and its Committees, Groups, Panel Committees, Divisions, and the Representative Body, will be used to consider the Government's proposals and to decide the Association's views thereon.

(b) That every practicable step will be taken to give all members of the profession, whether members or non-members of the Association, an opportunity to express their views and in particular that every practicable step will be taken to give members of the profession on service an opportunity of expressing their views, to assess those views, and to present them to the meeting or meetings of the Representative Body called to consider any proposals by the Government.

A.R.M., 1944

The Representative Body debated the Government's White Paper on its proposals for a National Health Service, and resolved:

That the Representative Body wishes to put on record that this Body would resist to the utmost any Government control of doctors in clinical matters, or any interference in the present doctor-patient relationship, and that no doctor be compelled to undertake medical practices which are contrary to his conscience freely exercised.

That no scheme for a National Health Service shall be accepted which does not allow to the individual medical practitioner full rights of scientific and political publication, freedom of speech, including the right to criticize the service, and full political rights.

Availability of Service

The meeting gave its views on the "100% issue" in the following resolution:

That pending further information on: (1) the general professional and administrative arrangements, both central and local, (2) the machinery whereby private practice is to be continued, including safeguards to secure its preservation for those members of the community who are able and willing to provide the medical service for themselves, there be affirmed the view of the A.R.M.,

1943, "that a comprehensive medical service should be available to all who need it, but it is unnecessary for the State to provide it for those who are willing and able to provide it for themselves."

General Principles

Approval was given to the following principles which should govern the provision of the Health Service:

(1) Freedom for people to use or not to use these facilities at their own wish; no compulsion into the new service, either for patient or for doctor. (2) Freedom for people to choose their own medical advisers. (3) Freedom for the doctor to pursue his professional methods in his own individual way. (4) The personal doctor-patient relationship to be preserved, and the whole service founded on the "family doctor" idea. (5) The responsibility for organizing and running the new service should be placed on the shoulders of the profession to the greatest extent possible without sacrificing the ultimate control of public expenditure by Parliament and the local authorities. (6) The service should not be a full-time salaried service under Government or local authority control.

The Representative Body approved the paragraph of the Council's report in which the following sentence occurs:

Neither a corporate body nor a department can of itself prove satisfactory unless the arrangements within it and in association with it are such as to secure the fundamental requirement that, subject to the responsibility of the Minister to Parliament, responsibility for medical policy and medical advice is borne by the medical profession.

It was also resolved:

That it be an instruction to the Association's representatives on the Negotiating Committee that, without prejudice to other issues, including the 100% question, remuneration and compensation, consideration of administrative structure, central and local, should precede consideration of all other questions, and that agreement on this subject is an essential prerequisite to discussion of other subjects.

S.R.M., 1945

A Special Representative Meeting was called on May 3 to discuss proposals for the administration of the Health Service. It agreed that an administrative plan proposed by the Minister be generally approved as a workable basis of the new Health Service, subject to reconsideration on the following points: (a) That the Ministry of Health should be concerned with all civilian health services in which the Government is involved and with none other. (b) That the local organization should function so as to secure really effective planning at the regional level and a proper integration of all local medical services, consultant, specialist, general practitioner, and other. (c) That, in relation to the suggested "single executive authority" areas, the area of planning should be related to natural medical areas and the area machinery should conform to that proposed for the composite areas.

100% Issue

The 100% issue was again debated and the following resolution resulted:

That the Association, regarding the 100% issue as one for Parliament to decide, is willing to negotiate terms and conditions for such a 100% service, if such be decided upon, provided that ample safeguards are introduced to ensure that any member of the community, whatever his income, should be enabled to obtain his medical service, in part or in whole, privately, as for example by grant-in-aid provisions. (Carried by a large majority. A preceding motion that there should be an income limit for people using the service was lost by 162 to 64.)

A.R.M., 1945

The Representative Body defined its policy for safeguarding private practice:

That all persons compulsorily insured should have the right to opt out from the Government service in matters of medical advice and treatment and receive a financial grant towards a private

contract, and that no new agreements be entered into which do not effectively safeguard this right; that insured patients should be in a position to assign to the hospital or nursing institution of their choice any financial grant received through their health insurance authority. (Carried by 114 to 74.)

That Council be requested to give concrete proposals safeguarding private practice under the 100% National Health Service.

S.R.M., 1946

The Government published its N.H.S. Bill, and a Special Representative Meeting was held on May 1 and 2.

The meeting supported the following principles stated by the Negotiating Committee and was prepared to support the Negotiating Committee in ensuring that they were not infringed.

(1) The medical profession is, in the public interest, opposed to any form of service which leads directly or indirectly to the profession as a whole becoming full-time salaried servants of the State or local authorities.

(2) The medical profession should remain free to exercise the art and science of medicine according to its traditions, standards, and knowledge, the individual doctor retaining full responsibility for the care of the patient, freedom of judgment, action, speech, and publication, without interference in his professional work.

(3) The citizen should be free to choose or change his or her family doctor, to choose, in consultation with his family doctor, the hospital at which he should be treated, and free to decide whether he avails himself of the public service or obtains the medical service he needs independently.

(4) Doctors should, like other workers, be free to choose the form, place, and type of work they prefer without governmental or other direction.

(5) Every registered medical practitioner should be entitled as a right to participate in the public service.

(6) The hospital service should be planned over natural hospital areas centred on universities in order that these centres of education and research may influence the whole service.

(7) There should be adequate representation of the medical profession on all administrative bodies associated with the new service in order that doctors may make their contribution to the efficiency of the service.

Opposition to Bill

The meeting expressed its opposition to the Bill as follows:

That the profession, while anxious and willing to co-operate with the Government in evolving a complete Health Service, is opposed on grounds of public interest to certain important features of the Government's proposals which render the Bill, in its present form, not only unacceptable to the profession, but also constitute strong reasons for advising the public against its acceptance. (Carried *nem. con.*)

That this meeting considers that the standard of a Health Service depends appreciably upon the maintenance and development of a high degree of skill, initiative, and sense of responsibility in the general practitioner, and that these qualities will be discouraged by the proposals of this Bill, which places hospitals, general practitioner services, and public health facilities under three separate organizations. This meeting presses for an amendment to the Bill whereby the family doctor will be assured of the right to assume personal responsibility in hospital for such of his patients as come within his scope, thus working in collaboration with the specialist services as a respected member of a team, rather than acting as a mere signpost to the various departments.

That this meeting disapproves of the administration set out in the White Paper, especially as to the powers given to the Minister, and demands that the Central Health Services Council shall have the right to guide the Minister and the right to publish its recommendations.

That this meeting views with great disfavour the transference of hospitals to State ownership and the consequent destruction of local interest in hospital services, and the confiscation of trust funds intended by donors for specific purposes.

Conditions of Service

The Bill proposed that the sale of goodwill of practices should be abolished, and the Representative Body resolved:

That this meeting regards as essential to the freedom of the patient and the profession the right to buy and sell practices as at present. (Carried by 229 to 13.)

It also laid down as Association policy that:

The freedom of the citizen requires that not only shall he be free to obtain his medical care privately but that the financial and administrative arrangements should not be such as to penalize him or his doctor if he does.

The meeting asserted that "subject to their fulfilling the normal professional requirements, doctors should have every facility to transfer from one branch of the service to another." It also resolved:

That the remuneration of general medical practitioners under any National Health Service should take the form of an adequate capitation fee without a fixed part salary and without a tapering scale of payment. (Carried by 209 to 8.)

That the specialist in the National Health Service should have the right to decide whether he will do part- or full-time work.

That any doctor while practising privately, either in special or in general practice, must enjoy the same privileges and rights and have all the facilities for treating his patients as are now held by all registered practitioners.

That general practitioners should have the same privileges as specialists and consultants in regard to pay beds in hospitals.

The availability of the service was again debated and it was resolved:

That all persons should be compulsorily insured and a complete medical service should be made available to all who need it or desire it, provided that a State monopoly of medicine is avoided.

That the patient who elects to obtain medical advice privately shall not be required to pay for drugs and appliances.

G.P. Spens Report

The Representative Body unanimously approved a recommendation of the Council:

That the Representative Body welcomes and approves the majority report of the Interdepartmental Committee on the Remuneration of General Practitioners [the G.P. Spens Committee].

S.R.M., 1947

A Special Representative Meeting was called on January 28 to consider the following recommendation of Council:

That the Association, having considered the final results of the plebiscite and the Minister's letter of January 6 to the Presidents of the Royal Colleges and desiring to secure for the people the best possible health service, is willing that discussions be entered into with the Minister to that end, provided that such discussions are comprehensive in their scope, and that the possibility that they may lead to further legislation is not excluded; and that after the conclusion of these discussions, a second plebiscite of the profession be taken on the issue of entering the service.

The Representative Body agreed to the recommendation by 252 votes to 17. The plebiscite referred to was held at the end of 1946, and the result (*Journal*, December 21, 1946, p. 957) showed an overall majority against entering into discussion with the Minister.

S.R.M., 1948

At a Special Representative Meeting on January 8, requisitioned by the Council to give a lead to the profession prior to a second plebiscite, the following declaration was resolved on with one dissentient:

The elected representatives of the medical profession in Great Britain and Northern Ireland meeting in London this 8th day of January, 1948, solemnly declare that in their considered opinion the National Health Service Act, 1946, in its present form is so grossly at variance with the essential principles of our profession that it should be rejected absolutely by all practitioners.

The second plebiscite showed that a 9 to 1 majority (in an 84% poll) of the medical profession disapproved of the Medical Act in the form in which it then was (*Journal*, February 21, 1948, p. 353). A Special Representative Meeting on March 17 resolved:

That the Representative Body, reaffirming the whole-hearted desire of the medical profession for a comprehensive health service available to everyone, urges that in the public interest such

changes should be made in the National Health Service Acts of 1946 and 1947 as are necessary to maintain the integrity of medicine and to prevent doctors being turned into State servants with harmful consequences to patient and doctor alike. The Representative Body therefore expresses the hope that the Government will make it possible for the profession to co-operate by making such changes, and states its view that it is not in the best interests of the public or of medicine for members of the profession to enter the service until such changes are made. (Carried unanimously.)

That, in view of the recent B.M.A. plebiscite result, which expressed a 90% disapproval of the National Health Act in its present form, the Representative Body, while agreeing with a comprehensive health service available to everyone, requests that it should be postponed until the necessary hospitals and other facilities have been built and equipped and the personnel for a complete service have been trained.

Many other resolutions critical of particular provisions in the Act were passed.

A Special Representative Meeting was held on May 28 to decide Association policy in the light of the results of a third plebiscite held in April, after the Minister had made some concessions to professional opinion. In a 77% poll, 2 out of every 3 doctors still disapproved of the Act. In answer to a question on accepting service under the Act, 12,799 were in favour, and 13,891 against (*Journal*, May 8, 1948, p. 893). The S.R.M. resolved:

That, despite the insufficiency of the safeguards to the profession's freedoms and the misgivings of a substantial section of the profession, the Representative Body, anxious as ever that in the public interest a comprehensive health service should be made available to the community, is prepared to advise the profession to co-operate in the new service on the understanding that the Minister will continue negotiations on outstanding matters, including terms and conditions of service for consultants and specialists, general practitioners, public health officers, and others.

That the Representative Body urges the profession to maintain its strength and unity in order to mould the service in accordance with the public interest and with enlightened professional opinion and continuously to protect the profession's legitimate freedoms and interests.

S.R.M., 1949

A Special Representative Meeting on March 29 debated general-practitioner remuneration, and resolved:

That this meeting is greatly disturbed by the serious financial position created by the National Health Service for many general practitioners, and wishes to support the efforts of the General Medical Services Committee to obtain an adequate betterment factor in the implementation of the Spens Committee report.

A.R.M., 1949

In May, 1949, the Minister presented to Parliament a Bill to amend certain parts of the N.H.S. Act. The Representative Body, meeting in June, commented as follows:

That this meeting registers its profound dissatisfaction at the Minister's breach of faith in not honouring his undertaking to consult the medical profession before presenting the Amending Bill to Parliament. (Carried unanimously.)

That disappointment and resentment be expressed by the Representative Body at the failure of the Minister to include in the Amending Bill provision for the free supply of medicines and scheduled appliances to private patients.

That as the Minister of Health has withdrawn the official assurances and undertakings, repeatedly given to the profession, on the question of arbitration in the event of a dispute, this Representative Body demands that effective action be taken forthwith to insist that arbitration machinery (including arbitration for resolution of disputes involving finance) be set up, and that demands for arbitration by the profession shall not be subject to the Minister's veto.

This Representative Body therefore calls upon the Minister of Health to redeem his Government's pledges by the necessary alteration in the Amending Bill. (Carried unanimously.)

The Representative Body also "regretfully recorded" that the Minister and Ministry of Health had shown "little or no desire for co-operation with the medical profession" and had "met the profession's suggestions with indifference

and procrastination," and that these were added reasons why the service was "falling far below the standard the public were led to expect."

A.R.M., 1950

The Representative Body called for reform of the Health Service:

That this meeting considers the time long overdue when the B.M.A. should formulate a detailed programme of reforms the profession desires to be adopted in relation to the National Health Service, and instructs Council to draw up such a list forthwith for submission to, and discussion by, Branches and Divisions.

It approved resolutions of the Conference of Local Medical Committees on (a) the claim for an adjustment of the remuneration of G.P.s; (b) the lowered status of the G.P.; (c) relation of G.P.s to hospitals. It instructed Council to continue to try to get the principle that private patients are entitled to free medicines and appliances accepted by the Government. And it expressed concern about registrars in the following resolution:

That in view of the large number of trainee specialists and the few specialist appointments available, the future position of such trainees be considered urgently by the Central Consultants and Specialists Committee so that these men might know their prospects.

A.R.M., 1951

The Representative Body recorded "that, although general practitioners are referred to as 'the backbone of the profession,' their opportunities for clinical work in the National Health Service have diminished. This seriously imperils their status and is contrary to the public interest." The meeting urged the G.M.S. Committee to bring continually to the notice of the Ministry the need for increasing the scope of the general practitioner services. It instructed the Council:

That since private practice supplies an indispensable element in this country's medical services, the Council should press urgently and insistently for the removal of the liabilities imposed by the National Health Service Act on private practitioners and their patients.

S.R.M., 1951

A Special Representative Meeting was called on December 13 to consider Council's report on the reform of the National Health Service. The following resolutions, among others, were passed:

That an amending Act should provide for the establishment of a National Health Service court of arbitration to which could be referred by the Ministers or representatives of the Management or Staff Side of Whitley Council disputes on the terms of service, including remuneration, without the consent of the other party, whether existing terms or new terms affecting any section or individual member of the profession.

That the present control exercised by regional hospital boards be modified so as to permit to hospital management committees: (a) a wider measure of executive powers; and (b) a greater measure of financial authority; and (c) these committees should include representatives of the general practitioners and public health medical officers elected by the profession in the area.

That a scheme of block grants, similar to the university grants system, be devised for hospital finance, the grants being paid to hospital management committees, with amounts for capital and maintenance expenditure to cover as long a period as possible, surpluses being carried on from year to year.

That there should be set up at all levels of hospital administration co-ordinating machinery... in the form of cross-representation and liaison of all branches of medical practice...

That section 38 of the N.H.S. Act, 1946, be amended... to entitle patients obtaining their medical care privately to obtain drugs, spectacles, and appliances at the public expense on the prescription of the attending practitioner... and any other hospital services, including pathology, x-rays, and physiotherapy, on the same terms as patients registered in the National Health Service...

That the National Health Service regulations be extended so as to provide disciplinary arrangements for the patient.

That medical advisory committees to advise boards of governors, regional hospital boards, and hospital management committees be elected respectively by the medical staff committees of teaching hospitals, by the medical staff committees of the non-teaching hospitals in the region, and the medical staff committees of the hospital group, statutory recognition to be given to the committees so electing and so elected. . . .

That this meeting welcomes the recommendations of the first interim report of the Council [on reform of the Health Service], but considers that the time is now opportune for consideration to be given to the amendment of the Acts as they now stand, with emphasis on decentralization, and unification of all parts of the service.

A.R.M., 1952

The Representative Body expressed its opinion on terms and conditions of service as follows:

That it be an instruction to the Council to make all possible efforts to achieve direct access to pathology and x-ray departments for all general practitioners.

That this meeting is concerned that after four years' operation of the National Health Service Act, 1946, its enactments have failed to facilitate the entry of doctors into practice and requests that this deplorable situation be further examined and reported on by the Council.

That this Representative Body considers that the impending dismissal of senior registrars is unjust, and that, in view of the grave difficulties most of these registrars will have in finding alternative employment, this meeting considers it is the responsibility of the Ministry of Health to provide suitable alternative employment for these doctors in view of their age and experience.

That this meeting deplores the fact that the Minister of Health refuses to negotiate with the medical profession on the question of a separate arbitration machinery. This Representative Body refuses to accept the Minister's view that the profession shall only negotiate through the General Council of the Health Services Whitley Councils. It re-endorses the decision taken at the Special Representative Meeting, December, 1951. (Carried unanimously.)

A.R.M., 1953

The Representative Body again deplored "the lack of a Whitley Court of Arbitration to which there should be a right of appeal by unilateral reference and where the ruling should be binding on both parties," and instructed Council to take immediate and urgent action.

The Council was instructed to make further representations to the Minister on drugs for private patients.

Two other resolutions were as follows:

That the Amending Acts Committee having recommended the restoration of the right to sell goodwill, this Representative Meeting instructs the Council of the Association to produce a scheme for the return of goodwill and to report to the Representative Body in 1954. (Carried by 144-137.)

That it should be the policy of the British Medical Association to strive for the early establishment of general-practitioner hospitals.

A.R.M., 1954

The following were among the resolutions adopted by the Representative Body:

That there should be the unilateral right to arbitration.

That this meeting deplores the inadequacy of the recent agreement reached on the remuneration of hospital medical staffs, and urges that steps be taken to reopen this matter immediately, with a view to obtaining the implementation of the Spens report as applied to consultants and specialists and obtaining adequate betterment. In the event of disagreement, the matter should be referred to arbitration.

That the disparity between remuneration in the public health service, and that of the medical profession as a whole, is a threat to the rest of the profession, and contrary to public interest.

That this meeting considers that the restoration of the right to buy and sell the goodwill of medical practices in the National Health Service is impracticable. (Carried by 135-124.)

That this A.R.M. reaffirms that opposition to any form of full-time salaried general medical service is the policy of the British Medical Association. (One dissentient.)

A.R.M., 1955

The Representative Body was of the opinion "that there should be a maximum expansion of the consultant establishment so as to provide a service adequate for the needs of the country in accordance with the expressed policy of the Central Consultants and Specialists and Joint Consultants Committees."

A.R.M., 1956

The Representative Body laid down Association policy on various matters in the following terms:

That this meeting urges that general practitioners should have access to hospital facilities, including beds, throughout the country.

That the Association affirms its adherence to the principle that medical men and women, in whatever form of medical practice or service they are engaged, should be remunerated as doctors, and that their remuneration should not be determined by relation to that of lay personnel employed in the same sphere.

That, since the two Spens Reports have established agreed levels of remuneration for general practitioners and hospital medical staffs, and indirectly for most other sections of the profession, the Association reaffirms its policy to maintain these reports as the basis of professional remuneration.

That the Government be urged to set up forthwith an independent committee of inquiry to consider what should be the range of remuneration of medical officers in the public health service, having regard to the remuneration of other sections of the profession and the desirability of the public health service maintaining its power to attract a suitable type of recruit.

That the Association develop a policy whereby the Council will come to assume fuller responsibility for all future claims submitted by any section of the profession.

S.R.M., 1957

At a Special Representative Meeting held on June 13 to consider the current dispute with the Minister on remuneration the Representative Body resolved:

That the Association should continue to press for the implementation of the Spens Reports, until such time as another arrangement is made.

The Representative Body also resolved:

That the Council be instructed to institute with some degree of urgency and through a committee representative of the interests concerned, both medical and lay, an inquiry into the whole field of medical services in the light of the experience gained of the National Health Service since 1948, with the aim of eradicating those faults of the system which cause dissatisfaction to the public and frustration to the profession; and to consider alternative schemes.

A.R.M., 1957

The following resolutions were passed by the Representative Body:

That this meeting stresses the need for the provision of ancillary diagnostic services for the general practitioner, so as to reduce pressure on hospitals, and as a means of reducing hospital costs.

That this Representative Meeting is concerned with the prospects and future of registrars and the supply and distribution of consultants. It asks Council to look at the problem afresh in consultation with doctors of the grades concerned and to report back to the Representative Body.

That this meeting notes with approval the expressed opinion of the Central Consultants and Specialists Committee (Supplement, April 13, 1957, p. 207) that senior hospital medical officers be paid a salary of 80% of that for consultants throughout the scale, and requires the Council to take all possible steps to bring this into effect.

That this meeting calls on the Government to put an end at an early date to the breach of faith whereby drugs are withheld from private patients.

That the position of the public health medical officers shall be reviewed after the report of the Royal Commission is received, and appropriate steps taken with a view to ensuring their proper status and remuneration *vis-à-vis* their colleagues in other branches of the medical profession.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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MERIT AWARDS FOR GENERAL PRACTITIONERS

BY

J. F. BURDON, M.B., B.S., D.A.

General Practitioner, Paignton, Devon

Recent suggestions (e.g., Evans, 1958) that general practitioners should receive merit awards prompt two questions: How is merit to be judged? And is it not already rewarded? These may be considered together, and in doing so I propose to discuss the following criteria which have been commonly advanced as being those by which merit can be determined.

Criteria of Merit

Optimum Size of List

A good doctor attracts patients easily, but is too sensible to take on too many. There is therefore an ideal size of list.

This argument breaks down owing to individual variations. Each doctor has different capacities; sparsity of population handicaps some doctors, and confines them to small lists; some doctors spend time in hospital appointments, or have other commitments which take away from their ordinary work; local competition may be fierce in over-doctored areas; some doctors may be easygoing when their patients make undue demands, others more resistant to exploitation—all these affect the list size of the doctors concerned, quite apart from their personal merits.

The smaller the list of a doctor, the more time he will have for each interview, and this makes for better work; but the larger the list the wider the experience of the doctor, and the more likely he is to have ancillary help and superior organization, if only to cope with numbers.

The only practical procedure is to let each doctor take on all he can or will; with a safety proviso of a maximum number beyond which it is ridiculous to assume that he can give an adequate service, even when aided by a local hospital's out-patient department.

Seniority of Doctor

Increasing age brings increasing experience, and this is easy to measure.

It does not follow that a doctor will keep abreast of developments in medicine, and the reading of journals is apt to fall off as retirement nears. It is also absurd to suppose

that the older man is necessarily more deserving than the younger. Either might be brilliant, energetic, interested, and well adapted, and the better doctor.

Postgraduate Study

The College of General Practitioners has adopted the criterion for its members that they must do prescribed minimum periods of approved study at intervals. The College is a select body of enthusiastic practitioners, apparently needing no incentive to keep up their efforts, and it has not seen fit to do more than leave it to members to carry out their undertakings.

If postgraduate study was to become a hallmark of merit, many more courses would be needed to satisfy the demand which would arise, and if a cash income depended on attendances it would bring after it a system of registration and probably inspection. Training staffs would need to be augmented. And if facilities were provided for all, there would still be no likelihood that equal profit would accrue from equal attendance or effort. Talents, teachers, and material all vary from place to place.

If only a limited number of doctors applied for postgraduate courses, as at present, they would seem to be the ones worthy of merit awards. If such a plan was followed, membership of the College would be the obvious criterion, and its rules governing entry would need to be reconsidered. But a better solution is to pay more to doctors who take postgraduate courses, and so encourage them to improve themselves and reward them for doing so in the same act.

Adequacy of Premises and Equipment

Although a minimum standard is generally accepted (Taylor, 1954) for waiting-room, consulting-room, and other needs, much variation is permissible according to local conditions. For instance, it is not necessary for a doctor to provide minor surgical facilities if these are available to him at a near-by cottage hospital. Similarly, a doctor running an appointment system does not need a large waiting-room.

Ancillary staff also affect the issue. If the doctor has time to do their work himself, and prefers to do so rather than pay them for doing it for him, he is not necessarily a worse doctor on that account. And if partners employ ancillary staff, it might be difficult to allot proportions of merit among them. If premises and equipment were to be a measure of merit, much window-dressing might result.

Academic Achievements

When a doctor wins an academic prize he shows merit, which is rewarded by the prize and the prestige which he

earnings. He need not be paid twice. The same applies to diplomas and higher degrees, the reward lying in the honour conferred or distinction given. Rates of pay may depend on certain diplomas—for example, the D.P.M.—and access to jobs be helped by possessing them, but it would be a sad development if all academic honours were valued in terms of cash. A doctor's ability to attract work is enhanced by high qualifications, and it seems wrong and unnecessary to penalize the others, some of whom are without extra letters for reasons other than lack of ability, and who are fine, practical doctors.

Contributions to research are difficult to judge, and their worth may become clear only after many years. It is good if a doctor does research, even if it later proves fruitless, and, conversely, a brilliant idea may have come easily to a lucky man who happened to observe some vital clue but who could hardly claim great merit.

Hospital posts held before entering general practice are different expressions of diplomas and higher degrees, and the same arguments apply to them. They were adequately rewarded at the time (or should have been), and do not necessarily fit a doctor for extramural practice. It would be a strange system which allowed a doctor who had been squeezed out of hospital work by better men to go into general practice reluctantly and find himself credited with merit by virtue of his previous hospital work.

Hospital Staff Membership

Doctors who enjoy the advantages and stimulation of hospital work as members of a general-practitioner hospital's staff are better doctors for the connexion, but are already paid for their hospital duties through the management committees and regional boards. If they are not being paid enough, that is a separate issue. The wider scope of their work is offset by the time demanded by their hospital responsibilities. On balance, there seems to be no claim for them to be paid more per patient than their less fortunate colleagues.

Offices Held

To be elected president of a learned society shows that the doctor so honoured is held high in the esteem of his fellows. But the honour does not need cash embellishments, and to introduce such posts as criteria for merit awards would detract from their value as posts of honour. The same applies to honorary posts generally.

It would be a grave and deplorable thing if everyone insisted on being paid for every effort he made in every direction, and it is not fitting that voluntary services should be weighed and judged when determining rates of pay for ordinary work.

Teaching Students

The increasing tendency to teach students the rudiments of general practice before their final examination is an excellent development. Doctors who participate find the teaching situation acts as a tonic, and they are forced to keep up to date in their knowledge. Any payment they may earn by teaching efforts should originate from their pupils through the university, or through Government grants specifically awarded for teaching, and not as a mark of meritorious general practice. Their patients gain something from the flow of new ideas, but lose privacy and cannot be dealt with so quickly as when no students are present. There is both a gain and a loss in efficiency.

Submission of Theses

Not every doctor can write a thesis, and a board of examiners would have to be created to judge such work. This suggested criterion has no advantages over the M.D., and the same arguments apply against it.

Esteem of Colleagues

Judgment by one's peers has always seemed fair to English-speaking people, and a judgment could be made if every general practitioner was given a ballot form on which

to write the names of his colleagues in order of merit. But a doctor might be unpopular for reasons other than his ability and quality of service to his patients, and in rural areas there might be few to speak for him. It would not be easy to adjust the marking to allow for this.

If consultants' and specialists' opinions were sought, similar problems would arise. There would also be an inevitable lack of uniformity up and down the country. There might be possible abuses—would, for instance, a high rate of domiciliary consultations earn a high or low mark? And who, general-practitioner colleague or consultant, would agree to act as judge in the face of "Judge not, lest ye be judged"? Those who undertake such judging in the consultant field have much criticism to contend with, and prefer to remain anonymous; or at least they do not let their deliberations and findings see the light of day. Who can blame them?

Conclusion

No single method of determining merit in general practice has been found free from faults. It seems unlikely that a faultless whole could be built from such parts, and there is no guarantee whatever that the different faults would cancel each other out—they are so different in quality.

But the merit-worthy general practitioner, who undoubtedly does exist, is not without consolation. He is being paid the rate for the job, a fundamental principle of paid-labour relations in these enlightened times, and he can, by reason of his ability, make his patients more healthy than those of the next doctor. He thus attends less illness and gains more leisure, or is able to care for more patients. The increase of work in the preventive field costs him much less in time and energy than the illness he prevents would have done, and he derives happiness and satisfaction from his work—things which he could not buy with extra income.

Finally, qualities like kindness and patience cannot be measured, judged, or priced; yet how meritorious is the doctor who has them! Such merit seeks no reward in cash.

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OPTICIANS ACT

N.O.T.B. ASSOCIATION'S INFLUENCE

The Opticians Bill received the Royal Assent on July 7. The N.O.T.B. Association's bulletin for June records the association's difficulty in getting changes made in the Bill, as it had come unexpectedly in the form of a Private Member's Bill. Summarizing the position, Dr. D. P. STEVENSON, the N.O.T.B.A.'s medical secretary, points out that the following conditions had been secured by amendments: (1) The functions of an ophthalmic optician had now been defined, and all cases requiring treatment must be referred to the general practitioner. (2) A further ophthalmologist would be appointed to the General Optical Council. (3) There would be a complete ban on unrestricted practice. (4) Protection had been achieved for N.O.T.B. medical eye centres.

TRADE UNION MEMBERSHIP

The following local authorities are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham.

Non-County Borough Councils.—Crewe.

The Minister of Health, Mr. Derek Walker-Smith, told Parliament recently that the average cost of a Health Service prescription had gone up about 4d. since the end of last year and had now passed the 6s. 4d. mark. He said he was "in consultation" about the interim report of the Hinchliffe Committee which is examining prescribing costs.

ROYAL COMMISSION ON DOCTORS' AND DENTISTS' REMUNERATION

SCOTTISH ASSOCIATION OF MEDICAL ADMINISTRATORS' EVIDENCE

A plea for the recognition of medical administration as a specialty in its own right, with salary grades with top figures of from £2,350 to £3,250, was made to the Royal Commission on Doctors' and Dentists' Remuneration by representatives of the Scottish Association of Medical Administrators at the morning session on June 19. Principal spokesman was the association's chairman, Dr. S. G. M. Francis, the other witnesses being Dr. C. Bainbridge (vice-chairman), Dr. F. D. Beddard, Dr. W. Mackie, and Dr. P. W. R. Petrie (hon. secretary and treasurer).

In a short historical outline, Dr. Francis said that the association was founded four years ago as a result of an agreement among the members to leave the Scottish branch of the Medical Superintendents' Society and form themselves into a separate Scottish association of doctors employed in hospital administration. Paid-up membership was about 50, potential membership being 85. It had a good representation from regional hospital boards, there were two senior administrative medical officers on the council, and, to a man, the Scottish administrative medical superintendents supported it strongly.

Medical Superintendents' Work

Sir HUGH WATSON explained that the Commission was not concerned with the merits of the divergence of view between England and Scotland on whether hospital superintendents should be medical or laymen but accepted the Scottish system as it was. Dr. PETRIE agreed, in answer to Sir Hugh's question, that the Scottish association's view was that hospitals ought to be administered by doctors rather than by laymen. Asked to describe the relationship of the medical superintendent to his board, he said it varied to some extent from board to board, but, generally speaking, in Scotland the medical superintendent was at the moment considered to be the chief executive officer, expected to have an overall picture of what went on in the hospital and to take decisions on all matters affecting patients except matters concerned with finance. He was required to interest himself in the organization of out-patient departments, records, and catering. Budgetary matters were excluded from his sphere except so far as medical equipment was concerned. It should be possible in some hospitals to off-load some of that administrative work to lay administration. In the past, medical superintendents had been much more concerned with such matters than they were to-day. The supervision and organization of the out-patient department was one of the medical superintendent's main functions, but once it was effectively organized it did not require a great deal of his time to keep the machinery in motion.

Sir HUGH WATSON (quoting from the Henderson report): "He ought to be a co-ordinator of all activities in the hospital." Dr. PETRIE: "We think that is fundamental."

Asked to deal with the subject of the relations between the medical superintendent and the medical staff, Dr. FRANCIS described them as "extremely good." There was a very well organized system of medical staff committees which found it very convenient to put their proposals through the medical superintendent to the board of management, and the superintendent transmitted the replies back to them. Describing the division of day-to-day management duties, he explained that the secretary was responsible for the minutes of the board of management, conducting correspondence on its behalf and custody of the funds; he could be loosely described as "the business manager of the hospital." The physician was responsible for the actual treatment of the patients. But the final responsibility when

things went wrong lay with the superintendent. He dealt with all complaints. Dr. Francis then gave examples of the sort of emergency which did arise in hospitals, and, when asked by the CHAIRMAN, Sir Harry Pilkington, whether the decisions which had been taken in those cases could not have been just as effectively taken by somebody who was not medically qualified, he said he did not think the medical staff would accept such decisions so readily from a layman.

A Specialty

Sir HUGH WATSON: "Are you describing the medical superintendent as a specialist in the sense that a consultant is described as a specialist?"—"The consultant has to take a senior qualification; on that basis we would not be in the same category, but the training, for a medical superintendent to be any good, is just as long and just as difficult to accomplish. You don't want them to go in for it too young. They must have had a very good clinical training and be able to understand the problems of a hospital. It is a difficult thing to do: it needs tact and a practical sort of mind. The registrar or senior registrar who has had a good training and finds in his early thirties that he has an aptitude for it should be seconded for training as a potential officer or administrator of a regional board."

Dr. BAINBRIDGE said the problem was that there was no qualification or degree which was particularly related to medical superintendents; on the other hand it was necessary to consider the length and breadth of experience that were required before taking up such a post. Dr. FRANCIS said that there were training courses for medical administrators in the U.S.A. and Canada. Of the practice in other countries, generally speaking it could be said that hospitals founded by the Churches tended to have lay administration while those founded by the profession tended towards medical administration. In Belgium and France and further south the former method prevailed, while in Holland and further north the accent was on the latter. Medical administration was not universal in the U.S.A. and Canada because of the difficulty in obtaining men of the required calibre.

The CHAIRMAN: "If you are once a medical administrator, do you remain as such or do you come back to consultant jobs and clinical responsibilities?" Dr. FRANCIS answered, "No," while Dr. PETRIE explained that it was not a question of their losing the ability to make use of their clinical training—they could not be good superintendents unless they were doctors—rather had they widened the narrower sphere of their clinical work. Recruitment was proving difficult; men of first-rate quality, although available, were hanging back because the remuneration was so poor. Dr. FRANCIS agreed there was no inducement for a man to take on work with the very wide responsibilities involved when his consultant colleagues were getting a thousand a year more than he was. He agreed with Sir Hugh Watson that the remuneration had been regulated by Whitley Committee B, and that the arguments being put forward had already been pressed before that body. In Scotland the B.M.A., the consultants and specialists, and the profession in general had always supported the idea that medical administrators should have a reasonable salary in comparison with their other professional brethren. Discussions had taken place with the Department of Health some eight years ago, after which it had been recommended that medical superintendents should be paid roughly the same as consultants, but nothing had come of it. Fundamentally, the position was that the Henderson recommendation on salaries simply confirmed what the B.M.A. and the whole profession in Scotland had said right from the beginning.

Dr. BAINBRIDGE said the only promotion prospect for a medical superintendent was with a regional hospital board,

but there were only 20 such senior posts throughout Great Britain. Dr. BEDDARD said that medical superintendents regarded themselves as members of the specialist staff; they had to know the Acts and regulations and to have all sorts of background knowledge and be able to apply it; they were meeting the specialists in clinical medicine on equal terms, being expected to live and work with them. The Henderson report was regarded by them as having recognized the fact that the senior medical administrators in the service were of comparable status with the specialist staff.

Sir HUGH WATSON pointed out that the Ministry's publication *Headquarters Medical Staff for Regional Hospital Boards—Scale of Remuneration*, put out last June, was full of unchallenged facts. Dr. FRANCIS said he did not think it had been circulated in Scotland. Sir HUGH WATSON: "It has been on sale there." (Laughter.)

Sir HUGH continued: "I find it very difficult to swallow—to put it crudely—the conception that, even with his experience and his knowledge of Acts of Parliament, the medical superintendent can be compared with a consultant from the point of view of his attainments, his ability, and the discipline through which he has gone, and I can't help feeling that that is why Whitley Committee B has not been able to award any higher remuneration than it has up to date." Dr. FRANCIS replied that there was no way of learning to be a medical superintendent at the present time, apart from taking the D.P.H., doing a certain amount of administrative training, and learning it as an apprentice. It was a little hard to penalize them just because there was not a qualification they could take. "We are not unrealistic enough to think that the superintendent of a smallish hospital should get the same scale as a consultant; we feel that the three top jobs should get a little less than the consultants and that the others should be scaled down accordingly," he said.

The Scottish Association of Medical Administrators' memorandum of evidence proposed salary grades with top figures of from £2,350 to £3,250.

A witness said that his association's claim was not for a cost-of-living increase, but to put right something which they felt should have been put right eight years ago. He also explained that normally in Scotland a medical superintendent was provided with a residence on the hospital premises for which he paid a rent fixed by the Treasury; formerly he had got his house free. In reply to a question by Sir Hugh Watson on the subject of entertainment allowances, he said that with a reasonable salary, comparable to that of the consultants, he would personally be perfectly prepared to entertain visitors to the hospital, although he found it difficult to do so on what he was receiving at present.

Dr. BEDDARD said that the same applied to regional board administrators, who had many visitors, but he did not think any of his colleagues would make a tremendous point about it. Asked by Mr. J. H. Gunlake what kind of allowance he had in mind, he said something between £25 and £50 a year on the present remuneration.

MEDICAL SUPERINTENDENTS' SOCIETY'S EVIDENCE

At the afternoon session the Medical Superintendents' Society representatives put forward their claim that a medical superintendent should be given extra remuneration over and above his purely clinical colleague. "Only he has his finger on the pulse of all the hospital activities, and his value to a management committee which regularly seeks his opinion on different problems is immense," said the written memorandum.

The Society's witnesses were: Dr. G. McCoull (president), Dr. M. J. Brookes (chairman of council), Dr. V. Cotton-Cornwall, Dr. A. Skene, and Mr. J. M. Milloy (hon. secretary). Dr. McCoull explained that the Society's membership numbered 250; potential membership was about 400, 95% of whom were of consultant status.

Consultant Status

It was pointed out in the written memorandum that the mental and mental deficiency hospitals accounted for about 45% of the country's hospital beds; all such hospitals had as their chief officer a medical superintendent with statutory powers; many of the former municipal hospitals still had medical superintendents, so that over 50% of the hospital beds of the country were administered by medical superintendents—yet the very existence of the medical or physician superintendent had been tacitly ignored by the Ministry of Health. Most medical superintendents were consultants in their various specialties and remunerated as such. The Society knew of only two medical superintendents in England and Wales whose work was wholly administrative; all others combined clinical and administrative duties.

Dr. SKENE said that in 11 hospital regions for which there had figures there were 368,600 beds, 221,600 of which were in hospitals administered by medical superintendents—just over 60%. Sir HUGH WATSON: "Yet you say that the very existence of the medical superintendents has been tacitly ignored by the Ministry of Health?" Dr. MCCOULL: "With any document from the Ministry the set-up is such that it comes down through lay hands and very often we find that the medical superintendent of the hospital is simply not named; it goes to the lay side and we are often bypassed." In the Ministry's official "Hospitals' Directory" no medical superintendent was mentioned.

Sir HUGH WATSON: "It is astonishing, because medical superintendents are recognized in their scale for remuneration as though the whole of their duties were clinical." Medical superintendents, he added, were graded as consultants. Dr. SKENE said they were recognized as consultants for the purposes of remuneration, but for the purposes of administration in the general hospitals there was no doubt that there was considerable substance in Dr. McCoull's remarks.

Mr. MILLOY said the Ministry's attention had been called to the matter on a number of occasions, and it had only issued polite replies. In reply to Sir HUGH WATSON, he said about 90% of the Society's members were superintendents of mental hospitals; the figure in respect of infectious diseases hospitals was small, while for general hospitals it was 7 or 8%. There were about a dozen medical superintendents in the country graded as S.H.M.O.s. In general the Society accepted the definition of the duties of the medical superintendent as laid down in the Bradbeer report, although in mental deficiency hospitals there was something extra.

Merit Awards

Dr. COTTON-CORNWALL said that the lack of interest shown by consultants in the merit award system did not correspond with the facts. Dr. MCCOULL said the Society strongly protested against the decision that administration did not count for merit awards; it was part of the man's total professional capacity and should be taken into account. The CHAIRMAN said there had been a generally expressed feeling that the line of demarcation should be left where it was. Dr. SKENE said it was felt that the medical administrator's job was an important one for the good of the hospital service; consequently, any condition of service which made it less attractive or carried with it a handicap was not calculated to maintain the quality of the service in which the members were interested.

Sir HUGH WATSON said the Commission had so far been impressed by the argument that the realm outside clinical medicine was a wide one, but he pointed out that medical superintendents were consultants to begin with. Dr. SKENE said that the physician superintendent consultant was handicapped in relation to his consultant colleagues. There was a limit to the amount of work which he could put into 24 hours. He was expected to carry out clinical duties in 9/11ths of his time, with the medical administration of a large hospital over and above that. He was often doing

administrative work which prevented him devoting his time to work which might make him eligible for the merit award.

Discrepancy in Figures

Sir HUGH WATSON pointed out that throughout England and Wales there appeared to be 129 doctors who acted as medical superintendents for a certain number of hospitals, and he wished to know whether that was, broadly speaking, the total number. Dr. MCCOULL said that the Ministry's factual memorandum of evidence gave the number of medical superintendents and deputies as 77, but the Society thought it was nearly 400, although the figures were not too certain.

The CHAIRMAN asked why such uncertainty existed, and Dr. MCCOULL said he thought it was because of the nomenclature used, which was sometimes "medical superintendent," sometimes "physician superintendent," sometimes "medical director." People tended just to look for the term "medical superintendent."

Sir HUGH WATSON said that, in view of the statutory obligation to have a medical superintendent in mental hospitals, there must be more than the figure of 44 quoted in Appendix C of the Bradbeer report. Dr. MCCOULL agreed that there must be many more.

The CHAIRMAN said that the Ministry's factual memorandum had come out in July last year, since when there should have been enough time to establish the true facts. Dr. SKENE said the Society had not had it until October.

More on Merit Awards

Returning to the subject of merit awards, Dr. MCCOULL said it was the Society's view that there should be a small body elected or appointed by the doctors to deal with the matter. The CHAIRMAN said it had been suggested, and fairly well accepted, that the comparatively informal method of ascertaining merit worked better than a formal committee method. Sir HUGH WATSON emphasized Lord Moran's statement that there had never been any doubt about who should have "A" awards; there had been some doubt, but not a lot, about "B" awards.

The CHAIRMAN: "Is this partly connected with the feeling that in the particular sphere of mental health there has not been as much recognition as in some of the other spheres?" Dr. MCCOULL: "That has not come into my mind up to the moment." He agreed that, on the whole, it worked as well as it could do under the present system. Dr. SKENE said that, allowing for human fallibility, he thought it was reasonably satisfactory.

Dr. COTTON-CORNWALL said that, although the end-result might be very similar to what it might be if there were an elected committee making recommendations, people would feel they had been more fairly treated if the latter system obtained. He thought the difficulty was restricted to the "C" award and did not arise in the case of the other two. Dr. BROOKE stated that people were fairly satisfied within his region. Mr. MILLOY: "In my region we don't know much about it."

Medical Administrator's Function

Sir HUGH WATSON then asked for the general view on the place of medical administration in general and special hospitals.

Dr. MCCOULL said he could speak with authority only on the mental and perhaps the mental deficiency sides, in which spheres he had no doubt at all that medical administration was an absolute necessity. He did not think that any other system such as those used in most general hospitals now would work. There was no way of looking after a person's total life 24 hours a day, perhaps for years, other than by an administration which had a doctor as its head.

Sir HUGH WATSON: "That means that the doctor supervises, if he does not deal with the details of the whole administration of the hospital?" Dr. BROOKES: "In the mental hospital he correlates the other departments and acts

as a liaison." Dr. SKENE said that position was obviously different with general hospitals in England, but the Society took the view that the employment of a medical superintendent in a hospital was highly desirable because the basic fact was that the hospital was simply a building to enable sick members of the public to be treated by doctors and nurses, and it seemed reasonable that the administration of such a place should be carried on by a medical man.

Asked by Sir Hugh Watson to comment on the importance of "the freedom of the subject," Dr. MCCOULL said that the responsibility in that field had been tremendous of late. There had been accusations that people had been kept too long in mental hospitals. New regulations, however, were lightening the responsibility. Previously a mental patient had to be certified on coming into the hospital, recertified at the end of the first year, again at the end of the second year, and then at the end of five years. They were now taking in patients more informally and such recertification was no longer necessary, but early experience showed that the responsibility of taking in mental defectives under uncertified conditions would be very much greater than when they had been certified. "I think we all welcome the informality," he said, "but it will put on the doctor a very much increased responsibility." The CHAIRMAN: "In an ordinary mental deficiency hospital, does that invariably come directly on the medical superintendent, or has he the ultimate responsibility but doctors under him take the decision in most cases?"—"In my hospital the other doctors take a very large share of the responsibility, but any questions of doubt I have to decide."

Allocation of Duties

Sir HUGH WATSON: "How much time is involved in clinical work and how much in administrative work in a hospital such as yours?" Dr. MCCOULL: "Everyone will speak as though doctors work 38½ hours a week as medical superintendents. I can double that almost every week in the year, so I don't know whether to take a proportion of 38½ or somewhere about 72. I would say that the actual administration, as administration, does not take very much. There are other people to do this work—group secretaries, group engineers. But there is the work which is looked upon by some people as administrative but which in our opinion is purely medical. With so many 'unknowns' I cannot get a definite proportion." Sir HUGH WATSON: "How far is a medical superintendent responsible for the clinical work of other consultants?"—"I would say not at all. Of course, he has to see that outside consultants turn up in time and do not keep other doctors and patients waiting, and he is responsible for seeing that the consultant is thoroughly looked after and has all the equipment he needs. If he is a part-time consultant he has to see that the job is properly carried out and that the nurses are at their work, but I do not think the medical superintendent has any responsibility for the clinical work carried out."

"You say that the S.H.M.O. grade should be abolished: what would you suggest to replace it?" Dr. MCCOULL: "Very largely, we think there ought to be a broadening-out of the consultant grade. We do not think that some form of junior-, sub-, or assistant-consultant is the right answer." He said his Society thought that the grade should die out, as such and in name, but that those who were already left in it should have a regular review of their status, because there were S.H.M.O.s doing consultants' work. Dr. COTTON-CORNWALL said the problem could not be tackled until there had been a whole, general review of hospital staffing—for which purpose a working party had been set up. Broadly speaking, the second memorandum submitted by the B.M.A. to the Commission had dealt with it very fairly and fully.

Sir HUGH WATSON agreed that the setting up of a working party had, at least to some extent, taken the matter away from the Commission.

Dr. COTTON-CORNWALL said that the grade had caused tremendous frustration. Doctors who had been in the

service before 1948 felt in many cases that they were being very unfairly treated *vis-à-vis* their colleagues, who, before 1948, had been considered to be their equals.

Extra Remuneration

Asked to explain the view expressed in the written memorandum that a medical superintendent should be given extra remuneration over and above his purely clinical colleagues, Dr. McCOLL said it was because a medical superintendent was more completely whole-time than anyone else and carried a burden of responsibility which no other member of the profession had. He disagreed with the Bradbeer Committee's contention that a medical superintendent should be paid for the sessions in which he was acting as such on the same scale as those in which he was acting in his consultant capacity. Dr. SKENE said the Ministry recognized the principle that the medical superintendent should be paid as a whole-time consultant if he was employed for up to 2/11ths of his time on administrative duties and the remainder on clinical work; but if it was 8/11ths clinical and 3/11ths administrative he was paid for his 3/11ths at administrative rates and not as a medical man at all.

The CHAIRMAN: "Where would you draw the line? If it was 1/11th clinical and 10/11ths administration you would not expect him to be paid as a clinician?"—"If it is a hospital with 250 beds he can undertake medical administration in 2/11ths of the time; if it has 1,250 beds it is less likely that he can undertake the same responsibility, and it seems anomalous that for undertaking the more onerous task he should suffer financially. This applies to general hospitals and sanatoria." The CHAIRMAN: "But you pointed out that the big general hospitals, on the whole, would not have medical superintendents?"—"A considerable proportion of general hospital beds are not under medical superintendents, but in fact a very considerable number of the really big hospitals do have medical administrators."

Dr. McCOLL said that medical superintendents felt that they ought to be paid as consultants, if they were consultants, for their clinical work, and, because they took on added responsibility as medical superintendents, there ought to be a component in their total remuneration to cover that point. Sir HUGH WATSON: "What criteria would you suggest should be employed in appraising that figure?"—"We think that size has to count largely, and beds are as far as we have got, although we do realize that there are other matters which will come into any scale." Sir HUGH: "If it is not beds it is out-patients?"—"Yes."

The CHAIRMAN: "I am left with a rather vague impression of something very complicated that would be a matter of individual assessment and judgment in most cases." Dr. BROOKES: "No more complicated, surely, than some other salary scales attached to hospital work in other than medical things. We want a system that varies according to the responsibilities and the work done." Dr. COTTON-CORNWALL: "An attempt to equate remuneration with the total administrative load in a particular appointment."

Sir HUGH WATSON: "Is it somewhat comparable to the responsibility pay which was given to certain schoolmasters, such as heads of departments?" Dr. COTTON-CORNWALL: "I would say we are thinking along those lines. But the head of a department is under a different kind of responsibility from that which a medical superintendent takes in relation to the whole of his charge."

Sir HUGH WATSON: "To what extent could the function of dealing with staff, whether medical or lay, be dealt with by a person with reasonable tact and personality and some administrative knowledge and experience? Do you think that a lay person who had some business experience, if he had tact, personality, and understanding, could deal to a very considerable extent with the problems about which you have been talking?"

Dr. McCOLL replied that it might appear that he could—if such a man existed—but there was something in hospital

administration over and above the official duties which was impossible to describe. It was so difficult for doctors to get it over that there was a component in hospital administration which consisted in binding everybody together. Dr. SKENE said that such a "paragon" could undertake all the duties for a considerable time, but when it came to a medical decision there was undoubtedly at least the desirability of having a medical man to undertake the responsibility.

Mr. MILLOY protested against statements that being a whole-time salaried doctor made him like an officer of Whitehall or Savile Row. He did not want such statements to go unchallenged. The CHAIRMAN: "You consider that you are doctors just as much as anybody else?" Mr. MILLOY: "I feel just as free now as I ever did before."

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

MINISTER'S ACTION ON REGISTRARS NOT APPROVED

The Central Consultants and Specialists Committee and the Joint Consultants Committee were not associated with and did not approve of the Minister of Health's proposal for specially designated posts for time-expired senior registrars. This was made clear at the meeting of the Central Consultants and Specialists Committee at B.M.A. House on June 26, when it was stated that some members of the profession were wrongly of the impression that the proposals had been accepted by the Committee and were critical of it on this account. Mr. T. HOLMES SELLORS, chairman of the Committee, presided. A suggestion that members of the hospital medical staff should be allowed to attend the Committee as observers was referred to the Executive Committee. A number of members spoke favourably on it.

Hospital Medical Staffing

A large portion of the whole-day meeting was devoted to the question of hospital medical staffing. Before the Committee were resolutions from the Hospital Junior Staffs Group Council and the Birmingham Regional Junior Staffs Group deploring the Minister's decision to create designated posts in a new category, and a report by the Committee's Medical Staffing Subcommittee with its own suggestion for a future staffing structure.

The CHAIRMAN said that the Minister's decision to create special posts for time-expired senior registrars was taken quite unilaterally. Four foolscap pages of careful argument in favour of a subconsultant grade had been presented by the Ministry to the Royal Commission on Doctors' and Dentists' Remuneration, and presumably the creation of this grade would be in the minds of the Ministry representatives on the working party which the Minister had appointed to review hospital staffing, warned Mr. Holmes Sellors.

Professor G. I. STRACHAN said that the fact that the designated posts seemed to be additional to the registrar establishment aggravated the position. There should be a reduction of the number of registrars to clear the bottleneck.

Subcommittee's Proposals

The Committee's Medical Staffing Subcommittee's proposals were outlined by Professor Strachan. They had been considered by the Executive Committee in the light of comments at the previous meeting. Professor P. C. P. CLOAKE said the Committee should realize that the proposals were intended for the future pattern of hospital staff as a whole. The present problems of the senior registrar bulge and S.H.M.O.s should be looked on as separate. "These proposals are intended to eliminate the recurrence of the problems we have now."

Dr. T. ROWLAND HILL was emphatic that, apart from certain well-defined exceptions, there should be only one career grade in the hospital service, and that was the consultant grade. He explained that the proposals followed this principle. The next stage, he thought, would be to fight for it on the working party. "What we call the senior registrar to-day is really too senior to be a registrar; he is really a consultant and sooner or later he should be called so." A decision on a man's future should be made at a stage early enough in his career for him to go into another branch of practice if he is not chosen to continue in hospital practice. There was no doubt that what had to be fought was a determined effort to get a large volume of work in hospitals, which ought to be done by consultants, done by the people paid permanently at a lower rate. The fact that the Government had been to the trouble already, without consulting the profession, to associate themselves with that view and put it in writing before the Royal Commission was an indication of how serious the matter was.

"In my opinion the action of the Ministry in creating these designated posts for time-expired registrars is probably not what it appears on the surface—an attempt at the expense of public funds to be kind to time-expired senior registrars," continued Dr. Rowland Hill. "There are party political factors. But, much more than that, my personal opinion is that this is a 'try-out,' well before the working party can report, of a subconsultant grade, and we should face up to that."

In Germany, where a similar situation had been developing in hospital staffing to that in this country, it had been decided that the only sound policy was to increase the number of consultants in the immediate future and decrease the number of men junior to that rank.

Principles for the Working Party

Mr. J. R. NICHOLSON-LAILEY enunciated three principles to be placed before the working party. First, there must be no impairment of the quality of the consultant service to be given by consultants properly trained. "Secondly, we must not train brilliant men and women and then throw them on the scrap-heap, which is what is tending to happen at present." Thirdly, there must be no "dead-end" grade, such as the S.H.M.O. grade had become; unfortunately it was there, and as long as it was there the Ministry had their subconsultant grade. It was true that part of a consultant's training consisted in taking consultant responsibility while he was a registrar. More and more responsibility was delegated to him by his chief. But the Ministry did not see the difference between this and the senior registrar who had carried on for five or six years and was really a consultant.

Mr. Nicholson-Lailey made a plea for the inclusion of a non-teaching hospital consultant on the working party. Practically everybody on the working party was connected with a teaching hospital, he pointed out, and yet a very large number of hospital beds were staffed by non-teaching consultants. "They have their staffing problems. It was from them that the original stimulus came for setting up the Strachan Committee. It would be a great advantage if the Ministry could be persuaded to put at least one non-teaching consultant on the working party, preferably from a provincial hospital. I do not think the S.H.M.O. is found in the teaching hospital at all. Again the distribution of senior registrars is quite different. There are few senior registrars in non-teaching hospitals."

Dr. J. VALENTINE added that there was no representation on the working party of psychiatry or mental hospitals. Their Mental hospitals contained 40% of hospital beds. Their staffing structure was traditionally different, and unless there was someone with knowledge of it the working party would be at a disadvantage.

In answer to Mr. T. H. DOCKRELL, the CHAIRMAN said it had been the policy of the Committee from the beginning that the consultant establishment should be increased. It also said that it did not see how this could be done without a review of what was needed. The Ministry had refused

a review and had put up the idea of subconsultants. Without a review one was fishing in the dark, and the situation was that, instead of being appointed consultant at 32, as Spens intended, doctors were now much nearer 40.

Dr. ALEXANDER SMITH read the resolution of the Scottish Consultants and Specialists Committee disapproving the Secretary of State for Scotland's proposals for registrars, welcoming the setting up of the working party and expressing willingness to co-operate with it, and urging that senior registrars should be given security of tenure until the working party reported and that they should be given a salary increase.

Professor STRACHAN said that Dr. Rowland Hill had pointed out the dangers of the Minister's proposed new posts. "I think we have been to blame in not emphasizing to the profession that this was done in the teeth of our opposition," he added. "I have not seen it stated in the *Journal** or elsewhere that we are in no way agreeable to the establishment of these new posts, and it is not the first time we have slipped up in this way." On one point Professor Strachan did not agree with Dr. Rowland Hill. The future consultant was not more or less selected when he began his senior registrar appointment. He was tentatively selected as a potential consultant then. The final selection should only come at the end of four years. Possibly 90% would go on.

Representation on Working Party

Dr. J. D. PROCTOR supported Mr. Nicholson-Lailey's plea for representation of the provincial hospitals on the working party, and suggested that region by region the consultant should decide what they considered was a reasonable consultant establishment. Dr. ALEXANDER SMITH pointed out that in the constitution of the working party all the Royal Colleges were represented except the Royal Faculty of Physicians and Surgeons of Glasgow, and asked that it might be given some representation. Sir RUSSELL BRAIN thought there was a great deal to be said for keeping the working party small. "The danger is that if you enlarge it—and that means one on each side—it will be too unwieldy." He had in mind that the matter could be dealt with by the use of deputies, and the working party would be taking evidence and visiting hospitals. "I would be sorry to see it enlarged beyond the present number of 12, which is already too much." He was very much in agreement with what Dr. Rowland Hill had said, but they had to face what was likely to happen. It was really a question of money.

Dr. G. S. W. ORGANE said that, if the working party arrived at an opinion that a certain number of consultants was necessary, the responsibility for not accepting that recommendation must fall on the Government's shoulders. Mr. R. J. RUTHERFORD underlined the difficulties of getting registrars in provincial hospitals.

On the motion of Professor STRACHAN it was agreed that the modifications to the Medical Staffing Subcommittee's proposals now presented be approved and that they be forwarded to the Joint Consultants Committee for the use of its members.

Registration of Medical Auxiliaries

It was reported that Dr. Rowland Hill and Sir Russell Brain were to meet two representatives of each of the bodies of medical auxiliaries to consider a new scheme which has been put forward for discussion for the registration of medical auxiliaries. Under this there would be a registration board for each type of auxiliary on which

*We commented on the Minister's proposal to create new posts for time-expired registrars in an annotation headed "The Plight of the Registrars" on April 26 (p. 993). Here we stated the Joint Committee's and the registrars' opposition to the proposal and why they opposed it. The letters on the subject exchanged between the Minister and Sir Russell Brain were published in the *Supplement* of April 26 at pp. 216-217, and we reported the Central Consultants and Specialists Committee's debate on this matter in the *Supplement* of May 10 at pp. 235-6.—Ed., B.M.J.

the auxiliaries themselves would in each case be in a majority. There would be a co-ordinating council of doctors, auxiliaries, and independent persons appointed by the Privy Council and other bodies. "It would have the power of veto only," explained Sir RUSSELL BRAIN. "It would have no power to put forward any alternative proposals." This was not in accordance with the view which had been put forward in the past by the Joint Committee.

Mr. H. H. LANGSTON said that orthopaedic surgeons were worried lest the individual registration boards should put up unacceptable conditions and it would be impossible to alter them. The Orthopaedic Group of the B.M.A. would support increased power for the co-ordinating council. Dr. HUGH DAVIES was sure the Association's Radiologists Group would support those views. Dr. A. T. RICHARDSON, supporting from the Physical Medicine Group, mentioned that already the Chartered Society of Physiotherapy had altered its ethical rules so that members could carry out treatment without a doctor's instructions. There was a move for independence which would upset the whole structure of medicine. Mr. O. GAYER MORGAN and Dr. A. GRAY associated the Ophthalmologists and Pathologists Groups with what had been said, and Sir RUSSELL BRAIN asked for details of the Chartered Society's action to bring to the notice of the meeting.

Tribute to Lord Webb-Johnson

Mr. HOLMES SELLORS and Sir RUSSELL BRAIN left the meeting to attend the memorial service to Lord Webb-Johnson, and Dr. ROWLAND HILL, deputy chairman, who took the chair, paid tribute to Lord Webb-Johnson's services in the discussions leading up to the National Health Service. Although he became a controversial figure, there could be no doubt that Lord Webb-Johnson's work was of very great value indeed in safeguarding professional interests at the outset of the National Health Service. "Perhaps his greatest contribution," said Dr. Hill, "was that he was the man more than any other who persuaded Aneurin Bevan—and that, you can imagine, took considerable powers of persuasion—of the need for the provision of private beds in National Health Service hospitals."

The Committee recorded its regret at Lord Webb-Johnson's death and appreciation of his past services as a member of the negotiating committee and of the Joint Consultants Committee.

Delay in Advertising Posts

The Junior Staffs Group Council urged that regional boards should make repeated and more energetic efforts to advertise vacant posts, which often remained vacant for many months, making it necessary for hospital junior staffs in adjacent hospitals to cover. Professor STRACHAN said that in his region a man might have left three weeks before an advertisement appeared. "That is due entirely to slackness on the part of the administration of the regional board," he declared.

Chairman's Burden

Such is the burden of B.M.A. work on the chairman of the Central Consultants and Specialists Committee, the Executive Committee reported, "that no consultant with wide clinical commitments can accept the chairmanship without danger of seriously disrupting his professional work." The Executive felt that the solution of the problem could adequately be met by the appointment of a second deputy-chairman, and for the chairman and his two deputies to agree upon a general division of responsibility.

Mr. LANGSTON said that the chairman should be present in the Council and Representative Body. "But I would put in a plea for more support from consultants in the work of those bodies," continued Mr. Langston. "I think there is a reluctance among consultants to seek membership of the Representative Body. I admit the Representative Meeting takes a lot of time and a great deal of the discussion would not concern us, but perhaps because of the lack of repre-

sentation of this committee a great burden of answering questions on resolutions is put on the chairman. It is easier in that we now have four representatives from the Committee to the A.R.M., but if other members sought election through Divisions it would aid him. The same applies to Council."

Supporting the Committee's proposals, Dr. R. P. KEMP said it was vital that the chairman should be in active clinical practice.

There was less support for the Executive's other proposal that, once a member had been appointed to the Executive or the Chair, and so long as the member held office, the regional committee or other body by whom he was appointed should be free to appoint a further representative for the period during which the office was held.

Mr. W. S. LEWIN said that the Committee was still building itself up as the body representing the views of the consultants and specialists of the country. It was by no means in a secure position. One of the essential things was to ensure that the chairman and deputy-chairmen were acting clinicians. Once make the post of chairman so burdensome that it could be occupied only by one who was more in the medico-political field or retired and there would be a breakaway. Members of the Executive Committee were by and large those who had been members for a number of years. Under the present arrangement that could only mean that other people in the regions were not having the opportunity of reaching the Central Consultants and Specialists Committee and widening its representation. "I am sure we must continue to build at the periphery," concluded Mr. Lewin.

Mr. A. N. GUTHKELCH moved an amendment which confined the Executive's proposal for the appointment of a further representative to the case of the chairman and deputy-chairmen. "While I am in favour of the idea that the office of chairman and two deputy-chairmen should be supra-regional, I am not in favour of a place on the Executive being supra-regional," he declared.

After further discussion the amendment was carried. The Committee accepted the proposal for an additional deputy-chairman.

Elections

In 1956 the Committee decided that it would elect its chairman, deputy-chairman, and members of its Executive and its representatives on the Joint Consultants Committee for the forthcoming year at the last regular meeting of each session instead of the first meeting of the new session, when a proportion of the members might be newcomers to the Committee. This is subject to the formal confirmation of the appointment of chairman at the first meeting in the autumn.

Mr. HOLMES SELLORS, who had intimated that he would not be willing to stand again for the chairmanship of the Committee, agreed, in view of the arrangements which had been made and the further consideration to be given by the Executive to relieving the burden of the chairman, to accept the renomination which was pressed upon him by members. Dr. Rowland Hill and Mr. Langston were elected joint deputy-chairmen.

Loss of Personal Property in Hospitals

"Another example of the juggernaut of the National Health Service having taken over the perquisites of junior hospital staff," was Mr. RUTHERFORD's comment on the confirmation from the Association's solicitor that in general a hospital authority has no duty towards the belongings of an employee, and that the only way in which an employing authority could be held liable would be by an express provision in the contract. "It comes into the category of one of those little pin-pricks to which the Royal College of Surgeons of Edinburgh referred in evidence to the Royal Commission," said Dr. ROWLAND HILL. "Pin-pricks such as charging everyone 3d. or 6d. for a cup of tea, even a consultant who came at night to do an emergency."

Inquiries of the Medical Insurance Agency, the Executive Committee's report added, indicated that it was possible for hospital residents to insure their personal belongings against all risks, under a group policy, for a modest premium.

Merit Awards for Psychiatrists

The Association's Psychological Medicine Group Committee told the Committee that it strongly supported representations by the Royal Medico-Psychological Association deploring the disparity between psychiatry and general medicine and general surgery in the distribution of distinction awards. Dr. VALENTINE said it had been claimed that the candidates for awards in psychiatry were not of the same category as those in general medicine and surgery. That could not be held when one considered the status of British psychiatry throughout the world. "Nowadays it is the mental hospitals in Britain that are most frequently visited by our colleagues abroad," he remarked.

The Executive had suggested that the marked disparity between the relative number of distinction awards in psychiatry and in general medicine and surgery might partly be explained by the greater expansion in psychiatry since the Health Service, and that the Group and the R.M.P.A. be asked for a "break-down" of the consultant establishment in psychiatry, showing the age-distribution and length of consultant service. On this Dr. VALENTINE commented: "A concomitant should be a break-down of the establishment in general medicine and surgery." Although members of the merit awards committee were not representatives of specialties, he added, one never failed to find physicians, surgeons, or obstetricians and gynaecologists. "Psychiatry is one of the major specialties, and it is going in the future to expand to a very great extent."

Dr. R. ORTON said the break-down should include S.H.M.O.s, who were in greater proportion in psychiatry. Mr. LANGSTON pointed out that others, such as chest physicians and anaesthetists, might be in the same position as regards proportion of merit awards. Dr. J. B. S. MORGAN said that immediately one brought out figures one was dealing with quantities. Figures were of no value, because this was a question of quality. But Dr. VALENTINE thought figures were valuable as showing trends.

It was agreed to seek the information.

"Merit" or "Special Responsibility"?

The Committee made clear its opposition to a system whereby distinction awards would be allocated on the basis of special responsibilities attached to posts rather than on the professional distinction of individual consultants, and for administrative qualities rather than clinical eminence. As a matter of urgency the Executive had already urged the Joint Consultants Committee to ensure that evidence be presented to the Royal Commission to this effect. The Executive did this when it learned that at the request of the Royal Commission the Ministry was seeking information about consultant posts involving special responsibility.

Said the CHAIRMAN: "We have always laid down that the highest form of payment is for clinical responsibility. We were never fond of the term 'director.' There might be a person in administrative charge, but he should not get extra for that." The part of the Ministry's evidence on merit awards was extremely well balanced, and it came down against payments for "responsibility."

Local Authorities and the N.H.S.

The Sheffield Division sent a resolution strongly resenting any suggestion that the hospital services should be returned to the control of local authorities, "and that, further, every effort should be made to have Part III Services, as defined by the National Health Service Act, removed from the control of local authorities and absorbed in the structure of the National Health Service." The Council had received the first part, and referred the second to the Central Consultants and other committees.

In a short debate reference was made to "enlightened" authorities where the welfare department was under the medical officer of health. The resolution was referred to the Liaison Committee.

Local Hospital Reorganization

It was reported that, as a result of a local hospital reorganization, the hospital appointment of a medical officer of health had been terminated. The Executive stated he had been advised of his right of appeal under paragraph 16 of the terms of service. "Hospital reorganizations, and developments in medical science, may, from time to time, mean that doctors working in one specialty may have to change to another specialty," stated the report. "The Executive would be strongly opposed, however, to boards deciding to displace a consultant (or S.H.M.O.) in one specialty and to transfer his work to a consultant (or S.H.M.O.) in another specialty."

Psychiatrists Employed by Local Health Authorities

"Local authorities advertise for specialists in psychiatry for the performance of duties requiring considerable clinical experience and knowledge and they advertise at rates of pay very much less than the National Health Service," Dr. VALENTINE told the Committee. "As a result the candidates that they get and appoint may be of inferior quality."

In the opinion of the Psychiatric Group Committee, the most satisfactory solution would be for local authorities needing the services of psychiatrists to obtain them by arrangement with hospital boards in the same way, for instance, as they obtained the services of chest physicians. Dr. MORGAN thought the most satisfactory solution was for local authorities to pay the same as the National Health Service.

Dr. VALENTINE said his Group would be glad for the matter to be referred to the Public Health Committee, and this was done.

Private Beds

The CHAIRMAN remarked that a review made on a Ministry basis of available private beds would give a fallacious figure which yielded no index of the pressure of applications on that section of beds. The Central Consultants and Specialists Committee, however, had asked to be notified of any intention to make an approach for additional private beds locally, so that it might make simultaneous representation to the Ministry of Health.

From Taunton came a report that, since 1948, the B.M.A. Division, the medical staff committee, and the hospital management committee had all pressed the regional hospital board to provide private beds in Taunton where none existed. Patients had to go 13 miles to Bridgwater (4 private beds in a hospital of 72 beds) or to Wellington, a distance of 8 miles, where there were two private beds in a cottage hospital of 20 beds. Something like three-quarters of the patients who had to go to Bridgwater and Wellington were in fact resident in Taunton, and a large number of them were admitted to the general wards although they would in fact prefer private accommodation if such existed. All that was needed was £2,000 to £3,000 to alter an already existing, unused ward.

Mr. NICHOLSON-LAILEY told the Committee: "The regional board have listened sympathetically, the management committee are behind us. Not only are there no private beds; there are no separate rooms in which we can accommodate patients needing a separate room. There is no accommodation for sick nurses."

Moral Obligation

Considerable concern was expressed at the wording of a letter from the secretary to the Management Side of Whitley Committee B which claimed "it was for members of appointments committees to decide what weight to give to a 'moral obligation' and that this was not a question in which the Minister could intervene." The moral obligation referred to was that of finding displaced consultants and S.H.M.O.s other employment. The CHAIRMAN said that in

a number of cases employing authorities had exerted themselves, but there was a small nucleus of cases of people who had been displaced and for whom no further appointment had been found. "I have asked the Minister to discuss these outstanding cases," reported Mr. Holmes Sellors. "He has accepted. He has said that he will suggest a date some time."

Dr. ROWLAND HILL said he was very worried about the letter from the secretary of the Management Side. "There has been a narrowing down, what Freud termed 'an active process of forgetting things.'" Originally the Ministry agreed that, if a consultant lost a post or part of a post through no fault of his own, the Minister accepted a moral obligation to do all in his power to find alternative work. The statement that it was for appointments committees to decide what weight to give to the moral obligation was the opposite of what was agreed.

Mr. LANGSTON said it was always understood that it was the Ministry that accepted the moral obligation; this narrowed it down. And Professor CLOAKE remarked that the appointing body was the board. The selection committee was quite a different thing and it would be ridiculous to suggest that the moral obligation be put on them. This was the first time there had been any suggestion that the Minister himself had not an obligation. "We should repudiate the suggestion and refuse to accept it completely," Professor Cloake asserted.

The CHAIRMAN promised that the matter would be taken up by the Staff Side and the statement would be challenged.

Tuberculosis in Industry

The Tuberculosis Group did not see anything to be gained by the director of a mass miniature radiography unit, which was not a diagnostic unit, notifying an industrial medical officer that "Mr. A" possibly had tuberculosis and he was being referred to the chest physician, Dr. PETER EDWARDS told the Committee. It was unnecessary and duplicating work. The Committee accepted the views of the Chest Group Committee, which confirmed those of the Public Health Committee but were contrary to those of the Occupational Health Committee. The Group considered, however, that, subject to the patient's consent, information should be made available to the industrial medical officer by the chest physician following a firm diagnosis.

"Discretion" in Starting Salaries

It was reported that, following a submission from Whitley Committee B that it was important that newly appointed consultants and S.H.M.O.s over the age of 32 should always have their cases considered in the light of the discretion to fix the starting salary up to four incremental points above the minimum of the scale, the Minister had sent a circular to boards stating that he is in general agreement with the views expressed.

S.H.M.O.s in Consultant Posts

A resolution from the S.E. Metropolitan Regional Consultants and Specialists Committee was considered which urged a settlement of the cases of S.H.M.O.s undertaking consultant duties, now under consideration in Whitley Committee B. The resolution stated that this should be regarded as a matter of urgency and it should not be allowed to restrict the completion of the work of the working party on hospital staffing.

Mr. A. LAWRENCE ABEL recalled that it was now eighteen months since the Central Consultants and Specialists Committee asked 3,000 S.H.M.O.s whether they thought they should be upgraded. One in three replied, and all these replies had been investigated by a review committee. It was agreed that about 500 were doing consultant work of consultant standard, and their colleagues locally agreed that they had full clinical responsibility. "It is our duty to do something about this injustice," declared Mr. Abel. It was really a matter of public opinion rather than medical opinion.

Dr. ROWLAND HILL said a subcommittee of Whitley Committee B was dealing with individual cases. What would come out of the examination was another thing.

Dr. E. BERESFORD DAVIES exemplified a psychiatric S.H.M.O. who was deputy-superintendent of a hospital. If his chief was on leave he had entire responsibility, and in effect, whether he liked it or not, was bound to do the work of a consultant. Dr. ROWLAND HILL said that if a case was strong enough, with the backing of the B.M.A., an appeal could be made to the regional Whitley appeals machinery not on behalf of the man's grade but on the grading of the post. Several such appeals had been won, and the Whitley appeals machinery had upgraded the posts.

Observers at Committee's Meetings

The Committee was asked by the S.W. Metropolitan (Eastern Area) Regional Consultants and Specialists Committee to consider the suggestion that members of hospital medical staffs should be allowed to attend the meetings of the Committee as observers. "Will they sit on the window-ledge?" asked Mr. GUTHKELCH, looking round the nearly full Council chamber where the Committee meets. Mr. LAWRENCE ABEL thought that only one or two would turn up. He suggested trying it for 12 months as an experiment. Dr. H. G. H. RICHARDS supported the suggestion in the resolution. He thought that a great deal of criticism could be allayed if the Committee allowed each regional committee to send one observer, perhaps with the right to speak. Of course they would have to undertake to respect the chairman's direction on matters that were confidential. Mr. W. S. LEWIN suggested that the most effective procedure would be to invite each management committee group in turn to send two or three observers. Mr. BERESFORD DAVIES disagreed. He thought it would be better if it were allowed to be known that, if people applied to come to the meeting, their case would be considered.

The matter was referred to the Executive Committee.

New Region

Notification was formally received of the division next year of the South-west Metropolitan Hospital Area into two regions. Said Mr. LANGSTON: "This is something which in our part of the region is warmly welcomed."

New Members

There have been two changes in membership of the Committee. Mr. R. V. Cooke has been elected from the South-western Region in place of Mr. A. Daunt Bateman, and Dr. A. Paton in place of Dr. G. R. Venning represents the Hospital Junior Staffs Group.

THE DAIN FUND

REPORT OF THE TRUSTEES, 1957-8

The Trustees of the Dain Fund report that during the year ended April 30, 1958, twenty-three cases have been assisted by the fund, the grants amounting to £2,315 12s. Sixteen of these have been helped over a period of years. Satisfactory reports on progress in school and university have been received in all cases.

New Cases

Seven new cases have been undertaken by the Trustees. Help may be requested for most of these for a period of years.

The widow of a public health doctor who died from poliomyelitis applied for assistance for this year in the education of the eldest of her three daughters. It is hoped that the temporary help given will enable suitable arrangements to be made for the education of all the family.

Help has been given to the daughter of a general practitioner who died as a result of an accident when returning from a night call. The daughter is a student undertaking a three-year college course.

Assistance with school fees for her son has been given to the widow of a naval medical officer who died in the course of his duty while rendering medical assistance at an accident.

The widow of a general practitioner, whose sudden death left her without the necessary means, has been helped with school fees so that her youngest son could finish his education and continue to avail himself of the scholarship he already held.

The widow of a doctor who died in 1950 has been given financial assistance to enable her son to complete his medical education.

The sudden death in tragic circumstances of her young general-practitioner husband left a widow with insufficient money to educate her two young sons, after settlement of debts. The widow hopes to find employment, but cannot do so until she has handed over the house and installed a successor into the practice. The Trustees have helped with two terms' school fees and will review the case later when the widow has resettled.

The widow of a general practitioner has been given assistance in meeting the extra expenses connected with her daughter's continued education at the school at which she was already being educated.

Cases Concluded

Three of the cases which have been helped by the Fund should be concluded this year. The Trustees report that in each case the conclusion of education seems to have been satisfactory. The first was helped with university fees, without which help he could not have attended the university. Following excellent reports on his academic progress, and a very distinguished career in sport, he has now achieved an honours degree. The second was a medical student when his father died suddenly. Help was given so that he could continue with his course. He hopes to qualify in October, 1958. The son of a consultant who died suddenly in early middle age has been helped with school fees and has now obtained an appointment as a student apprentice.

Nearly every case assisted by the Fund needs help over a period of years. School fees, as many of the profession know, are mounting, and the help required, in consequence, increases. The Trustees earnestly request subscribers to continue their support and to help further by enlisting the support of others. They endorse the gratitude expressed by those who have been helped, and once again record their appreciation of the help and generous donations given by local medical committees.

The Trustees also express their thanks to the Royal Medical Benevolent Fund and their Ladies' Guild and the Royal Medical Foundation of Epsom College for the help and advice which have been extended to the Fund during the year. They remind individual members of the profession that valuable help can be given to the Fund by completing a form of covenant for seven years or by sending a donation to the secretary.

WINCHESTER ADDRESS

MEDICINE'S "ARCHAIC CURTAINS OF MYSTERY"

Nearly 300 doctors and their guests heard the Rector of Edinburgh University, Dr. JAMES ROBERTSON JUSTICE, better known, perhaps, in his role as a film actor, make a plea for the abolition of mystery in medicine when giving this year's Winchester address on June 26.

Dr. Justice praised the "closed shop" in medicine in so far as it upheld the rigorous standards of conduct which made the British medical profession the envy of many other countries. But medicine, an empirical science, tended to be too esoteric, to share its mysteries only with the initiated, and to assume that it was bad for a patient to know too much. This attitude was based on false premises. The speaker agreed that "popular medicine" was a horror to be avoided at all costs, but he felt very strongly that the medical profession should cease to take refuge behind the archaic curtains of mystery. People had come to take medicine for granted, and if this was to be corrected it was necessary for doctors to take patients into their confidence much more. "Having spent a large part of my life

in your hands," Dr. Justice told the doctors in his audience. "I have been irritated to a state of frenzy by the hush-hush tactics of members of your profession." He objected not only to the "conspiracy of silence" but to the puritanical attitude that suffering was somehow linked with sin and that an ability to endure pain was a sign of merit.

The days of the great individualist were now over, Dr. Justice commented, and with the spread of knowledge it was impossible for a man to know more than a narrow shaft of the whole subject. The doctor was part of a team of specialists. The biochemist, the cytologist, the radiologist, the pathologist, and the physicist, with his radioactive isotopes, all funnelled their findings through the doctor at the bedside. Medicine was no longer a mystery, because the doctor had to rely on so many non-medical men for his data. "Hence obscurantism must defeat itself," he concluded, "for medicine is now so linked with the other sciences, which have thrown off the stigma of alchemy and are not obsessed with mystery, that she will have to fall in line."

Before Dr. Justice gave his address Dr. J. R. BODINGTON, chairman of the Winchester Division, who presided, presented Dr. BALFOUR BARROW with the scroll admitting him to the Roll of Fellows of the Association.

TUBERCULOSIS AND DISEASES OF THE CHEST GROUP

ANNUAL MEETING

What is to be the future of chest services? For how long should a treated case of tubercle be followed up? These were among the questions considered at the annual meeting of the Tuberculosis and Diseases of the Chest Group at B.M.A. House, London, on July 1. In their annual report the Group Committee stated that it could not "emphasize too strongly the danger to the community which is resulting from attempts to curtail the chest service."

Dr. PETER EDWARDS, chairman of the Group Committee, was elected chairman of the meeting. The present membership of the Group is 506.

Future of Chest Services

Since it was undesirable that work on a study of the future of chest services should be duplicated, the Group Committee, it was reported, had agreed that the Joint Tuberculosis Council should set up its proposed special committee and that its draft reports should be submitted to the Group Committee with the object of an agreed report being produced. The intention was that the final document would be submitted by the Group Committee through the Central Consultants and Specialists Committee to the Joint Consultants Committee, while the Joint Tuberculosis Council will take the report to the Ministry through its own channels.

Dr. NORMAN ENGLAND said that statistical evidence had been collected. At the earliest the report could not be ready before October. It was not a job that could be rushed. Referring to the future of the chest service, Dr. England said that if a chest clinic was providing a good service, used by general practitioners and the public, no regional board would want to close it. But if the service supposed to be provided was not being provided, that perhaps was another matter. Dr. HUGH RAMSAY remarked that, with the best will in the world, the fact of empty beds had to be faced and from the administrative point of view this problem of redundancy was a real one. It was up to chest physicians to show that their service was not a more or less extinct one, which it was not.

Emphasizing the point made in the Group Committee's report that the chest physicians had a special and epidemiological approach to their work and that it should be made use of in studying chronic chest conditions such as bronchitis,

asthma, and cardiac diseases, Dr. EDWARDS said that chest physicians had been a help to general practitioners in this way. Dr. F. RIDEHALGH remarked that if a chest physician had beds and was doing good work he would have so many patients sent to him that he could not be redundant. There might be more out-patient work than in the past. The real danger was that as chest physicians retired they would be replaced by general physicians. That was the policy which some regional boards had decided upon.

How Long?

The Group discussed the problem of how long a case of tuberculosis should be followed up. Professor F. R. G. HEAF remarked that this was one of those questions one could not answer. A figure could not be laid down, and it depended on the clinical state of the patient.

The Group Committee's report stated: "Evidence shows that tuberculosis is ceasing to be the national menace which it was at one time. Fewer cases of tuberculosis are proving fatal and more are recovering, but at the same time there is no doubt that the work of chest clinics is increasing. . . . It is felt that the general physician can learn much from the experience of the chest physician, and while the chest service should be integrated within the whole ambit of medicine there are special contributions which it can make."

S.H.M.O.s and Consultant Work

On the question of S.H.M.O.s and consultant work the CHAIRMAN commented: "A terrific amount of labour has been put into this matter by the Group and the S.H.M.O. Group and it is all very disappointing. The position is anything but what we had hoped. The Ministry seems to find methods all the time of pushing things on and on, and now, with the appointment of the working party on hospital staffing, there will be more delay."

Dr. D. L. PUGH agreed that this was a fair summary of a disappointing position. The review panels worked hard and in most cases the appeals were considered to be justified. He understood that the number of appeals caused concern to the Ministry. The Assistant Secretary (Dr. E. E. CLAXTON) reported that the Staff Side of Committee B of the Whitley Council were still pressing individual cases. There seemed no doubt that some 550 S.H.M.O.s in all branches were doing consultant work. There were really shocking examples of first-class S.H.M.O.s doing consultant work and thereby saving regional boards money.

Representations made by the B.M.A. to the Northern Ireland Tuberculosis Authority on the staffing of the chest service are reported under "Northern Ireland News" on this page.

Domiciliary Consultations

The CHAIRMAN reported that, under an agreement reached during the year, only domiciliary visits to patients under active treatment for tuberculosis did not now rank for payment of fees (*Supplement*, March 29, p. 139). He paid tribute to Dr. H. Midgley Turner's handling of these negotiations.

Mass Miniature Radiography

The Ministry had not accepted the Group Committee's representations on static mass miniature radiography units. The Group Committee, said Dr. EDWARDS, had pointed out that primarily the M.M.R. service was for dealing with cases of tuberculosis, and therefore miniature camera units should be under the control of chest physicians and be placed in chest units, which if possible should be in a general hospital. Whether they were in a general hospital or not the chest physician should be in clinical charge. The Ministry had preferred not to be too dogmatic about the control of these units and preferred to see different methods tried (*Supplement*, April 5, p. 146).

Dr. A. GORDON EVANS thought that the principle that the units should be under the charge of chest physicians should be pressed for. But Dr. HUGH RAMSAY said that the principle was not easy to uphold. He referred to general practitioners being given direct access to hospital facilities. Dr.

ENGLAND also thought that here it was necessary to be liberal because of providing general practitioners access to x-ray examinations not only for chest but other diseases. Dr. T. W. DAVIES, however, entered a plea for not giving in to everything.

Tuberculosis in Industry

The Committee were invited to comment on representations made to the Ministry of Health by the Association of Industrial Medical Officers that industrial medical officers should be notified by the M.M.R. unit, with the patient's consent, of any cases referred to general practitioners as requiring further investigation.

The view taken by the Group Committee, which was shared by the Public Health Committee, was that notification to the I.M.O. about patients who have been examined at M.M.R. units would not be in keeping with the confidential nature of the scheme, and, furthermore, it might unnecessarily endanger a patient's employment. It was felt that there was not such a degree of urgency as would justify informing the I.M.O. before a proper investigation and diagnosis had been made.

The Committee fully agreed, however, that it was desirable, subject to the patient's consent, that information should be made available to the industrial medical officer by the chest physician when a firm diagnosis had been made. Industrial medical officers should be encouraged to establish close liaison with their local chest physicians.

Northern Ireland News

BRANCH ANNUAL MEETING

Mr. W. S. BRAIDWOOD was elected president, and Dr. J. B. MCKINNEY vice-president, at the annual meeting of the Association's Northern Ireland Branch on May 22. Dr. J. NORRIS WHYTE was made president-elect, Dr. A. W. MOORE was appointed honorary treasurer, and Dr. D. L. W. CHAPMAN was reappointed in office as honorary secretary.

Dealings with the Northern Ireland Ministry of Health and Local Government and the various Health Service authorities figured largely in the honorary secretary's report on the activities of the Branch Council and its committees in the year 1957-8. Agreement has still not been reached with the Ministry on appeals machinery in Northern Ireland, and the Branch Council's disappointment at the slow progress made is recorded.

Staffing of Chest Service

Deputations, which included Dr. Peter Edwards, Chairman of the Association's Tuberculosis and Diseases of the Chest Group, met representatives of the Ministry and of the Northern Ireland Tuberculosis Authority on the matter of senior medical staffing of the chest service. The Association's spokesmen expressed concern about the insufficient number of consultants in chest medicine who had to carry the responsibility for the service, and pointed out that many S.H.M.O.s were working without supervision. As a result of this discussion a joint committee, consisting of representatives of the N. Ireland Tuberculosis and Hospitals Authorities, with representatives of the Ministry of Health and Local Government as observers, has been set up to report on future developments of chest medicine in N. Ireland. One of the matters to be considered will be medical staffing. The Branch Council asked the Minister for adequate B.M.A. representation on this joint committee and for consultation on any medical staffing changes recommended. The Minister promised consultation, but, on the question of representation on the committee, he replied that this was a matter for the authorities concerned. The latter were then approached, but they informed the Association that, "after carefully considering the matter," they felt that the membership of the committee, which consisted solely of members of the two authorities, should not be altered. However, an

assurance of consultations between the committee and the Association when proposals were formulated was given.

Hospital Staffing

The General Medical Services Committee (N.I.) is reported to have pressed, with the support of consultant obstetricians, the Hospitals Authority for general-practitioner obstetric hospital facilities in Belfast, and it is hoped as a result that a separate hospital unit will be put at the disposal of G.P.s in the near future.

The Consultants and Specialists Group (N.I.) has asked the Hospitals Authority to carry out a review of S.H.M.O. grading in N. Ireland. Medical staff committees of hospitals are supplying information on the present and future staffing needs of their hospitals, and a special subcommittee has been appointed to report on this information and make recommendations which will be considered by the Group and subsequently discussed with the Hospitals Authority.

AMERICAN MEDICAL ASSOCIATION ANNUAL MEETING

Dr. Gunnar Gunderson, La Crosse, Wisconsin, was installed 112th President of the American Medical Association at its annual meeting in San Francisco last month. Dr. Frank H. Krusen, professor of physical medicine and rehabilitation, Mayo Foundation, University of Minnesota, received the A.M.A.'s distinguished service award for 1958.

The two main subjects for general discussion at the scientific meeting were the management of the severely injured patient and a review of the hazards encountered in the use of certain therapeutic agents. There were 20 scientific sections and a full programme of colour television demonstrations. Scientific exhibits exceeded 300, and a factor common to a number of them was an emphasis on alcoholism, a problem now claiming attention in the U.S.A. Technical exhibitions, of which there were also more than 300 and which were aptly described in the meeting's daily bulletin as a "scientific supermarket," included a giant "walk round" model of a human cell magnified more than a million times. About 16,000 doctors attended the meeting.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Service

SIR,—In 1943, realizing that some form of national medical service was inevitable and not very far off, the doctors in the southern group of islands here met together to consider the matter. At that time we all had learned the requirements of doctor and patient in our respective areas, the most junior having been in charge for over ten years. We had to take into account not only the exceptional circumstances, varying from one island to another, but also that the doctor lived as one of a friendly community, serving and advising everyone in it as necessary, and having to depend on them in some matters as they had to rely on him; that he had to have a status, which he must maintain; and that the stability of the service depended on one and all knowing that whatever was necessary would be done or provided without delay, within the limits of possibility. In view of these considerations we gave ourselves the terms: "If we were giving up, and our sons taking over in our place, what should the service set-up for them be?"

On certain matters we were unanimous, and these were formulated and forwarded to the Department of Health for Scotland, who "noted" them. About the same time,

similar measures were taken by the practitioners in the more northerly, and more compact, group of Lewis and Harris. Their conclusions were largely similar and were also "noted" by the Department. In 1944 the findings common to both were embodied in a motion to a B.M.A. conference in Edinburgh, and were warmly approved by our Scottish colleagues, but the representatives from the Association Headquarters in London spoke so strongly and repeatedly against them that they got them watered down to insignificance.

Again, to quote from a survey of existing health services in Scotland in Appendix A of the White Paper, *A National Health Service*, "The keystone of this structure [a complete medical service available to all classes in the Highlands and Islands area] is the Highlands and Islands Medical Service, a unique effort in co-operation between the State and doctors in private general practice, which has revolutionized medical provision in the area. A Subcommittee of the Scottish Health Services Committee, reporting in 1936 on the suitability of the Service to the peculiar conditions of the Highlands and Islands, suggested that it might even provide a model on which to build the future medical service in Scotland as a whole." In the event, of course, it was much otherwise. The H. and I. Service was destroyed, and not by the Government but by the "profession," or its representatives, our Association, in insistence on a narrow doctrine based on the interests of those who already had large panel practices.

The present obvious shambles follows various loudly acclaimed "victories." Victories, perhaps, but temporary, sectional, and expedient. Now, to get out of a somewhat tragic position, we resolutely say we are going to scour the world to see what we can find elsewhere in the way of medical services on which to shape for ourselves. Would it be too much to suggest that we go back to the beginning and look at the knowledge and experience which we had available at the start? Could we listen to those who know their local requirements and allow them to Serve?—I am, etc.,

North Uist,
Outer Hebrides.

ALEX. J. MACLEOD.

REFERENCE

¹ Ministry of Health and Department of Health for Scotland, *A National Health Service*, 1944, Cmd. 6502, p. 72. H.M.S.O., London.

Books on Disease

SIR,—I should like to comment on this section of Dr. H. A. Clegg's paper on professional ethics (*Supplement*, June 21, p. 341). It is rather startling to me, as I have written two such books, one under a pseudonym and the other now in the press, for publication by the British Medical Association, when Dr. Clegg asserts, "I very much doubt the value of such books, and despite the authority behind some of them I think the writers run the risk of offence against medical ethics" (my italics).

I think any capable writer could avoid the pitfalls mentioned in the two following paragraphs—leading the patient to suppose that he could diagnose his own illness or giving dogmatic advice that might undermine his confidence in his regular medical attendant. But I am not at all sure that laymen are so innocent as to imagine that doctors invariably see eye to eye. There is a cynical saying: "Doctors differ and patients die." We need to disprove it, not by keeping up the pretence of a non-existent professional unanimity, but by demonstrating that honest discussion of our various theories can materially prevent the patients' dying.—I am, etc.,

London, W.1.

F. R. C. CASSON.

Consultant Ethics

SIR,—We have noted with disapproval the increase in the number of patients seen directly by consultants, privately, and without reference by a general practitioner. Worse, we have received verbal instructions from the person consulted via the patient and without the politeness of a letter. At times these verbal instructions have contained the implication

of a criticism of the general practitioner made by the consultant to the patient.

We feel that either the old-fashioned courtesies of general practitioner-consultant relations should be enforceable by the Central Ethical Committee, or that the B.M.A. should provide a list of established, experienced, and recognized specialists in their respective fields. We wish to emphasize that these suggestions are also directed at protecting the body of wise and reputable consultants from the parasitic "consultoid" infection which has recently become manifest.—We are, etc.,

S. GINSBORG.
M. B. CLYNE.
P. FREELING.

Southall, Middlesex.

Doctors' Remuneration

SIR,—The Royal Commission has been considering the remuneration of doctors and dentists as compared with the incomes of other professions. Examples have recently come to my notice from which it appears that some technicians' and manual workers' earnings compare favourably with those of general practitioners: (1) For cleaning a watch—with a year's guarantee—charge, £1 1s. (2) For repair to a washing machine which took $\frac{1}{2}$ hour—labour only—charge, 19s. (3) For replacing washers on three ordinary taps—time spent was about 20 minutes—charge, £1 1s. A recent calculation showed that my average (gross) remuneration for undertaking the care of a patient for one year was about 18s.

The technicians mentioned above have their fixed working hours, and they are not subject to legal penalties if they fail to carry out their work promptly. It took four months, and repeated requests, to persuade a well-known firm to repair its own washing machine, and that for a minor defect which could have been put right promptly. If a doctor defers a visit, even for four days, the penalty may be considerable. I have thought it well to draw the attention of the Chairman of the Royal Commission to these facts.—I am, etc.,

Stanmore, Middlesex.

H. BARBARA WOODHOUSE.

Removal from the List

SIR,—I have not agreed with many of the things that Dr. A. M. Goldthorpe (*Supplement*, May 31, p. 291, and April 19, p. 209) has written about the attitude of doctor to patient, but I feel that some answer must be given to the "more holy than thou" stand taken up by Dr. L. A. Nichols (*Supplement*, June 14, p. 340). A doctor, we are taught, should be a cultured man with a sufficient amount of leisure to improve that culture. He should be a man who is known to his fellow men and be able to help them and take part in their affairs outside the professional sphere.

I take it that Dr. Nichols has a small, selected, and hand-picked practice, which leaves him ample time to cultivate his psychiatry. One hopes that it also enables him to make a living. What about active membership of professional bodies? What about participation in communal affairs? Or does Dr. Nichols think that these may be safely left to those unsympathetic doctors who have developed a disliking for their patients? This attitude of "leave me alone to practise medicine and do not bother me with other matters" was the subject of a warning by Dr. S. Wand at the recent Conference of Honorary Secretaries.

We are all agreed on one thing—we want to do the best that we can for all of our patients. We want to be allowed sufficient time in which to do this, and to take part in all of those other activities that our liberal education has taught us to expect. Unfortunately, so long as the present set-up of the N.H.S. remains in being, we shall not be able to achieve these things, and, until we can bring together such divergent points of view as those expressed by Drs. Goldthorpe and Nichols, many of us must be anxious for the future of general medical practice in this country.—I am, etc.,

Seven Kings, Essex.

I. M. SEGAL.

Association Notices

KATHERINE BISHOP HARMAN PRIZE

The Council of the British Medical Association is prepared to consider an award of the Katherine Bishop Harman prize in the year 1959. The value of the prize is £75. The purpose of the prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and child-bearing. It will be awarded for the best contribution (not previously published) submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the prize. Any registered medical practitioner in (a) the British Commonwealth and Empire or the Republic of Ireland and (b) any member of the British Medical Association, wherever resident, is eligible to compete.

Should the Council of the Association decide that no contribution submitted is of sufficient merit, the prize will not be awarded in 1959 but will be offered again in the year next following this decision, and in this event the money value of the prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each contribution must be typewritten or printed in the English language, and must be accompanied by a detachable slip bearing the candidate's name and address. The Council anticipates that contributions should be between 3,000 and 10,000 words, although no definite limits are laid down. Preliminary notice of entry is required and a form for this purpose can be obtained from the Secretary. Essays must be forwarded so as to reach the Secretary, B.M.A. House, Tavistock Square, London, W.C.1, not later than January 31, 1959. Inquiries relative to the prize should be addressed to the Secretary.

A. MACRAE,
Secretary.

Diary of Central Meetings

JULY	
12 Sat.	Council (at Birmingham), 9 a.m.
12 Sat.	Annual Representative Meeting (at Birmingham), 10.15 a.m.
14 Mon.	Annual Representative Meeting (at Birmingham), 10 a.m.
14 Mon.	Annual General Meeting (at Birmingham), 12.30 p.m.
14 Mon.	Council (at Birmingham), at conclusion of A.R.M.
14 Mon.	Adjourned Annual General Meeting and President's Address (at Birmingham), 8.15 p.m.
23 Wed.	Central Ethical Committee.
24 Thurs.	G.M.S. Committee, 10.30 a.m.
24 Thurs.	Staff Side, Committee C, Medical Whitley Council (at 14, Russell Square, W.C.), 10.30 a.m.
24 Thurs.	Full Committee C, Medical Whitley Council (at 14, Russell Square, W.C.), 11.15 a.m.
28 Mon.	Staff Side, General Whitley Council (at 14, Russell Square, W.C.), 10.30 a.m.
28 Mon.	Full General Whitley Council (at 14, Russell Square, W.C.), 12 noon.

Branch and Division Meetings to be Held

WORCESTERSHIRE AND HEREFORDSHIRE BRANCH.—At Abbot's Kitchen, Old Palace, Worcester, Thursday, July 17, 2.45 p.m.—annual meeting. Wives of members are invited.

Meetings of Branches and Divisions

SUTHERLAND DIVISION

The following officers have been elected:

Chairman.—Dr. K. A. Macrae.
Vice-chairman.—Mr. B. Soutar Simpson.
Honorary Secretary.—Dr. E. J. R. Primrose.

TASMANIA BRANCH

The following officers have been elected:

President.—Dr. A. McL. Millar.
President-elect.—Dr. L. H. Wilson.
Vice-president.—Dr. R. A. Lewis.
Honorary Secretary.—Dr. R. A. Rowe.
Honorary Treasurer.—Dr. F. R. Fay.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 19 1958



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British Medical Association

ANNUAL REPRESENTATIVE MEETING, BIRMINGHAM, 1958

Nearly 500 representatives from home constituencies and over 30 representatives from overseas attended the Annual Representative Meeting, which opened at Birmingham University on Thursday, July 10.

The chair was taken by Dr. A. BEAUCHAMP (Birmingham), who was supported by Mr. WELDON WATTS (President), Dr. S. WAND (Chairman of Council), Professor A. P. THOMSON (President-Elect), Mr. L. DOUGAL CALLANDER (Treasurer), and Dr. A. TALBOT ROGERS (Deputy Chairman of the Representative Body).

PRELIMINARY

The CHAIRMAN OF COUNCIL (Dr. S. Wand), in moving that the Annual and Supplementary Reports of Council under "Preliminary" and the summary of action taken on last year's resolutions be received, said that the most important item on the report was that which disclosed that next year's President at the Edinburgh meeting would be His Royal Highness The Duke of Edinburgh. "He has done great honour to our Association, and we humbly acknowledge that," he said, amid applause. It had been decided, Dr. Wand said, to award the Gold Medal of the Association to a distinguished medical scientist, Lord Adrian, O.M., F.R.S. The Council had taken the unusual step of recommending the election of three vice-presidents in one year. The work for the Association done by many whose services were given largely in their own areas had been recognized by adding their names to the Roll of Fellows. Further names had been added to the Book of Valour, said Dr. Wand, and during the course of the year he had had an opportunity of visiting in Africa one of the places at which one of those acts of valour had been carried out.

Dr. Wand paid tribute to an oration delivered in the Great Hall of B.M.A. House on June 25 by "the doyen of British surgery," Sir Gordon Gordon-Taylor, commemorating the Jubilee of the Royal Army Medical Corps (*Journal*, July 5, p. 42). Sir Gordon had expressed the opinion that the part played by the Association in forming the R.A.M.C. was the most important piece of work undertaken by the Association.

Referring to staff changes, the Chairman of Council said that Brigadier H. A. Sandiford, who had organized the Association's Commonwealth and Overseas Visitors' Bureaux, had been succeeded by Dr. R. A. Pallister. Owing to ill-health Dr. Agnes Kelynack unfortunately had had

to tender her resignation. She had had a great influence on the whole Association. She was for many years secretary of the Public Health Committee and of the Charities Committee, and was Joint Secretary of the General Practitioner Spens Committee. Dr. Wand's suggestion that a message should be sent wishing her well was received with acclamation.

At this point the Annual Representative Meeting was adjourned for the holding of an Extraordinary General Meeting.

EXTRAORDINARY GENERAL MEETING

The Resolution published in the *Supplement* to the *British Medical Journal*, April 12, page 158, was carried *nem. con.*

The Extraordinary General Meeting concluded.

ANNUAL REPRESENTATIVE MEETING CONTINUED

Dr. Macrae's Retirement

Dr. S. WAND, Chairman of Council, continuing his introduction of the Annual and Supplementary Reports of Council, next referred to the impending retirement of Dr. Angus Macrae, Secretary of the Association, and said that he would be succeeded by Dr. D. P. Stevenson. Dr. Wand was sure that with the assistance of his very loyal colleagues, the other medical secretaries, he would prove a worthy successor to a long line of distinguished Secretaries. Paying tribute to Dr. Macrae, Dr. Wand said he was a man whose self-effacement tended to cloak his effectiveness, but those in close association with him realized that Dr. Macrae was "not merely a good Secretary, he is of the great. I have never seen him ruffled; I have never heard him complain. . . . He is learned, and he has a fund of sound common sense. There are no words to express his loyalty to the Association."

Dr. MACRAE was asked to address the Meeting, and representatives rose in their places to accord him an ovation. He said that Dr. Wand, as one might expect of someone of his exuberant temperament, had in painting his picture slapped on the colours with a certain lack of restraint. He expressed great appreciation to the Representative Body for its kindness. He added: "For more reasons than one I am sorry to be going. But the time has come to go, and it is right that I should go, and therefore I am happy to be going."

Heavy Session

The CHAIRMAN OF COUNCIL said that the past year had been one of the heaviest in the history of the Association, the principal business being the preparation of evidence for the Royal Commission. Evidence had been given to the Hinchliffe Committee on the cost of prescribing, whose recently issued interim report had vindicated the doctors of the charge of irresponsibility in prescribing.

A very useful and successful Junior Members Forum had been held, and this initial venture, the credit for which was owed to Dr. R. G. Gibson, would be repeated. In December the Association would be holding in Southampton its first annual clinical meeting. Parking motor-cars in big cities was becoming an increasingly difficult problem for doctors, and the Association had made representations in every proper quarter on their behalf. It was not impossible, unless a solution was found, that people who lived in the centre of a big town would not be able to obtain a National Health Service practitioner to look after them.

Dr. Wand said that during the past year he had had the privilege, with Professor D. E. C. Mekie, Chairman of the Overseas Committee, of visiting the Association's Central and East African Branches, and they had been much impressed by the magnificent work of the doctors there, conducted often in most difficult circumstances. In the coming year he hoped to visit the Mediterranean Branches.

Relations with the B.B.C.

Reference was made in the Report to a conflict with the B.B.C. earlier in the year. In this field Dr. Wand thought it might be well to look only to the future, which seemed more hopeful. Broadcasts and television programmes on medical subjects must have a useful educational object, and full regard must be paid to the views of those who were in constant contact with patients. They had suggested to the B.B.C. in the past that the Association had some help to give, and that help would continue to be freely offered. In the last week or two exploratory discussions with the Corporation had proved not unfruitful, and he hoped that bickering would now be a thing of the past.

Increase for M.O.H.s Refused

The Public Health Committee had taken its case for a 5% increase in remuneration to the Industrial Court. The Court had pronounced to the effect that the pay of doctors in the public health service should be related to that of their colleagues on the local authority staff and not to that of their colleagues in other branches of medicine, which was the Association's policy.

Minister's "No"

Dr. Wand told the meeting that on June 17, accompanied by Dr. A. B. Davies and Mr. T. Holmes Sellors, he had visited the Minister of Health, Mr. Derek Walker-Smith, and put to him a claim for a further interim adjustment in remuneration in view of Mr. Vosper's, the previous Minister's, undertaking that a claim would be considered if the Royal Commission had not reported by Easter, 1958. Dr. Wand had asked the Minister for a written answer in time for the present meeting. That letter had been received only the previous afternoon. It read:

"Dear Dr. Wand,

"You came to see me with your colleagues on the 17th June and put to me the medical profession's case for a further interim increase in remuneration. I had the benefit of a very full statement of your case and you will recall that we considered the position for no less than two and three-quarter hours. I am now writing, as I promised, to put on record—necessarily in a highly summarized form—the reasons why I was not able to agree to an immediate further adjustment.

You pointed out that my predecessor had undertaken that a claim could be considered if the Royal Commission had not reported by Easter, 1958. (You will, of course, remember that my predecessor's letter of the 6th June, 1957, in which he gave this

undertaking, concluded with the phrase 'But you will, I know, understand that it is impossible for me to commit myself in any way at this stage, when neither we nor you can have any idea what might happen in the interim or what such a claim might amount to.'")

"The reasons why I am unable to agree that the circumstances warrant a further interim increase at the present time are broadly twofold. In the first place, although the Royal Commission are not yet ready to report, they are pressing ahead with all speed and, assuming that their Report is not unduly delayed, a further increase would run the risk of prejudicing their work. Secondly, the economic situation of the country at the present time must be taken into account. Circumstances since April and May, 1957, to date have not changed so greatly as to justify an increase. Moreover, no other people remunerated from the public purse who received a pay increase of 5% in April and May, 1957, have yet received any further award. A further award to the doctors might well lead to claims for increases in remuneration of an inflationary nature from others and it remains just as important as ever to secure stability in wages and salaries.

"It is of course open to the Association to make further representations at any time, but what I have said in this letter represents the view I am bound to take at present."

"It has taken a long time," Dr. Wand remarked, "to say No." He would like to comment on one or two statements in the letter. The Minister referred to prejudicing the Royal Commission. A few weeks ago a new grade of registrar had been determined unilaterally by the Minister. Did that prejudice the Commission any less than an interim adjustment? How did the Minister know that the Royal Commission would be prejudiced? Dr. Wand had offered to write to the Chairman of the Royal Commission and ask whether such an adjustment would prejudice the Commission. It was an extraordinary comment on the Minister's opinion of the Royal Commission if he thought it would be prejudiced.

Then there was the reference to the economic situation of the country. That was always brought in; they were always told that they were too early or too late in their claims. What was the relevance of the statement that no increase of 5% had been given to others since May, 1957? What other section of the community had had only 5% since 1951? In his last paragraph the Minister stated that it was open to the Association to make further representations at any time. "We have heard that one before," Dr. Wand commented, "but we shall go back."

"We must ponder the position of a profession," he added, "whose future can be determined in this way, financially and otherwise, by having regard to considerations of political expediency and without any regard to common justice." He believed that the Meeting would like more time to consider the matter before discussing it, and therefore suggested to the Chairman that items 37 to 39 should be deferred until Saturday.

Professional Unity

Dr. Wand then turned to the subject of unity within the profession. The Council, he said, had given much time and thought to that problem, but considered that it was not only impossible but in fact undesirable completely to solidify a profession such as that of medicine. It did desire, however, to bring together all doctors and all organizations in a brotherhood which, while respecting the opinions of others, would effect and maintain a loyal general professional outlook. A most friendly relationship had been established with the Royal Colleges, the Royal Scottish Corporations, the Society of Medical Officers of Health, and the College of General Practitioners in regard to the proposed Review Committee. It would also be noted that the Consultants and Specialists Committee had recommended that the Presidents of the Colleges or their nominees should be ex-officio members of that committee. Dr. Wand reminded representatives that he had said two years ago, when he became Chairman of Council, that if, when he left the chair, such a thing had happened, he would feel that he had played a part in doing something for the future of medicine.

There had also been some bringing together of the young men in the Junior Forum, while several committees had been investigating the difficult problem of to-and-fro machinery from the centre to the periphery. If the best medical services were to be available to the country, they must be run in the light of medical need and the opinions of those whose duty it was to minister to the sick and prevent disease, and not to suit administrative convenience.

"There are doctors who feel themselves above medical politics," he said. "They are walking about with their heads in the clouds, because in the National Health Service political action is necessary to preserve those essential professional freedoms which doctors must have in carrying out their work."

After 10 years of the National Health Service, Dr. Wand continued, he could say quite unashamedly that the public had had wonderful value for its money. (*Applause.*) That had been due to the devotion—in spite of many frustrations and disappointments—of those engaged in the practice of medicine and its associated professions and callings. "After 10 years I can also say to you that our relationship with Government officials has been consistently good; but when we come to the realms of higher policy, can we say the same of our relations with Government?" he asked. It was not only from the point of view of remuneration that the profession needed to be alive to the danger of unilateral Ministerial decisions, for such decisions, occurring frequently, would definitely lead to control of the profession. There had been more than one example, of which certainly one at least had had an ominous ring, and they were inconsistent with the profession's conception of the partnership of endeavour and of a free doctor-Government relationship which was necessary if the public was to have the best possible service. Now was a time for preparation, when each member of the profession must get in touch with his colleagues, learn to understand the brotherhood of medicine, and keep in touch with medico-political affairs. Unity or loyalty must lie ultimately in the heart of the individual. As a profession those engaged in medicine could be strong only if they were united in the face of common danger. "In the future not only will our future depend on our strength, but the quality of the medical service which we are able to give to the community will itself depend upon that strength," he concluded, amid applause.

Election of President

On the motion of Dr. Wand, it was unanimously decided by acclamation,

"That the Association do honour itself by electing His Royal Highness The Prince Philip, Duke of Edinburgh, K.G., K.T., as President of the Association for session 1959-60."

Election of Vice-Presidents

On the motion of Dr. Wand, the following were unanimously, and with acclaim, elected vice-presidents of the Association in recognition of their distinguished service: Mr. J. L. Gilks (Bournemouth), Dr. Ian D. Grant (Glasgow), and Dr. J. A. L. Vaughan Jones (Leeds).

CIVIC WELCOME

At 11 a.m. the meeting suspended its business to receive the LORD MAYOR OF BIRMINGHAM (Alderman Donald Johnstone), who extended a civic welcome to the Association. The Chairman replied.

COMMITTEE TO REVIEW THE MEDICAL SERVICES

Dr. S. WAND, Chairman of Council, moved:

That the action taken by the Council be approved; and that the Council be authorized, in consultation with the Royal Colleges, the Scottish Royal Medical Corporations, the College of General Practitioners, and the Society of Medical Officers of Health, to determine the size and the precise composition and terms of reference of the committee to review the medical services, and to appoint the chairman of the committee.

He said the Council had given considerable thought to the matter and vigorously pursued it. The task was not easy of fulfilment if the objects in mind were to be achieved. It was clear, after a decade of the National Health Service, that certain investigations would have to be made, and it had seemed not impossible that the Government might consider setting up a Royal Commission; it was therefore important to hear the views of the whole profession in good time. The findings of a review committee, representing medicine in its widest fields, would have a tremendous impact on the profession and the public.

Amendments by East Hertfordshire and others deplored the failure of the Council to set up a committee to review the whole field of medical services, as it was instructed to do by the S.R.M. in May, 1957.

Dr. J. S. ROSS (East Herts) said that it had been expected that a report would be made long before the Royal Commission reported, and in the Divisions there was disappointment at the delay in setting up the committee. It had been thought that its report would be the touchstone for deciding what to do when the Royal Commission reported. However, provided an assurance could be given that other means could be found for discussing the whole position before the Royal Commission reported, he would be prepared to withdraw the amendment. Dr. L. J. LANKESTER (Reigate) welcomed the representation of the Royal Colleges on the Review Committee, and hoped it would bring in a new era when the Royal Colleges and the B.M.A. could work together. The Committee's task was a long-term one, and it would be of great value should there be a Royal Commission on the Health Service. He asked for an assurance that a short-term policy would be evolved ready for the Royal Commission's report next spring.

Dr. C. P. WALLACE (Guildford) did not criticize the suggestion that there should be adequate and full representation of the Royal Colleges, and if necessary all other important academic bodies, on the Review Committee, but he was disappointed and dismayed at the apparent dilatoriness of the Council in a matter which had been described as one of urgency. Dr. A. R. FOX (South-west Essex) said that most of those present had spent most of their spare time in the ten years of the National Health Service sitting on committees trying to bring order out of chaos, but still they felt a sense of frustration. It certainly looked as if the profession was being sacrificed to political expediency. They hoped the Council would expedite matters.

Dr. WAND said there was some confusion of thought about the purpose of the Review Committee and that of the Committee set up by the G.M.S. Committee to make plans for an alternative service in the event of a conflict with the Government. The Review Committee would be concerned with long-term policy and preparing for possibly 25 years ahead. Such a matter could not and should not be hurried. He emphasized that the investigation into an alternative service in the event of a conflict was being treated as a matter of urgency.

The amendment was withdrawn. The substantive motion was then put and carried.

A motion by East Herts, that the medical practitioners of this country would not be able to have the type of Health Service they want until it was known what form of Health Service the majority of them would support, was carried as a reference to Council.

Doctors' Frustration

Dr. B. BURNS (Sheffield) moved:

That in the opinion of this Meeting the frustration of family doctors in the National Health Service in its present form arises from two basic causes: (1) The terms of service inseparable from capitation fee remuneration, and (2) the abuse of the "free" service by certain patients.

Dr. Burns pointed out that the demand for changes in the general-practitioner service had been first voiced by the Representative Body within two years of the inception of the Service, and it was growing rapidly more insistent. It

was not enough to demand reform and then placidly leave all the vital decisions to a committee. "The family doctor," he said, "has borne the burden of this Service for ten weary, unhappy years. He needs no Royal College to tell him why he is frustrated. If the Representative Body has not the courage or ability to express an informed opinion on the cause of this trouble we have no business to be here, so let us say what we know to be the truth, even if we incur unpopularity as a result." While most patients were decent, considerate people whom it was a delight to treat, he said, "We also know the others, the relentless minority." It was a mockery to talk of vocation when the free service was driving doctors into hiding. When the profession's leaders capitulated in 1948, said Dr. Burns, they failed to protect doctors against the onslaught of people who instinctively abuse anything placed at their disposal. If the doctor's time was to be of value to patients, they must pay for it. "Only by a charge for service can we guarantee to provide a proper standard of care for those who need it by deterring those who do not."

Dr. Burns asserted that the capitation method of payment was the nearest approach to medical serfdom any country had yet achieved. "How else," he asked, "could you put the family doctor at the mercy of the electorate in perpetuity?" He challenged the Government to devise a method of payment more calculated to debase the standard of general practice. Such a method of payment had been condemned by doctors in Australia and New Zealand. "The capitation fee," he said, "brings out the worst in the doctor, and the free service brings out the worst in the patient."

Dr. J. S. NOBLE (Council), opposing the motion, said that while many doctors were not contented with all aspects of the National Health Service, to imply that all doctors were unhappy, frustrated, and trammelled by an unpleasant minority was unjustified. The capitation fee question was not one which could be decided suddenly; it needed to be examined in great detail by the committee. He added that he felt a little ashamed that the meeting should be asked almost to blame the patients for abuse of the Service. "Doctors," he said, "are responsible for the running of their practices. Patients respond to the treatment they get. Slack doctors produce contempt; efficient doctors produce respect."

Dr. F. GRAY (St. Pancras) also opposed the motion, which he condemned as reckless and irresponsible. If the profession committed itself to a decision against the capitation fee, he pointed out, it might play into the hands of a future Government, whose reaction would be to replace that system with a salaried service. The CHAIRMAN OF COUNCIL pointed out that if it passed the motion the Meeting would be committed to something different from the capitation fee, while by rejecting it it would be committed to the capitation fee. To do either of these things would mean anticipating the findings of the Review Committee, and he suggested that the Meeting should either pass to the next business or refer the matter to the Council. It was inadvisable at this juncture to take a decision.

Dr. W. P. LAMBIE (Sheffield), as a younger practitioner, supported the motion in order, he said, "to make a heartfelt protest against the insidious corruption of the art and practice of medicine over the past ten years." A great majority of the younger practitioners were clamouring for a full-time salaried service. They had become so veneered with cynicism and disgust that they could see only the personal advantages which they imagined that it would bring. One of its major attractions lay in the paradox that only in a full-time service would the practitioner not be on duty full-time. They could not continue as at present, and the only real alternative to the capitation fee was a fee per item of service. This would wipe out the present frustrations and discontents, particularly if the patient paid a proportion of the cost of the item at the time. Those who genuinely could not pay should not have to do so. It would mean lifting the emphasis from the swallowing of pharmaceuticals and the provision of a service given to the patient by the individual doctor.

A motion to pass to the next business was carried to the necessary majority.

In reply to Dr. J. N. SWANTON (South Shields), who moved that the committee to review the medical services should pay particular regard to administrative costs, the CHAIRMAN OF COUNCIL hoped that the Committee would pay attention to everything that was done in the National Health Service. The Committee would be free to suggest modifications in its terms of reference if it found that they were restricting its investigations.

The South Shields motion was carried.

A telegram was read from the Irish Medical Association conveying its good wishes to the Meeting.

Schedule E Expenses

Dr. D. W. K. BUCHANAN (Dundee) moved a motion exploring the lack of income-tax relief for whole-time specialists in respect of their cars, telephones, and medical subscriptions. This motion had been carried by a previous Representative Meeting, but it was desirable to strengthen the hands of the Council in obtaining justice for consultants. The TREASURER (Mr. L. Dougal Callander) said the Chancellor of the Exchequer had promised that subscriptions to professional societies would be allowed as an expense against taxable income. The Finance Bill was still under discussion, but the Association had already instructed its solicitors to take the necessary steps for getting the B.M.A. subscription recognized as coming under the provisions of the Act when passed.

Inflammable Clothing

Dr. MARIAN M. REEKIE (Manchester) moved: "That this Meeting is profoundly dissatisfied with the report of the Committee of the British Standards Institution (1957) concerning inflammable clothing." This report stated that, whilst it would appear that there were a few materials which burned abnormally quickly and presented a positive fire risk, there was no evidence that some fabrics were so inflammable that they burned almost spontaneously, but that there was need for vigilance with regard to any new fabrics. The report tended to place most of the responsibility on adults and parents. Parents should be educated to buy only clothes which had been rendered non-inflammable or were of fire-resisting material; but when such clothing cost 50-60% more than other types—and she had had that figure from a member of the B.S.I.—their desire to do so was undermined by the temptation to spend less and take the risk. She had asked many patients what they would do if fire-resisting material was available at a higher price, and almost all of them said, "I would take the risk, because I have a fireguard." Fireguards, however, did not keep out sparks and could be moved by children. Children also often played with matches—and the hospitals saw the results. In 1955, deaths from burns due to clothing catching fire numbered 725, and many more had been injured, some severely. The B.S.I. report stated that at any one time 550 people were in hospital under treatment for burns due to clothing catching fire.

Dr. ANNIS GILLIE (Paddington), supporting the motion, said that while provision of the right sort of materials at suitable prices was a matter of priority, it must go hand in hand with the education of the public to ask for it. It was for the medical profession to hammer home to mothers the fact that dangerously inflammable material was as injurious to children as letting them cross traffic roads unattended and alone—as dangerous as dirty milk. Dr. B. H. PENTNEY (Camberwell), supporting, suggested there should be some sort of subsidy to produce non-inflammable material. Miss GLADYS M. SANDES (Marylebone), also speaking in support, pointed out that a lot of work had already been done on the subject of flame-resistant materials. The real problem lay in the difficulty of producing materials which, when so treated, would still be acceptable to world fashion.

Dr. REEKIE, replying, agreed that a lot of work on the subject had been done by the industry concerned, but asked that every effort should be made to render clothing much safer than it was at present.

The Manchester motion expressing dissatisfaction with the report of the British Standards Institution concerning inflammable clothing was carried.

THE ROYAL COMMISSION

Dr. WAND moved that the Annual and Supplementary Reports of Council under the above heading be received. He felt it would be wrong for him to comment on the evidence given by the Association to the Royal Commission at the present stage. The Association was in the course of preparing what might be its last memorandum of evidence, although it might produce rebutting evidence, orally or in writing. The members of the Commission had certainly made themselves familiar with a most difficult subject in a very short time.

Mr. E. N. CALLUM (Kingston-on-Thames) moved:

That the question of doctors' remuneration should be treated by the Government with the utmost urgency.

He did not think the Royal Commission was proceeding speedily enough. The original understanding had been that something would be heard by Easter. Was it to be 1958, 1959, or 1960? Meanwhile the cost of living was certainly not going down. Comparing notes with colleagues disclosed that a very high proportion were overdrawn—many of them with heavy family and other responsibilities—and the status of the profession, as compared with before the war, was very poor indeed.

Dr. A. V. RUSSELL (Council) asked that the motion be referred to Council. While everybody in the hall would be in sympathy with the spirit behind it, any Royal Commission proceeding with all speed, at best, took years to report; there was nothing that the Association could do to speed up its work while it still had evidence to hear. Dr. R. P. LISTON (Tunbridge Wells) opposed the motion on the ground that it would be bad policy for the Association at the moment to attempt to show impatience with the work the Royal Commission was undertaking. He had attended one of its sittings as a spectator and had been impressed by how meticulously the members had informed themselves of the problems with which they had to deal. He had not heard one question addressed to Dr. Wand or any of his colleagues which had not had a very direct bearing on the subject. Whatever the result of the Royal Commission's findings, it had been determined to take the greatest care.

Dr. C. P. WALLACE (Guildford) protested against any comment being made on the work of the Royal Commission. It would be equally unsuitable for anyone to praise or blame a judge or jury while they were still in the course of their important and responsible work. Dr. W. WOOLLEY (Council) pointed out that the motion made no reference at all to the Royal Commission; it referred merely to "The Government." Its place on the agenda under the "Royal Commission" heading seemed scarcely suitable. The CHAIRMAN said that the Agenda Committee had found difficulty in deciding which part of the agenda the motion should occupy and had eventually decided that there was no other place for it than where it stood.

Dr. J. S. M. ORD (Glasgow) supported the motion. It was the policy of the Government, he said, to delay on financial matters. Dr. G. CORMACK (Newcastle upon Tyne) objected to the proposed reference to Council and asked that the motion be carried. The Royal Commission had been unilaterally appointed by the Government irrespective of the profession's wishes in the matter; no doubt it was competent, but so were all Royal Commissions; they were appointed for that very reason.

Dr. CALLUM, in reply, still asked that the motion should be carried in its existing form.

The motion, calling on the Government to treat with urgency the question of doctors' remuneration, was carried.

Dr. H. H. GOODMAN (Newcastle upon Tyne) moved that:

In view of the fact that the Royal Commission is now sitting and will, amongst other things, discuss the future remuneration of the profession, all resolutions relating specifically to levels of remuneration which appear in the Agenda of this Annual Representative Meeting be allowed to lie on the table.

By giving evidence to the Royal Commission, the Association had tacitly accepted that body and its functions. It was undesirable to embarrass the Royal Commission by having a public discussion on remuneration at present. It should be allowed to work out its problems free from an atmosphere of disturbing influences. The motion asked that the subject be treated more or less as *sub judice*; that, however, did not preclude the profession from combating any adverse situation which might arise in future. But it was not desirable that remuneration problems should be bandied about in public at a time when the Government's main preoccupation was to limit public expenditure.

Dr. J. S. NOBLE (Council) thought that the Minister's letter quoted during the morning should be an adequate answer to the motion, which, he said, did not refer to remuneration in the National Health Service alone, whereas the Royal Commission was mainly concerned with doctors in that Service. Negotiations were in progress on various other aspects of the profession. To accept the motion would be to tie the hands of the leaders of the profession, who, in the highly volatile political atmosphere of the moment, should be free to press and make demands when they felt it was necessary.

A motion from the floor to proceed to next business failed to secure the necessary two-thirds majority.

A further motion from the floor asked that "the question be now put."

Dr. WAND said it seemed inconceivable that they should be so anxious to put their heads on the martyrs' block by asking for such proposals as that contained in the motion under discussion. "If this motion becomes your policy and the Royal Commission does not report until 1959, you will be laying things on the table and the table will collapse."

It was decided that the question should then be put to the vote, and the motion was lost.

A motion by Dr. R. W. MCCONNEL (Buckinghamshire) calling for a request to the Royal Commission to announce the proposed publication date of its report two months beforehand was lost.

A Glasgow motion asking Council to consider the advisability of preparing a précis of the evidence so far presented to the Royal Commission and distributing it to the profession was, by leave, withdrawn.

Upon a Manchester motion, the Representative Body decided to express its thanks to all who, on its behalf, had been concerned in the preparation and presentation of evidence to the Royal Commission. Dr. A. F. DUNN CARRIE, in moving, paid a special tribute to the work of Dr. A. Macrae.

The motion was carried with acclamation.

Further Interim Adjustment

A Harrogate motion asking that an interim increase in payment of 10% over and above the increases granted last year should be granted to all doctors in the National Health Service, including hospital doctors, pending the report of the Royal Commission, was, by leave, withdrawn.

Consideration of motions by Portsmouth and by Rugby with South Warwickshire on the subject of the interim adjustment were, by leave, deferred for later consideration.

PRIVATE PRACTICE

Dr. I. M. JONES, Chairman of the Private Practice Committee, moved the reception of the Annual and Supplementary Reports of Council under Private Practice and the Personal Accident Insurance Scheme for Members of the B.M.A.

Referring first to two matters which were not included in the report, Dr. Jones said that an offer had been received

from the Life Offices Association to increase the fee for the short form of life assurance from 15s. to £1 1s. Secondly, after discussions with the Liner Committee, some improvement had been obtained in the fees paid to ship surgeons giving attention to Government-assisted passengers.

There were three or four matters over and above those two which had occupied a major part of the Committee's time during the year. Dr. Jones recalled that in February there was a long debate in the House of Commons, when suggestions were made that the confirmatory certificate necessary before a deceased person could be cremated should be abolished. There was another suggestion that doctors should issue such certificates free of charge. There was the further issue of whether a doctor should always, before signing Certificate C, have a talk with the practitioner who attended the deceased, and the issue of whether he should always examine the body. There had also been some disagreement about who should act as crematorium referees. The Private Practice Committee had set up a sub-committee which would review the whole aspect of cremation certification and would report to the A.R.M. in 1959.

Another matter which had occupied a great deal of time was traffic and parking problems. The parking restrictions were interfering with the conduct of practice in the metropolis, and there had been cases where doctors' cars had been towed away by the police. "Medical practice cannot be conducted against a background of the doctor being at the mercy of the favour of the police," said Dr. Jones. The problem was being tackled. According to the latest Road Traffic Act, whilst local authorities were given power to make all sorts of parking restrictions, they were also, under the same Act, given power to make a large number of exceptions. A policy had been formulated whereby certain premises, such as hospitals and doctors' residences and surgeries, should be listed as essential premises, outside which no parking meters would be erected, and the Ministry had been asked to issue parking licences to doctors which would enable the holder to park outside his residence or in "no parking" places, or in meter parking places free of charge. A deputation had interviewed officials of the Ministry of Health on the subject and had been extremely well received; there had been complete accord and the Ministry had offered to accompany the Association in any discussion of the matter with the Ministry of Transport.

The Minister of Transport at first refused to meet the Association, but had now agreed to do so immediately after the Marylebone Inquiry report had been issued and he had taken a decision on it. He had indicated that no extension of the parking meter scheme would be made until the Marylebone scheme had had a full trial and he had had a discussion with the Association.

Drugs for Private Patients

Last year a deputation from the Association had discussed the scheme of drugs for private patients with officials of the Ministry of Health, and later a memorandum had been received from the Ministry making four main points: (i) that before there could be further discussion there must be an estimate of the cost of the scheme; (ii) that registration of both the private practitioner and the private patient with the executive council would be necessary; (iii) that it must be possible to deal punitively with and recover money from the private practitioner if he abused the Service; and (iv) that the institution of the scheme might call for a recalculation of the basis of the central pool.

A memorandum in reply had been drawn up by his Committee in the autumn, agreed to by a joint subcommittee of his Committee and the General Medical Services Committee, approved by the Council, published in the *Supplement* to the *B.M.J.* (February 15, p. 67), and sent to the Ministry of Health. In reply to point (i), it showed that the cost could not be more, and would probably be less, than £1,500,000 in a full year, which would be only a tiny

fraction of the total cost of the N.H.S. On (ii), the agreed in principle with the registration of the private practitioner, but not with the registration of private patients. Registration would be anathema to private patients, and any private-patient list would suffer from inflation, because many would receive treatment at different times from different doctors. With regard to (iii), they agreed that the private practitioner should enter into a legal contract with the executive council which would enable the council to recover from him any sum of money which he was fined for abuse of the Service, and that the permission to prescribe drugs for private patients could be withdrawn if abused, but that private practitioners should have the right of appeal from the decisions of the local medical committee. They did not say much about (iv), because it had not been clear that the Government intended to put forward legislation, and such a scheme would require an Amending Act. In any case agreement on the details would not be reached until after the Royal Commission had reported, and after that there might not be a central pool calculated as at present.

They felt that the Ministry's memorandum might be a sincere attempt to devise means for bringing about a desired end, or it might be intended to postpone indefinitely something which was not desired, but which for political reasons the Ministry did not wish publicly to refuse, or that the Ministry might simply be trying to show private practitioners that they could get what they wanted only by entering the Service.

The memorandum had been sent to the Ministry in January, and the Ministry had been reminded that the Association was anxious to continue the discussion, but so far no reply had been received. The Council had appointed a small negotiating committee to discuss the matter with the Ministry when that became possible. The institution of a scheme to provide drugs for private patients was a simple matter of justice to the people of this country and would enhance the standing of medical practice.

There had also, Dr. Jones added, been set up a special committee to deal entirely with the problems of private practitioners. An insurance scheme for private general practice, along the lines of the many existing provident schemes for consultant practice in hospitals and nursing-homes, was desirable. During the past year a memorandum had been prepared on the availability of pay beds in hospitals and nursing-homes throughout the country, and publicity had been given in the *Journal* to the conclusions jointly arrived at by the Private Practice and Central Consultants and Specialists Committees—namely, that in any area where local practitioners considered there was a shortage of pay beds liaison should be established between the Divisions concerned with the hospital or hospital group medical committees, who should make joint representation to the regional hospital board and local hospital management committee, simultaneously advising the central office of their action so that the Central Consultants and Specialists Committee could take up the question of the shortage with the Ministry.

Mr. E. N. CALLUM (Kingston-on-Thames), moving that all patients, private or otherwise, should be entitled to drugs under the National Health Service, pointed out that at the inception of the Service the then Minister of Health had promised that patients should have part or all of the Service. That private patients were not getting part was all "part and parcel of the great confidence trick played on the profession when it was persuaded to join in this National Health Service in 1948."

Dr. L. J. BARFORD (Reigate) asked from which fund drugs for private patients would be paid for, and whether this amount would automatically reduce the amount of the capitation fee. Dr. A. B. DAVIES (Chairman, G.M.S. Committee) said that in the Council's view there were approximately 2% of the population not using the N.H.S. Service. If they were allowed to have drugs on E.C.10s, it would mean a net increase of that proportion to be paid for by the Government in its pharmaceutical bill. However,

the Government had threatened that an extension of drugs to private patients could lead the Government to reconsider the whole basis of doctors' remuneration, particularly the Danckwerts Award. After recent joint approaches the Government tactics had altered a little, and it now said that if the privilege were granted there would be an increase in private practice, and the present £2m. per annum at present allowed in the Central Pool for private practice could be increased. This would mean that more would be subtracted from the global sum, leaving less available for distribution to practitioners. By using a different-coloured E.C.10 for identifying private patients' prescriptions, the figure could be arrived at, and, on an estimate of £1m., the privilege could, on the Government's argument, cost every general practitioner £50 a year. While, he said, the G.M.S. Committee were agreed on the desirability of private patients having free drugs, they were also concerned to see that it did not lead to a reduction in doctors' remuneration.

Dr. C. W. WALKER (Cambridge and Huntingdon) opposed the motion. What was being asked for, he said, was State drugs for fee-paying patients. He submitted further that no patients were entitled to drugs under the National Health Service; it was the E.C.10 with the doctor's signature on it which entitled a patient to drugs, and therefore the doctor must have an agreement with the Government about prescribing for his fee-paying patients. They should, he said, go to the Government with a scheme for the benefit of patients, private or otherwise. He did not know which doctors were to have this privilege. If it was to be all registered medical practitioners, the Government would lay down very hard regulations to restrict abuse, but if it was to be only general practitioners they might be more lenient. If it was restricted to purely private practitioners he believed the Government would allow almost a gentleman's agreement.

Dr. A. V. RUSSELL (Council) pointed out that private patients paid as much towards the Service as any other member of the community, and for the Government to say that they could use part of the Service under penalty of reducing the global sum from which N.H.S. doctors were paid was a dishonest and inequitable argument. The money for drugs came out of the Pharmaceutical Fund, he said: "If it comes out of the global pool, then we are being done." Dr. W. MORGAN EVANS (South Middlesex), speaking as a member of the G.M.S. and Private Practice Committees, said the only way to decide the issue was on the basis of common justice. Everybody in the country should be entitled to such drugs as were necessary for his treatment. That had been promised, and was implied in the Act. This view was endorsed by Dr. D. L. GULLICK (East Herts), who asked the meeting not to allow its judgment to be clouded by Dr. Davies's figures. It was, he said, a matter of equity.

Dr. C. P. WALLACE (Guildford) said that in voting for the motion representatives would be following what had been the Association's policy since the inception of the Service, and hoped they would not be swayed by the possibilities of threats mentioned by Dr. Davies. Dr. I. M. JONES said that the practitioners able to prescribe on E.C.10s for private patients had been defined and should be those engaged in private general practice. They should be asked to apply to the local executive council for permission so to prescribe, the local executive council, guided by the local medical and the local executive committee, should have power to decide whether a man was or was not a bona-fide general medical practitioner. He submitted that until the Ministry agreed that a practicable scheme could be put into operation there was no point in discussing what effect any mythical scheme might have on any central pool. While he agreed with Dr. Davies's figures, he pointed out that the £50 reduction would be offset by fees to be expected from private patients using the scheme, and in the view of the Council the net result would be a gain to general medical practitioners.

The Kingston-on-Thames motion was carried. Motions in the names of Harrow and Guildford deploring the delay in reaching agreement with the Government on the right of private patients to obtain drugs and requesting

the Council to press with urgency for the provision of such drugs and appliances for private patients on the same terms as for N.H.S. patients were carried.

After Dr. JONES had asked for the rejection of a Harrow motion calling for an application of the same principle for a test period of three years, it was decided to pass to next business.

Life Assurance Reports

Dr. R. P. HENDRY (Rugby (with South Warwickshire)) moved that the meeting should express itself as seeing no objection to the issue of "attendance reports," provided that a suitable form of consent, separate from the proposal, signed by the patient, was forwarded to the practitioner. The motion suggested as a suitable form of consent the words:

I agree that the Company may, at its own expense, before accepting me for life assurance seek medical information from any doctor who has at any time attended me and I hereby authorize any such doctor to give such information.

The point at issue was evidence of the patient's consent. It was also important that the patient himself should understand the form of consent which he had given.

Dr. JONES, asking for the rejection of the motion, said that the form of wording suggested differed from that produced by the Association's solicitors and agreed to by the Life Officers Association. The latter body had reaffirmed as recently as May last their intention to incorporate in all forms sent to doctors requesting an attendance report a statement to the effect that the consent of the patient had been received in a form acceptable to the British Medical Association. Dr. HENDRY, in reply, said it seemed that nobody could be under any doubt whatever if they received a patient's signed certificate. The question lay in the difference between what should happen and what did happen.

The motion was lost.

Dr. J. P. SPARKS (Rugby (with South Warwickshire)) moved that the Council should make further representations to the few Life Assurance Companies which did not yet pay the now customary fee of one guinea for full attendance reports. Some companies were paying only 10s. 6d. for such reports, which he regarded as a negligible fee.

Dr. JONES said it was not true to suggest, as the motion did, that a guinea was the maximum fee ever paid for such reports; some companies were in fact paying more, and the effect of the motion would be to ask that those higher fees should be reduced. Secondly, it was undesirable to suggest that individual companies should be approached rather than that such matters should be dealt with through the Life Officers Association, with whom the Association had conducted all its negotiations in an excellent atmosphere. It had not agreed, last May, to the request for a guinea minimum for attendance reports but had indicated that all the best companies in fact paid that amount, and that it was up to any practitioner who received less to apply for the full guinea, and it would be paid.

The motion was lost.

Dr. JONES moved that the following recommendation of the Council be adopted: "That when a full clinical examination is commissioned by a third party and no special investigation is involved, the fee for the examination and report should be a minimum of £2 2s." The passing of the resolution would do two things. Doctors would know what was the appropriate fee for a report and, secondly, it would help to bring central and local government bodies into line with the banks, large industrial undertakings, etc.

The motion was carried.

Dr. JONES accepted a motion, moved on behalf of East Yorkshire by Dr. C. GROVES, that hospital medical officers should receive a fee for completion of Certificate B of the cremation form. He pointed out, however, that as recently as last month an endeavour to obtain what the motion asked was turned down. Unfortunately, some doctors had been disregarding the policy of the Association in the matter of fees for cremation certificates. He reminded representa-

tives that the appropriate fee for Part B, when it was legitimate to charge a fee, and for part C in all circumstances was £2 2s. Doctors who charged more were prejudicing the continuance of the existing understanding with the Home Office.

The motion was carried.

Message to the Queen

The Representative Body unanimously agreed that the following loyal message should be sent to Her Majesty the Queen:

The Representative Body of the British Medical Association assembled at the Annual Representative Meeting in Birmingham sends loyal greetings to Her Majesty the Queen and earnestly hopes that Her Majesty may speedily be restored to complete health.

Personal Accident Insurance for Members

Dr. JONES recalled that a year ago the Representative Body passed a resolution asking Council to look into the possibility of arranging with the Medical Insurance Agency a scheme of insurance to protect doctors against the contingency of death or disablement by accident while engaged in their professional duties. The task was remitted to the Private Practice Committee. The Committee's first thought was of the difficulties in defining when a doctor was on professional duty, and for that reason, and others, it was decided that it would be better, if it could be done, to have a scheme which covered a doctor against accident in all circumstances. The Committee's second thought was to see if the scheme could be made available as part of the general benefits accorded to all members in return for their membership subscription. It became clear, however, that to get this it would be necessary to alter the Articles of Association in a way which would, on other grounds, be totally unacceptable. But the rates of premium and benefits offered for a policy issued to the Association and being given as a right to all members were so attractive that Dr. Jones asked the Medical Insurance Agency to see what could be done to obtain these rates even though policies were issued on an individual basis. After further negotiation the Agency agreed.

The cover was world-wide. There was no barrier of colour, race, or creed in the policy, and on that ground it was unique. Again, it was unique in that overseas members benefited equally with home members at exactly the same rate of premium, although in most overseas territories insurance premiums were appreciably higher than those in this country. Thirdly, it was available to women on the same terms as to men. Fourthly, it had fewer exclusions than any other policy, and for a doctor actually in the act of proceeding to or giving aid to any distressed person there were no exclusions whatever. Exclusions applied only to accidents occurring outside the realm of professional duty, and even then they were less than in other policies available on the market. Further, no medical examination was required before taking out the policy. It was available to all members of the Association up to the age of 70. Benefit would be paid under the policy on death occurring within 52 weeks of actual injury.

The policy had been taken out with a company carrying assets of over £100m. It covered against death or disablement by any accident, and it was calculated in units of benefit of £1,000. The premium per unit of benefit was 10s. for full cover and 7s. for fatal accident cover only. The maximum holding was 10 units per member. Those rates were just over one-third of the lowest rates available to ordinary members of the public and less than half any offered, even on a restricted basis, to any section of the community.

Dr. Jones paid tribute to Mr. A. N. Dixon, Manager of the Medical Insurance Agency, Dr. Walter Hedgcock, Assistant Secretary of the Association, the Chairman of Council, and the Treasurer of the Association for all that they had done to make the scheme possible.

Dr. W. N. LEAK (Mid-Cheshire), whose Division had brought this matter before the Council for two years running, thanked the Private Practice Committee and Dr. Jones for their work and hoped that all members of the Association would take advantage of the scheme. In answer to Dr. J. B. WRATHALL ROWE'S question whether the scheme would cover the result of accidental infections in the course of professional work, Dr. I. M. JONES reiterated that there were no exclusions whatever on death or total disablement resulting from accidents occurring in the course of professional duty. The company had agreed to submit any dispute to a referee or referees appointed by the Association, whose decision would be final. The policy would be available from the time the motion was passed. The Association had promised to do everything possible to ensure that the company got a minimum of 50,000 units, and the company had agreed to leave the premiums unaltered for three years.

The motion was carried.

The remainder of the Annual and Supplementary Reports of Council under "Private Practice" was approved.

Road Accidents

Dr. R. A. LEADER (East Suffolk) moved:

That this Meeting declares that it is wrong that prevention of road accidents due to medical causes of unfitness to drive a motor-car should remain incidental to the interests of insurance companies, especially as these appear to leave the obtaining of certificates of fitness to drive entirely to the initiative of prospective policy-holders.

If the patient's doctor refused to give a certificate, he said, the patient could go to another doctor, concealing what had happened, and the certificate of the second doctor would be accepted by the insurance company.

Dr. I. M. JONES confessed his inability to understand what the motion meant. On the assumption that it asked for compulsory medical examination before the issue of a driving licence, he pointed out that the Occupational Health Committee had not gone so far as that, even for drivers of heavy vehicles. There was no evidence that an appreciable number of accidents were caused by the illness of the driver, and in such cases it was usually a case of sudden collapse which could not have been forecast by previous medical examination.

The motion was lost.

Duration Certificates

Dr. R. P. HENDRY (Rugby (with South Warwickshire)) moved:

That this Meeting is of the opinion that "duration certificates" are noxious (i.e., certificates regarding the medical history of a person who has died shortly after being accepted without medical opinion for life assurance). They should be discontinued altogether, and for the present be issued only, at the discretion of the practitioner, provided all the following conditions are fulfilled:

(a) the original proposal signed by the deceased contained a clause clearly authorizing the doctor to issue a report in the event of his early death.

(b) This proposal form be shown to the doctor and a photostatic copy or duplicate be supplied for his retention.

(c) The proposer dies within three years of taking out the policy.

(d) The policy be taken out prior to January 1, 1959.

(e) That, where applicable, a paragraph be inserted on the certificate stressing that although the doctor may have been aware of serious illness the assured may not have known of this.

The object of the duration certificate, he explained, was to enable the company to avoid paying the claim. It involved a breach of professional secrecy and was repugnant to the principles of British justice; it should be for the company to prove guilt and not for the relatives to prove innocence. If the company took a calculated risk it should abide by its bargain. It could always go to the courts and

subpoena the doctor. The certificate might lead to injustice, because the basis of the contract was good faith, not good medical knowledge, and the assured might not have known that he was a bad risk. The motion did not say that doctors must not give these certificates, but that they should not do so.

Dr. R. S. V. MARSHALL (South Staffordshire) said that he did not regard it as his duty to treat the burnt fingers of assurance companies. He never gave duration certificates, although he had been offered as much as five guineas for one, and he had never been made to go to court.

Dr. W. MORGAN EVANS (South Middlesex), speaking as a member of the G.M.S. and Private Practice Committees, strongly opposed the motion. In 30 years he had never given a duration certificate, and said that when asked for one he invariably advised the patient to tell the insurance company that his doctor was behind him, and never once had an insurance company failed to pay. Insurance companies knew the risks they were undertaking when accepting an insurer, and they should not attempt to ride out of their responsibilities on the backs of doctors. Dr. I. M. JONES, opposing the motion, pointed out that in view of a resolution passed in 1949 it would require a two-thirds majority, as it was contrary to present Association policy. Dr. HENDRY replied that under the 1949 resolution it was Association policy to give duration certificates. It was also important to remember that the patient may have been ill to the doctor's but not the patient's knowledge.

The motion was lost.

Medical Examination of Nursing Candidates

Mr. G. E. MOLONEY (Oxford) moved:

That the prevalent practice of some hospitals of demanding a preliminary medical examination of candidates for training as nurses by the candidate's general practitioner is deprecated, but where such an examination is required the appropriate fee be paid by the authority concerned.

He pointed out that some, particularly teaching, hospitals demanded that prospective trainee nurses be medically examined by a general practitioner before being taken on the staff, but he had been informed that the Ministry considered such examinations unnecessary on the ground that nurses had a full medical examination after joining the staff. However, although hospitals were authorized to pay a fee when demanding a prior examination, some had refused to pay, saying that the prospective nurse should pay it. Doctors were reluctant to collect a fee from a prospective nurse.

An amendment by North Staffs to insert the words "and medical ancillaries" after the word "nurses" was accepted by Oxford and agreed to by the meeting.

Dr. L. J. BARFORD (Reigate) opposed the motion. He said that if it were passed great difficulty would be experienced over trainee nurses from abroad, some of whom had spent years going from hospital to hospital in an attempt to pass the preliminary medical examination. Also, if accepted, what was to prevent the same principle being extended to prospective university students who required a medical certificate before being accepted? Miss GLADYS M. SANDES (Marylebone) thought there was much muddled thinking over the problem. Anxious as they all were to recruit nurses and ancillary staff, they must avoid accepting trainees who subsequently had to be paid although unable to work. This could be prevented by a prior medical examination. Examinations carried out by hospitals were done by members of the staff without extra pay, and in large hospitals this could be very unfair to the consultant or senior officer.

Dr. D. L. GULLICK (E. Herts) asked if it would not be better to sort out medically unfit candidates before they started their training rather than to take them in and then have to spend more money and time on them before they were subjected to the disappointment of being rejected after having once started. He suggested that the word "encouraged" should replace the word "deprecated." Dr. S. G. BROOK (Barnstaple) said his Branch could not accept the motion as it stood. He had experienced no difficulty about the fee once it had been pointed out that

the Ministry allowed it. No one could object to a preliminary examination by a general practitioner. Dr. H. S. HOWIE WOOD (Isle of Wight) said that at a time when many doctors were having difficulty in finding enough money to live on and educate their children properly it seemed silly to despise the humble guinea or two which could be obtained in this way.

Dr. A. R. FRENCH (Marylebone) asked the mover to give a specific answer to the criticism which had been expressed of the word "deprecated," and asked whether Mr. Moloney had used it because he did not consider the general practitioner to be competent to perform the examination or because he was asked to do it without a fee. The Representative Body had already been told that the doctor could be paid a fee for the work. Dr. JONES opposed the motion, for its acceptance would mean rejecting the idea of pre-employment examinations. Surely no doctor would want to refuse to examine one of his own patients for fitness for training as a nurse. The second part of the motion was unnecessary, the Ministry having already authorized a fee of one guinea for such examinations.

Mr. MOLONEY, in reply, emphasized that there had been no intention to deprecate the services and skills of the general practitioner; his objection was to the fact that the doctor either did not get a fee or had difficulty in getting it. The Ministry allowed a fee to be paid when the hospital believed a pre-registration examination to be necessary. He knew of one hospital in the Oxford area which would not pay the fee, so that the doctor had to collect it from the person concerned, who was sometimes his own patient. The Ministry, while approving the fee, disapproved of having too many such examinations, because on entering the hospital the nurse was nearly always examined by a general practitioner employed there for that purpose.

The motion was not carried.

Sickness Insurance Society Premiums

Mr. G. E. MOLONEY (Oxford) then moved that the premium to private sickness insurance societies should be untaxed. He said there were people whose personal position made it necessary for them to have some privacy in hospital, yet most of them got no financial help towards hospital expenses from their contributions to the National Health Service. Many patients who desired privacy in their treatment were turning to private insurance to help towards meeting the whole or part of the cost. A patient who made his own arrangements for treatment, thereby relieving the National Health Service of the cost of that treatment, got no tax relief for the money spent in that way. Last May the Minister had refused to allow only the difference between the cost of a public and a private bed to be charged, because he had said there were difficulties involved. The method proposed by the motion was almost free of administrative and financial difficulties and had been well tried and found successful in other countries, including Southern Ireland.

Dr. JONES said that he would be happy to accept the motion as a reference to Council, as there were difficulties in it other than those outlined by the proposer, and this was agreed to. The motion was, accordingly, so referred.

Election of Representative of R.N. Medical Branch on the Council

Dr. WAND moved the acceptance of the recommendation of Council, passed at its meeting last evening, that Surgeon Rear-Admiral J. Hamilton should be elected to represent the medical branch of the Royal Navy on the Council of the Association for the period 1958-61.

The motion was carried.

ORGANIZATION

Dr. A. TALBOT ROGERS, Deputy Chairman of the Representative Body, took the Chair at this stage of the meeting.

The Chairman of the Organization Committee, Dr. RONALD G. GIBSON, moved the reception of the Annual and

Supplementary Reports of Council under "Organization" and the proposals for Amendments of Articles, By-laws, and Representative Body Standing Orders. He reported that the present membership of the Association was 70,683.

Dr. Gibson recalled the pledge he gave last year that the Committee would do everything possible to get the younger doctors together to discuss their problems. That had been done in the Junior Members Forum, to which the Chairman of Council had already referred, and which had been very successful. The older members went to the Forum prepared for attacks by angry young men, but they did not come. It was obvious that these younger practitioners had a great deal to give to the Association, and the future of the Association depended on them. Other things had been done for the younger doctor, one of which was the preparation of a hospital gazetteer—an A.A. book of hospitals. Dr. Gibson also referred to the Honorary Secretaries' Conference, which this year was bigger than ever. Dr. Potter, who did so much to promote this conference, could be justly proud of it.

Dealing with the Roll of Fellows, Dr. Gibson said the Committee was worried because some Divisions were regarding the bestowal of the Fellowship as a compliment to their members rather than as an honour. "We hope that you will impress upon Divisions that this is an honour given by the Association on behalf of the Division, and that you will keep the standard as high as possible," he concluded.

Dr. Gibson acknowledged the help his Committee had received during the year from the British Medical Students Association, and especially the co-operation of those members of it who sat on the Medical Students and Young Practitioners Subcommittee.

During the latter part of the last session the Committee had been considering intraprofessional relations, and although, said Dr. Gibson, he could talk for hours on the subject, he only proposed to touch on two points. The first referred to the word "unity." A resolution on the need for unity was passed by the Conference of Local Medical Committees. The Junior Members Forum also referred to it and suggested that rather than unity the Association should seek loyalty. In order to obtain loyalty it was necessary to obtain understanding, and in order to obtain understanding there must be an adequate information service to members. "Information service starts in the home of the individual member," continued Dr. Gibson. "He must know from day to day what his problems are and must know the problems of his neighbours. The information service must be comprehensive and geared to move at any speed in any direction, and one must ask the question whether that service is available at the moment."

Secondly, in spite of the machinations of the Minister and his Civil Service masters, medicine was still a dignified, learned, and noble profession, and in six months' time it might be that the profession would have to fight for its dignity and nobility. Some thought that it could be the last battle. The question was whether the profession's army at the moment was fit for such a battle. Could it fight as one man and, if not, why not? The Organization Committee had looked into the question of an information service with two points in mind: first, that it was absolutely necessary and, secondly, it was urgently necessary if the profession were to be ready early next year to fight the crucial battle should it arise. The Organization Committee would do everything possible, if it was the wish of the Representative Body, to help to bring about a comprehensive and adequate information service within the Association during the ensuing year.

Motions to the A.R.M.

Dr. R. G. GIBSON (Chairman, Organization Committee) moved the adoption of the following Recommendation of the Council:

That the terms of By-law 47 should be so amended as to permit those bodies of members empowered to elect members to the Representative Body to submit through the medium of one of their appointed representatives motions for inclusion in the Agenda of the Representative Meeting.

The CHAIRMAN announced that an amendment to this motion had been received, proposed by Dr. R. P. Hendry (Rugby (with South Warwickshire)) and Dr. R. S. V. Marshall (South Staffordshire), to omit the words "through the medium of one of their appointed representatives."

Dr. HENDRY, moving the amendment, pointed out that the normal method for submitting motions for inclusion in the Agenda was by the secretary of the various groups, not by the representative who proposed them in the A.R.M.

Dr. GIBSON accepted the amendment, and his motion, so amended, was carried.

Quorum of Council

On the motion of Dr. R. G. GIBSON, the Meeting adopted without debate a recommendation of the Council that By-law 66 be amended so as to increase the size of the quorum of the Council from 15 to 20.

Amendments to Articles, By-laws, and R.B. Standing Orders

On the motion of Dr. GIBSON, the Meeting also adopted without debate a recommendation of the Council that the Articles and By-laws of the Association and the Standing Orders of the Representative Body be altered in the manner shown in Appendix VI to the Report of Council, and that the Council be instructed to submit the amendments of Articles concerned to an Extraordinary General Meeting of the Association.

Autonomous Bodies

Dr. GIBSON moved the adoption of the following recommendation of the Council:

That the autonomous powers of the General Medical Services Committee and the Central Consultants and Specialists Committee be renewed in respect of the year 1958-9.

That the Representative Body looks to these Committees to ensure (1) that no action be taken by either which may prejudice the interests of another part of the profession without full prior consultation with the appropriate interests, and (2) that their autonomous powers will be used so as to expedite and not delay the work of the Association.

Pending the report of the Co-ordination Committee, he said, the wording was the same as before.

Dr. R. P. HENDRY (Rugby (with South Warwickshire)) moved as an amendment that the first paragraph of the recommendation be amended to read:

That the autonomous powers of the General Medical Services Committee and the Central Consultants and Specialists Committee be renewed only in so far as they affect the purely domestic affairs of these Committees and not in respect of activities in which other branches of the profession are concerned.

The object, he said, was to profit by the misfortunes of the past and safeguard the future. The autonomous bodies did a vast amount of work for the profession and he had nothing against them, but the events of last year had shown a serious flaw in the set-up, when the various bodies had announced separately their intentions, irrespective of the views of the profession as a whole. Unity of action was essential to progress. A majority as well as a minority had some rights.

The CHAIRMAN OF COUNCIL emphasized that they must look forward and not backwards. Since last year, great progress had been made towards unifying the profession. The amendment, if carried, would have to be considered by the autonomous bodies and was bound to lead to that type of discussion which the events of the past year had tended to eliminate. The atmosphere between the Colleges and the Association to-day was better than it had been for a very long time, and the same applied in the general medical services field.

Dr. O. C. CARTER (Bournemouth) said the amendment was not an attack on the autonomous bodies. It was impossible to do without them; they included some of the most important people in the profession. It was essential, however, to avoid a repetition of the chaos which had occurred over the giving of evidence to the Royal Commission. They could not run the risk of different bodies speaking with

different voices. Dr. J. S. NOBLE (Council) regarded the amendment as dangerous and bound to cause friction. It was the duty of the Association, as the only body representing the whole profession, to lead it and not to drive it.

Dr. GIBSON said that the amendment was impracticable because of the impossibility of drawing a hard and fast line between what were and what were not purely domestic affairs, and thought that Rugby's aim would be better achieved by cross-representation between committees.

A motion to pass to next business was moved, seconded, and carried.

An amendment by Torquay was withdrawn, and the recommendation of the Council was adopted.

The A.R.M. received a recommendation from the meeting of 1957, which deferred discussion on it in view of the Council's decision to set up a special committee to investigate unity within the profession.

(a) That the existing relationship of the autonomous bodies to the Association should be continued, subject to ratification annually by the Representative Body of the powers of these bodies.

(b) That the arrangements under which the Joint Committee between the Central Consultants and Specialists Committee of the B.M.A. and the Royal Colleges and the Scottish Royal Medical Corporations acts as the negotiating body with the Government in respect of those engaged in the hospital and specialist service under the N.H.S. should be continued.

Intraprofessional Relations

Mr. H. H. LANGSTON (Winchester), moving that Council be instructed to set up an intraprofessional information service as a matter of urgency, said that every member of the Association should know what members in other parts of the country were thinking, yet every conflict with central Government made more obvious the lack of cohesion and unity in the profession. While repudiating the type of trade unionism by which the leaders decided policies which the rank and file must follow irrespective of the dictates of their own hearts and consciences, he believed the profession must have the confidence springing from certain knowledge of general medical opinion. A great deal more could be done, he said, by way of dissemination of information from the centre to the periphery and from the periphery to Headquarters, from Division to Division, and doctor to doctor quarters, to produce unity and loyalty of purpose. "We cannot," he added, "afford to be indecisive. The Council must be in a position to know and to reach decisions quickly, otherwise once again we shall be too late and we shall lose the battle."

Dr. R. P. LISTON (Tunbridge Wells) said that the Public Relations Committee, of which he was a member, had discussed this subject at length. Various memoranda had been submitted to the Committee, and he believed that if the proposals for local organization which he himself had put forward in a memorandum were accepted it would achieve everything required at the periphery. He thought that information from the centre to the periphery was already given to those who wanted to read it, first through the *Supplement to the Journal*, and secondly to a limited number of people through a personal, unofficial, highly informative letter from the Secretary to the chairmen and secretaries of Divisions. However, to this second means he had two rooted objections: that it was issued at irregular periods, and that it was of limited distribution. He thought there was no foundation for the allegation that the profession was not being adequately informed. He had sent a questionnaire to members of his Division. Of 138 forms sent out, 114 were returned. Seventy-six said they were interested in medico-politics, and 89 indicated that if they were not properly informed it was not the fault of Headquarters. The *Supplement* was read regularly by 60 of those replying and they thought the information it contained was adequate. The periphery would be informed if it would read what was made available.

Dr. JOAN CHAPPELL (North Middlesex), supporting the motion, said that the complexity and quantity of the work

at Headquarters was increasing, and new means were required to maintain its quality. She believed that the proposed scheme would facilitate a two-way exchange of facts and opinions, and would demonstrate to the Royal Commission and the Ministry that the profession was closing its ranks and was preparing against the possibility of an adverse report. Dr. J. C. ARTHUR (Gateshead) said that the Association's experience in these matters was very similar to that of the trade unions. About 10% of members turned up at meetings and of the other 90% very little was known. But the latter had an information service in the form of the *Journal* and the *Supplement*. He felt that no useful purpose would be served by setting up another service. The matter was not one of quite such urgency as that at the moment; it should be approached with great care and circumspection. He suggested that the motion should be rejected.

Dr. J. S. HAPPEL (Winchester) emphasized that the motion had been worded in general terms only, leaving it to the Council and the secretariat to work out details. It might well be that the object envisaged by the Winchester motion could be obtained at very little cost to the Association. But whether it would cost little or much, the results last year had been so bad that his Division felt that things would have to be altered and that if the Finance Committee could not find the money to advance one of the basic aims of the Association, then indeed things had come to a pretty pass. The major fault in the existing information services was that they were no particular person's responsibility. Dr. W. E. DORNAN (Council) said that the great weakness of the Association as a body negotiating with the Government in the National Health Service was the complete lack of knowledge of what the doctor in his surgery was thinking. Nor had the information in the hands of the leaders of the profession gone to the periphery sufficiently early and in sufficiently palatable form to be easily digested by the ordinary doctor. That had made the Association a laughing-stock among comparable organizations which were aware of what their members thought. The problem could only be solved by having an efficient two-way source of information from the periphery to Headquarters and back again. The National Farmers' Union had devised methods of doing this, and how highly they were respected in Government circles. They nearly always got their way. Winchester was right to stress the urgency of the matter. The Association's last chance was likely to come next year, and it was essential for a service of the sort suggested to be organized at least six months before the Royal Commission reported, the details worked out and the proper staff employed to man it. Council should be instructed to do it now; not invited to think about it.

Dr. WAND said a lot of heat was being engendered over certain aspects of the resolution, but it was about matters on which all were entirely in agreement. It was agreed that there was a need for the best possible to-and-fro service between the centre and the periphery; but the motion merely instructed Council to do a certain thing; it did not ask for a re-examination of the intraprofessional information service with a view to its overhaul and tightening up. It could only be assumed that what was envisaged was a completely independent service, and such a thing must inevitably, to some extent, work in conflict or antagonism with the Secretary, who was doing the same kind of work. The motion made no reference to the relationship between the suggested service and the remainder of the profession. The suggested scheme was incomplete in so many details. He asked whether the Representative Body was prepared to agree to the formation of such a service without knowing what it would involve or what it would cost. He suggested that the Council be asked to investigate and re-examine the matter.

Dr. A. V. RUSSELL (Council) supported the motion, but he did not believe that a service of the type envisaged would cost an enormous amount of money. He felt that before the Association came into possible conflict with the Government both Headquarters and the periphery must know what

opinions were held and what it was proposed should be done. He did not think it would be necessary to set up a new department; the Association already had a very efficient department dealing with public relations, and, for the rest of it, an efficient committee clerk could probably do all that was necessary—certainly all that the mover of the motion had in mind.

Dr. J. S. NOBLE (Council), responding to Dr. Wand's request that those who supported the motion should say exactly what was meant by it, said that the Association had worked well with its present structure for over 50 years, but had now reached a stage where it must change with the times. The first operation should be the appointment of a full-time information officer, whether medical or lay, who would work in close co-operation with the Public Relations Department and in contact with all the Committees, his duty being to collect, correlate, and disseminate information, and the appointment at a lower level of officers, to begin with voluntary, whose job it would be to contact all doctors within their area. It might be said that this was impossible, but other organizations had done something on these lines. In time, these people might become full-time servants of the organization. In addition, a newsletter might be produced periodically to reach every practitioner, which should be attractively produced. Part of the cost could be covered by advertisements. So far as the collection of information from the periphery was concerned, nothing more had been heard of the excellent suggestion from Edinburgh for a statistical survey. The first task, however, was to appoint an information officer.

Dr. ENID A. HUGHES (West Denbigh and Flint) said that her Division was very much in favour of anything which would lead to proper understanding between the various branches of the profession. Some years ago they had felt that the Welsh Committee lacked information both from the north and from the south, and also that the consultant and other branches were completely ignorant of each other's goings on. They therefore suggested, and it was agreed, that the local medical committees and the consultants and specialists should be asked to furnish the Branch secretary with reports of their meetings. Her Division suggested that local Divisional secretaries should be furnished with reports from the local medical committees and local consultants and specialists. In that way the Divisions would know what was going on in all branches of the profession.

Dr. I. M. JONES (Chairman, Private Practice Committee) remarked that since Dr. Wand had asked for further details of the Winchester proposal Dr. Noble had spoken—with the support of Winchester, Dr. Jones understood.

Mr. H. H. LANGSTON (Winchester) broke in to say that he had had no knowledge beforehand of what Dr. Noble was going to say.

Dr. JONES: "I understand that Mr. Langston supports the claims that Dr. Noble made."

Mr. LANGSTON: "I protest. Such assumptions have no foundation."

The CHAIRMAN: "I must ask Dr. Jones not to refer to what he thinks Mr. Langston may be going to say, but to confine his remarks to what has actually been said."

Dr. JONES went on to say that Dr. Noble proposed taking away duties at present carried out by the secretariat. The Council gave instructions and the secretariat carried them out. The secretariat had carried on an information service for some time. The proposal for a weekly newsletter had been put to the Finance Committee the previous day. Calculations had been made and it had been estimated that this might cost as much as £40,000 in one year.

The CHAIRMAN intervened to point out that various estimates had been given in the Council meeting and there had been no firm result. The Council would discuss the matter again later.

Dr. JONES contended that in any event the proposals must involve an expenditure of several thousand pounds, which would inevitably result in a considerable rise in the subscription rate. Several Representatives suggested from the floor of the hall that, in order to give more time for the

consideration of the matter, the debate should be adjourned until the following day.

The CHAIRMAN, while feeling that there were advantages in disposing of the matter that day, said he would be prepared to accept a motion for adjournment.

The CHAIRMAN OF COUNCIL (Dr. Wand), rising to a point of order, said that the Finance Committee had made certain recommendations on this subject to the Council, and asked leave, in the absence of the Treasurer, to bring the Finance Committee's decisions to the notice of the Meeting.

The CHAIRMAN said he would accept the interventions from the floor of the hall as a motion that the Meeting be adjourned.

The motion for adjournment was seconded and carried by the necessary majority, and the Meeting adjourned until the following day.

Friday, July 11

The A.R.M. resumed at 9.30 a.m., with Dr. A. BEAUCHAMP in the chair.

ORGANIZATION (continued)

Intraprofessional Relations

Recalling that the A.R.M. had adjourned the previous evening without having voted on the Winchester motion which sought to instruct Council to set up an intraprofessional information service as a matter of urgency, the CHAIRMAN announced that an amendment to the motion had since been handed in, and called upon the mover.

Dr. J. G. M. HAMILTON (Edinburgh) moved, as an amendment:

The Representative Body, being aware of the pressing need to improve intraprofessional relationships and solidarity, instructs the Council to consider as a matter of urgency the specific arrangements, staffing and otherwise, necessary to achieve this object.

The R.B. had appeared last night, Dr. Hamilton said, to have been unanimous in its view that there was a need for some improvement in the provision of information and intraprofessional relations generally; the difficulty and related to the manner in which this could be achieved, and speakers had expressed doubts on the practicability of the various methods proposed. The purpose of the amendment was to emphasize the point on which the R.B. had seemed to be reasonably agreed—the need for something to be done urgently in view of the approaching medico-political storm. It was thought also that Representatives might care to remit to Council for consideration the question of the techniques to be employed for achieving this end, it being manifestly ridiculous to suggest that a matter of that sort, requiring detailed study, could be dealt with by a body of over 500 people.

Mr. H. H. LANGSTON (Winchester) said that his Division would be happy to accept the amendment as an alternative to the Winchester motion, which, he said, had not been intended to suggest specific measures but merely to point out the need to be sure that the whole profession was really ready when next year the report of the Royal Commission burst upon it. Hitherto the Government had been in a position to gamble on the chance that the profession could not be firm and decisive because it did not really know the measure of support which it could command. He felt that Dr. Hamilton's wording would achieve what was needed. The Edinburgh text was carried as a substantive motion in place of the Winchester proposal, and the remaining motions under "Intraprofessional Relations" were referred to Council.

Message from H.M. the Queen

The CHAIRMAN read the following telegram received from Her Majesty the Queen:

Please convey to the Representatives of the British Medical Association, assembled at their Annual Meeting in Birmingham, the sincere thanks of the Queen for their loyal greetings and their kind message, which Her Majesty greatly appreciates.

The remainder of the report under "Organization" was approved.

Referendum

Dr. R. P. HENDRY (Rugby (with South Warwickshire)) then moved what he described as a "six-pronged" motion seeking to amend article 40 of the Constitution, which, he explained, provided that within a month of the annual meeting of the R.B. the Council, when considering the resolutions passed thereat, could with a 50% majority and a 66% quorum decide to institute a referendum on any matter on which it considered that the R.B. had been "talking through their hats." The motion set out in detail the procedure for doing this. It was intended to set out the circumstances in which there was a valid reason for the Council not accepting R.B. decisions and a procedure of "delay of implementation" for dealing with such objections; it went on to provide that if circumstances later changed the Council might take similar action with the same quorum and majority—a matter not covered by the present constitution so far as a referendum was concerned—and that in cases where it was decided to invoke a delay of implementation a notice to that effect should appear in the *Journal*, and that, in the absence of any objection by the number of individuals who could call for an extraordinary meeting of the Association or by the number of Divisions who could request a supplementary Representative Meeting, the motion should stand over to the next meeting of the R.B., to be reviewed in the light of new information or changed circumstances, when a final decision would be made.

Dr. GIBSON (Chairman of the Organization Committee) said that after careful examination the Committee thought the motion if accepted would cause more delay rather than less; if anything, it appeared to tie the hands of Council. However, he was prepared to accept it as a reference to Council. Dr. Hendry concurred, and the Meeting agreed to this course.

CONSTITUTION OF THE ASSOCIATION

The Chairman of the Constitution Committee, Mr. H. H. LANGSTON, moved the reception of the Annual Report of Council under this head.

The reorganization of Branches, he said, was the main consideration arising out of last year's A.R.M. decision that the function of a Branch as it existed in some areas required at least modification and extension to meet present-day conditions, and that, if it were necessary to achieve this so that the views of all sections of the profession in an area or region could be properly ascertained and co-ordinated, the Branch area should be varied and the Branch reconstituted. Recalling last year's debate, he said that in view of the Meeting's opinion that there was no universal panacea for achieving the necessary co-ordination, and that it was necessary for each Branch to examine the problem individually, the relevant documents had again been resubmitted to Branches, whose comments were still awaited. Since it had been agreed that change was necessary, he asked for constructive proposals from Branches and Divisions in the light of what they desired the function and purpose of Branches to be. As an example, he cited a recent resolution of the Metropolitan Counties Branch that in each area of the four Metropolitan regional hospital boards there should be appointed a standing committee consisting of the chairman and secretary of each B.M.A. Division within the area, with a convener, to meet as and when appropriate.

Dr. R. A. LEADER (East Suffolk) moved as an amendment that, bearing in mind the importance of liaison between peripheral units and the central body in future relations with the Government concerning the general-practitioner service, no administrative unit should be interposed between the Divisions and the Council. He emphasized that this was not intended as a stricture on Branch activities. Dr. J. A. PRIDHAM (Dorset), opposing the amendment, suggested that East Suffolk did not intend it to be taken very seriously, but used it to air their fears of a second tier. There was no need for any fear; the second

tier unit was not something interposed between the Divisions and the centre, but rather something to bind them together. It would allow those in any Division who were interested in medical politics to meet their colleagues in neighbouring Divisions and the members of central committees, and so obtain first-hand knowledge of their views. Dr. ANNIS GILLIE (Paddington) enlarged on what Mr. Langston had said about the Metropolitan Counties Branch resolution, and said that it had been adopted at a joint meeting at which were present representatives of the Metropolitan Counties Branch Council and of all the Branches within the areas of the four Metropolitan regional hospital boards. The meeting had brought out the advantages of a meeting covering a big area of this kind without losing the identity of the individual Branches.

Mr. LANGSTON pointed out that there was no question of something being interposed between a Division and the centre which would mean that everything from the Division would have to go through the Branch. The Branch would have specific functions of a kind which the Division could not cover, but the Division would have full access to the centre.

Dr. LEADER, in view of the assurances given, asked leave to withdraw the amendment, and this was accorded.

A motion by Bournemouth on the same subject was also, by leave, withdrawn, and the remainder of the Annual Report of Council under "Constitution of the Association" was approved.

A motion by Tunbridge Wells recommending the Council to appoint a small executive committee to expedite the conduct of its business was, with the leave of the Meeting, withdrawn.

Co-ordination of the Profession

Dr. S. WAND, speaking as Chairman of the Committee on Professional Co-ordination, moved the approval of the Annual and Supplementary Reports of Council under "Co-ordination of the Profession." The Committee, he said, had nothing dramatic to offer; co-ordination proceeded by evolution rather than by edict, and it was not possible to impose unity between democratic institutions simply by passing resolutions. There were three tiers of co-ordination. The first was organizational, between the Association and the Royal Colleges and bodies such as the Society of Medical Officers of Health; the second was intra-B.M.A. co-ordination, and the third was co-ordination at the periphery, where there must be unity and loyalty in the hearts of individuals. The Meeting had already discussed the improvement of this last type of co-ordination. On intra-B.M.A. co-ordination a recommendation had been made which, though small, was important, and was designed to close a gap which existed in getting together the doctors in different groups in the Divisions and Branches. It was at the top level that most progress had been made, and the dark clouds which had overshadowed medical unity a year ago were disappearing. There was a much better feeling between the Association and the Colleges and the Society of Medical Officers of Health.

The motion was carried.

Dr. A. M. MAIDEN (Lincoln) moved "that this meeting welcomes any action which will promote unity on matters affecting the general welfare of the profession." Although it was obvious that the matter of unity in the profession was firmly in the minds of the Council, he said that it might serve to emphasize to the Council that there might be other unexplored avenues between the doctor at the periphery and Headquarters. Mr. A. LAWRENCE ABEL (Marylebone) said it had been made clear that some action must be taken by the Association to promote unity on matters affecting the general welfare of the profession. Those who were not quite anaesthetized by the Royal Commission would wake up to the fact that each member of the profession must be in contact with every other. On July 5, continued Mr. Abel, a number of "young" men aged 65 would be retiring from the Health Service. Already he had heard one or two of them wondering what they were going to do. He submitted

that ten, twenty, or thirty of these retired doctors could be employed by Headquarters to visit every doctor in the country who did not attend B.M.A. meetings. Mr. Abel said he had estimated that if twenty such men were employed by Headquarters it would take approximately three months, visiting five doctors a day, to make the calls. It was a constructive proposal.

Dr. S. WAND said that Council did everything in its power to carry out the wishes of the Representative Body, but Council could never pretend to know all there was to know about everything that was in the mind of every doctor in the periphery.

Dr. MAIDEN, in reply, said that he was prepared to accept Mr. Lawrence Abel's suggestion.

The motion was carried.

ELECTION OF CHAIRMAN

The Representative Body received with acclamation the announcement that Dr. A. BEAUCHAMP (Birmingham) had been re-elected unopposed as Chairman of the Representative Body.

The CHAIRMAN thanked Representatives for the trust which they had reposed in him.

PUBLIC RELATIONS

In moving that the Annual Report of Council under "Public Relations" be received, Dr. H. GUY DAIN, Chairman of the Public Relations Committee, drew attention to the very valuable work which was done by the Public Relations Department for the Association and, indeed, for the whole profession. The responsibility had increased greatly in recent years, and it was true to say that the last year had been not only the heaviest but most effective in the way of putting across Association policy and the sense in which the Association served the interests of the profession and the public. There had been close co-operation with the press in making the profession's views known on all subjects which had arisen during the year—not the least among them being the trouble with the Royal Commission.

With regard to relationships with the B.B.C., Dr. Dain said that the Public Relations Department had endeavoured to improve relationships with the B.B.C. Deputations had gone to the B.B.C. several times to discuss some particular subject of which the Association disapproved, and had been able to influence the B.B.C. in that way. So far as intra-professional relationships were concerned, the Public Relations Department had made a start on that subject with the man at the periphery. The "group" method had been adopted, and it was suggested that the new central information service should regularly furnish the groups with information, and in return Headquarters would find out the views of members. There were many subjects which groups of doctors living near to one another could discuss, and the results of those discussions could be sent back to Headquarters. "It is up to you," Dr. Dain told Representatives, "to go back to your own areas and see that the method suggested by the Public Relations Committee of putting the groups into action is adopted."

Dr. G. S. R. LITTLE (Greenwich and Deptford) expressed concern about the relationship between the Association and the B.B.C., while fully bearing in mind the assurance given by Dr. Wand yesterday. The Association not having been consulted about the *Your Life in Their Hands* television programmes, the Council had been concerned in case live operations should be televised. A leading article in the *Journal* had suggested that disease was being dramatized. He felt that the B.B.C.'s honest intention of being instructive had been somewhat misinterpreted by the profession, which had not done itself any good by suggesting that such programmes were a cheap form of public entertainment. They had in fact continued after the Council meeting of February 19, at which the matter had been discussed, and there was no evidence of any adverse public reaction. "We must aim in future at co-operating with the B.B.C.," he said. "Don't let this ever occur again. We are apt to be

looked upon by the public with a little disfavour when we batten down and blow cold over things of this nature."

Dr. WAND pleaded with the A.R.M. not to embark upon a discussion of this subject; rather, to let the past be past, to think only of what good could be done in this field by healthy co-operation in the future, and to consider the general principles of approach to such programmes. As he had indicated yesterday, exploratory discussions of an encouraging character had taken place. "We may have to revise our own ethical approach to these developments, which are bound to take place and which are taking place in other countries, particularly in the North Americas," he said.

Dr. DORIS ODLUM (Bournemouth) urged the need for a very warm and close liaison between the profession and the B.B.C. She thought that the medical profession ought to take a more active role by way of suggesting programmes which would be of value, rather than leaving all the initiative to the B.B.C. There was a real need for an active and live relationship. There was a feeling among the public that doctors were trying to hide from them the secrets or mysteries of their calling.

The CHAIRMAN said the general feeling of the meeting seemed to be in agreement with the views expressed by Dr. Wand in his desire that the subject should not be discussed further, and this was agreed to.

A Harrow motion which sought to call upon the B.B.C. to consult with the Association before again televising or broadcasting programmes liable artificially to increase the work of doctors and cause anxiety in the population at large, and expressing objection to the Ministry of Health co-operating in the presentation of such programmes without prior consultation with the profession, was, by leave, withdrawn.

Television Programmes

Dr. K. W. BEETHAM (East Yorks) moved that the Representative Body deplore the use of television for the purposes of cancer education.

He said that the continuing alarming increase in cancer mortality, plus the fact that inevitably cancer research was a slow business, inspired a minority of the profession to believe that improvement could be achieved if the public were told the facts of cancer. He maintained that if the profession could not tell all the facts it should divulge none. Cancer educationists did little harm, he continued, until recently, when eight million people had 30 minutes of intensive cancer education on television from the Christie Hospital, Manchester. While it had been maintained that if one life could be saved a programme of that nature was justified, he preferred to judge it by the harm it must have done. For example, it had been reported that the programme was a contributory factor to a suicide. Moreover, after seeing such a programme possibly hundreds of thousands might some time develop a mild cancerphobia and a small percentage a moderately severe cancerphobia. Speaking as one who spent almost all his working day dealing with cancer patients, he said that many such patients who had seen the programme confessed subsequently they wished they had not. He emphasized that the profession should be most cautious before embarking on such a campaign, before being sure whether cancer education was a good or a bad thing.

Dr. G. CORMACK (Newcastle upon Tyne), opposing the motion, did not see why cancer should not be a subject of education for the public. He said that to attempt to control the activities of television authorities would redound to the profession's discredit, for it was a medium which the public regarded as a source of entertainment and education. The television authorities were in touch with public feeling and opinion much more than doctors, and would present programmes they considered of interest, and for the medical profession to contradict their view was to adopt an ostrich-like attitude and would achieve nothing. The late reporting of cancer symptoms by patients was a cause of concern to doctors, and something which brought

these symptoms to the notice of people must do some good. Anyway, people could always read about cancer, and the sources chosen by the public were not always the best and were outside the profession's control. Dr. B. H. PENTNEY (Camberwell), endorsing Dr. Cormack's remarks, said that as cancer education progressed it would help to reduce cancer mortality.

Mr. A. LAWRENCE ABEL (Marylebone) also opposed the motion. A recent hospital analysis of over 1,000 cases showed that 10 years ago 40% of breast cancers were reported early and 60% late; the figures were now 50% early and 50% late, and he pointed out that at that rate of progress it would be 50 years before women would attend early enough for cure. It was, he said, necessary to differentiate between cancerphobia and the fear of cancer. It was the doctor's duty to do away with the fear of cancer, and people should know that if reported in the early stages it could be cured. He was sure that in relying on the report of the Public Relations Committee they were carrying on the highest traditions of the profession and helping to do away with not only cancer itself but the fear of cancer.

OVERSEAS

It being 11 a.m., the Meeting proceeded, under the Standing Orders, to the consideration of Overseas business.

Professor D. E. C. MEKIE, in moving that the Annual and Supplementary Reports of Council under "Overseas" be approved, said that throughout the world many territories were moving in the direction of or had already attained independence, which was inevitable and right. One of the first effects of home rule was the determination to set up an independent local medical service. He had been proud to see his old assistants and students assuming new responsibilities and undertaking the work in a very wonderful way, but it meant that members of the old Colonial Service found their appointments suddenly terminated, and, although they received compensation, no monetary payment could compensate for the loss of a career. Their chance of entering general practice or of obtaining a specialist post in this country was small. The Government of this country, having recruited these men and offered them career appointments overseas, should be prepared to accept more responsibility than it did at present for ensuring that they had an opportunity to carry on medical work elsewhere, overseas or at home.

Many overseas territories which had attained independence wished to supply their deficiencies by recruiting men from outside on short-term contracts. After a doctor had served for a few years overseas, however, he might find that his whole career in this country had ended. This was a matter which it was hoped to discuss at length at a conference to be held in the autumn. In these overseas territories doctors, like other professional people, formed only a small minority, and there was a political opportunity to exploit their weakness. The Association wished to see a strong sense of unity among doctors in dealing with local governments, and, without wanting to interfere with the autonomy of overseas Divisions, wanted them to be strong.

The report was adopted.

Greetings from Overseas Representatives

Professor E. N. MACDERMOTT, President of the Irish Medical Association, conveyed its cordial greetings. The two Associations, he said, were linked by the closest bonds and had always worked in amity. The Irish Medical Association was grateful for the very generous help it had received from the British Medical Association and wished to reciprocate when the opportunity offered. Dr. A. P. CRAWFORD brought greetings from Queensland and expressed his gratitude for the help received from this country. They in turn, he said, were always delighted to help doctors from this country who came to Australia.

Mr. K. C. T. RAWLE, a Past-President of the New South Wales Branch, said that the high regard in which the medical profession was held both at home and overseas was

in large measure due to the fact that doctors belonged to a Commonwealth-wide organization, the British Medical Association. In Australia they had a fee-for-service system, the patient being given substantial assistance in meeting the cost of medical and hospital care by voluntary insurance, subsidized by the Government. This system had the approval of the public and of medical opinion. It resulted in a high standard of professional practice, with professional freedom, freedom to practise in any branch of medicine, freedom to prescribe whatever was necessary in the interests of the patient, and a confidential yet independent doctor-patient relationship. (Applause.)

Professor J. L. WRIGHT (New Zealand) brought fraternal greetings from the New Zealand Branch and issued an invitation to British Representatives to visit Auckland in 1961. Dr. A. D. McSHINE, in bringing the greetings of the Trinidad and Tobago Branch, said that the greatest task of his Branch was to ensure that the Government recognized the British Medical Association as the sole bargaining power of the doctors.

Dr. E. M. CLARK (Uganda) expressed gratitude for the interest and concern shown by the Overseas Committee about conditions in Her Majesty's Overseas Civil Service. The members of his Branch were most happy that the Chairman of Council and the Chairman of the Overseas Committee had been able to visit Uganda. It was a great help to the Association there. Dr. A. S. VALENTINE (Sierra Leone) brought fraternal greetings from West Africa and from Sierra Leone in particular. He extended an invitation to the Chairman and members of the Overseas Committee to visit the Sierra Leone Branch.

The CHAIRMAN thanked the overseas visitors for their remarks. It was a pleasure to have them at the meeting, and it was to be hoped that there would be many more present next year.

COMMONWEALTH MEDICAL ADVISORY BUREAU

In the absence of Mr. A. M. A. MOORE, Chairman of the Committee of Management of the Commonwealth Medical Advisory Bureau, Dr. H. GUY DAIN moved the reception and approval of the Annual Report under "Commonwealth Medical Advisory Bureau." The success of the Bureau, which was in its tenth year, was shown by the work which had been done. During the previous year more than a thousand doctors from the Commonwealth had sought the help of the Bureau, which had been able to find accommodation for more than 200 doctors. The Bureau also provided doctors in the Commonwealth with information in a booklet which was distributed to them on the nature of the post-graduate degrees and courses which could be found in this country.

The motion was carried.

INTERNATIONAL MEDICAL ADVISORY BUREAU

Dr. DAIN, in the absence of Mr. Moore, also moved the reception and approval of the Annual Report under "International Medical Advisory Bureau."

In the current year, he said, there were 470 new inquiries, mostly concerned with accommodation. The Bureau also proved very helpful indeed to the Hungarian refugee doctors. It had undertaken another job in connexion with the exchange of visits between people in this country and those in other countries. 566 inquiries had been received, and it was known that at least 167 holiday exchanges had been arranged by the Bureau.

The motion was carried.

INTERNATIONAL RELATIONS

The Chairman of the International Relations Committee (Dr. I. D. GRANT), moving the reception of the Annual Report of Council under "International Relations," first paid tribute to the work of Dr. J. A. Pridham, who had been the Committee's chairman for the last ten years; Dr.

Pridham was also one of the founder members of the World Medical Association, and there were many who were unaware of the tremendous amount of work he had done for both bodies.

The work of the International Relations Committee this year, said Dr. Grant, had been mainly concerned with the World Medical Association. The latter body—consisting of 52 member nations—acted, among other things, as a watchdog of the World Health Organization, the latter being run by the governments while the former was run by doctors. The W.M.A. also served as a forum for international medical problems. A British supporting group for the W.M.A. had been formed during the year with Dr. Alexander H. Hall, Past President of the Association, as chairman. So far there were only 34 individual members and some corporate members, and he asked Representatives to join it. The individual subscription was £2 10s., which entitled members to attend all the W.M.A. conferences. While many people considered that the W.M.A. was extravagantly run—a view with which he had a certain amount of sympathy—it had to be remembered that the finances were provided very largely from American sources.

The British Medical Association's annual subscription to the World Medical Association was about £7,000, and, while it did not provide any tangible, direct benefit for individual members in this country, they were, none the less, by virtue of that expenditure, taking a part in an international organization to which all the member nations except ten paid their full dues.

Dr. J. A. PRIDHAM (Dorset), appealing for membership for the British Supporting Group, said that to many Representatives the W.M.A. was perhaps an esoteric body, somewhat removed; however, it was extremely necessary for the doctors of the world, and if it should cease to exist within a few weeks or months someone would be trying to create something similar. In addition to individual membership, there was an associate membership, for a subscription of 10s. The corporate body membership had just been reduced to £3.

Dr. R. L. LUFFINGHAM (East Yorkshire) moved to amend the sentence in the report reading, "The subjects discussed by the General Assembly included . . . the alleged persecution of medical practitioners in Cuba by the Cuban Government" by the omission of the word "alleged." This referred to the report made by the B.M.A. delegates attending the General Assembly of the W.M.A. last October. There was now sufficient evidence to show that what the delegation had heard on that occasion was no more than the plain, unvarnished truth. Any observer of the proceedings of the W.M.A. could not fail to be struck by its perspicacity and urgent desire to maintain the highest standards of medical practice. It was taken for granted in this country that doctors could safely treat their patients without interference from anybody and that they could, without fear of reprisal or political action, treat people whose ideas were opposed to those of the government in power. In Cuba that was not so. The Government there was a dictatorship against which armed conflict was being waged, amounting to limited civil war. The Cuban delegates had risen at the General Assembly to describe incidents of interference in the practice of medicine there on the orders of the reigning dictator, including imprisonment of doctors for treating medically patients with political views against the dictatorship; interrogation, including physical beating, and imprisonment of doctors for refusing to disclose matters of a medical nature to the police concerning their patients; mounting guards of armed police outside the doctor's surgery in order to intimidate him and prevent, though not by physical violence, the free access of patients to their doctors. The Assembly had received the report with shocked surprise.

Dr. MARY ESSLEMONT (City of Aberdeen) pointed out that, although the incidents were alleged at the time of the conference, the subsequent report from the Secretary-General virtually established their truth. Dr. GRANT said that the word "alleged" had been used in the report because it dealt with what had transpired at the conference.

While in no way doubting the statements of their Cuban colleagues, the Council felt that they should if possible be substantiated by outside observers, and permission for such an investigation had been made to the Cuban Government. If it was the wish of the Meeting he would raise no objection to the removal of the word. Dr. S. WAND opposed the amendment on the ground that removal of the word "alleged" would make the report inaccurate.

Dr. LUFFINGHAM said that it was not the intention of the amendment to ask for the deletion of the word; it merely asked the Meeting not to agree with its use.

In reply to a point of order by Dr. Wand, the CHAIRMAN said that acceptance of the amendment would not indicate that the word be expunged from the report.

The amendment was agreed to and carried as a substantive motion.

The Annual Report of Council under "International Relations" was approved.

Reinstatement by Federal German Medical Authorities of Practitioner Guilty of Medical War Crimes

Dr. E. TOWNSEND (Cornwall) moved:

That this Representative Body expresses its deep distress on learning that the Federal German Medical Authorities have seen fit to permit the reinstatement of a practitioner guilty of medical war crimes. It instructs Council to take whatever steps seem practical and effective to bring the views of the British Medical Association to the notice of those responsible for this cynical affront to the honour, morals, and high ideals of the true practice of medicine throughout the world.

Dr. Townsend said that his first contact with a concentration camp was in May, 1945, when shortly after being released by the Russians from a prisoner-of-war camp in Eastern Germany he assisted in helping to rescue the survivors from a small concentration camp on the other side of the town. The Germans had marched off all those capable of walking, leaving the remainder behind a live electric fence. He had, he said, seen things he wished he could forget and hoped never to see again. Later in the same year he had returned to Germany as a civilian and he had had ample opportunity to meet not only displaced persons but some of the survivors from medical war crimes. He particularly remembered a house in Lübeck containing a number of women victims of sterilization, carried out so that they might be used for the pleasure of the German Army.

Dr. Townsend then referred to Dr. Herta Oberheuser, who was convicted at the Nuremberg war crimes trials. She was, he said, a young, fanatical Nazi doctor who volunteered to be camp doctor at the notorious Ravensbrück concentration camp for women. There, under the name of research, human experiments were carried out. At Nuremberg convincing evidence had been produced to show that Herta Oberheuser was responsible for selecting the victims of these experiments, that she examined them and assisted at the operations. The trial report said that she "faithfully co-operated at the conclusion of each operation by deliberately neglecting the patients so that wounds became infected," and she had admitted that many of her patients had died as a result of the experiments. In 1947 she had been sentenced to 20 years' imprisonment, her immediate superior being executed. In 1951 her sentence was reduced to 10 years, and in 1952 she was released. Subsequently, not only had she been reinstated and been practising as a doctor, but had been treated as a returned prisoner-of-war, by which means she had been granted an *ex gratia* payment and also given an interest-free loan to enable her to set up in practice. In addition, she had been admitted to the insurance list, which was essential for any doctor wishing to make a living in Germany. Hans Eisele, from Buchenwald, had also been convicted at Nuremberg but was again in practice and had been assisted in the same way. Hans Gorgass, convicted of killing a thousand victims in a mental hospital in trying to find a method of euthan-

asia, had been sentenced to death but reprieved, and was also in practice and had received so-called compensation.

What of the victims? Very few had received anything. "It may be said," Dr. Townsend went on, "that this is all past history, or that these doctors may have reformed and should have another chance. But past history lives on. Real evil does not end with its perpetration. It is our plain duty to protest against such men and women being allowed to practise again. It is a violation of the very basis of medical practice. I ask you to pass this motion as a protest against these acts which have taken place in Germany." (*Prolonged applause.*)

Dr. I. H. MILNER (City), supporting the motion, quoted from Albert Deutsch's note on the book *Doctors of Infamy*, by Mitscherlich and Mielke:

"It is not for the sake of vengeance that the record of the foul deeds of the medical perverts under Nazism should be read and remembered. It is far more important to the maintenance and progress of civilization that the tragic record be remembered as an episode in history which must not be repeated."

Dr. I. D. GRANT (Council) said that the International Relations Committee had not been idle so far as this matter was concerned. It had written to the West German Medical Association referring to an article in the *Daily Express* about Herta Oberheuser and setting out what had happened to her. The Committee's letter continued:

The article has given rise to letters of protest in the correspondence columns of the *British Medical Journal*. Some doctors have suggested that the British Medical Association should make some official protest against the return of Herta Oberheuser to medical practice. It may be necessary for our International Relations Committee to consider this matter. In this connexion I would be most grateful if you could send me answers to the three following questions: (1) Was the name of Herta Oberheuser erased from the medical register of Federal Germany when she was convicted of carrying out criminal experiments on human beings? (2) If so, when was her name restored to the medical register? (3) Has the German Chamber of Doctors expressed any opinion or made any public statement about the resumption of medical practice by Herta Oberheuser?

On July 3 the following reply had been received:

In Germany a doctor receives permission to practise from the State. The State alone can take away this permission. In the Oberheuser case the competent authority is the Ministry of the Interior of the province of Schleswig-Holstein; therefore questions (1) and (2) cannot be answered, because we have no medical register for West Germany maintained by the medical profession such as you have in England. The Chamber of Doctors, therefore, has no power to take away from Dr. Oberheuser the right to practise her profession. Both the Chamber of Doctors of Schleswig-Holstein and the Federal Chamber of Doctors have represented to the Ministry of the Interior of Schleswig-Holstein that Dr. Oberheuser's approbation should be withdrawn. The Ministry of the Interior, however, could not do this for legal reasons because a criminal inquiry from the Public Prosecutor's Office was in progress against Dr. Oberheuser. . . . The inquiry has now been suspended because it is not permissible to undertake criminal proceedings for acts which have already been regularly judged by the Military Court No. 1. No new evidence was forthcoming to promote a new charge. After the suspension of the inquiry by the Public Prosecutor's office, the Ministry of the Interior of Schleswig-Holstein has now instituted proceedings for the withdrawal of the approbation. The German medical profession hopes that the withdrawal of the approbation will be pronounced and that the right to practise medicine will be taken away from Dr. Oberheuser.

We German doctors deplore the fact that we have not the legal right in the Oberheuser case to withdraw permission to practise. You can perhaps imagine that such a case will be dragged through every possible stage in the legal machinery of the courts.

The letter went on to say:

Through the article in the *Daily Express* the impression has been created that the doctors of Germany do not wish to separate themselves from the reprehensible actions of Dr. Oberheuser or of certain other doctors. This is untrue. After the war the representatives of the German doctors always separated themselves publicly from the crimes against humanity and in particular from experiments on human beings that had been committed by certain doctors and condemned them most strongly.

In answer to the third question it was stated that the Federal Chamber of Doctors had taken every step within the ambit of the law to prevent the practice of medicine by Dr. Oberheuser.

A motion from the floor that the question be now put was carried by the requisite majority.

The Representative Body agreed to a suggestion by the mover of the motion, Dr. TOWNSEND, that the words "Federal" and "Medical" should be deleted.

The motion, as amended, was carried.

PUBLIC RELATIONS (continued)

Television Programmes

The Meeting resumed consideration of the motion standing in the name of the East Yorkshire Branch deploring the use of television for the purposes of cancer education.

Dr. BEETHAM, in reply, said that the motion was not directed against the B.B.C. It was directed against cancer education to the millions.

The motion was lost.

National Insurance Contribution to N.H.S.

Dr. T. M. GALLOWAY (Worcester and Bromsgrove) moved:

That this Meeting considers that publicity should be given to the fact that only a small proportion of the weekly National Insurance Contribution goes to the National Health Service.

The motion, he said, reflected the concern of his Branch that the weekly National Insurance contribution was too often described as a "National Health contribution," and the weekly stamp was too often referred to as the "health stamp." The contribution had been raised many times since it was instituted ten years ago, and in the advertisements giving public notice of the fact it was not pointed out that only about one-tenth of the money went to the Health Service. He suggested that posters might be introduced for display in surgeries setting out how the contribution was made up.

Dr. A. B. DAVIES (Walsall and Lichfield) urged the Meeting to support the motion. The present adult male stamp was 17s. 6d., made up of the contribution by the employer and employee, and it covered such things as old-age pension, widow's pension, sick pay, disablement benefit, unemployment benefit, maternity benefit, and funeral benefit. Out of the 17s. 6d., 1s. 8d. was the contribution towards the National Health Service. That by no means defrayed the cost of the Service but only a small portion of it. The greater part of the cost of the Service came from general taxation.

Mr. A. DICKSON WRIGHT (Marylebone) exhorted the meeting to support the motion, and urged all Representatives in their own special spheres to bring home to the public that the National Health Service was a form of public assistance. He had discovered that there was a great ignorance so far as the question of the contribution was concerned, and many people were under the impression that 1s. 4d. a week paid for the whole of the Health Service. It took more than the whole of the tobacco revenue to keep the National Health Service afloat.

Dr. H. GUY DAIN (Council) said that on a public document issued by the Government which he had received there was the statement that the National Health Service contribution had been increased by 6d. for men and 4d. for women, and it then gave the details of how much of the contribution went to the National Health Service. Therefore, it would appear that the Government was doing what the motion sought to do.

The motion was carried.

Speaking to the motion that the remainder of the Report under "Public Relations" be approved, Dr. J. F. L. KING (Kensington and Hammersmith) asked the Committee to ensure that continuous vigilance was exercised, especially so far as the B.B.C. was concerned.

The remainder of the Report under "Public Relations" was approved.

MEDICAL BENEVOLENCE

In moving that the Annual Report of Council under "Medical Benevolence" be approved, Dr. H. M. GOLDING, Chairman of the Charities Committee, referred to the retirement of Dr. Agnes V. Kelynack, who was secretary of the Committee for fourteen years. Her experience and enthusiasm had been of great value to the Committee, he said, and she would be greatly missed.

Dr. Golding said he was happy to report that the Committee showed an increase in subscriptions of £862 over the previous year. That included the great collection at Newcastle of nearly £250, for which the Committee expressed its gratitude. The Committee also expressed thanks and appreciation to the Ladies' Guild for the work which they did. The Committee was in contact with all the established medical funds and with charities outside medicine. "As in the New Testament," he said, "the poor are always with us. There is the unfortunate doctor who is overcome by illness or other circumstances and there are always the widows and orphans who need our help." There were also the "invisible beneficiaries"—the young doctor going into practice. But there had been a time when medical benevolence had been a life-line to him personally, giving him freedom from fear.

Dr. Golding said that the Council had set up a Charities Trust Fund. This would not compete in any way with the established medical charities and would not treat individual cases, but would hand the funds over to other medical charities. The idea had first been thought of in 1930. He reminded Representatives that the Charities Committee could receive covenanted subscriptions, recovering income tax on them to the extent of about 14s. 10d. in every pound. Last year the fund had received £4,538 in uncovenanted subscriptions; if they could all have been made under covenant the extra benefit would have been very great.

A motion from the floor that the sitting be adjourned until after lunch to secure a larger attendance achieved the necessary two-thirds majority of those present and was agreed to.

On the resumption, the Chair was taken by Dr. A. TALBOT ROGERS (Deputy Chairman), who invited Dr. H. M. Golding to repeat that part of his speech dealing with the new form of covenant, in view of the small attendance before the adjournment.

Having done this, Dr. GOLDING said it had been calculated that the £4,538 to which he had referred would under covenant become £7,813. When annual subscription forms were sent out there would be included a place for indicating that members wished to enter into a covenant, and he hoped members would take that means of joining the scheme.

Dr. J. W. WIGG (St. Pancras), adding his voice to Dr. Golding's appeal, said that from his work in an industrial practice he knew what living on public assistance meant. He believed that there were doctors' dependants drawing public assistance. Dr. J. S. ROSS (East Herts) thought that the amount subscribed to charities by the profession was parsimonious in the extreme. There was not enough money-collecting effort in Divisions, and he hoped the Association would endeavour to arrange for a local secretary in every Division to encourage medical benevolence.

The Annual Report of Council under "Medical Benevolence" was approved.

PUBLIC HEALTH

Moving the reception of the Annual and Supplementary Reports under this head, Dr. J. B. TILLEY (Chairman of the Public Health Committee) said that the Society of Medical Officers of Health had requested that the section of the Association's organization dealing with the affairs of public health doctors should have the same autonomy as other sections of the profession, and the Council had asked the Committee on Professional Co-ordination to consider the position of the Public Health Committee in relation to the autonomous powers of other committees. The Association's

agreement with the Society of Medical Officers of Health for action on matters of mutual concern had also been considered, the present arrangements being unsatisfactory, and he said he would later move for agreement of revised arrangements allowing for freedom of action to both parties in a manner satisfactory to both. The Council, he continued, felt that co-operation with health visitors was improving. However, less hopefully, much as the introduction of chiropody into the National Health Service was favoured, it was felt that nothing was to be gained by pressing for this at present.

In December last the Staff Side of Whitley Committee C had made a claim for an increase in remuneration of 5%, based on the increase in the cost of living since the previous rise in salaries. This had been rejected by the Management Side and, by agreement, referred to arbitration. The claim had been rejected by the Industrial Court, which said that public health doctors must be considered as part of the local government hierarchy and that their salaries should not be considered in isolation, without prejudice to any claim which might be made on their behalf after the claims of other local authority officers had been settled. The Management Side, in rejecting the claim, had said nothing about the local government hierarchy. It was the policy of the Association that doctors' salaries should be considered in relation to the remuneration of other doctors and not in relation to that of lay personnel working in the same field. It was most unsatisfactory that the Industrial Court should have made such a pronouncement on a matter on which it had not been asked to give an opinion.

In 1957 the then Minister of Health had informed the Association that although the public health doctors had not been included within the terms of reference of the Royal Commission, when any settlement was made after the Commission reported its recommendations would be considered in considering the remuneration of public health doctors. It would be impossible to carry that out if the terms of the award of the Industrial Court were strictly adhered to. Legal opinion had been taken, and there seemed to be some doubt about whether the wording used by the Court meant that there must be a fixed relationship with other local government salaries, but it was clear that the Court meant that final arrangements could not be made until other arrangements had been made final. When the Association had considered the position of the public health doctors after the Royal Commission had been set up it decided to press for an independent inquiry into public health remuneration, and Dr. Tilley and Dr. Wand had seen the then Minister, who had said that he could not set up an independent inquiry unless the normal negotiating machinery had broken down. The possibility of its breaking down was very real. It was farcical to pretend that the Whitley machinery was negotiating salaries for a group of people when it was simply reiterating what had been said in negotiations elsewhere. If the Association believed that the salaries of doctors in any branch of the profession must stand by its guns, and the Public Health Committee would recommend to the Council that all possible steps should be taken to establish this principle.

The motion was carried.

Agreement with Society of Medical Officers of Health
The following Recommendation of the Council was adopted without debate, on the motion of the Chairman of the Public Health Committee (Dr. TILLEY):

That the following draft new agreement between the Association and the Society be approved for adoption in lieu of the agreement adopted by the A.R.M., 1939:

1. If either the Society of Medical Officers of Health or the British Medical Association proposes to formulate or urge any medico-political policy which is or may be of mutual concern to the other, the Society or Association, as the case may be, shall communicate its opinions or proposals to the other and shall refrain from taking any further action on such policy except in accordance with para. 2.

2. (a) Where agreement is reached between the Society and the Association on the matter referred by one to the other, the two shall act on the matter as may be agreed between them.

(b) Where agreement is not reached and when it is deemed necessary by either the Society or the Association, the matter will be considered by a joint committee, and, if agreement is then reached, the two shall act in accordance with para. 2 (a).

(c) When agreement is not reached, either party will be free to act separately as though the agreement did not exist.

Domiciliary Chiropody

Dr. J. S. HAPPEL (Winchester) moved as an amendment:

That (with reference to para. 100 of the Annual Report of Council) this Meeting instructs Council to press for implementation of the service of domiciliary chiropody, which should become a facility under the National Health Service, and does not accept the opinion of the Council that no useful purpose would be served by pressing the matter at this stage.

In his part of rural Hampshire, he said, many retired people from London came to live. Most of them were not well off, and their feet did not take kindly to having to walk a mile or two to reach a shop. Many were already in ill-health. The Council had approached the Ministry of Health about this, and their representations had been turned down.

Dr. J. MADDISON (Public Health Service) said that under one section of the Public Assistance Act it was possible for a local authority to contribute to the funds of any voluntary organization which concerned itself with recreation and meals for old people. The Act did not say in what way that money should be used. If local authorities could be persuaded to give funds to such a voluntary committee that committee could pay the salary of a chiropodist in the area. The voluntary committee could be composed of members of the health committee, and it could further use the town clerk as its secretary, the treasurer of the authority as its treasurer, and the medical officer of health as its doctor. If the medical officer could persuade his authority to allow one of the clinics to be used by the voluntary committee, that would be one way of surmounting the difficulty.

Dr. TILLEY said that the Public Health Committee was aware of the arrangements which Dr. Maddison had outlined. Everyone was agreed about the desirability of the service, but having considered the matter very carefully the Council had decided it was not the time to press for it.

Dr. A. REZLER (City) supported the amendment, which was carried.

Sewage in the Sea

The meeting considered a motion, moved by Dr. R. P. LISTON (Tunbridge Wells), urging the Government to undertake a full inquiry into the possible danger to public health from the continued disposal of sewage into the sea and river estuaries. Dr. Liston said that the reason for putting the motion forward was to enable practitioners to give a perfectly firm answer when patients asked, "Doctor, is it safe for me to bring my wife and children to the sea?"

Dr. DORIS ODLUM (Bournemouth) said that those people living on the coast knew that sewage in the sea was unsightly and was undesirable on that ground, but how far it was in fact a menace to health was not yet known. It was a subject on which the public needed a good deal of reassurance. The Association should be able to give a lead and ask for an inquiry to ascertain the facts. Dr. R. COVE-SMITH (Marebone) supported the motion. The main point to be stressed, he said, was that effluent and the materials therein should be reduced to as fine a state of division as possible. The criterion of pure and sterile effluent was probably impossible. Dr. H. S. HOWIE WOOD (Isle of Wight) said he understood that by modern techniques it was possible to carry sewage effluent into the sea provided that it had been properly treated and that it was discharged at a sufficient distance from the beach. He suggested that the Public Health Committee might investigate the matter.

Dr. TILLEY, in reply, said that the motion of the sea could not be controlled but that which went into it could be. There was no doubt that in a perfect world Britain would

be surrounded by a beautiful blue or green sea without any obnoxious substance in it at all, but the cost would be very great indeed. At the same time there was no real evidence of grave danger to health arising from the system of sewage disposal into tidal waters. There had been an indication by the Ministry of Housing and Local Government that an inquiry into the matter in connexion with sea-bathing was already in progress.

The motion was carried.

Notification of Infectious Diseases

Dr. A. A. COCHRANE (Dartford) moved:

That this Meeting calls upon the Council to implement the resolution passed in 1955 when it was resolved that this Meeting is of the opinion that a review of the legislation concerning the notification of infectious diseases should be carried out by the Association with a view to making recommendations to the Ministry regarding the form of revision, which is long overdue.

He explained that since putting the motion down he had learned that a special subcommittee of the Public Health Committee had been set up to examine the whole question. There were at present certain diseases which were notifiable although it was no longer necessary that they should be, including pneumonia, relapsing fever, membranous croup, scarlet fever, erysipelas, malaria, whooping-cough, and measles; there were other complaints which ought to be notifiable, such as German measles. Public money was thereby wasted. Fees paid during an epidemic might amount to £3,000 a week over the whole country. The fee paid for notification should be raised but fewer diseases ought to be notifiable, so that the usefulness of notification might be increased. Most of the present legislation dated from 1889.

The motion was carried without further discussion and the remainder of the report under "Public Health" was approved.

Public Health Administration

Dr. J. B. WRATHALL ROWE (Harrow) moved:

That this Meeting, noting with concern a tendency on the part of certain local authorities to separate their public health functions into self-contained departments, reaffirms the principle that all public health work, whether that of medical personnel, public health inspectors, or other auxiliary workers, should be under the direction of the medical officer of health, and that no part of it should be placed under lay control.

In recent months some local authorities had granted chief officer status to the lay head of their public health inspectorate, thereby reducing the authority of the medical officer of health and weakening the overall general direction which he formerly exercised over the environmental health services for which he was statutorily responsible. The preservation of health, in whatever context, should always be a medical matter, especially where infectious diseases were involved. Where it was necessary to apply knowledge of bacteriology and pathology the lay officer could only work by rule of thumb, not having received a sufficiently comprehensive technical and scientific education to enable him to do otherwise; but the rule-of-thumb approach might be distinctly dangerous and might even result in the spread of diseases among the community rather than its control.

Dr. R. M. S. MCCONAGHEY (Torquay) moved to amend the motion by the deletion of the words in the last line, "and that no part of it should be placed under lay control." In many districts three or four local authorities were served by one medical officer, who would find it difficult to keep complete control over his sanitary inspectors all the time. The motion would be stronger with those last words and would be more easily applicable. Dr. ROWE thought that the deletion would, to a certain extent, weaken the medical officer's general direction. If the public health inspector was given chief officer status it might happen that he was not subject to the direction of the M.O.H. Dr. F. A. BELAM (Guildford) said he had been M.O.H. of three different areas and had been perfectly capable of controlling them all without any difficulty at all. Dr. J. B. TILLEY said

that his committee would welcome the motion, with or without the amendment. If it was firmly agreed that the whole department should be under the M.O.H., then it followed that no part of it was under lay control.

Dr. MCCONAGHEY, in reply, emphasized that he had nothing to do with public health administration; his informants had been medical officers who had complained of experiencing difficulty if they could not allow a certain amount of control to their lay officers.

The amendment was lost, and the motion was carried.

At this point Dr. Beauchamp resumed the chair.

Medical Examination of Immigrants

Dr. R. LL. MEYRICK (Lewisham) moved that Council should campaign vigorously for the medical examination of all immigrants to this country. He said the purpose of the motion was not to influence adversely legitimate immigration, but doctors had a duty to offer protection both to our own population and to those coming here. The United Kingdom was one of the few countries which did not raise protective barriers against immigrants, with the result that there was increasing evidence of the existence of a pool of ill-health constantly being supplemented and replenished from abroad. Taking tuberculosis as an example, he said that in 1956 a review of mass radiographs in South-east London showed an incidence of 3.6 cases per thousand overall, but 14.2 per thousand amongst those living in common lodging-houses and similar institutions. In September, 1957, of 245 tuberculous immigrants examined, no fewer than 205 had arrived within the previous 12 months suffering from the disease. Another review of 32,000 x-ray films showed that the tuberculosis rate was five to seven times higher amongst immigrants than amongst the indigenous population. He fervently asked the Representative Body to demand protection for patients by the simple expedient of medical examination of immigrants.

Dr. H. D. CHALKE (Council) pointed out that a similar motion had been carried a few years ago at Brighton, since when the situation had worsened considerably. For the first time since records had been kept, he said, more people were coming into this country than were leaving it, and this at a time when for the first time since about 1870 tuberculosis was on the run. There were now two groups increasing the incidence of the disease. First, there was a high incidence among those from places such as Pakistan—of whom there were 1,000 wandering around cold and unemployed in Leeds at Easter—and rural people coming to an urban environment, conditions they had never before known, living in poor, overcrowded conditions, wandering about and changing their address, perhaps before attending a chest clinic when told to do so. Secondly, there were those from, for example, Ireland, who had not such a high incidence of the disease but who had a high susceptibility to it. The Government had said that the problem could be dealt with by co-operation, yet an edict from Whitehall had prevented the examination of Hungarian refugees, despite the existence of a scheme devised in co-operation between medical officers of health and mass radiography units, who had x-ray plant made available. Since then a minimum of 60 or 70 of those refugees had been wandering about in an infectious condition. There was, he said, no question of racial discrimination. These people had to be protected against themselves and helped to help themselves. He pointed out that immigrants into New Zealand, Australia, and Canada had to have proper x-ray examinations, and the United Kingdom was getting the rejects.

The motion was carried.

Milk

Dr. I. M. JONES (Sunderland) moved:

That this Meeting reaffirms the great value which the profession has hitherto attached to milk as a food and deplores the recent decision of Her Majesty's Government sharply to discourage the production of milk at a time when the average liquid consumption remains below that level which is desirable in the best interest of the health of the nation.

Since 1956, he said, Government policy had been to encourage beef production and discourage milk production by making beef production more profitable. From 1956 to 1958 the price of beef increased by 13%, while, despite production costs rising more for the dairy farmer than the stock farmer, the price of milk to the farmer had been reduced by 3%. According to the Government White Paper issued in March, 1958, the average income in 1957-8 from a dairy farm was £865, but from a stock farm £1,267; the income per £100 of rent for the dairy farm was £308, and for the stock farm £706. In the White Paper the Government also dared to suggest that the production of less milk was in the best interests of the nation. Approximately 60% of calves born in this country were produced by artificial insemination, and in 1957-8 there had been an average fall of 10.7% in the use of dairy bull semen, an 18.1% fall in the use of dual purpose semen, but a 45.5% increase in the use of semen from beef herds. Since the publication of the White Paper there had been a further swing of 10% in the direction of beef production. In April, 1958, for the first time since the 'thirties, there had been a fall in the monthly milk gallonage compared with the previous year. The average daily consumption of 0.7 pint in this country compared unfavourably with that in every other civilized country, being 100% below New Zealand, 55% below Canada, 50% below America, 100% below Scandinavia, and 150% below Switzerland; it was also below the amount specified by dietitians, and for children miles below it. He asked the Meeting to do for milk what it had in recent years done for heroin and crash helmets in obtaining a reversal of Government policy.

Dr. J. W. WIGG (St. Pancras) drew attention to the fact that the promotion of milk as a food was still the subject of an intensive public relations campaign by a commercial organization, and said it was not the duty of the Representative Body either to further or to oppose that campaign. There was no evidence of serious malnutrition in the country, and they should not let themselves be used by publicity people. They should express no opinion on the virtues or vices of the motion, and he moved that they pass to the next business.

This was duly seconded, put to the Meeting, and carried.

Egg Products

Dr. W. B. ADAM (Tunbridge Wells) moved:

That this Meeting requests the Government (a) to ban the import of infected egg products; and (b) to control the production of home dried and frozen eggs, to prevent infection.

He said the motion stemmed from an annotation in the *Journal* of March 8, 1958, on the dangers of imported eggs, which quoted a report of the Public Health Laboratory Service, after examining 20,000 specimen eggs, that apart from *Salm. pullorum*, which was non-pathogenic for man, the percentages of imported frozen egg infected were 5% Australian, 10% Chinese, 16% New Zealand, and, worst of all, 29% British. The report showed a close correspondence between the numbers of strains isolated from egg products and those causing human infection. *Salmonella enteritidis* had more than doubled since 1950, when the import started, and it was therefore clearly beyond reasonable doubt that those products were related to human infection. Rather more serious, Chinese eggs were found to contain *Salm. paratyphi B*. There had been a number of outbreaks of typhoid associated with synthetic cream, and the type of organism isolated was the same from human infection as those recovered from egg products in use at local level. While, he said, M.O.H.s had been active at local level, no Government action had been taken. He therefore pressed for a ban on imported eggs and the control of the home product.

Dr. J. B. TILLEY agreed that trouble had arisen from imported eggs of the type in question and supported the motion.

The motion was carried.

Clean Air Act

Dr. I. R. D. PROCTOR (Chesterfield) moved the motion standing on the Agenda in the name of Chesterfield in the following amended form, leave having been given:

That in view of the high mortality rate from bronchitis in North Derbyshire and certain parts of Yorkshire and Lancashire, and the known relationship between bronchitis and air pollution, and the provisions of the Clean Air Act this Meeting considers that the provisions of the Act should be rigidly enforced in these areas forthwith, and that local authorities be pressed to proceed with the establishment of smoke-control areas.

The mortality from bronchitis, he said, was notably higher in the industrial areas mentioned in the motion than in the rest of the country. Taking the overall average death rate as 100, some areas had figures of over 130. There was growing evidence that the incidence of bronchitis, and therefore mortality from it, was increased by air pollution, and especially by high sulphur dioxide levels. The Clean Air Act was a first step in the right direction, but suffered from weaknesses and omissions. The degree of reduction in air pollution depended on the enthusiasm of the local authorities concerned. Only a limited quantity of smokeless fuel, other than coke, was available for householders, and half the air pollution came from domestic chimneys, so that there was a case for increasing the production of smokeless fuels and giving priority in distribution to areas of high air pollution. Industrial concerns were given a seven-year period of grace in which to reduce their pollution by exhaust gases; a subsidy, reduced each year, would encourage early improvement. Many industrial plants came under the Alkali Act of 1906, as amended in 1926, and not under the Clean Air Act. That legislation was out of date, and the permitted level of noxious effluent should be lowered by making use of recent technical advances; the permitted level of 4 grains per cubic foot could be halved. No provision was made to curtail the building of industrial plant in areas already highly polluted. More attention should be paid to medical and meteorological advice in the siting of new plant.

Dr. G. R. OUTWIN (Doncaster) moved as an amendment to add at the end of the motion the words:

and that in all areas within which the enforcement of the Clean Air Act is desirable the initial enforcement shall be directed towards those communities from which the greatest opposition to such enforcement is to be anticipated—namely, the local authority public housing estates.

In his area, he said, the initial enforcement was directed against factories and a section of the private housing area. As the latter was surrounded by municipal housing estates, containing a fair proportion of colliery families, it was not likely to improve appreciably the lot of the community as a whole. The hard areas should be attacked first.

Dr. J. B. TILLEY, while agreeing that a great deal of the pollution came from domestic chimneys, said that the amendment singled out a particular group of houses and implied that on local authority housing estates less would be done than could be done. He did not think that could be supported so far as the country as a whole was concerned. Dr. OUTWIN replied that his intention was not to single out any group but to devise a means by which the scheme could be introduced most effectively.

The amendment was lost.

Dr. TILLEY said that the Public Health Committee welcomed the motion, and it was carried.

Dr. ELIZABETH V. ROHR moved on behalf of Marylebone that the Minister's attention be called to the low level of smallpox immunization throughout the country, and urged that a campaign to rectify it should be renewed at once. It was said that about 40% of the population were effectively immunized, and even that might well be an exaggerated figure. All present were aware of the panic which ensued when a case of smallpox was suspected in the population. Dr. H. B. MUIR (Fife) said that, while he supported what Dr. Rohr had said, he did not feel that the objective

would be attained by the suggested approach alone. The remedy lay in the hands of general practitioners. The National Health Service provided a golden opportunity and a challenge to the profession in the practice of preventive medicine. "I regard vaccination and inoculation as a continuation of post-natal care," said Dr. Muir. "I do not believe that the family doctor should wait until the mother brings the child to him. He ought, in the interest of preventive medicine, to go to her." The motion should encompass general practitioners and public health authorities as well.

Dr. R. LL. MEYRICK (Lewisham) stressed the importance and urgency of the motion. There was an epidemic of smallpox now in Pakistan, which was not very far away in present times, and over 15,000 people had died in recent weeks.

The motion was carried.

ELECTIONS

It was announced that Dr. G. W. IRELAND and Dr. J. C. MACARTHUR had been elected unopposed as members of Council for 1958-9, and Dr. T. W. DAVIES (Swansea) had been elected unopposed by Welsh Representatives.

FINANCE

The Treasurer, Mr. L. DOUGAL CALLANDER, moved that the Annual and Supplementary Reports of Council under "Finance" and the Financial Statement for the year ended December 31, 1957, be received.

He reminded Representatives that when he presented the accounts in the previous year he drew attention to the rapidly diminishing margin between income and expenditure, and pointed out that a situation might arise in a few years' time of a much more serious nature. At that time he stated there was no occasion for undue optimism. Indeed, it was thought at the close of the year that an adverse balance might be shown. Mr. Callander said he was now happy to say that it was found possible to carry forward a small surplus to the accumulated fund; but the result was only achieved by surpluses on publications which were much greater than was then anticipated, and from a number of what might be described as "windfalls" to which reference would be made later.

Referring to the income and expenditure account, it would be seen that revenue from subscriptions, after providing for losses on collection and exchange, amounted to £269,252 as compared with £264,331 the previous year. Membership in 1957 reached a fine figure of 71,141, the highest ever in the history of the Association. It had been achieved by a propaganda drive, initiated by Headquarters, and there had been much help and co-operation from Branches and Local Divisions. There was, however, still room for improvement in the membership, and he urged Divisional secretaries and members of executive committees to devote their energies to improving the membership position.

Mr. Callander stressed—as he had done last year—that the income from subscriptions had, for many years, not been sufficient to deal with the expenditure of the Association. By way of a bright spot on the income side, he disclosed that, as a result of various leases having fallen in, and because it was known that others would fall in the course of the coming year, it had been possible to increase rentals by about £5,000 this year. That figure would increase, during the next two or three years, to something like a further £20,000. B.M.A. House had been one of the finest investments that the Association had ever made. There had been a small drop in the income from investments, owing to the reduction in the Treasury bill rate consequent upon the reduction of the bank rate. The accounts showed a total income of £295,000, as against last year's figure of £287,000.

On the expenditure side, the only item which was less than that of last year was in respect of the secretarial and finance departments, due to a number of "windfalls" from

various sources. *Family Doctor* had paid the Association £3,000 for office expenses, but it had to be borne in mind that next year's contribution from that source would be only a sixth or seventh of that amount. A similar sum had been received from the Hospital Medical Staffs Defence Trust for work done in connexion with their committee. Acknowledgment was due of the continued very substantial assistance given by the National Insurance Defence Trust and the General Medical Services Defence Trust in relieving the Association of all but £500 of the cost of running the General Medical Services Committee—a gift which was very much appreciated. Central meeting expenses had risen from £22,000 to £31,000, this being to a considerable extent due to the cost of the special A.R.M. Furthermore, increased membership meant an increase in capitation grants. In a very generous gesture, the New Zealand Branch had refunded to the Association for 1957 the sum of £750 when they had noticed the financial position of the Association. He extended to them his most sincere thanks. After providing for the third instalment of £5,000 for the joint meeting with the Canadians next year in Edinburgh, a surplus of £6,552 had been carried forward.

A new Clerical Staff Superannuation and Assurance scheme had been set up whereby when a person became entitled to superannuation he could take so much of it as a capital sum and had to pay tax on the interest content only. The funds of the new scheme had been invested in local authority loans at 5½ to 6½% for a period of 20 years. It should be possible in that time to show a surplus which could never have been contemplated three or four years ago; that would make it possible either to reduce the premiums or to pay larger bonuses, as the various insurance companies in the country working in similar circumstances were able to do.

There was still room for considerable increase in the charity contributions.

The auditors had declared that the valuations of the Association's premises in London and elsewhere were nothing like what they should be; as a result of a new estimate, the figure had jumped to £800,000—a very conservative estimate of the value with 160 years of lease still to run. The saleable value of the library had been uplifted to £27,000. A new item on the liability side was the capital reserve. The budget approved by the Council envisaged a net deficit of something like £13,000, provision being made for a full year's cost-of-living bonus to the staff and heavier postage bills as from last October, costing many thousands of pounds, which would have to be met in this full year. The Journal Committee had thought it prudent to make provision for increased cost of printing. The cost of a possible further meeting in connexion with the remuneration claim had also to be considered. However, there was already evidence that it might not be necessary to provide for all those contingencies in the current year, and it was possible that, with care, with an improvement on the budgets of other departments, the year could be closed with a smaller deficit than had been anticipated last December. But the fact must not be ignored that the Association was living on a shoestring. It did not want to accumulate large surpluses, but there had to be reserves which could be called upon to meet inevitable emergencies from time to time.

Dr. O. C. CARTER (Bournemouth) asked whether paragraph 136 of the Annual Report of Council complied with the requirements of articles 52 and 53. He agreed with the Chairman that, in effect, what he was asking for was a full balance sheet.

Mr. CALLANDER said that that had never been done; it would mean a tremendous lot of extra printing and a lot of information included which not one in a dozen would follow. If it was the desire of the Annual Representative Meeting to have that, it would be carried out. Dr. CARTER said that a few years ago details of the estimated income and expenditure had been provided. He did not see how it was possible to discuss matters and for Branches to put down motions when they were not provided with the neces-

sary information, particularly when there was talk of increasing the subscriptions.

The CHAIRMAN said that for several years there had not been a detailed account of the estimated budget. Questions could, of course, be asked of the Treasurer on any items, and he pointed out that the Auditor's Report covered the matter.

On his putting it to the Meeting, the Representative Body decided that there was sufficient information available in the present report, and also that it did not require a more detailed budgetary account next year.

Dr. IAN D. GRANT (Glasgow) moved:

That this Representative Body, recognizing that the steadily increasing expenditure in all departments of the Association will inevitably necessitate increases in the subscription, declares as its policy that the time has now come for some retrenchment in the activities of the Association.

He said that despite the gratitude felt in Glasgow for the new B.M.A. House there, they put forward the motion because they considered it the duty of the Representative Body to formulate the policy of the Association. He felt that Council members were trustees of the Association and had no right to spend money in excess of what was obtained from subscriptions, rents, and investments unless the Representative Body had given full approval. The point had been reached in their financial position when it would be very difficult to maintain the day-to-day activities, and would certainly be impossible to embark on new activities at present income rates, from which he excluded fortuitous gains from the *Journal* and *Family Doctor*, which should be regarded as windfalls and placed to reserve. He emphasized that the motion was intended to be in no way critical of any member of the staff, all of whom carried a tremendous burden of work.

Over the past ten years, he pointed out, there had been established the International and Commonwealth Medical Bureaux costing about £7,000 annually; each year membership of the World Medical Association cost £7,000; the Public Relations Department £14,000, subsistence allowances to members of the R.B., Council, and committees about £7,000 to £8,000; there was the non-recurring item of £20,000 for the Edinburgh Meeting; goodwill visits had been paid to overseas Branches and European countries, which undoubtedly did tremendous and intangible good to the Association; *Abstracts of World Medicine* had been published at a loss of about £14,000 a year, which was a contribution to medicine by the Association and was more than met by the profits made on other journals.

If the present membership was maintained and overseas members were no longer subsidized, he thought that by exercising due economies they could carry on effectively at the present subscription rate. Economies were always unpopular and difficult to suggest, but he tentatively suggested that no new subcommittees or committees be appointed unless absolutely necessary, for they consumed a great deal of Association money, in both the use of clerical staff and the payment of railway fares. It might also be suggested to committee chairmen that for the next year or two they should do what was done when the Association was in financial straits before, and cut down the number of committee meetings. Also, unless the cost of living continued to rise dramatically, he thought the present wage and salary level might be stabilized. The object of the motion, he continued, was not to cut out any of the present activities, but to achieve retrenchment in new activities. To reject the motion and thus give approval to embarking on new projects would, he asserted, necessitate a substantial rise in subscription.

Dr. D. H. ANDERSON (Sheffield), on a point of order, said that Dr. Grant had referred to new activities of the Association, but the motion spoke of "retrenchment in the activities," which presumably meant the present activities. The CHAIRMAN said he had thought of pulling up Dr. Grant on that, but he assumed that Representatives would realize on what they were voting. They would vote on the actual words of the motion.

Message from Sir Arthur Porritt

At this point the SECRETARY announced that a telegram had been received from Sir Arthur Porritt asking that his sincere thanks be conveyed to the Representative Body for the honour they had done him by electing him President for 1960-1.

Deputy Chairman of Representative Body for 1958-9

The SECRETARY also announced that Dr. A. Talbot Rogers had been re-elected Deputy Chairman of the Representative Body for 1958-9.

The Meeting then adjourned for half an hour for tea.

FINANCE (continued)

Dr. O. C. CARTER (Bournemouth) contended that the Association should be able to live within its income, but complained that no document had been submitted showing how the money would be spent and what would be received. The Treasurer said that the income for 1957 was £8,000 more than for 1956, but in paragraph 131 of the Report of Council reference was made to a difference of £18,000. In 1952, when an increase in the subscription had been authorized, an amendment had been carried instructing the Council to consider the possibility of bringing down the subscription rate within two years, but there now seemed no question of its coming down, and it might go up considerably. The income in 1957 was £78,000 more than it had been in 1952, and yet it was said that the Association could not live within it. If a document were submitted setting out the detailed position it might be possible to find some activities which, though desirable, were not strictly necessary. The Treasurer had said that to present a detailed account of income and expenditure would necessitate a great deal of work, but such a document had been before the Finance Committee and the Council, so it was difficult to see what extra work would be involved in sending it to every Division and printing it in the *Journal*.

Dr. E. C. DAWSON (Council) asked the Meeting to reject the motion, in view of its wording. The motion asked for retrenchment in the activities of the Association, and this would compel the Council to reduce its activities and would mean that no new expenditure could be undertaken; yet the question of intraprofessional relationships, with which the Representative Body had already dealt, might mean a great deal of expense, and a crisis lay ahead which might entail spending a great deal of money. The wording of the motion meant that it would be a great embarrassment to the Council.

Dr. R. B. L. RIDGE (Enfield and Potters Bar) asked the Representative Body to reject the Glasgow motion. The meeting had already been given one definition of retrenchment, and he would give another. It was retirement to prepared positions in accordance with a plan—the old story in the communiqué for retreat. The coming year might well prove to be the most momentous in the history of the medical profession in modern times. Was that the time to retreat? Was that the time to think in terms of limiting the expenditure of the Association?

Dr. WAND said he understood that the Glasgow motion was submitted with the object of asking the Representative Body to determine at once whether it felt that the Association should cut its coat according to its cloth, or carry out all the activities which it was asked to do. That was a fair question to put to the Representative Body, and a clear-cut decision on the motion would indicate to Council which way the Representative Body wanted things to move financially. He reminded representatives that all the publications and property of the Association made a contribution towards the activities of the Association. He also reminded the meeting that from 1922 until 1950 the subscription was three guineas for home subscribers. If one added to that the betterment which was appropriate it would be found that the present subscription should not be six guineas but something nearer eight guineas. That allowed only for the

change in the value of money. Yet since that time new regional offices had been opened for the convenience of members, and the Association had done a number of things to which no reference had been made. But, above all, since that time the Association had been involved in a national health service, and that had produced an infinity of problems. In many cases those problems were new and difficult and involved time spent by committees and legal advice.

Even overseas there had been so many changes and suggested changes that it had been necessary for the Association to spend more money than hitherto. If there were retrenchment, it was necessary for the Representative Body to decide whether it retrenched on present spending or future spending. It had been decided that a Review Committee should be set up. It would cost money. Agreement had also been reached in general principle that intraprofessional relationships should be improved. That would cost even more money. What, in the end, did retrenchment mean? asked Dr. Wand. If the subscription went up by four guineas, to the general practitioner it was equivalent to a family of four removing from his list. "I ask this Representative Body whether it is prepared to jeopardize its future simply because each practitioner is involved in a loss of income equal to that of one family of four," he concluded.

Dr. ALEX SMITH (Lanarkshire) wished to correct a misapprehension that Dr. Grant might have created. The Central Consultants and Specialists Committee (Scotland) paid its own expenses and was able to send a contribution to the central fund. That was done because the money was deducted at source. Dr. J. S. McLAREN ORD (Glasgow) said it was unnecessary to make heavy weather of the motion. All it pointed out was that members were faced with an inevitable rise in their annual subscriptions, and, that being so, they should take stock of what was being done and find out if anything could be done to lessen expenditure. "If we continue to spend as we are doing, so, with a small rise in the cost of living, will our expenditure rise and our annual subscription," he said, "and the time has arrived to look to what we are doing and find out if we are spending wisely, knowing that we are the custodians of the purse of the B.M.A."

Dr. J. E. MILLER (Glasgow) said that what concerned him at the present time was not so much a question of retrenchment as that an increase in subscription might cause a marked reduction in the membership of the Association. Those who had the interest of the profession at heart might not object to an increase of three or four guineas, but there were many members who under the slight provocation of such an increase might leave the Association and thus reduce its strength at a time when it needed every possible support. No one liked to retrench if it could be avoided, but there were many who believed that an increase in subscriptions might be the worse of the two evils.

Mr. CALLANDER said that many economies had been effected during the year, but they were lost in the accounts because other expenses had come along and swallowed them up. If the Association was to maintain its position members must be prepared for extra expenditure.

Dr. GRANT, in reply, said he was not making any fervent appeal to Representatives to pass the motion. What Glasgow particularly wanted was that there should be a clear-cut expression of opinion from the Representatives on whether they were willing to go back to their constituents and tell them what the financial situation of the Association was at present, and what would be its financial situation in the very near future.

The Glasgow motion calling for retrenchment in the activities of the Association was lost.

Dr. R. B. L. RIDGE (Enfield and Potters Bar) moved:

That this Meeting prefers an increase in the annual subscription of the Association to a budgetary deficit.

"How can the B.M.A. represent itself as the strong right arm of the medical profession when it is limping on the

border of an overdraft?" he asked. Those who read the story of the development of health services in other countries would find that in those where the profession was united—in particular, Australia and New Zealand—the medical profession had been able to dictate the type of health service which it thought would be in the best interests of the patients and would best preserve the traditions of the profession; in countries where disunity prevailed it had got nowhere. The only things that the ordinary member of the Association could do to promote the strength and unity in the profession were (1) to be loyal; (2) to pay his whack. When a time came such as that which now faced the profession they would be only too willing to pay more.

Dr. D. L. GULLICK (East Herts) commended the motion to the meeting as being no more than Micawber's advice stated in other terms—if the income did not increase by 6d. over the expenditure, result: misery! The budget deficiency was due purely and simply to inflation. The value of the £1 was half what it had been in 1939, when the subscription had been three guineas. It had thus only doubled; no one could complain if it trebled in the course of the next year or two. Dr. W. E. DORNAN (Sheffield) said that about two months ago Council had, by a very narrow majority, decided not to recommend to the R.B. this year that the subscription should be raised, but he believed that there was not one member of Council who did not believe that it would have to go up within the next twelve months or two years. He wished that Council had in fact recommended one.

Dr. C. P. WALLACE (Guildford) asked the R.B. to reject the motion without hesitation, on the grounds that it was untimely. Dr. H. FIDLER (Bradford), appealing to the R.B. to be "logical," said that in the last two or three years a pay claim had been put in for a considerable percentage increase in doctors' pay owing to the altered value of money; the expenses of the Association had risen during that period for the very same reason. Mr. CALLANDER said that the subject had been well debated and he proposed to leave the motion to the wisdom of the R.B.

The Enfield and Potters Bar motion was carried.

A motion by the Treasurer for adoption of a Council Recommendation that, pending a general review of membership subscription rates, there should be a surcharge of one guinea for overseas members, was by leave withdrawn in order to allow for further consideration.

Mr. CALLANDER moved the adoption of the following Council Recommendation:

That the Council be authorized to adjust the concessional rate of £4 4s. paid by certain members in the light of any tax relief that may be allowed to members assessed under Schedule E as a result of the Finance Act, 1958;

and to make the necessary amendment to By-law 16 (1).

An amendment by Dr. WRATHALL ROWE (Harrow) to the proposed amendment to the By-law, which it was argued would avoid future unnecessary alterations of the By-law, was lost.

The Recommendation was adopted.

Motions by Derby, Trowbridge, and Sunderland were, by leave, withdrawn.

Dr. H. B. DODWELL (Consett (with Hexham)) moved:

That, except in the cases of the newly qualified and members retired or of over 40 years' membership, all members shall pay an annual subscription at least adequate to cover the cost to the Association of providing them with their weekly copy of the *British Medical Journal*.

He pointed out that, based on the Treasurer's report to the Council of March 16, the cost of sending the *Journal* to overseas members, namely £3 15s. per annum, was barely covered by their subscriptions.

Mr. CALLANDER pointed out that overseas subscriptions were not being discussed at the Meeting, and that he had himself only a few minutes earlier withdrawn a motion on this subject.

The motion was lost.

Subscription Rates for Newly Qualified

Dr. R. P. HENDRY (Rugby (with South Warwickshire)) moved: "That this Meeting considers the subscription payable by a member for the first 13 months after qualification should be half a guinea." The newly qualified should be encouraged to join the Association at the moment of their triumph over the examiners and should be given a warm welcome to what was probably the most altruistic organization in the world. The actual membership as a proportion of the possible had fallen by 1% in the past year, and since 1951 by 6%, the decline being mainly in the entry of the newly qualified.

Dr. H. G. DOWLER (Gloucestershire), opposing the motion, said that the Organization Committee was working hard to get the newly qualified to join, and subscription rates were constantly discussed. He believed that they had the best possible arrangement at the moment.

The motion was lost.

Husband and Wife Combined Subscriptions

Dr. T. B. ANDERSON (Cambridge and Huntingdon) moved that where a combined subscription for husband and wife was paid to the Association only one *Journal* should be sent.

The TREASURER pointed out that the Association was required by the By-laws to send a *Journal* to each member, as it was the only way of communicating domestic matters to members. But when a husband and wife asked for only one *Journal* between them their request was met. Miss GLADYS M. SANDES (Marylebone) thought that a single *Journal* for husband and wife would not be satisfactory, but if they were being subsidized as a result of their concessional subscription rates they should be told so and asked to make up the difference.

The motion was lost.

The remainder of the Annual and Supplementary Reports of Council under "Finance" was approved.

Subsistence Allowances

Dr. C. HARROWER (Glasgow) moved what she felt would be the most unpopular proposal to come before the Meeting—namely, that in view of the financial position of the Association, subsistence allowances be discontinued. Subsistence for the Representative Body, she said, cost about £4,000, and the total cost of subsistence allowances to the Association, excluding the General Medical Services Committee and the Conference, was about £8,000 a year. She thought it was their public duty to do without subsistence allowance. It was said that more young people had been able to attend the A.R.M. since subsistence was paid, but the older one became the younger other people looked, and what prevented young people from coming was not lack of money but lack of time.

Dr. M. R. SHERIDAN (North Middlesex), opposing the motion, said it was the best possible representatives of Divisions who should attend the A.R.M., and not simply those who could afford to come. Dr. ERIC TOWNSEND (Cornwall), taking the same view, said: "If you want a mediocre Representative Body and Council, pass the motion and save your miserable £7,000." Dr. A. H. GRANT (Trowbridge), on the other hand, said his Division wanted the subsistence allowance withdrawn and felt that Divisions should support their representatives if there was hardship.

Dr. AVIS M. BLUNDELL JONES (Exeter) opposed most strongly, she said, four-fifths of the motion, but supported equally strongly the remaining one-fifth; in other words, the A.R.M. lasted five days and she felt that no subsistence should be paid for the Sunday. That would show that doctors wished to be paid only for an honest day's work.

The motion was lost.

Repair of Books

Dr. R. M. S. MCCONAGHEY (Torquay) moved that, notwithstanding the need for stringent economy, the Council should consider the advisability of setting aside annually

the sum of £150 for the repair of valuable and historic books in the possession of the Association, and supported his plea by producing three volumes from the Library which showed the state which some of the older books had reached. At the suggestion of the TREASURER it was decided to refer the motion to the Science Committee.

The Meeting then adjourned until the following day.

THIRD DAY

Saturday, July 12

The Meeting resumed at 10 a.m., with Dr. A. BEAUCHAMP in the Chair.

MEDICAL FILMS

Moving the reception of the Annual Report of Council under this head, Dr. R. P. LISTON (Chairman of the Film Committee) said that during the past year the number of applications for film showings had increased. Unfortunately, he added, the necessary financial backing had not been obtained for making a film on industrial rehabilitation. The Report was received and adopted.

MEDICAL ETHICS

Dr. S. NOY SCOTT (Chairman of the Central Ethical Committee) moved the reception of the Annual and Supplementary Reports of Council under this head, and the Revised Rules of the Committee. He prefaced his remarks by paying tribute to Dr. Robert Forbes, former Chairman of the Committee, for his long service, who, he said, was absent from the Meeting for the first time in 28 years.

There had, he continued, been prolonged correspondence with the Ministry on the question of professional secrecy about cancer registration. As it was felt that a too strong insistence on that one issue might result in psychological harm to patients, to whom their paramount duty lay, the Council had given way, while reaffirming the principle and making clear it was an exceptional case. Clarifying the powers of the Central Ethical Committee *vis-à-vis* the Council had been, he said, a complicated task. To summarize the revised rules, the Council was made the final arbiter in cases of expulsion, but the Committee was left to investigate the case and establish the facts, which must be accepted. Anyone whose expulsion was recommended could produce evidence or other matter in mitigation to the Council.

CONTRACTUAL VALIDITY OF G.P. SPENS REPORT

Scottish Case

At the request of the Chairman, the Meeting agreed to vary the order of the agenda so that a statement by the Chairman of Council might be interposed.

The CHAIRMAN OF COUNCIL (Dr. S. Wand) then made a statement informing the Meeting that the Secretary of State for Scotland had been asked to give his consent to the presentation of a special case to the Scottish Court of Session raising the question of the contractual validity of the G.P. Spens Report. Dr. Wand's statement setting out the matter in detail is printed in full at page 80.

Dr. Wand told the Meeting that he had sent a letter to the Minister of Health and to the Chairman of the Royal Commission informing them of the action that had been taken. The matter had been laid before the Secretary of State for Scotland, who now held the letter from the Association's solicitors.

MEDICAL ETHICS (continued)

Dr. F. GRAY (St. Pancras) moved that the statement approved by Council, as set out in the resolution in paragraph 108 of the Annual Report, be amended by the omission of the first three lines and the substitution of:

That general practitioners and dentists should, wherever possible, avoid sharing the same premises for professional purposes. The Council, recognizing that such sharing may, in certain circumstances, be unavoidable or even desirable. . . .

Last year's general statement, with which all had been in agreement, had been rather rigid and the Representative Body had asked the Council to safeguard the position of those in exceptional cases. The new statement, as printed, did not appear to set out the main principle. The decisions of the Representative Body on ethical matters, set out in cold print, were of the utmost value for reference and advice for doctors in doubtful cases. During the last month embarrassment had been caused in three cases in London alone through the absence of a statement of policy to which to refer until the Representative Body had taken a decision.

Dr. NOY SCOTT said that he would be willing and happy to accept Dr. Gray's text, which expressed exactly what the Committee had had in mind but in better terms.

The new text was agreed to.

Professional Secrecy

Dr. R. P. HENDRY (Rugby (with South Warwickshire)) moved that minute 281 of the A.R.M., 1952, on the subject of professional secrecy, which provided that a practitioner must refrain from "disclosing voluntarily without the consent of the patient (save with statutory sanction) to any third party information which he has learnt in his professional relationship with the patient," be amended by inserting after the words "statutory sanction" the words "or for approved medical research, such as cancer registration." He asked the leave of the Meeting to omit the words "approved medical research, such as," but this was refused.

The proposal, he said, would nominally involve a change of policy, but it meant no change in what was in fact done; it simply regularized the position. Cancer-registration schemes had the support of all doctors, and information should be given for the purpose; but information must not be divulged without the consent of the patient, and some doctors on some occasions might not want to tell a patient that he had cancer.

Dr. H. GLYN JONES (Bromley) said that the Central Ethical Committee had decided that cancer research was a special matter where disclosure might reasonably take place, but had made it clear that this was to be regarded as an exception and not a precedent. The motion would make it a precedent and not an exception, and he urged the Meeting to reject it. Dr. J. S. McLAREN ORD (Glasgow) said that cancer was generally diagnosed in hospital. In Glasgow the names of the patients were registered at the hospitals which they attended, and they kept in touch with that hospital for many years. He opposed the motion. Dr. A. R. FRENCH (Marylebone) maintained that it could safely be left to the conscience of every doctor to deal with each case in the interests of his patient, and there was no need for rigid rules. Dr. S. NOY SCOTT (Chairman of the Central Ethical Committee) agreed with previous speakers and urged the rejection of the motion. Dr. HENDRY, replying, asked whether it was contrary to the ethical code to give information on cancer, or were they to say one thing and do another? He suggested that the motion be referred to Council. (Loud cries of dissent.)

The motion was lost.

Dr. R. M. WARREN (Southampton) moved:

That the Annual Representative Meeting instructs Council to re-examine the disclosure of information to the appropriate medical authority when a doctor is aware of a disability in a public service official which in his opinion may endanger life.

While fully appreciating that professional secrecy was of fundamental importance in the doctor-patient relationship, he said that his Division recognized a wider sphere of responsibility towards the general public, such as already obtained in the notification of infectious diseases. Every year the lives of millions of people using public transport were in the hands of airline pilots, engine drivers, bus-drivers, guards, and signalmen, yet, he pointed out, permission to disclose an illness rendering any one of these unfit to continue work had been persistently denied. In a recent investigation by Dr. E. C. Dawson, he went on, 84% of a representative cross-section of doctors had been in

favour of notifying the responsible authority of a driver with epilepsy.

Dr. A. M. MAIDEN (Lincoln) pointed out that in Dublin, in 1952, the Central Ethical Committee had made a similar recommendation, feeling that some relaxation of the rigid rule of professional secrecy might, under great safeguards, be considered. It was, he said, terrifying to think that one's own child might be the victim of an accident involving a car driven by an epileptic known to the doctor himself. "By giving the epileptic a motor-car," he added, "we have armed him in this modern world and made him lethal." He supported the motion, which he thought expressed the wish of the majority of the profession.

Dr. R. L. LUFFINGHAM (East Yorkshire), speaking as a doctor employed by a public authority, opposed the motion, which he said was nothing but a proposal to "pass the buck" because the general practitioner was either not efficient enough or not confident enough to deal with the matter himself. An engine driver suffering from epilepsy, he added, had not a hope of staying on the footplate for six months before his condition was brought to the attention of the management, his union, or his mates. Where was the danger when he had either a fireman with him or a "dead man's hand"? It had been said that a man suffering from coronary thrombosis should not drive a car, but, he said: "No person over 50 can expect to get into a car and be absolutely certain he won't drop dead as he drives down the street." But such accidents, he pointed out, happened only about once every six months. The prevention of epileptics driving cars was, he continued, a matter for legislation, and the Minister was at fault in not providing means of ensuring the proper filling up of the driving certificate application form.

Dr. E. C. DAWSON (Council) supported the motion, which he said would give the Committee an opportunity to study the question and produce a report next year. Dr. J. S. McLAREN ORD (Glasgow) argued that the motion would defeat its own object, because if it were accepted any public service employee knowing he had a disqualifying disability would carry on working untreated rather than risk being unemployed. From a long experience of post-mortem examinations in accident cases he could not say that the maintenance of professional secrecy had contributed materially to the cause of fatalities. Dr. NOY SCOTT hoped that the motion would be accepted in order that the problem could be re-examined and reported on next year.

The motion by Southampton was carried.

Rules Governing Procedure in Ethical Matters

Dr. NOY SCOTT moved the adoption of the recommendation that the Revised Rules of the Central Ethical Committee be approved, and in amplification of his former remarks pointed out that provision was made that a practitioner intending to make a complaint against another must inform him of his intention in writing.

A proposed amendment by Lincoln was, by leave, withdrawn.

The Recommendation was adopted.

On the motion of Dr. NOY SCOTT, a Recommendation that a consequential amendment of Rule 7 of the Revised Rules governing procedure in ethical matters was adopted, as was a Recommendation that all Divisions and Branches be urged to adopt the revised wording of Rule 7 before December 31, 1958, after which date the Association would accept no responsibility for any ethical proceedings by a Branch or Division otherwise than in strict accordance with the new wording of Rule 7.

Mr. H. H. LANGSTON (Winchester) moved, as a reference to Council:

That in view of the alterations in the Branches of the Association whereby there will be fewer but larger Branches, this meeting of the Representative Body requests Council to take steps to amend Rule 11 of the Ethical Rules relating to a Branch so that the number of elected members to a Branch ethical committee be increased from seven to nine.

He said the motion concerned matters which were before the Constitution Committee in considering a revised Branch structure, and it would appear probable that some modification of the structure of the local ethical committees would be necessary in the light of recommendations coming up. Upon Dr. NOY SCOTT's acceptance, the motion was carried as a reference to Council.

Remainder of Report under "Medical Ethics"

Dr. DORIS ODLUM (Bournemouth) expressed satisfaction that the Council had deplored the practice of members of the ambulance service on certain occasions reporting to the police cases of attempted suicide when the ambulance had been summoned by the doctor actually in charge of the case, such information being given without the doctor's consent. This was a violation of professional secrecy which, in the present state of the law, might well lead to the patient being taken to court and possibly even sent to prison. The practice of making such disclosures was not universal; it depended entirely on the attitude of the local authority.

Dr. C. P. WALLACE (Guildford) said he had read the report with interest but profound disquiet. Things in the outside world had been moving during the past year; the Association, as represented by its Ethical Committee, had stood still, wasting and dissipating its energies on pettifogging matters. Yesterday the R.B. had wisely decided not to pass any resolution which would interfere with cancer education, yet the Association still intimidated and prevented learned members of the profession from giving information to the public, so that it reached the public behind the screen of anonymity. He could see nothing unethical, immoral, or improper in a well-known and highly respected surgeon addressing the public on cancer; yet, according to the Ethical Rules of the Association, that would be out of order. He then paid a tribute to the excellent chairmanship of Dr. Forbes; his absence was noted with profound regret and doubtless all would wish to send him their best wishes for his speedy recovery.

Dr. NOY SCOTT said that one of the items on the agenda of the next Central Ethical Committee's meeting was to reconsider anonymity in television.

The remainder of the report under "Medical Ethics" was approved.

HOSPITAL AND CONSULTANT SERVICES

Mr. T. HOLMES SELLORS (Council), moving the reception of the report of Council under "Hospital and Consultant Services," said that the most important matter considered during the year by the C.C. & S. Committee and the Joint Consultants Committee had been hospital staffing, mixed up with which was the problem of the time-expired senior registrar and that of the S.H.M.O. The hard core of the time-expired senior registrar occurred mainly in general medicine and general surgery. There were estimated to be between 100 and 110 in each specialty who could not be employed as consultants, although in nearly every case they were fully equipped for consultant work. It was felt that there should be a survey of hospital establishments to find out where in the country there was a deficiency of consultants. That should not be difficult to achieve if it could be done from the periphery, whereby each hospital group would examine its own establishment without fear, let, or hindrance or any parochial feelings, to decide whether or not they were adequately staffed; the findings could then be collected and sent to the Ministry for examination. But the Ministry had persistently refused to accept that principle. It had been hoped that while the review was going on the Ministry might consider giving some of the time-expired registrars a limited period of security of tenure, so that they would not be open to risk of dismissal, and also, very rightly, give them a salary increase. That, too, had been refused.

Finally, the Joint Committee had met the Minister, who said that he was under considerable Parliamentary pressure to find a solution to the problem. But he would not accept

the Association's views and had imposed his own attempted solution, which was to create a special type of post to be determined by regional hospital boards when they felt that there was a vacancy for a man doing such advanced work.

The Central Consultants and Specialists Committee and the Joint Committee had rejected that idea completely as being mere stalling for political expediency. It was impossible to establish such posts until there had been a review to find out where the vacancies existed. The effect would be that the bulge would still exist. The only suggestion of the Ministry which had been accepted as providing a loophole to continue negotiations was the formation of a working party which had as its terms of reference to study the whole of hospital staffing. It was hoped that its meetings would be very frequent and that a wide geographical survey would be carried out, every branch of the country being studied, and that particular attention would be paid to the problem of the time-expired senior registrar and the S.H.M.O. Whether an accurate and successful solution could be achieved remained to be seen, but he could not imagine that a report from such a working party could be produced in less than 12 months.

The Management Side of Whitley Committee B had agreed to consider the cases of S.H.M.O.s doing consultant work of the sort that, when the post was vacated, would require a consultant replacement, and the Staff Side had perhaps been a little optimistic in hoping that this would lead to the possibility of a salary increase. The cases of about 500 S.H.M.O.s had been selected as suitable for placing before the Management Side for discussion. There was, however, the disconcerting feature that it appeared that the Management Side had had no idea that the problem was so extensive, and they had quickly reverted to their original terms—that they would look at such cases and see what the nature and size of the problem was but would not commit themselves. That was as far as the matter could be taken at the present moment. However, consideration of the problem would continue independently of the working party being in action.

With regard to distinction awards, the Chairman of the advisory committee had admitted that the system was not perfect, and had said that if a better one could be suggested he would be happy to examine it. It was the general view that the system was open to criticism, but that at the moment there was no better one, so that it should be allowed to continue. One alternative considered was payment for responsibility, but that should be rejected, as it bore no relation to merit but rather to increasing years.

A number of practitioners had through no fault of their own been relieved of a substantial part of their sessional employment. They had been through the procedure of appeals, but there remained the "moral obligation" clause, and the Minister agreed that there was a moral obligation to find those concerned equal employment. A great number of practitioners had been placed in equivalent employment, but there remained a hard core of a few people who were out of employment and had no access to the Health Service. Two days ago Mr. Holmes Sellors had met the Minister to discuss these cases. The Minister had studied all the cases and agreed that the moral obligation clause existed; he said that his officials were prepared to discuss each case again in detail to see whether or not everything had been done to fulfil the clause, and, if it had not, to see what could be done.

Constitution of C.C.&S. Committee

To the Recommendation of the Council on this subject the Meeting agreed, on the motion of Dr. D. H. ANDERSON (Sheffield), that the following addendum, which Mr. Holmes Sellors accepted, should be added: "these representatives not to be eligible to represent the Central Consultants and Specialists Committee on the Joint Consultants Committee."

Mr. HOLMES SELLORS accordingly moved the adoption of the Recommendation in the following form:

That the constitution of the Central Consultants and Specialists Committee be amended to provide: (1) That the Chairman of

the Joint Consultants Committee be invited to serve as an ex officio member of the Central Consultants and Specialists Committee. (2) That each of the three Royal Colleges in England be invited to appoint a representative on the Central Consultants and Specialists Committee, these representatives not to be eligible to represent the Central Consultants Committee on the Joint Consultants Committee.

Dr. ALEXANDER SMITH (Lanarkshire), as Chairman of the Central Consultants and Specialists Committee of Scotland, moved as an amendment that (2) be amended to read:

That each of the six Royal Colleges and the Royal Medical Corporations in England and Scotland be invited to appoint a representative on the Consultants and Specialists Committee.

They had had in Scotland for a long time, he said, representatives of the Colleges and Royal Corporations on the Scottish Committee, and it meant that the Committee represented the whole of the consultants' profession. Mr. HOLMES SELLORS said that if any matters of Scottish interest were before the Committee they would welcome the addition of Scottish Corporation and College representatives.

The amendment was carried, and the motion, so amended, adopted.

A motion on the same subject by South-west Essex was, by leave, withdrawn.

Hospital Medical Staffing

Dr. C. VIPONT BROWN (Manchester) moved that Council should continue to press for an improved consultant service. They were all aware, he said, of the frustrations of hospital junior staffs and of the difficulties of senior registrars in obtaining consultants' posts. One aspect of this problem was of particular concern to the general practitioner. It was the aim that out-patients' departments should be regarded as consultative clinics, but in many cases the patients were not seen by consultants. Of 13 cases that he had sent for an opinion, six had been seen by consultants, five by a senior registrar, and two by lecturers. It was not suggested that these other members of hospital staffs were not well qualified to give an opinion, but they had been doing work of consultant status, and this emphasized the need for the creation of more consultants' posts.

Mr. J. T. RICE EDWARDS (Council) mentioned that an alteration in the terms of service of a consultant and a S.H.M.O. in Chepstow had arisen as a result of a diminution in the incidence of tuberculosis, and had been made without reference to local committees. It was felt that their services could have been retained by redesignating the hospital as one for general chest diseases. There should be full local consultation in such cases. Mr. HOLMES SELLORS said his Committee would be happy to see the motion carried. They wanted to see the consultant service expanded to its full limit and maximum efficiency.

The motion was carried.

Dr. H. A. WALKER (South-west Essex) moved that the Meeting welcomes the report concerning the staffing of hospitals and asks for the review of hospital medical staffing as a matter of urgency with particular reference to grades other than consultants. Dr. V. COTTON CORNWALL (Liverpool) opposed the motion on the ground that the working party had been set up to review the whole position. Mr. HOLMES SELLORS agreed that the working party had a comprehensive remit, but said that the particular concern of his Committee had been with grades below that of consultants.

The motion was carried.

Mr. R. BREARLEY (Liverpool) moved:

That this Meeting urges the working party in conducting its review of hospital staffing needs to give careful consideration to the present inequalities in the provision of beds and consultant sessions per head of population in various regions, the delays in securing out-patient consultations and the regular holding of out-patient clinics by junior staff; it further urges the working party during its investigations to visit each region and to interview the local representatives of the general practitioners, consultants, and junior hospital staffs.

The appointment of the working party was, he emphasized, of crucial importance, and their report would set the future

pattern of hospital planning for at least a generation to come.

Dr. W. D. GRAY (Liverpool) asked for the insertion of "S.H.M.O.s" after "consultants" in the last line of the motion; this was accepted by the mover, and the motion, so amended, was carried. Further motions on the subject of hospital medical staffing appeared on the Agenda in the names of Birmingham and Liverpool, and the CHAIRMAN announced that their sponsors had agreed on a single motion, which took the form of an amended version of that submitted by Birmingham and read:

That this Representative Body deplores the decision of the Minister of Health to create designated senior registrar posts before the recommendation of the Working Party on Hospital Medical Staffing has been made.

Dr. N. K. SHINTON (Birmingham), proposing the amended motion, said that the Hospital Junior Staffs Group Committee did not like these designated posts or the manner in which they had been set up by unilateral decision. They did not like the posts, because they were not applicable to all senior registrars, and because there had been no prior discussion with the profession on the level of remuneration and no provision for the future of the occupants of the posts. They would not solve the problem of too many fully trained candidates for too few consultant vacancies. Dr. ALEXANDER SMITH (Lanarkshire) supported the motion. The Minister's proposal, he said, would create a new sub-S.H.M.O. grade. His committee in Scotland had passed a resolution in much the same terms. Mr. H. H. LANGSTON (Winchester) asked whether the Hospital Junior Staffs Group Committee would be prepared to advise its members in no circumstances to apply for these new posts. That would show the Minister that he must not introduce posts not agreed with the profession beforehand. (Applause.)

Mr. R. BREARLEY replied that he could give only a personal answer, but he would be prepared to advise such a course of action, and he believed his Executive Committee would endorse it.

Mr. A. LAWRENCE ABEL (Marylebone) suggested that the Meeting should instruct the *Journal* not to accept advertisements for these positions. The CHAIRMAN took the view that the Meeting could not do so directly, but could instruct the Council to do it. The CHAIRMAN OF COUNCIL (Dr. Wand) said the Meeting could determine a policy on advertising of the kind in question and the Council would be bound to endorse it.

Mr. G. E. MOLONEY (Oxford) said that the volume of work done by general practitioners and specialists had greatly increased owing to advances in science. They had not let the public down. In the National Health Service, however, the remuneration of the consultant surgeon for a serious operation and for looking after the patient before and afterwards was about £5. The anaesthetist received about one-third of this. A senior registrar, who might have undergone training for twenty years since entering his medical course, received about £2 for an operation, and could earn more by signing cremation certificates. The answer was to have more consultants and not more overworked and underpaid lower grades.

The CHAIRMAN said he had received from Mr. Lawrence Abel, duly seconded, a proposal to add the words "and that the Council be instructed to refuse advertisements for these posts."

Mr. LAWRENCE ABEL moved this addendum.

Mr. HOLMES SELLORS observed that this matter had been raised rather suddenly, and the opinions of senior registrars were not fully known. To adopt the addendum might not be fair to some senior registrars, whose financial position was unsatisfactory. He would prefer the addendum to be accepted as a reference to Council.

The motion was carried, and the addendum, with the assent of Mr. Lawrence Abel, was accepted as a reference to Council.

Mr. R. BREARLEY (Liverpool) moved:

That this Meeting endorses the principle of filling retirement vacancies in the consultant grade of the N.H.S. some time (ideally

two years) before they occur, whenever suitably trained candidates are available. Besides freeing a number of senior registrars from the uncertainty and insecurity this would enable them, should they so desire, to widen their experience by taking short-term appointments in posts outside the confines of the present training grades.

He pointed out that the principle involved was not new, being followed in most industries and some nationalized industries. Indeed, he understood in the region in which the Meeting was being held it was applied and worked satisfactorily. Under the present promotion system men were frightened to lose their place in the queue by taking short-term appointments overseas, where there was a shortage of fully trained specialists, particularly in the Colonies and some Dominions.

An amendment, duly seconded, to omit the words "(ideally two years)" and to delete all the words after "occur" was moved by Mr. A. LAWRENCE ABEL (Marylebone). He said that they could not know in advance what would be the ideal period for any particular hospital; he believed there would always be suitably trained candidates available; and he regarded the last sentence purely as a talking point. Mr. Brearley had indicated, he added, that he would accept the amendment. Addressing himself to the principle, Mr. Abel said it was well known that young men would not risk going outside the four walls of their hospitals for fear of being overlooked when an appointment became vacant, and he maintained that a system under which no young man could with an easy mind study elsewhere would mean that those in the consultant service in Great Britain would eventually run the risk of being less well trained than those in many places throughout the Commonwealth. He pointed out that many young men coming to this country for postgraduate study from Australia, New Zealand, and elsewhere had the promise of a job on their return home.

The amendment was carried.

Professor D. E. C. MEKIE (Council), addressing himself to the substantive motion, said that the Overseas Committee heartily endorsed the motion. Dr. J. D. LLEWELLYN-JONES (Malaya) also strongly supported the motion, as one who had left the "queue" and saw no hope of getting back. There were, he said, many places in the Commonwealth where there was a shortage of specialists, and which, although they could not offer careers, would willingly accept qualified men from the U.K. on a short-term basis. He said that as members of an Association with Branches in all parts of the Commonwealth they should foster interchange. Acceptance of the principle enunciated in the motion would enable suitably qualified specialists to go overseas and give the people there the benefit of their services and assistance in training local doctors.

Dr. S. WAND said that those at university level found that such an arrangement would be by no means impossible. Doctors and others who had been overseas had expressed the opinion that unless something of the sort suggested were done many other countries would turn elsewhere for medical help. He commended the proposal as well worth trying, at all events on an experimental scale, and said that a pilot survey could easily be devised. Dr. W. WOOLLEY (Council) pointed out that an important section of the community who would benefit from such an arrangement would be the patients who experienced long delay in getting hospital outpatient appointments because of the delay in filling consultant staff vacancies.

Mr. HOLMES SELLORS said the Ministry's objections were, first, that legislation would be required because a vacancy would be made before it actually occurred, but he did not doubt that could be got over easily. Secondly, and more important, the Ministry pointed out that in specialties such as radiology and anaesthetics, which in this country were understaffed, the profession might not be prepared to deprive itself of the services of senior registrars for the necessary time. The Ministry further said that, so far as they were aware, there was in the Colonies at the moment only one vacant post in general medicine, two in obstetrics,

and none in general surgery, though there was a very large demand in some of the super-specialties. They also objected that in appointing a man one, two, or more years before he joined a hospital staff the appointing body would not know they were choosing the best man. He concluded by saying he thought there was a great deal in the proposal if adopted in principle, provided it was not made compulsory throughout the country.

Replying to the Ministry's objections, Mr. BREARLEY said that it was palpably untrue to say legislation was required, because, as he had already pointed out, such a scheme was already in operation without legislation. There was first-hand testimony to make it seem highly dubious whether the statement that there were insufficient vacancies in the Colonies was correct and whether the information on this point was exhaustive. Finally, the argument about not choosing the best man was one of crying over spilt milk, which could be applied whenever any appointment was made.

The motion by Liverpool, as amended, was carried.

Senior Hospital Medical Officers

A motion by Dartford calling for the rectification of anomalies and injustices in connexion with remuneration was, by leave, withdrawn.

Professor P. C. P. CLOAKE (Birmingham) moved:

That this Representative Body is gravely concerned with the situation referred to in para. 57 of the Annual Report of Council relating to S.H.M.O.s in consultant posts. It urges that action be speedily taken so that S.H.M.O.s whose level of work and responsibility in their present posts can be shown to be of consultant standard may be paid as consultants.

In October, 1956, he said, the Management Side of Whitley Committee B agreed to consider cases in which it could be shown that the present level of work and responsibility of S.H.M.O.s was of consultant standard, and reviewing committees had selected over 500 candidates of this standard. The dimensions of the problem thus revealed had shocked the Management Side. In order to bring the problem into manageable proportions, a joint subcommittee with terms of reference was agreed upon after considerable haggling. The subcommittee had been selected as long ago as January, but nothing had been done since. It would seem that the Management Side were rather anxious to shelve their responsibility if they could, and he suggested that the motion would inject stimulus into their proceedings.

Dr. W. D. GRAY (Liverpool and S.H.M.O.s Group), supporting the motion, said his Group was disturbed at the delay in beginning the review of the position of S.H.M.O.s doing consultants' work. Year after year the R.B. had solved that these doctors should be paid as consultants and year after year had asked for such a review. He had nothing but praise for the way the review had been dealt with by the Association's Secretariat and the negotiators on the Staff Side of the Whitley Council, but after nearly two years S.H.M.O.s were impatient. Some of those who had had the best chance of being upgraded had given up hope and had gone abroad.

Dr. K. C. BAILEY (West Somerset) said his Division had put forward a motion each year on behalf of the S.H.M.O.s, believing that they had been very unfairly treated, not only by the Minister but by the profession, and particularly by the consultants. Dr. Guy Dain had warned the profession about the S.H.M.O. grade when it had first been proposed in 1946; shortly afterwards the profession had been amazed when the Minister had broadened it to include not only full-time hospital doctors but others working in different specialties. When the grade had been discussed in his own locality there had been much opposition to it. He was pleased that the Central Consultants and Specialists Committee had changed its view and now fully supported S.H.M.O.s. No indication had ever been given them as to the qualifications or experience required to enable them to qualify for consultant status.

Mr. S. F. LOGAN DAHNE (Council) said that of the original 1,000 S.H.M.O.s who had deemed themselves to be doing consultants' work all had been supported unanimously by their respective medical advisory committees, unanimously in practically every case by their area medical staff committees, and in many cases also unanimously supported by their own area management committees—all being bodies who knew their work, their quality, and their responsibilities. Of that 1,000, 500 had been deemed by those investigating their claims in fact to be doing consultants' work. There was thus a substantial measure of inequity. Then, at that late stage, the Management Side of Whitley Committee B had deliberately backed down on its original undertaking, and this had amounted to a callous, calculated delaying action and was nothing less than a breach of faith. Dr. H. W. DONOVAN (Birmingham) said that that had happened since a very similar action had been perpetrated upon the whole profession last year. He hoped that that would act as an incentive to the R.B. in unanimously carrying the motion. Mr. J. R. NICHOLSON-LAILEY (West Somerset) said it had been an education to members of the C.C.&S. Committee to go through the claims that had been put forward by the many S.H.M.O.s who were suffering such injustice. The trouble lay in the Staff Side's difficulty in trying to persuade the Management Side of the justice of their case.

Professor P. C. P. CLOAKE (Birmingham), replying to the debate, said that the Association had again and again asked the Ministry to review the position of S.H.M.O.s and their grading, and to have, if possible, a central committee to reconsider their grading. Time and time again that had been refused and cases had had to be put up. There were S.H.M.O.s occupying consultants' posts which were definitely assigned as such yet were continuing to be paid and to work as S.H.M.O.s; others, graded as consultants, were working in S.H.M.O. posts and were still paid at S.H.M.O. rates. It had therefore been felt that there was some ground for putting the case forward to the Whitley Committee. There had also been an appeal to the Industrial Court in which the position had been expounded, and some perturbation had been felt by the Management Side because the court had been quite obviously amazed that the situation existed. If it were possible to get consultants' pay for some of those S.H.M.O.s who undoubtedly deserved it, it would certainly not be possible to get consultants' grading for them. It was better to have one of the two than nothing. The Birmingham motion was carried.

Starting Salaries of Consultants and S.H.M.O.s

Mr. R. BREARLEY (Liverpool) moved, as an amendment to para. 58 of the report of Council:

That this Meeting notes with satisfaction that the two sides of Whitley Committee B have agreed to make a submission to the Minister urging that hospital boards should be reminded of their power to increase the starting salary of newly appointed consultants or S.H.M.O.s in certain circumstances, but considers that, owing to the completely changed age pattern of promotion which has come about since this purely permissive provision was first suggested by the Spens Committee, it is desirable that it should now be replaced by a new regulation requiring the automatic crediting of one year's consultant or S.H.M.O. seniority for every year in excess of four spent in the senior registrar grade.

When the Spens Committee had drawn up its report it had pointed out that the pattern of earnings of consultants prior to the N.H.S. had been one in which the income was at a very low level for a considerable period, followed by an income at a much higher level for a short period later in life. It had been the Spens Committee's intention that the situation should be smoothed out to some extent while keeping the whole life earnings at a reasonable level. As a result of the delays which had since occurred the average age of appointment to consultant posts in the major specialties was now about 38, instead of 32 as envisaged by Spens. This meant a loss of six years' earnings at the top figure, normally amounting to over £11,000.

Mr. HOLMES SELLORS asked that the amendment be treated as a reference to Council. The discretion which

boards were entitled to exercise had been brought to their notice very recently by the Ministry, and in more than one case it had been used in favour of the candidate at a much higher level than that which the amendment suggested should be the regular one. Mr. BREARLEY said he assumed that the Council had already considered the matter, as the proposal was contained in the document of evidence to the Royal Commission which had been approved by Council. While he was pleased to hear that the discretion was sometimes more favourably exercised than the amendment suggested, there were many others where it was exercised much less generously than the provisions allowed. It was better to have a cut-and-dried regulation than to continue with a permissive clause.

The motion was carried.

Board-and-Lodging Charges

Dr. R. DERHAM (Liverpool) moved to amend para. 59 of the annual report of Council (dealing with board-and-lodging charges) by the words:

This Meeting deplores the continuing delay in implementing the proposals of Whitley Committee B and urges that the reductions be back dated.

He said that in some cases board-and-lodging charges were in excess of the actual cost, as had been confirmed by regional boards; thus they had been overcharged since 1956 in some cases. The Management Side had agreed to the payment of abatements of £75 to £80 per annum where overcharges had been made, but that agreement had been made last winter and still no abatements had been paid.

Mr. HOLMES SELLORS said he regretted the delay as much as anyone. If any person felt that he had been overcharged he could apply individually to his employing authority for the abatement.

The motion was carried.

Distinction Awards

Dr. C. P. WALLACE (Guildford) moved to deplore the action of Council in rejecting, on the grounds that publication of merit awards would not benefit either the service or the community, the 1957 A.R.M. motion, referred to the Council for consideration, urging that in any revision of the publicly administered medical services there should be no secrecy about any special payments made for merit or other grants. He did not think it was necessary to apologize for bringing the matter up again. The Council seemed unaware of the fact that the present method of award was unacceptable to the profession and contrary to public policy. In any matter affecting medical politics the members of the R.B. had a duty to perform as citizens. He did not feel that the C.C. & S. Committee could approach the matter with that lack of bias it demanded. He realized that the consultants were a bit fearful lest the publication of merit awards should result in an improper use of them and therefore appear to be unethical, but there was no secrecy when a member of the medical profession received a knighthood, baronetcy, or peerage; the whole country knew about it.

ELECTION OF COUNCIL MEMBERS

At this point the SECRETARY announced the following elections to the Council: A. Lawrence Abel, H. Guy Dain, W. E. Dornan, I. D. Grant, F. Gray, E. A. Gregg, H. H. Langston, W. N. Leak, J. S. Noble, A. Dickson Wright.

HOSPITAL AND CONSULTANT SERVICES (continued)

Distinction Awards (continued)

Mr. H. H. LANGSTON (Winchester) asked the R.B. to reject the amendment. In reply to the criticism that the C.C. & S. Committee would have a bias and therefore could not consider the question dispassionately, he said he had never heard it suggested that the G.M.S. Committee or the Public Health Committee could not consider their

remuneration dispassionately and reach proper decisions. The C.C. & S. Committee had on more than one occasion considered the matter and had always supported the view that it was better that merit awards should remain confidential, as at present. He asked representatives to consider what really would happen if merit awards were publicized. Would they welcome a situation where, in a medical directory, somebody was down as an orthopaedic surgeon, Grade B, or psychiatrist, Grade Nothing, and what would be the effect of that on the individual consultants or what advantage would it be to the patients? The Chairman of the Merit Awards Committee had come to the Committee a year ago and explained the whole method of working of his committee and, after a very full and frank discussion, that method had been accepted unanimously. Surely that Committee really had the right to express a view on the way in which consultants received their remuneration and the conditions which governed its receipt. They wished the method to continue as at present. Dr. ALEXANDER SMITH (Lanarkshire) said that they were well satisfied in Scotland, after exhaustive inquiries, that the system operated satisfactorily and equitably and that publicity at this stage would be very wrong.

Dr. H. GLYN JONES (Bromley) said there was some doubt about the consultants' opinions on the matter. In the hospital service at large there was a great deal of dissatisfaction both with the whole system and especially with the secrecy with which it operated. Surely if there were within a State service people of such ability that they merited very special awards, surely, above everything else, they should be known to the general practitioners—the people who would refer cases to them. Dr. J. C. KNOX (Tyneside) said the debate was an exact repetition of last year's debate on the same subject. The R.B. had had no doubt about its decision last year, and the only thing that had occurred meanwhile was that the C.C. & S. Committee had persuaded the Council not to follow the R.B.'s wishes. The consultants in his Division felt quite as strongly about the secrecy as did the general practitioners.

Mr. J. R. NICHOLSON-LAILEY (Council) contended that many of the previous speakers had discussed not secrecy but the general principles of the merit award system. If there was to be a system of this kind, it was possible to carry it out only in the way in which this was being done at present. It would be grossly unfair to pillory those who had not received such an award, because many of them were more deserving than those who had. General practitioners knew perfectly well to whom they wanted to send their patients, and knew better than any merit award committee who were the bad consultants. Mr. HOLMES SELLORS remarked that the year after year this question had been raised. At the start of the Service a form of publicity had been considered, but it had been realized that this would be impracticable. The general practitioner was well able to select the consultant appropriate to his needs. After Lord Moran had explained the position to the C.C. & S. Committee, there had been a unanimous vote to maintain the present procedure. They might not be entirely satisfied with the method, but could find no better way of administering it.

Dr. C. P. WALLACE (Guildford), replying to the discussion, said that they must put out of their minds the envy, wrath, and malice which were often introduced when this problem was discussed. It could not be in the public interest that public money should be disposed of at the instance of secret committees to secret people. If a secret ballot were taken of specialists and consultants on the method of making these awards, it would be overwhelmingly thrown out. Dr. E. C. WARNER (Marylebone) asked whether any decision contrary to that accepted by the Central Consultants and Specialists Committee would be liable to cause a split between consultants and the rest of the profession. Mr. HOLMES SELLORS replied that for several years running the decision of the Committee had been to maintain the present system, even though it included secrecy.

On a vote being taken by show of hands, the Guildford amendment was carried by 96 votes to 91.

The CHAIRMAN, replying to a suggestion that a count should be taken of those who had abstained, said that the Standing Orders did not call for this unless there was a roll-call or card vote.

Dr. G. M. WODDIS (Nottinghamshire) moved that the Annual Representative Meeting noted with surprise the figures quoted by the Minister of Health on March 31 concerning the percentage distribution of merit awards to consultants in general medicine, general surgery, and psychiatry. In the light of those disclosures, the motion asked the Meeting to request that Council obtained the percentage distribution for all specialties and as between part-time and whole-time consultants, and took such action as was necessary to rectify any inequity. The figures referred to showed that out of 822 consultants in general medicine, 57% were in receipt of awards; out of 863 consultants in general surgery, 53% were in receipt of awards; and out of 614 consultant psychiatrists, only 14%. It might be claimed that there were few psychiatrists of distinction, concluded Dr. Woddis, but it could not be claimed that as a body they were so lacking in merit. His Branch was concerned about the deductions which could be made from those figures.

Dr. K. C. BAILEY (Somerset, West) said that psychiatry had come into its own in recent years, and efforts were being made to improve the recruitment into that service. Therefore more encouragement should be given. Mr. J. T. RICE EDWARDS (Council) said that the motion made no reference to the percentage distribution of merit awards between teaching and non-teaching hospitals. There was considerable dissatisfaction in the Welsh area about that. So far as merit awards were concerned, it seemed that a good gimmick was far more valuable than years of conscientious service to the patient, and he asked therefore for the inclusion of regional consultants in any investigation which arose out of the motion.

Mr. HOLMES SELLORS, in reply, pointed out that psychiatry was a specialty which had expanded very rapidly since the inception of the Service, and it might be that a larger number of younger and perhaps less experienced entrants into that branch had occurred proportionately with other branches with which it was compared. His Committee would be prepared to accept the motion as a reference to Council.

The motion was carried as a reference to Council.

An amendment asking that immediate representation should be made for all domiciliary consultations, irrespective of the number involved, to carry the normal fee, was moved on behalf of Southampton by Dr. R. M. WARREN.

He said that it applied mainly to consultant physicians. The labourer was worthy of his hire and the consultant should be paid for the work which he did. There might be some embarrassment to the general practitioner when a consultant had reached the allotted number, which made him reluctant to call the consultant in when he knew that it would carry no fee. The risk was that the patient might be deprived of the opinion which he would desire to have. Dr. W. S. L. GILCHRIST (Bromley) said it appeared from the Sixth Report of the Select Committee on Estimates that the average number of domiciliary visits per specialist in the South-eastern Metropolitan Region worked out at 31.9 per annum. The concession whereby a whole-timer was paid for visits after doing 32 free was absolutely valueless. It was one of the most futile concessions which had ever been negotiated.

Mr. HOLMES SELLORS replied that the matter was at the present time being reviewed, and the points made by the mover had already been incorporated in the Royal Commission evidence. The only point which had not been incorporated was the request for the ceiling to be waived altogether. Domiciliary consultations had been singled out in the Select Committee on Estimates for considerable criticism. There was no doubt that they had been of the greatest value, and it was equally certain that there had been a certain amount of "greyness" concerning the way in which domiciliary visits had been worked.

The amendment was carried as a reference to Council.

Mr. R. BREARLEY (Liverpool) moved by way of amendment that, notwithstanding the decision of the Industrial Court concerning mileage allowances payable to hospital staff, further energetic action should be taken forthwith to secure a special loading for small mileage claims. Those particularly hit were junior members of hospital staffs, because they were full-time. Mr. Brearley pointed out that if a man had a 10 h.p. car and covered a mileage of 5,000 in a year, he received £139 8s. 11d. If he covered a mileage of 500 during the year, he would receive £16 2s. 11d. To cover road tax, insurance, depreciation in value, interest on capital, and garage took well over £100; therefore, if the use of a car were necessary for the Health Service, it meant that the owner who travelled only 500 miles a year subsidized the Service to the extent of £84 per annum.

At the suggestion of Mr. J. R. NICHOLSON-LAILEY (Council) Liverpool asked that the matter should be passed as a reference to Council, and this was agreed to.

Treatment and Rehabilitation of the Chronic Sick

Miss GLADYS M. SANDES (Marylebone) moved:

That this Meeting calls the attention of the Minister, the Ministry, and local authorities to the increasingly great number of chronic sick, especially amongst (a) the aged and (b) the handicapped sections of the populace, particularly young people, and stresses the urgent need for development of all facilities available for their care and welfare.

Referring particularly to young people with congenital defects who were treated in hospitals where they had special schooling and were taught a trade, she pointed out that it was very difficult to place them between the ages of 16, when they were supposed to be turned out, and 18, when they had to be. The local authorities had permissive powers to support them; they were not mandatory. Were more publicity given to this problem, voluntary societies, such as the Cheshire Homes and Shaftesbury Homes, would probably be prepared to do even more than they had done if local authorities would, where necessary, pay for what was after all only hostel accommodation.

Mr. HOLMES SELLORS said that a letter from the Ministry, following a deputation at the end of May, expressed no major disagreement on the geriatric problem, and he thought there would be a great deal of co-operation.

The motion was carried.

Dr. A. ELLIOTT (Stratford) moved:

That this Annual Representative Meeting welcomes the action of Council in bringing to the attention of the Minister the serious position of the treatment and rehabilitation of the chronic sick; and instructs the Council at its meeting with the Minister to press the urgent implementation of the recommendations in the Report of the Geriatric Joint Subcommittee; at the same time bring to the attention of the Ministry the serious position of the mentally infirm who do not require admission to mental hospitals.

He hoped the Meeting would reaffirm that doctors accepted the moral right of old people, as of everybody else who needed it, to medical attention. The Minister was not, he thought, implementing the recommendations of the Geriatric Joint Subcommittee quickly enough, and unless something further was done quickly there would not be sufficient money available, much of which had to go through local authorities, who were having other demands made on them. The Royal Commission Report on Mental Health in 1954, he added, showed that one-fifth of those admitted to mental hospitals in that year were over 65.

Dr. JOAN CHAPPELL (North Middlesex) moved as an amendment to delete the words "to press the urgent implementation of the recommendations in the Report of the Geriatric Joint Subcommittee," substituting the words "to request him to press local health authorities and regional hospital boards to implement the recommendations of the Geriatric Joint Subcommittee as a matter of urgency." North Middlesex was sure that the obstruction was at regional board and public health authority level, and she thought the motion would be strengthened by naming those authorities.

Mr. T. HOLMES SELLORS said the Ministry explained that hospital authorities and local authorities had no power to share the financial responsibility for particular patients or persons in need of care.

Dr. K. C. BAILEY (West Somerset) agreed that the problem of treating old people would not be undertaken satisfactorily unless there was co-ordination between regional hospital boards and local authorities. It was imperative, he said, that the appointment of a geriatrician should be a joint appointment between the regional hospital board and the local authority, and that the local authority should provide more Part III accommodation. Many elderly patients who showed mental symptoms were often admitted to mental hospitals, those being the only places they could get into, and he thought that was quite contrary to the spirit of the National Health Service. Many of such people could be cared for in Part III accommodation if it were available, and if there was supervision at night time.

The CHAIRMAN OF COUNCIL said it might be thought that the Council had done nothing about this, but in fact they were being instructed to do the very things which they had already done. Evidence had been given to the Royal Commission on Mental Illness, and one of the recommendations of that Commission had been in the sense of the suggestion now made. After the deputation which went to the Ministry a few weeks ago, when every point made that afternoon, and many others, had been made, a letter had been received from the Ministry in which it was stated that there was no major disagreement between the views of the Department and those expressed by the Association.

The mover of the motion accepted the amendment, and the motion, so amended, was carried.

Internal Administration of Hospitals

Dr. V. COTTON CORNWALL (Liverpool) moved that, with reference to paragraph 66 of the Annual Report of Council, the Meeting reaffirm its decision of 1956 and 1957 that it was opposed to equal tripartite administration of hospitals and welcomed the statement of the Central Consultants and Specialists Committee that it was quite firm in its policy that in no hospital should there be any interference by lay administrators in clinical or nursing matters.

Professor P. C. P. CLOAKE (Birmingham) said that the system condemned by the amendment was that by which some of the best and largest hospitals in the country were administered. When it did not work it was because there was encroachment on the medical or nursing sides by lay administrators, and therefore not equal tripartite administration.

The amendment was carried.

Dr. LENA W. WILLIAMS (Hampstead) moved that, with reference to paragraph 66 of the Annual Report of Council, hospital administration should be in the hands of medical superintendents. Hampstead, she said, was well served by hospitals, and there was ample opportunity to make comparisons between those run by medical superintendents and those not so fortunate. Such posts would provide for members of the profession who had to retire from the Services in their early fifties, and for general practitioners who wanted a less arduous way of making a living. Dr. COTTON CORNWALL said the amendment was so vague that the Representative Body would not want to pass it, but would also not want to give the impression that it was opposed to medical superintendency as such. He suggested, therefore, that it should be referred to Council for consideration.

Both the mover and the Meeting agreed that the amendment should be treated as a reference to Council.

Dr. K. C. BAILEY (Somerset, West) maintained that the whole question of the internal administration of hospitals and the position of medical superintendents needed reviewing. Those who were medical superintendents, particularly in special hospitals, took this view. The Council might set up a committee on which would be represented the Medical Superintendents Society and other interested bodies. Mr. H. H. LANGSTON (Winchester) invited the Meeting to

reject the amendment, even as a reference to Council. He did not see what the Council could do about it. Was it suggested that every hospital in the country should be in the hands of a medical superintendent? For most hospitals the best scheme was a hospital medical committee or medical advisory committee which, through its chairman, could advise the hospital management committee on administration as it affected medical matters. Dr. G. S. R. LITTLE (Greenwich and Deptford), supporting the amendment, said the medical profession had lost the initiative in hospital administration to lay people, perhaps because doctors had not equipped themselves for the work. He hoped that means would be found to equip medical men to act as administrators.

Dr. H. GLYN JONES (Bromley) said that they had rejected the idea of interference by lay administrators in the treatment of patients, but once medical superintendents were appointed it meant accepting the principle of administrative interference in the treatment of patients. He doubted whether there had ever been a hospital with a medical superintendent in which there had not been administrative interference with the staff of the hospital in their relations with patients. (*Cries of dissent.*) The medical superintendent was an outgrowth of the old Poor Law. Dr. H. G. H. RICHARDS (Central Consultants and Specialists Committee), opposing the amendment, said that in his hospital they had a most satisfactory arrangement whereby the medical advisory committee was permitted by the management committee to send its chairman and secretary as non-voting observers to attend all management committee meetings, and the management committee referred to them on all important medical matters. This worked better than having a medical superintendent.

Dr. C. P. WALLACE (Guildford), who also opposed the amendment, contended that the glories of British medicine had been bound up with the work of the old voluntary hospitals, which had been done without "medical bosses." He would sooner share the responsibility for the administration of a hospital on a great many matters with lay people than put in a boss called a medical superintendent. Army methods were thoroughly unsuited to civil administration.

Dr. ALEXANDER SMITH (Lanarkshire) said that Scotland had always had medical superintendents, even in voluntary hospitals, and the entire consultant body in Scotland was in favour of medical superintendents of the Scottish type. Mr. HOLMES SELLORS said that in this country there were many types of structure, and to attempt to enforce uniformity by putting in a medical superintendent would be a most retrograde step.

The amendment was carried as a reference to Council.

Child Guidance

A motion by Manchester supporting the Council in the views it had expressed and the action it had taken in the matter of child guidance was formally moved and agreed to without debate.

Shortage of Medical Auxiliaries

Dr. J. B. S. MORGAN (Derby (with Derbyshire, West)) moved:

That this Meeting expresses profound concern in the difficulties experienced by hospitals in many areas in retaining the services of senior physiotherapists and radiographers, and requests the Council to examine the situation and take appropriate steps in an endeavour to rectify the situation.

Some senior radiographers and physiotherapists, he said, had been attracted to posts in the United States and Canada or in industry.

The motion was carried.

Dr. W. H. N. ANGUS (Southampton) moved:

That the A.R.M. considers that all student radiographers and other auxiliaries be paid according to the Ministry circular letter of 1957 and not only those in specific training schools, and instructs Council to make appropriate representations.

The Ministry, he said, divided training schools into three categories: (1) established schools where no grant had been paid, but where, if recruitment dropped below 75%, application could be made for permission to make grants; (2) established schools where grants were at present being made, and which could continue to make grants; and (3) new schools, which could pay grants subject to the prior consent of the Ministry. This meant that schools where grants were not at present being paid were at a disadvantage. Student radiographers were necessary for the efficient working of their departments.

The motion was carried.

Medical Membership of Hospital Authorities

Dr. K. D. WOOLAS (Portsmouth) moved that the Representative Body reaffirm Minute 240 of A.R.M., 1957, and urge Council to make further attempts to implement the purpose of this resolution. (A reference to Minute 243 of A.R.M., 1957, which appeared in the motion as printed was deleted by leave of the Meeting.) The purpose of the resolution, he said, was to secure greater medical representation on regional hospital boards and hospital management committees. Of the fourteen regional hospital boards in England, four had less than 25% medical membership. It would seem that anybody, provided he had not a medical qualification, was considered eligible—a doctor's wife, but not the doctor himself. A doctor who had been associated with hospitals in his group for twenty years had been replaced by someone who had rarely been in a hospital in his life.

Mr. HOLMES SELLORS, in reply, said that during the past year six medical members had been lost from regional hospital boards, and now, out of the 14 boards for which there were figures, in 6 there was 25% or less medical representation. In only one was there more than 30%, and a few of the medical members of boards were more noted for political than medical activities. It was a distressing state of affairs and one on which the Ministry had been approached a number of times, but it had not yielded. He was happy to support the motion.

The motion was carried.

A motion standing in the name of Morpeth deploring the reduction in medical representatives on hospital boards was by leave withdrawn.

National Major Casualties Service

An amendment asking the Meeting to express dissatisfaction at the complacency of the Council regarding the National Major Casualties Service was moved by Dr. W. N. LEAK (Mid-Cheshire). It was known that much had been done in recent years to organize rescue work, he said, but apart from the Didcot disaster all major accidents had occurred in well-populated areas where help was readily available. It would be a different matter if a disaster occurred in some remote rural area far from hospital help. In such conditions careful planning beforehand might save lives, but so far general practitioners had not received any indication of such planning. After the Lewisham disaster there was, for the first time, an inquiry into the rescue arrangements. The opinion had been voiced that all that general practitioners needed was morphine and field dressings. Again, it was pointed out in correspondence in the *Journal* that dangers attached to the use of morphine, and that pethidine should be used; but it was known that morphine relieved fear as well as pain.

Dr. R. SMITH (Middlesex, South) said he strongly supported the amendment, speaking as a general practitioner living very near London Airport. Adjoining London Airport were the homes of half a million people who were subjected to the constant menace of disaster in the air. Arrangements for dealing with disasters at the airport itself were probably the best in the world, but what of the arrangements outside? The regional hospital boards had a plan for the London

Airport area, but it ignored almost completely the fact that on the spot there was already a mobile medical force of 200 general practitioners. None of them would know where to start if he found himself suddenly in an area of disaster. The Air Commandant of London Airport would be pleased to integrate all medical services into his most efficient but at present restricted plan. The risk increased all the time, and it was necessary to act at once.

Dr. R. LL. MEYRICK (Lewisham) asked the Meeting to reject the amendment. That might appear to be a somewhat callous attitude, but members would recall the major disaster last year in his area, and he could say without qualification that the arrangements made in that area worked with complete satisfaction. It had been suggested that the general practitioners could take a greater part in life-saving work. But general practitioners did take a part. They were first on the scene at Lewisham, and the hospital arrangements followed rapidly. It was a matter of only a few hours before all the casualties were cleared from the scene and were receiving treatment.

Dr. A. ELLIOTT (Stratford, London) said he was present at the Dagenham train disaster. It was a very foggy night and only a few doctors were able to get through. On arrival there was nobody in charge of the casualty operations. There were in fact two teams from different hospitals on the scene, neither of which knew of the presence of the other. He asked the Meeting to support the amendment. Dr. F. E. GOULD (Birmingham) said that in his view it would not be fair to pass an amendment which accused the Council of complacency in the matter. "If you are not satisfied with the arrangements in your own districts, then I think it is a matter for your local medical committees or local divisions to take it up with your regional hospital boards and get the arrangements made locally," he said.

Dr. LEAK replied that it was not a matter for local medical committees. It was something which the Government alone could do.

The amendment expressing dissatisfaction with the complacency of the Council regarding the National Major Casualties Service was lost.

General Practice for Consultants

Dr. E. C. WARNER (Marylebone) moved: "This Meeting considers that the arrangements for the hospital junior medical staff to obtain experience in general practice during their hospital employment should be left to the individual hospital." It was highly desirable, he said, that not only consultants in training should have experience in general practice, but that anybody who was to play a part in the medical life of the country should have that experience. It was not something which should be left to students or young postgraduates to decide. Arrangements should be made by hospitals, especially teaching hospitals and medical schools, to ensure that all those who were to practise medicine in this country should have a period of training in general practice.

Dr. R. M. S. MCCONAGHEY (Torquay) suggested that to obtain complete harmony in the profession it was necessary to ensure that all its branches understood each other's work. In order to achieve that, no better way could be devised than that each should serve a spell doing the work of the other. If a hospital management group could devise a pilot scheme for the co-operation of the general practitioners in its area, it would be found quite soon how easily that type of interchange of work could be arranged. Dr. G. S. R. LITTLE (Greenwich and Deptford) said it was not sufficient to leave it to the individual. A young doctor would not know the value of obtaining general practice experience. Dr. K. A. WOOD (Portsmouth) said there was no real way for the young man to gain general practice experience without jeopardizing his future. He asked the Meeting to consider the amendment as a reference to Council.

Dr. E. C. WARNER (Marylebone) said he was sure that the Council would keep the matter under continual observation; at the same time, he would like the R.B. to express a

firm opinion on the question in the terms of the Marylebone amendment.

The amendment was carried.

Dr. K. A. WOOD (Portsmouth) moved:

That this Representative Body, having considered the Council's report on Minute 285 of the A.R.M., 1957 [that consultants in training should be encouraged to spend a period in general practice during their training], instructs the Council to keep the matter under continuous review, as this Representative Body feels that the general principle embodied in Minute 285 is right.

The amendment was carried.

Dr. H. W. ASHWORTH (Manchester) moved:

That this Meeting is of the opinion that, when consultant appointments are made, experience of general practice should be considered to be an advantage.

"If you adopt this motion you can improve the National Health Service without the expenditure of one extra penny," he said. In days gone by the consultants climbed the ladder of general practice before they fell off to become specialists. (Laughter and applause.) Thanks to the College of General Practitioners, a start had been made by introducing students to general practice. Of course, passing resolutions in itself meant nothing; the secret of success lay in so raising the standard of general practice that in future consultants would be proud to say, "I, too, was once a general practitioner but there wasn't room for me at the top." (Laughter and applause.)

Mr. G. E. MOLONEY (Oxford) said that university students who had just been doing their two weeks' spell in general practice were delighted with it. It opened their eyes to what general practice meant and helped them to make up their minds perhaps a little earlier as to the branch of the profession that they wished to follow. But two weeks was far too short; there should be at least six months in general practice for everybody, just as it was the period for house officer posts in hospital. He would like the G.M.C. to grant its certificate of practice only when a student had completed a year in house officer posts, in order to gain experience of serious disease and its treatment, and at least six months in general practice, to gain experience of the care of sick people. There was no better way to unite a profession than by each member of it having practical experience of each other's work.

Mr. J. R. NICHOLSON-LAILEY (Council) said it seemed that there were so many considerations that the selection committees had to have in mind when making appointments that they tended to regard experience in general practice as a drawback. That attitude could be altered by passing the Manchester motion. He hoped it would be realized that prolonged experience in hospital resident posts was not altogether undesirable for the general practitioner.

The Manchester motion was carried.

Staff Side of Whitley Committee B

Dr. W. S. L. GILCHRIST (Bromley) moved:

That this Meeting wishes to ensure the continuous direct representation of all grades of hospital medical staff on the Staff Side of the Whitley B Medical Committee.

He said that 15 of the 17 members of the Whitley B Committee—which conducted negotiations on terms and conditions of service for all grades of hospital medical staff—were on the staffs of teaching hospitals, the remaining two being part-time consultants in private practice. Thus there was no whole-time consultant, no S.H.M.O., no registrar or lower grade. It would be admitted by all fair-minded persons that the negotiations had not been conducted very successfully. In the past the committee had not had very good consultation with the various grades of staff, but that position had improved of late, largely owing to the efforts of Mr. Holmes Sellors since he had become chairman.

Dr. N. K. SHINTON (Birmingham) reminded the R.B. of last year's decision which had recommended that in future Whitley Committee B should always consult or co-opt representatives of any group whose terms and conditions of

service were being negotiated. This, he said, remained a policy of the Hospital Junior Staffs Committee. Mr. HOLMES SELLORS said that when dealing with a body such as the Staff Side of Whitley Committee B it was impossible to include all the sectional interests in the profession. He assured the R.B., however, that the interests of individual sections were most carefully studied and that, wherever possible, members were co-opted on to special subcommittees and brought before the Management Side to state their own case. He thought it would be found that the majority of the sectional interests would admit that they had had a fair hearing of their problems.

On the motion of Mr. D. S. PRACY (Nuneaton and Tamworth), it was agreed to pass to next business.

Hospital Building

Dr. H. G. H. RICHARDS (Central Consultants and Specialists Committee) moved a motion standing in the name of Winchester:

That this Meeting strongly supports the view of the Central Consultants and Specialists Committee on the deficiencies of hospital buildings and instructs Council to press the Ministry to allocate substantially greater sums to capital development in relation to Hospital Services.

He said that not two completely new hospitals had been built since the National Health Service began. The substantial majority of provincial hospitals, which performed an ever-increasing proportion of the total hospital work, were outdated Victorian structures, expensive to run and shockingly wasteful of labour, so that the average cost per bed per week had reached excessive proportions. Dr. H. SCOTT-KERR (Gloucestershire) said that the Government's promise of a full medical service when it instituted the National Health Service had not been fulfilled; there were waiting-lists extending from three to 18 months, and occasionally two years.

The motion was carried.

A motion by Oxford, that Council be asked to promote and assist an inquiry into present hospital building and the requirements for the future, was carried.

Dr. E. A. GERRARD (Manchester) moved:

That this Representative Meeting deplores the fact that so little hospital building is being carried out and calls for the setting up of a Select Committee to review the provisions of the Welfare State and the relative distribution of the moneys spent thereon.

He said that present hospital waiting-lists constituted nothing less than a public scandal. In surgery, there were four people waiting for every London teaching hospital bed, and five for every such bed in the provinces. In gynaecology there were 29 patients waiting for every bed, although the position varied from hospital to hospital: at the Middlesex Hospital there were 16 women waiting per bed, at St. Cardiff 19, at Cambridge 21, and at his own hospital, St. Mary's, Manchester, 26. At his own hospital of just over 100 beds, in December last there was a waiting-list of 2,676, with the result that non-urgent cases had to wait three to four years before being admitted. For the Middlesex Hospital the comparable time was two years, for Cardiff three years, and for Cambridge three and a half years. "This," he added, "in a Health Service which is claimed to be the envy of the world. What complacency! What deception! What a scandal it all is!" Not a thing had been done to remedy this; there were no new hospital beds because the money allocated had to go on renovations, yet the building of new houses, flats, and offices, particularly Government offices and music-halls had gone on apace. This had happened, he asserted, because of the miscalculations at the inception of the Service, calculated to cost £200m. a year but now costing £760m. "Who," he asked, "are paying for these miscalculations now? Not the Beveridges. Not the Bevans. Not the planners at that time. Do they wait two or three years for an operation? Of course they don't. The people who are paying are the ordinary folk of our country. How patient and tolerant they are, otherwise heads

in high places would have fallen long ago." The regional boards and boards of governors, he continued, were doing their best, and he believed the Minister probably was hampered for money. Although this Welfare State was desperately short of money, was it fair, in days when flats were being subsidized up to £5 a week, when children were attending new modern schools, for mothers to have to wait three to four years before having a prolapse repaired? The matter should, he concluded, be dealt with at a high level, and the question of capital expenditure removed from the squalor and squabble of party politics.

The motion was carried.

Remuneration of Full-time University Medical Teachers and Research Workers

A motion by Hendon, welcoming the Report under this head and instructing the Council to take appropriate steps to ensure the adoption of its recommendations by the various employing bodies, was carried.

Remainder of Report under Hospital and Consultant Services

Mr. HOLMES SELLORS moved the approval of the remainder of the Report. Miss GLADYS M. SANDES (Marylebone) urged that when changes of hospital user were contemplated the position of the medical staff should be fully protected at the commencement of the negotiations.

The remainder of the Report was approved.

Membership of Hospital Management Committees

Dr. L. B. PALING (South Staffs) moved:

That no member of a hospital management committee should serve for more than six consecutive years. After such a period he should not be eligible for re-election for a further year.

He pointed out that unless there was some form of rotation a number of the official bodies and organizations would Minister could consult before making nominations would never get direct representation on the committees. Acceptance of the motion would, he said, ensure a flow of fresh ideas and new views. Mr. J. T. RICE EDWARDS (Council) opposed the motion on the ground that it would considerably weaken the strength of the medical membership of the committees. Dr. J. O. McDONAGH (Perth), speaking as vice-chairman of a hospital management committee and chairman of an executive council, said that because of such a rule he had lost excellent members from these bodies. It was not until someone had been a member for three years that he became useful. To have a greater turnover of members than that provided by ordinary retirements would put more power into the hands of permanent officials.

Mr. HOLMES SELLORS said that while the desire for new blood was a good principle, the six-year rule would cause a great deal of disorganization and inflict hardship on members of committees, who must have continuity.

The motion was lost.

Constitution of Hospital Group Medical Committees

The Meeting then carried an amended motion by Worcester and Bromsgrove:

That in the opinion of the Representative Body, all members of the senior medical staff of a group, whether whole-time or part-time, should constitute the Group Medical Committee, but when, on account of the size of a group staff, it is considered that this would be impracticable, then the Group Medical Committee should consist of elected representatives from the Consultants, S.H.M.O.s, and G.P.10Bs, plus in either case one member of the junior staff—a registrar or S.H.O.

Constitution of Regional Consultants Committee

The Meeting carried a further motion by Worcester and Bromsgrove:

That, in the opinion of the Representative Body, general practitioners on the staff of hospitals (G.P.10Bs) should have the right

to take part in the election of group consultant and S.H.M.O. representatives on the Regional Consultants and Specialists Committee.

Remuneration of Residents in Smaller Hospitals

Dr. J. G. R. CLARKE (South Bedfordshire) moved a motion standing in the name of Harrogate:

That the system of paying residents in smaller hospitals be reviewed with a view to offering them a larger salary than that paid to residents in teaching and major non-teaching hospitals in order to assist recruitment of staff.

There were, he said, great difficulties in getting residents for many peripheral hospitals which had been accentuated by the increase in the number of resident posts available. Harrogate suggested that the Ministry be asked to return to the pre-N.H.S. salary system, under which residents in the peripheral hospitals were paid a higher salary than those in larger hospitals, including teaching hospitals; the salaries at teaching hospitals would need to be in some ways nominal, as before the Act, the surplus being added to the salaries of those in less fortunately situated hospitals.

Mr. HOLMES SELLORS said there was power to increase the salaries of house officers by up to £50 with Ministry approval when the post could not be filled, but it had scarcely been used. He could not support the proposal if it meant reducing the salaries of some to increase the salaries of others, but added that if the power to pay the extra £50 could be invoked more frequently it was a very suitable proposal.

Dr. CLARKE said that the suggestion that nominal salaries should be paid in teaching hospitals was not being pressed. The motion was carried.

Restrictions on Hospital Expenditure

Dr. R. LL. MEYRICK (Lewisham) moved:

That this Meeting deplores the present restrictions on hospital expenditure as being detrimental to the best interests of medicine.

He pointed out that in one hospital, where over £100,000 had recently been spent on buildings, there were no funds to replace an outdated E.C.G. machine. In another, now replete with its new out-patients' buildings, there was no money to provide the doors with door stops, or to reduce the orthopaedic out-patient waiting-list time from seven weeks. Yet another, because of lack of beds, was unable to admit antenatal patients with complications during pregnancy, despite the fact that it had wards kept empty and unused for lack of the price of a pot of paint to redecorate them.

Mr. HOLMES SELLORS strongly endorsed Dr. Meyrick's remarks. In his own case, he said, in developing one particular branch of intracardiac surgery there were no funds available for the purchase of any new machinery; they had to depend on outside charity for things which ought to be regarded as obtainable out of ordinary working expenditure and development in the evolution of any hospital. In a number of cases the reduction of expenditure was even further retarding the progress of medicine.

The motion was carried.

Board Charges in Hospital

Dr. R. A. G. HAMILTON (Harrow) moved:

That in a reformed National Health Service patients should be required to make a payment for board in hospital according to their means.

He said that patients were called upon to pay various charges, and it was only reasonable that people in hospital should pay for their board, as they would have to do if under treatment at home. Dr. N. NELSON (Dundee City) opposed the motion, saying that it would mean those with known incomes paying through the nose, as they did for most things, while those with unknown incomes would get away scot-free as usual.

A motion that the Meeting pass to next business was duly seconded and carried.

Poliomyelitis Vaccine

Dr. J. B. S. MORGAN (Derby (with Derbyshire, West)) moved that poliomyelitis vaccine be made available for the staffs of general hospitals.

Since cases admitted to hospital in the early stages of poliomyelitis, when diagnosis was indefinite, were looked after by house-physicians and nursing staff in susceptible age groups, he thought they should be dealt with in precisely the same way as general practitioners and ambulance staffs and their families, for whom the vaccine was made available.

Dr. C. W. WALKER (Cambridge and Huntingdon) moved as an amendment the insertion of the words "and students" after "staffs," and this was agreed.

Dr. H. N. ROSE (Stratford) said that the Minister intended to make poliomyelitis vaccine available to the staffs of all hospitals and the families and residents in doctors' houses, and to extend the age group from 15 to 25. The motion was therefore probably unnecessary.

The motion, as amended, was carried.

Home Paediatric Treatment

Dr. L. J. STOLL (Hampstead) moved:

That this Meeting approves of the St. Mary's Hospital home-care paediatric scheme and recommends that this scheme be adopted on a national basis with the support of the Ministry of Health as part of the National Health scheme.

The scheme had been started, he said, when it had been found that nearly a quarter of the children in hospital had been admitted for conditions which could have been dealt with at home if facilities for home management and nursing had been available. Using endowment funds, St. Mary's had set out to discover (1) what conditions could be nursed at home under the care of the general practitioner, supported by a mobile team; (2) whether liaison between the paediatric staff of the hospital and the family doctor could thereby be improved; and (3) how the cost of in-patient treatment compared with that of home care. The team consisted of two paediatricians, a sister, two nurses, and a part-time physiotherapist. The area had a population of 75,000, with a high proportion of poor and overcrowded homes, and was one in which parents tended to take their children direct to hospital. In the first year 206 patients had been treated at home, and in the second 582. The number of family doctors participating was 114. The cost per patient per week with home care had been £4, compared with £26-£30 for in-patients. The scheme brought hospital facilities to the home and gave a new stimulus to team-work outside hospital walls.

Dr. W. WOOLLEY (Council) suggested that the motion should take the form of a reference to Council. The scheme described seemed to be an excellent one, but there were other excellent but rather different schemes elsewhere and the Meeting should not be asked to recommend the adoption of this one scheme as a national scheme. Dr. F. GRAY (St. Pancras) said that the scheme was a pilot one and had already achieved immense results. It would benefit the whole country, but it had to be paid for out of St. Mary's private funds; it would require legislation to make national funds available. That was the intention of the reference to a national basis. The Ministry knew what was going on but did nothing.

The motion was carried as a reference to Council.

Hospital Reports to General Practitioners

Dr. G. S. R. LITTLE (Greenwich and Deptford), with the leave of the Meeting, moved as a reference to Council the following motion which stood on the Agenda in the name of his Division:

That this Representative Body asks that approach be made to the Minister of Health requesting that all hospital reports to general practitioners should be on paper of a uniform size, suitable for filing in F.M.R. holders.

Mr. G. E. MOLONEY (Oxford), as a hospital doctor, supported the proposal but suggested that it should work both ways. If doctors could use a standard form when sending patients to hospital it would be of the greatest help.

The motion was carried as a reference to Council.

At this point Dr. Talbot Rogers took the Chair.

GENERAL MEDICAL SERVICES

Dr. A. B. DAVIES (Chairman, General Medical Services Committee) moved that the Annual and Supplementary Reports of Council under "General Medical Services" be received. In doing so, he said that a few weeks ago he had given a full account of the work of the G.M.S. Committee to the Conference of Local Medical Committees, which had been fully and accurately reported in the *Journal*, and at the present Meeting Dr. Wand had brought this up to date. The G.M.S. Committee had not completed all the tasks given it by the A.R.M. last year or solved all the problems, but the Royal Commission had had an impact on almost everything that it had done.

Dealing with the "full and final settlement," Dr. DAVIES said that by "final settlement" he meant the supplementary payment, because there could be no such thing as a "final settlement" until their claim had been met. On this occasion doctors were being paid capitations on numbers on their total lists which were greater than the total population of this country. When the totals were added together it would be found that in the past year they would have received the highest sum on record. In 1956 the final settlement was received in December. In 1957 it proved possible to bring it forward to September, and this year it had been received on June 30, which meant that six months of the backlog had already been caught up. The Committee had gone much further and had persuaded the Ministry to pay on account for the year 1957-8 the sum of £3m. next December. So that in this year practitioners would receive £7,600,000 in addition to the normal capitation and loading and other payments. The Representative Body approved in the previous year that some of the moneys, particularly the interim award, should be allocated where the shoe pinched most. Inducement payments came from outside the Pool, and an increase in the amount paid of about 10% had been achieved, and also a raising of the ceiling within which payments could be made. The trainee allowance received a 5% interim award, and apart from that an increase of £75 in the allowance was secured. In addition the motoring allowance had been raised from £150 to £200 a year. Although the Committee did not achieve all that it asked for, it did, nevertheless, obtain an increase in the locum allowance for refresher courses from 16 to 17 guineas and an 80% increase in the subsistence allowance.

The question of the discount on priority drugs for the rural practitioners was once again raised, and the Committee had achieved the price allowance of basic price less 20% in place of the former price less 33%. In addition many costly drugs had been added to the special list.

The CHAIRMAN recalled that the Representative Body agreed earlier to defer a motion by Portsmouth and one by Rugby (with South Warwickshire) until the presentation of the G.M.S. Committee's report. By agreement with those concerned, the Agenda Committee now presented the following composite motion:

That this Meeting wholeheartedly supports the Council in making continued efforts to secure a further interim increase in remuneration.

Dr. A. M. READ (Portsmouth) moved the composite motion. He said he did not suppose that there was anyone present who was surprised by the contents of the Minister's letter to Dr. Wand. "We have long since discovered that a gentleman's agreement with politicians is a contradiction in terms," he said, and he urged the Meeting to strengthen the hand of the Council by giving unanimous support to the motion.

Dr. WAND expressed the hope that the Meeting would pass the motion unanimously, and assured Representatives that Council would proceed as soon as it appeared to be the right moment, probably some time in September. Dr. R. P. HENDRY (Rugby (with South Warwickshire)) supported the motion.

The motion was carried *nem. con.*

Central Pool

Dr. A. G. HERON (Bristol) moved: "That the Representative Body requests Council to review the necessity for a change in this or any replanned Health Service in the working of the Central Pool, which is proving to be unjust and discouraging in its effects."

The Central Pool was a Gilbertian affair, he said, containing the elements of tragedy for the profession and comedy for the onlookers. In so far as the Minister could calculate, general practitioners as a whole could not earn any more, however hard they worked, or whatever extra jobs they undertook. There must be a change in the working of the Central Pool. It was levelling down and undermining practitioners' ability to earn their living.

Dr. DAVIES said that there was some misunderstanding about the motion. Was it an attack on the pool system, or a criticism of the distribution of the Pool? He would like to know which it was. Dr. HERON (Bristol) said that his Branch was not opposed to the Pool or to Spens, but as it stood at the present time it was absurd.

Dr. DAVIES said he had been assured that the motion was a criticism of the distribution within the Pool. If that were so, he took exception to the word "unjust." The G.M.S. Committee had always carried out the profession's wishes and had negotiated variations in the distribution of the Pool accordingly.

Dr. J. L. MCCALLUM (Westminster and Holborn) said that a confidence trick was being pulled on the profession by the Government. The Part III services commanded a 50% grant from the Exchequer, the other 50% coming from the rates; the Exchequer got back 100% from the Pool and pocketed the other 50%. Dr. WAND said it did not matter where the money came from, because Spens had said that a general practitioner should earn a certain average and the Danckwerts Award had been based on Spens. Since then the profession had not received the betterment that it felt it justly ought to have. "If you have a pool which allows for an average income for each practitioner, and if, as Mr. Justice Danckwerts determined, every practitioner who comes into the Service provides for the pool a certain amount of extra money to be divided, then we cannot have it both ways," he said. There had to be a distribution of moneys within a global sum. On the question of vaccination nobody had considered the possibility that by vaccinating more people possibly there would ultimately be less work for doctors to do. "On the whole, the pool has done us well," he said. "If you start making alterations you are likely to get into difficulties. Can you imagine a worse time to start altering something which has been useful and satisfactory than while the Royal Commission is deliberating? I can think of nothing worse or more foolish."

It was agreed to pass to the next business.

Schemes for Withdrawal from the N.H.S.

Dr. DAVIES, in a statement preceding the discussion of motions on the above subject, said that the G.M.S. Committee had appointed a special subcommittee which was studying possible schemes of alternative services. Expert advice was being sought and an impartial, non-medical expert of eminence had been engaged. The committee hoped to be in a position to report to the profession in good time before the Royal Commission reported.

Dr. R. L. LUFFINGHAM (East Yorkshire) moved:

That this Representative Body demands that a scheme be prepared for action to be taken in the event of the Government's

offer being unsatisfactory after the recommendations of the Royal Commission are made known.

His Branch had not been pleased to find the motion placed under the heading of "General Medical Services"; any action taken should be a matter for the whole profession, not just one branch of it. It was time that the Association faced hard political facts. The Royal Commission would not be prejudiced, whatever was said. If the report was favourable it would not be implemented; if unfavourable it would be used as an excuse by politicians to discard Spens. The profession had built up a consultation procedure second to none and had established the right to be heard, but implicit faith in the procedure was bound to fail when one side gave fair warning that it would only be used when it suited them. The motion was a call for action in a new form of direct political pressure. All the evidence showed that ministers and politicians were susceptible to political pressure properly applied. His Division believed that the Council should, as a matter of urgency, set up a small subcommittee to be convened in the name of the British Medical Guild. Its purpose would be to investigate the possibilities of action in the political field on lines which included lobbying techniques, methods of increasing the use and value of the present Parliamentary group, and the increased use of distributing information and propaganda to M.P.s and prospective M.P.s. It should report to the Council at the earliest possible moment. The Royal Commission was due to report on a specified date; informed opinion believed that that would coincide with a general election.

Dr. W. WOOLLEY (Bristol) said that most of Dr. Luffingham's suggestions were already being carried out by the Public Relations Committee. Dr. LUFFINGHAM replied that when facing a political fight the Association needed every possible weapon. No harm could result from overhauling the machinery.

The motion calling for a scheme of action to be prepared was carried.

A Harrow motion under the same heading was, by leave, withdrawn.

Dr. G. CORMACK (Newcastle upon Tyne) moved:

That the Representative Body instruct Council to investigate the method of strike action adopted recently by the doctors of Vienna, when they achieved their object in the matter of increased remuneration, yet ensured that the public received adequate medical attention.

The motion was not a direct proposal that the profession should proceed to strike action yet, but suggested that efforts should be made to find out how the Vienna strike had been successful. Such information might well be useful to the Association.

Dr. DAVIES said that the motion could only be interpreted as a reference to Council, which he would be perfectly willing to accept. Dr. G. S. R. LITTLE (Greenwich and Deptford) said that the R.B. should throw the motion out immediately. It should not consider or examine any question of strike action. Strikes were completely outmoded. The recent London bus strike of seven weeks had demonstrated that the public were not in sympathy with people who even talked about strikes. Dr. CORMACK said that any request to reject the motion wholeheartedly was rather prejudging the issue. The time might come when men and women would be driven to desperate measures, when it might be useful to have some idea of how a temporary withdrawal might be organized.

The motion was carried as a reference to Council.

Mileage

A Morpeth amendment on this subject was, by leave, withdrawn.

An East Norfolk motion urging that, in assessing mileage between an area which had no mileage and one which had a mileage grant, the city, borough, or urban district boundary should be the accepted start and finish for calculations was carried as a reference to Council.

Disciplinary Machinery

A City motion asking that no doctor should be required to reply to a complaint unless a breach of terms of service was specified was, by leave, withdrawn.

Dr. A. REZLER (City) moved:

That this Meeting resist the proposal that the Council on Tribunals should have power to supervise and make recommendations affecting the disciplinary bodies set up under the N.H.S., whose procedure has formerly been negotiated direct between the profession and the Ministry of Health.

He said his Branch had wondered how tough things could get. The disciplinary machinery of the N.H.S. resembled that of rent tribunals, agricultural committees, and the like.

Dr. H. GUY DAIN (Council) said that the Association did not wish its machinery to be interfered with, even by the new Council on Tribunals. That body had no power of action; it could recommend and advise different Ministries, and their various procedures and a number of different kinds of tribunal had been listed for their consideration. What consideration they would give them was not yet known, but the Association would certainly resist any attempt to increase the number of tribunals which might be affected.

The motion was carried.

Dr. W. F. JONES (Liverpool) moved that the Meeting record its opinion that a local medical committee, sitting without formal rules of procedure, was not a suitable body to recommend penalties for excessive prescribing. It was, he said, an established principle of British justice that an accused person should be given a fair hearing and the help of an experienced advocate. When a doctor was accused of excessive prescribing the charge was a debatable one to begin with; what was "excessive" in one sphere of medicine was not so regarded in another. The inquiry was conducted in an informal manner, which ruled out any legal procedure or opportunity of experienced help. If when it was held that a case had been made out the matter were remitted to a responsible body following a proper procedure he would be content, but as a result of the informal inquiry a doctor could be fined several hundred pounds. He did not question the right of the Ministry to investigate a case where there was alleged to be excessive prescribing, but there should be a proper trial.

Dr. F. GRAY (St. Pancras) pointed out that this was a professional matter, and they had secured that the investigation of it was entirely in the hands of professional men. The Ministry brought the case and the local medical committee was the judge. It did not as a rule permit lawyers on either side, and if allowed to the doctor the Ministry would also be entitled to legal representation. The local medical committee had two duties. The first was to say whether or not there had been excessive prescribing. If it found that there had not been, only an appeal to independent referees could upset that verdict. If it found that there had been, it had to estimate how much. That was a difficult task, but nobody else could do it. It was then for the executive council to say that something should be taken back from the doctor's remuneration. The local medical committee could also suggest considerations which should be taken into account, such as the youth and inexperience of the practitioner.

Dr. DAVIES supported what Dr. Gray had said and pointed out that on several occasions the Conference of Local Medical Committees had turned down a similar proposal.

Dr. JONES, in reply, said that if a large sum of money was to be taken from a practitioner it should be done only by strict legal procedure. There should be judgment by the man's peers, but they should only say that there was a case to answer.

The motion was lost.

Prescription Charges

In the absence of a representative of Tower Hamlets, the Chairman formally moved the motion standing in their

name, which asked the Meeting to reaffirm its opposition to charges for prescriptions and urge the Minister of Health to abolish them in the interests of economy and the avoidance of hardship.

The motion was carried.

General Practitioners and Hospital Administration

Dr. G. S. R. LITTLE (Greenwich and Deptford) moved that increased representation be given to general practitioners on hospital management committees. He wanted to see at least one general practitioner on each such committee. Dr. DAVIES agreed that the situation was very far from satisfactory and supported the motion. Dr. R. LL. MEYRICK (Lewisham) moved as an amendment the addition of the words "without detriment to present consultant representation." He pointed out that there were still many management committees on which there was no medical representation at all.

The amendment was carried, and the motion as amended agreed to.

General-practitioner Beds

The CHAIRMAN stated that the motions on this subject submitted by Manchester, Kingston-on-Thames, and Harrow had been grouped together and would be taken under the Manchester motion.

Dr. F. S. CATTO (Manchester) moved that the Council should continue to urge the need for more general-practitioner obstetric and medical beds. On behalf also of his colleagues of Kingston-on-Thames and Harrow, he said, he wished to contend that all general practitioners should have access to G.P. obstetric and medical beds in hospitals and specially staffed homes in which they could treat their own patients. Where necessary consultants could be called in for domiciliary consultations and paid as if the consultation took place in the patient's home. In the debate on the Health Service in the House of Lords, Lord Moran had advocated beds for selected G.P.s in the big hospitals, but every G.P. should have access to such beds; otherwise, who was to select them?

Dr. R. LL. MEYRICK (Lewisham) moved by way of amendment the deletion of the words "and medical." He said he did not wish in any circumstances to deny the need for medical beds for general practitioners, but the most important need was for G.P. maternity beds. Dr. L. F. KEENAN (Harrow) urged the Meeting to reject the amendment. "Let us ask for medical beds and get them if we can," he said. Dr. MEYRICK, in reply, stressed the need for general-practitioner obstetric beds, and asked the Representative Body to carry the amendment.

The amendment was lost.

Mr. E. N. CALLUM (Kingston-on-Thames) said that the way in which many doctors had to refer their more interesting cases to hospital or elsewhere, where they lost touch with them, was very discouraging to general practitioners and detrimental to the quality of their work.

Dr. DAVIES pointed out that it was already B.M.A. policy, and Dr. CATTO pressed for medical beds.

The motion was carried.

Dr. R. LL. MEYRICK (Lewisham) moved: "That this Meeting calls upon the Government to provide general-practitioner maternity units in all areas, as being the most satisfactory solution to the maternity problems of the country." In the London area, he said, except for one particular area, there was a constant overflow of mothers who were unable to book for a hospital confinement. He suggested that a 50% saving in the cost of running obstetric beds could be effected by the use of general-practitioner maternity units.

Dr. DAVIES said that the proposition was desirable as a long-term plan, but in the meantime it would be helpful to have more obstetric beds in existing hospitals rather than to wait too long for entirely new units.

The motion was carried.

A motion moved by Dr. J. C. ARTHUR (Gateshead) that the Ministry be pressed to implement its declared policy of providing general-practitioner maternity beds by allocating to regional boards earmarked grants for that purpose was carried.

The Meeting accepted as a reference to Council the following motion moved on behalf of Wandsworth by Dr. M. I. CORNICK: "That this meeting deplores the closure at the inception of the National Health Service of all general-practitioner obstetric beds in Wandsworth and other areas, and calls for their re-establishment in suitable hospitals or hospital annexes."

Dr. F. GRAY (St. Pancras) moved that attention be drawn to the waste of public funds in the use of specialized maternity beds for patients who needed hospital confinement only on social grounds. It was, he said, obvious to every member of the Representative Body, but unfortunately not to any member of the Ministry of Health.

The motion was carried.

An amendment by the City of Dundee calling for the abolition of the Trainee General Practitioner Scheme, and a motion by the City of Aberdeen calling for adequate attention to be paid to the remuneration of trainee assistants, were withdrawn.

Dr. W. N. LEAK (Mid-Cheshire) moved that durable, more suitable envelopes should be supplied for National Health Service records.

The motion was carried.

The remainder of the report was approved.

The Meeting adjourned at 6.20 p.m.

FOURTH DAY

Monday, July 14

The meeting resumed at 10 a.m., with Dr. ARTHUR BEAUCHAMP in the chair.

WELCOME TO OVERSEAS VISITORS

The CHAIRMAN extended a welcome to Dr. A. J. Orenstein, from South Africa—a vice-president of the Association; Dr. C. Jacobsen, of Copenhagen, president-elect of the World Medical Association, who conveyed greetings on behalf of that organization; Dr. Swengen, of the Netherlands; and Dr. H. Grant-Whyte, president of the Medical Association of South Africa, who expressed the thanks of his own association for all that the British Medical Association had done for South Africa.

OFFICIAL VOTE OF THANKS

The Meeting then extended a vote of thanks to:

The Lord Mayor (Alderman D. Johnstone) and City Council of Birmingham; the Vice-chancellor (Dr. R. S. Aitken), Council, and Senate of the University of Birmingham; the Secretary (Mr. G. Barnes), Assistant-secretary (Mr. P. Burton), and staff of the University; the Catering Officer and staff; the Town Clerk (Mr. J. F. Gregg); the Chairman and Board of Management of Queen Elizabeth Hospital; the Permanent Secretary and catering staff of the Union; the Automobile Association; British Railways; of the Union; the Automobile Association; the Midland Branch (Get-together reception); the local executive committee; the Ladies' Committee (for arrangements at the Ladies' Club and floral decorations); the permanent staff of the local B.M.A. regional office; the wardens of the university halls of residence; Messrs. W. R. Warner and Co. (for newsreel films); Dr. A. P. D. Thomson and the medical students who acted as stewards; Professor E. K. Waterhouse (Barber Institute) and Professor A. Lewis (Department of Music, University) for arrangements for chamber music concert and for making the galleries available for inspection; Doctors' Wives Association (for garden party); chairman of the committee of the University Staff Club; chairman of the committee of the Union Club; chairman of the committee of the

Warwickshire County Cricket Club; chairman of the committee of the Edgbaston Golf Club; and all others who have contributed to the comfort and entertainment of the members of the Representative Body and their ladies.

OTHER MOTIONS BY DIVISIONS AND BRANCHES

Dr. J. B. W. ROWE (Harrow) moved:

That this Meeting is strongly opposed to a whole-time salaried National Health Service.

His Division was aware that this was the Association's policy, but felt that, since two or three years had elapsed since its views had been expressed on this subject, time had come for a reaffirmation of such policy. It might assist the deliberations of the Royal Commission if it became aware that the A.R.M. had voted by an overwhelming majority against a whole-time salaried service. Secondly, many young practitioners who had qualified during and since the war had become principals, while others were waiting to do so, and they represented a generation which had never known the practice of medicine under conditions of real freedom with an undisturbed doctor-patient relationship. That generation had a growing feeling that they might be better off under such conditions. "We must save them from themselves," he said. Thirdly, many people influential in the affairs of the Royal Colleges, the B.M.A., and other medical bodies were beginning to feel that the whole trend of events in the last few years revealed an increasing Government inclination towards the establishment of a medical civil service.

Dr. A. J. MACLEOD (Outer Isles) moved to amend the motion by the addition of the words, "for general practitioners for the country as a whole without prejudice to what may be found best in limited areas." No one had full knowledge of everybody's requirements in the Service throughout the country. The Association might be doing a grave injustice to people who were trying to give just as good a service as anybody else if it introduced a limiting clause into its policy. Dr. J. S. NOBLE (Blyth (with Morpeth)) asked the meeting to reject the amendment. The motion as it stood was one of principle. Surely the negotiators and leaders of the profession could be left to handle the ideal of achieving the best service for special areas. In the circumstances, he asked leave to withdraw the next motion, standing in the name of his Division, which was in similar terms to that under discussion.

Dr. A. LAMONT (Inverness) asked representatives not to feel that the word "salary" was a swear-word. Some of those doing the best work in the profession were salaried people, even if they were not general practitioners. The CHAIRMAN OF COUNCIL appealed to the meeting, in view of the shortness of time available for dealing with the remainder of the agenda, not to occupy time on matters which were only restatements of policy, thereby unreasonably limiting the time at its disposal for discussing other important questions.

The CHAIRMAN said that the amendment, as it sought to alter policy, came within the category of those which required six weeks' notice; it was, accordingly, ruled out of order. Dr. LAMONT protested that the amendment did not ask for any change in policy; the agreement between the Government and the Association was that no change for the country as a whole in the state of the Service should be introduced without consultation with the profession.

On the suggestion of the CHAIRMAN, the meeting agreed "that we reaffirm our policy." The Blyth (with Morpeth) motion was, by leave, withdrawn.

Negotiations on Terms of Service

Permission was granted to Dr. R. S. V. MARSHALL (South Staffordshire) to move a motion standing in the name of his

The CHAIRMAN reported that a letter had been received from Dr. R. Forbes in which he tendered his resignation as a member of the Council. Dr. Forbes said that he had had a long run which he had enjoyed to the full, and he had taken his decision before he became ill. "Please convey to the members of the Council my sincere thanks for their comradeship and their recent expression of sympathy and good wishes," he concluded. Dr. WAND said he could recall few members of Council whose services had been so valuable as those of Dr. Forbes, and there were few members of the Association who had done such great work for

the Association as member, member of Council, Deputy Secretary, Secretary of the Medical Defence Union, and, later, Chairman of the Ethical Committee.

Election of Council, 1958-9

It was reported that the voting for the election of members of Council for 1958-9 in Groups where there were contests resulted in the election of the following members:

Group 2	B. Burns, Sheffield, I. G. Innes, Hull, J. A. L. Vaughan Jones, Leeds.
Group 12	A. N. Mathias, London, J. B. W. Rowe, Harrow.
Group 20	J. L. McCallum, London, A. Barker, Whitstable.

Advisory Committee on Dental Publicity

It was reported that the CHAIRMAN, after consultation with the Society of Medical Officers of Health, had authorized the name of Dr. J. L. Patton, Medical Officer of Health for Hendon, to be submitted, on behalf of the Association, for membership of the Committee on Dental Publicity.

Danish Medical Association

The CHAIRMAN reported that an invitation had been received from the Danish Medical Association to send a delegate or delegates as guests of the D.M.A. to its annual meeting to be held at Naestved from September 13 to 15. Council nominated Dr. R. G. Gibson to represent the Association.

Representation of Other Bodies

Dr. C. Metcalfe Brown (Manchester) was nominated as the Association's delegate to attend the National Society for Clean Air's annual conference at Llandudno from October 1 to 3.

Mr. H. H. Langston and Dr. J. G. McDowell were re-appointed representatives of the Association to serve on the Court of the University of Southampton.

Association for the Study of Medical Education

Council agreed that the British Medical Association should become a corporate member of the Association for the Study of Medical Education, and that Dr. Hugh Clegg and Professor W. Melville Arnott should be the Association's representatives at the first annual general meeting of that body.

Annual Clinical Meeting

The Council agreed to hold the annual clinical meeting in 1959 in Norwich.

Proposed Committee to Review the Medical Services

The Council received a report of a meeting with representatives of the Royal Colleges, the Scottish Royal Medical Corporations, the College of General Practitioners, and the Society of Medical Officers of Health for further discussion of the arrangements for setting up a committee to review the provision of medical services to the public, and their organization, in the light of ten years' experience of the National Health Service, and to make recommendations.

Central Pool

The following resolution passed at a general meeting of the East Norfolk Division on May 7 was remitted to the General Medical Services Committee:

"That the present method of calculating the Central Pool, whereby the more extra work we do the less we get for basic N.H.I. duties, should be made less ridiculous."

Geriatric Services

The CHAIRMAN reported that letters had been received from the Deputy Chief Medical Officer of the Ministry of Health, Dr. G. E. GODBER, concerning matters dealt with at the discussion on May 28 between the deputation appointed by the Council on March 26 and officers of the Ministry. Dr. Godber pointed out that the discussion showed that there was no major disagreement between the views of the Department and those expressed on behalf of the Association. The difference lay rather in the degree of emphasis which the Ministry felt it right to put on the various ways in which improvement could be made in the care of the chronic sick and elderly.

COUNCIL MEETING

The Council met at Birmingham on July 12 at 9 a.m. Before proceeding with the business on the agenda, Dr. S. WAND, Chairman of Council, said that Sir Tudor Thomas had written to say that he had decided not to seek nomination again for a seat on the Council. Sir TUDOR THOMAS, who was present, said that he had reached this decision with feelings of much regret, having enjoyed membership of the Council for nine years.

The CHAIRMAN said it would be a matter of regret to all that Sir Tudor would not be at future meetings of the Council. He had been a very distinguished member, and it was a privilege to have him as a colleague. His term of office as President of the Association would not be forgotten. Sir TUDOR THOMAS thanked the Chairman for his kind remarks.

Central Consultants and Specialists Committee

Mr. T. HOLMES SELLORS, Chairman of the Committee, reported that, to ease the work of the Chairman, the Committee had decided to appoint two deputy-chairmen to share the duties of the office. The Committee also recommended that the constitution of the Central Consultants and Specialists Committee be amended to provide that, while any member held the office of chairman or deputy-chairman, the body by which he was appointed to the Committee should be free to appoint an additional representative. Secondly, it recommended that the matter be referred to the Organization Committee to prepare the necessary alteration of the Schedule to the By-laws.

The recommendation was adopted.

Hospital Medical Staffing

Mr. HOLMES SELLORS reported that in the discussions on hospital medical staffing over the past few years the Joint Consultants Committee had had in mind two objectives: (i) to find a satisfactory long-term solution of the present staffing difficulties, and (ii) to deal with the immediate problem of the excessive number of senior registrars. It had always been the view of the Joint Committee that the long-term solution could not properly be determined until there had been a nation-wide survey of hospital staffing needs, and the Committee had been confirmed in that view by the numerous attempts of the Ministry to procure the acceptance of a subconsultant grade in one guise or another. The Committee had therefore repeatedly pressed for a survey of hospital medical establishments, at the same time suggesting that, pending the results of such a survey, time-expired senior registrars should be given security in the grade with an extension of their salary scale.

In July, 1957, continued Mr. Holmes Sellors, it seemed there was some prospect of persuading the Ministry to accept the Joint Committee's view, but at a meeting on July 30 the Ministry again resisted a survey of hospital medical staffing. It did, however, seize upon the Joint Committee's suggestion about the extension of senior registrar appointments. It stated that the Minister was prepared to agree to a number of special posts being allocated for senior registrars with

four or more years' service in the grade, and to extra remuneration for the holders of those posts. It also agreed that senior registrars who were unsuccessful in obtaining one of these special posts might be allowed an extension of their appointments, but without any increase of salary. After further proposals by the Ministry, which appeared, among other things, to involve once more the introduction of a subconsultant grade, the Joint Committee, on two further occasions, endeavoured to convince the Ministry of the desirability of conducting a survey of hospital staffing needs before introducing a change in staffing structure, as was envisaged. The Ministry, however, still resisted a review, but suggested the creation of a joint working party to study, in the light of experience, the principles on which the hospital medical staffing structure should be organized.

The Joint Committee welcomed this, provided a survey of hospital medical staffing was subsequently carried out in the light of its recommendations, and provided also that in the meantime there was no change in the senior registrar structure other than an extension of appointment and salary scale. It became apparent, however, that the Ministry's officers had no authority to move from the position they had taken up, and the Joint Committee therefore sought an opportunity of meeting the Minister.

That meeting was held on March 25, when the Joint Committee's representatives explained their objections to the Ministry's plans, and suggested that the only adequate solution of the present problem was to create more consultant posts where they were needed, and that that could be ascertained only by a survey of hospital staffing. In reply the Minister stated that he was under considerable pressure in Parliament to find a solution of the existing senior registrar problem. He thought it would be of doubtful value to conduct a survey to ascertain the ideal consultant establishment if the country could not afford it. Mr. Holmes Sellors pointed out that it was the first time there had been an admission of that kind, and if there was a financial restriction on the hospital service it was necessary to ascertain what it was. The Minister commended to the Joint Committee the establishment of a joint working party, but stressed that he found it essential, owing to Parliamentary pressure, to make some interim provision for the senior registrars who had completed their training. That could not wait until the working party had reported.

Mr. Holmes Sellors then referred Council to an exchange of letters between the Minister and the Chairman of the Joint Consultants Committee, Sir Russell Brain (*Supplement*, April 26, pp. 216-17), and said that one of the main points giving rise to uneasiness in the profession, particularly among junior staff, had been whether the new designated posts were to be additional to the present establishment of senior registrars, thus increasing rather than reducing the number of candidates for consultant vacancies. It was clear that the special posts would be provided mainly within the existing total number of senior registrars. Pending the report of the joint working party, hospital boards would, however, be able to apply for additional posts to be designated where a clear need existed.

The Central Consultants and Specialists Committee had prepared a statement of its views on the future structure of hospital medical staffing for the consideration and use of the Joint Committee's members of the working party.

Expenses Allowable under Schedule E

The Association had been given an opportunity of elaborating before the Board of Inland Revenue the case for granting relief to doctors in salaried employment and assessed under Schedule E in respect of their professional expenses. The Board's representatives were at great pains to reach a clear understanding of the situation, reported Mr. Holmes Sellors. The Committee was preparing for submission to Council in due course an application to the Commissioners of Inland Revenue that the proposed legislation should apply to the membership subscription of the Association.

In view of the fact that the Chancellor of the Exchequer had taken no steps to allow tax relief in respect of other professional expenses incurred by whole-time hospital medical staff, the Committee was to ask the Staff Side of Whitley Committee B to reopen discussions with the Management Side on the recommendations of the Spens Committee on the reimbursement of expenses.

Moral Obligation Clause

Mr. Holmes Sellors recalled that at the beginning of the Health Service the Minister accepted that he had a moral obligation to do everything in his power to try to find alternative employment for a consultant who was displaced or whose sessions were seriously reduced as a result of any reorganization of hospital services. Latterly there had appeared to be an attempt on the part of the Ministry to depart from the spirit of the undertaking which the Minister gave in 1949. The Central Consultants and Specialists Committee had been profoundly disturbed by a recent letter from the Ministry in which the scope of the moral obligation was so narrowed as to be almost valueless, and it had drawn the Joint Committee's attention to the matter.

Applications for Hospital Appointments

The Ministry had accepted the view of the Committee that if a hospital board required a substantial number of copies of an application it should make them itself.

Public Health Committee

Dr. J. B. TILLEY, Chairman of the Public Health Committee, referred to the question of remuneration of public health doctors, and the rejection by the Industrial Court of the claim by the Staff Side of Whitley Committee C for a 5% interim increase from January 1, 1958. The Committee was not yet in a position to ask the Council to approach the Minister requesting an independent inquiry, but that position could not be very far off.

The Committee recommended, however, that all possible steps be taken to establish the principle that the remuneration of public health doctors should be related to the remuneration in other fields of medical practice and not to the salaries of other chief officers of local authorities.

The recommendation was adopted.

Occupational Health Committee

The Council adopted a recommendation, presented by Dr. H. ALEXANDER on behalf of the Occupational Health Committee, that the Lord President of the Council be informed that the Association was not convinced that the satisfactory liaison in the field of occupational health research, which he anticipated in 1956, had yet been established, and urged that steps be taken now with a view to improving the position.

Fees Paid to Appointed Factory Doctors

After representations made by the Association to the Ministry of Labour and National Service over the past year, the Ministry had issued a list of revised fees which, with relatively minor exceptions, corresponded with those recommended by the Association. The Committee recommended acceptance of the proposals, and, as the Department was prepared to arrange the introduction of the new fees as soon as possible, the Chairman of Council approved of the Ministry being so informed.

Office Committee

Dr. S. WAND, as Chairman of the Office Committee, presented the report and recommended that the Council join in the invitation to hold the International Poliomyelitis Congress in London in 1960, and offer all practical assistance possible without, at the present stage, undertaking any financial commitment.

The recommendation was adopted.

Annual Clinical Meeting, 1958

Two recommendations submitted by Dr. R. G. GIBSON on behalf of the Committee of Management of the Annual Clinical Meeting were adopted. The first was that the President of the Association, Professor A. P. Thomson, be invited to open the Meeting at Southampton on December 5, and the second was that each of the following be invited to take the chair at one of the three general sessions: the Chairman of Council, Dr. S. Wand; the President of the College of General Practitioners, Dr. I. D. Grant; and the Medical Officer of Health for Southampton, Dr. H. C. Maurice Williams.

Scientific Programme

The Committee arranged a full programme of three general sessions, four panel discussions, a session of medical films, colour television of surgical operations each day, a transatlantic clinical conference, live clinical demonstrations at the local hospitals and clinics, and visits to centres of medical interest in the area. It was proposed to invite the press to attend only the general sessions, panel discussions, and the transatlantic clinical conference.

Welsh Committee

Sir TUDOR THOMAS reported that the Committee had received a suggestion from the Glamorgan Local Medical Committee that the representatives of Welsh local medical committees on the General Medical Services Committee should be members of the Welsh Committee. The Committee welcomed such broadening of its membership, and considered that to include the Welsh representatives on the Central Consultants and Specialists Committee would be equally valuable. It therefore recommended (i) that the constitution of the Welsh Committee be amended to include in its membership (a) the representatives of Welsh local medical committees on the General Medical Services Committee, and (b) the representatives of the Welsh Regional Consultants and Specialists Committee; (ii) that it be referred to the Organization Committee to prepare the necessary alteration of the Schedule to the By-laws.

The recommendation was adopted.

Membership of Regional Hospital Boards

Council agreed to refer to the Central Consultants and Specialists Committee a resolution passed by the annual general meeting of the East Somerset Division deploring the dwindling of the number of medical men appointed to serve on regional hospital boards.

Candidates for Election

On the motion by the CHAIRMAN, 137 candidates were elected as members of the Association.

Council also received and approved the reports of the General Medical Services Committee, Science Committee, Family Doctor Committee, Rehabilitation Committee, and the Committee on Drug Addiction.

OPENING OF TRADE EXHIBITION

The Exhibition of pharmaceutical products, instruments, appliances, and medical publications was opened by the President-Elect, Professor A. P. THOMSON, in the forecourt of the University, Edgbaston, on July 14.

The pharmacological activity of the drug industry, said Professor Thomson, had probably done as much for medicine of late as any other branch of scientific activity. It had brought back to medicine the realization that there could be no assured progress unless there was precise knowledge of the finer chemical processes involved in biological systems.

In declaring the Exhibition open, Professor Thomson congratulated the organizers on the result of their work.

**CHURCHES' COUNCIL OF HEALING
THE ROLE OF PARSON AND DOCTOR**

"I think this gathering is a great sense of witness," Sir CLEMENT PRICE THOMAS said of the meeting of doctors and clergy organized by the Churches' Council of Healing at the Grand Hotel, Birmingham, on July 11, in connexion with the Annual Meeting. There was a good attendance of both representatives and clergy and ministers. 1958 being the tenth anniversary of the National Health Service, this year's subject was the role of the parson and the doctor in the Welfare State.

The Bishop of Lichfield, Dr. A. S. REEVE, who presided, said that, although "know-how" had never been so much in evidence as to-day, the world had never been so sick. There was sometimes a feeling between various sections of the community which was a *malaise*. The need was for a healing of the spirit. The National Health Service could go on developing in the right way only if it had at its heart a spirit of vocation on the part of all those working in it. "We Christians believe that because we look to God as revealed in the Lord Jesus Christ, we have the perfect ideal at whom to aim," concluded Dr. Reeve.

Dangers of Full-time Service

Sir CLEMENT PRICE THOMAS asked: "Does the Welfare State fare well, and is the National Health Service rendering the service it should? The National Health Service, I think we all have to admit, was the will of the people," he said. "This was a non-political thing. It was something which had to come. I am sure that there are many things in the National Health Service that as doctors perhaps do not know if the lay people would agree—we would like to change, but by and large it has been a success."

The National Health Service, to all intents and purposes, was a full-time service—and as a full-time service it had dangers. From the patient's point of view there was the danger of looking on medical care as merchandise to which he was justly entitled. A little boy, sent to ask the doctor for castor oil, explained it was for his father's boots. Abuse of the service because it was "free" was a serious thing.

Another danger was that in a full-time service the sense of service itself might be lost. "The majority of us were, medically speaking, brought up to the so-called voluntary system, whereby there was a large opportunity of voluntary service without any reward, not only among the physicians and surgeons, but among general practitioners," continued Sir Clement. "That opportunity is apparently getting less and less."

Surgery, and medicine equally, had advanced so much that people were living longer, and the maternity and infant mortality rates had dropped as a result of technical advances. But that was not all.

Beyond Symptomatology

"Medicine is not just giving people medicine," said Sir Clement. "I believe that we as doctors need to go beyond the symptomatology. We need to meet the patient on his own ground." "Tell me, sir," a trainee had asked him, "what do you consider to be the qualities of a good surgeon?" First, Sir Clement defined, a surgeon must have the requisite knowledge and skill. Second, he must have the ability to put himself in the place of the patient, to enter into his feelings and to be able to give him a quiet mind. For any patient to get a quiet mind he must have confidence in the doctor. He must be satisfied that the treatment outlined was correct. And then there was the residual something which the patient had to settle for himself. The quiet mind was achieved most easily and most satisfactorily by people who had faith in God. That was something no money could buy, something which no technological advance could give. What greater ideal could they have than Christ Himself, who gave Himself for His people?

Faith Healing

On faith healing, Sir Clement knew nothing except what he had read. Numbers of his patients asked if they could have someone to come and lay on hands, and he never refused. He had not seen any organic result, but he was quite sure that these patients had a spiritual comfort which he was not able to give them. Sir Clement stressed that he did not mean that there was nothing in spiritual healing; he was certain, from what he had read, that there must be.

New Kind of Man

The Rev. AUSTEN WILLIAMS, vicar of St. Martin's-in-the-Fields, London, spoke of the estrangement of the vast bulk of the population from the Church. "There has been a new kind of man in our present age with a different outlook and different ways of thinking," he said, "and we in the Church, and perhaps not in Medicine, have not caught up with that yet." It could be seen most in the new housing estates where there were communities of men and women living new kinds of lives without the church. Doctors and parsons particularly had the responsibility of taking into that set-up the vital personal element which was lacking.

"Already I believe parsons are changing," continued Mr. Williams. They were being wanted because their contribution to the modern welfare set-up was valuable. The Church was being asked to feel and sympathize in the life that was going on, and not simply in a spiritual way. One could not make poetry without words; one could not take the trinity without the other parts besides the spiritual.

The work of doctors and parsons was interdependent. Both were concerned with human relationships. There was need for the personal approach to these people, as person to person, by parsons and doctors. "I believe that talking about people is prayer, that you don't have to lard it up with a lot of other stuff," said Mr. Williams.

Parsons and doctors were the two key people of the present day in so far as they carried into the present set-up the infinitely precious thing which came from God. No Welfare State could give contentment and self-giving.

IN AND AROUND BIRMINGHAM

A minor heatwave added its warmth to the welcome representatives received as they gathered in Birmingham on July 9 for this year's A.R.M. That the weather reverted to current form later in the meeting was of no great consequence, although Warwick Castle, Coughton Court, and Stratford-upon-Avon, visited on a most enjoyable Sunday excursion, would have looked even more beautiful had the sun shone. Nor was it outdoor weather for the garden party given by the Doctors' Wives' Association on the Saturday. An evening-of-the-meeting reception for representatives and their ladies, given at the Grand Hotel by the Midland Branch, brought old friends and new together. Dr. F. E. GOULD, President of the Branch, and Mrs. GOULD received the guests. Another party, for women representatives and medical women accompanying representatives, was given on Friday, July 11, by the Birmingham and District Association of the Medical Women's Federation. The guests were received by Dr. E. M. NEWHAM, its president, and notable among those present were some women medical students at the University.

Education, Music, and Art

Birmingham's position as the focal point for industry in the Midlands holds good also for education, music, and the arts. The University buildings, in their green surroundings, with the massive blocks of the Queen Elizabeth Hospital and Medical School in the near distance, made a splendid setting for the meeting. There was plenty of room to move inside and outside the Great Hall, and the proceedings were marred only by frequent complaints about the loud-speaker system.

On Sunday evening members had the enjoyable experience of listening to a Symphony Concert by the celebrated City of Birmingham Symphony Orchestra, under its leader, WILFRED LEHMANN. The conductor was RUDOLF SCHWARZ, who recently left the directorship of the orchestra to become Director of Music at the B.B.C., and the soloist was DENIS MATTHEWS. Grieg's Piano Concerto, Brahms' Academic Festival Overture, Richard Strauss's Symphonic Poem, Don Juan, and Dvorák's Symphony No. 4 in G were the items in the programme. For this musical *tour de force* the Association owed its gratitude to the generosity of CIBA Laboratories Ltd., who sponsored the concert.

Another artistic occasion of a high order was a Chamber Music Concert given, by kind permission of the Director, Professor E. K. WATERHOUSE, at the Royal Institute of Fine Arts on Saturday evening, July 12, and arranged by the Midland Branch. YFRAH NEAMAN (violin) and HOWARD FERGUSON (piano) were the soloists, and listeners heard beautiful renderings of César Franck's Sonata in A Major and Beethoven's Sonata in F Major for violin and piano. The programme was arranged by Professor AUBREY LEWIS, Barber professor of music in the University. Afterwards the visitors were able to tour the galleries and admire at their leisure a representative collection of pictures.

These were only two of the many pleasures so generously made available during the first week of the Meeting, and those who had not previously visited "Britain's Second City" came away feeling that in and around it there was more than enough to please and interest every taste.

HOSPITALITY

A German doctor's daughters, aged 15 and 17, would like to make exchange visits of about a month during the summer with a British doctor's daughters. A German doctor's son, aged 17, would like to exchange visits during the summer holidays with a British boy of the same age. Two German boys, aged 15 and 18, would like to stay with British medical families as paying guests during August.

A French doctor's daughter, aged 17, would like to stay for three months in this country as a paying guest or *au pair*. A French girl, aged 16, a doctor's daughter, would like to stay with a family in a university town as a paying guest during the summer so that she could follow a vacation course. A 14-year-old French girl and boy would like to stay as paying guests with British medical families with children of about the same age. A French girl, aged 16, would like to exchange visits with a British doctor's daughter for about six weeks from July.

Would anyone interested please get in touch with Dr. R. A. Pallister, International Medical Advisory Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

NEWS IN BRIEF

RESETTLEMENT OF EX-REGULARS.—The Minister of Health has reminded hospital boards and management committees that they should assist in the resettlement of ex-regulars from the armed Forces by giving special consideration to their applications for employment in jobs for which they are suited. As a result of the Government's defence policy a number of officers and men will have their Service careers prematurely ended during the next few years because of the large reductions in Forces.

NATIONAL INSURANCE CONTRIBUTIONS.—From July 7 the weekly contribution for the National Health Service has been increased by 6d. for men, 4d. for women, and 2d. for those under 18, with an additional 2d. from the employer in the case of employed persons. Full details of the new combined National Insurance and N.H.S. rates are given in leaflet N.I.103 available at Pensions and National Insurance offices. The new stamps have been on sale at post offices since June 30.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Lessons from the Past

SIR.—There is one small but important point which Lord Moran does not mention in his article (*Supplement*, July 5, p. 3). In discussing the 1954 award to consultants and comparing their remuneration with general practitioners, it should be remembered that a G.P.'s N.H.S. income from the central pool is adversely affected if private earnings are increased. This cannot apply to consultants. Another relevant point is that a general practitioner's annual remuneration should include the cost (currently about £150) of a six-weeks locum per annum.—I am, etc.,

Llandrindod Wells.

H. J. HOUGHTON.

Ten Years

SIR.—After reading the sour leading article in the *Journal* of July 5 (p. 33), it was refreshing to see Dr. Fry's letter in the *Observer*, which effectively contradicts several of your points. I agree with him that there is no widespread desire for G.P.s to work in hospitals. Medicine is so specialized nowadays that it would be impossible for us to work with more than one type of consultant. In hospitals, consultants will not look at patients with illnesses outside their own specialty. How then can G.P.s be expected to work with several? Lord Moran talks about picked general practitioners. Who is to do the choosing? No more secret committees, please.

I think it is time we stopped this querulous nonsense about too much form-filling. We do less now than we did in the days of private practice: at least we don't have to keep accounts. All we have to do is to keep notes adequate for treating our patients, filling in E.C.24, and signing our names when new patients come on to our lists (or leave them). Heaven knows how much form-filling there will be if we are paid for items of service. An epidemic of chicken-pox would have more forms than spots.

If, as Dr. Guy Dain (*Supplement*, July 5, p. 1) says, the doctor-patient relationship has been helped by the service, and now Lord Moran (*Supplement*, July 5, p. 3) says that we are not worried financially, what is all the trouble about? Anyone would think, from reading the *B.M.J.*, that troublesome patients, queues in waiting-rooms, and non-payment of bills were unknown before 1948. Insecurity was greater then than now despite what Dr. Dain says.—I am, etc.,

Lincoln.

A. H. FERGUSON.

Cost of Prescribing

SIR.—We keep on hearing about the cost of medicines: a select committee even wants to examine wretched students on the subject. Yet it is absurdly difficult to get data. It is not surprising that at Oxford last year I heard very inaccurate statements about prices of drugs from several senior consultants. When a doctor from the Ministry itself came to rattle our partnership on prescribing costs, the poor chap was hopelessly at sea: he did not even know that many proprietaries are cheaper than their *B.N.F.* equivalents.

What are our sources of information on the subject? (1) The Drug Tariff hardly prices anything less than twenty years old. It mentions dozens of newer drugs, only to put a dash against the price. (2) The Ministry occasionally sends a squalidly produced circular, giving incomplete facts about certain things. (3) *Prescriber's Notes* appears to be moribund, and anyway only a few oddly chosen subjects were mentioned. Unless I am off some official posting list, that is our total official source of information.

On the other hand, we have reams of gorgeous paper from the manufacturers. Price statements in them are of course

suspect, though not necessarily false. One can see through such a subterfuge as "Cost of maintenance may be as little as 6d. a day," when the tablets cost 6d. each. But there must be deeper wiles: one cannot easily believe that a dozen 125 mg. penicillin V tablets by one great British firm cost nearly twice as much as the same thing from another equally famous British firm: yet that appears to emerge from two recent circulars. One's nearest thing to a textbook is *A Prescriber's List of Ethical Products*, published—presumably unofficially—by Unichem Ltd. and given to us by a local chemist. But its prices are retail, plus tax, and it is wholly concerned with proprietaries.

Surely, on a matter of importance, doctors are entitled to a reasonable presentation of facts? On several occasions a few years ago I wrote to the Ministry to advocate a formulary whose sections would be based on the actions of drugs rather than on their shapes. This is now available as the *B.N.F.* alternative edition, and the interleaved version makes a good book, if you pay for it, and if you take the trouble to make copious notes on the interleaves. The monographs are excellent. But what chances have been lost. The layout could be enormously improved. How easy, too, to put prices against the *B.N.F.* preparations and to put proprietaries (and their prices) on the interleaves for immediate comparison. All similarly acting drugs would then be together, and most doctors would use the book for information, entirely apart from any interest in prices. It should, of course, be free, as it would be the only decent counter-advertisement to the wicked proprietaries. Its cost would probably be saved in a day's prescribing. I suggest that the G.P.'s answer to any official about prices should be the schoolboy "I don't know, and nor do you: and soon I shan't care."—I am, etc.,

Sidmouth.

GERALD GIBBENS.

SIR.—In these days of concern over the size of the national drug bill, I think it is only right to draw attention to the discrepancies in the costs of immunizing agents—against typhoid, paratyphoid, cholera, and tetanus—as supplied by different firms. One firm in particular charges twice as much and more than another no less reputable. There may be some reason or other, but surely there can be no appreciable difference in the quality of medical products so important as these.—I am, etc.,

Staines.

S. J. POOTS.

Tax Relief for Higher Education

SIR.—I was interested to read that the Council considers that the consultants are underpaid, and should receive up to £8,000 per annum (*Supplement*, June 14, p. 312). This seems to me to be an inflationary method of dealing with this situation, when the margin of surtax is still at its pre-war level.

One of the main problems confronting the medical profession is that of educating their children. I will not refer to public schools, as it can be argued that a free alternative is provided, but there is no alternative for a university education. A well-established consultant in a high-income group, and therefore not eligible for a grant, will have to pay full fees plus the tax on that cost. It costs at least £600 per annum to keep a son, or daughter, at a university, and if he, or she, happens to be a medical student the education continues for seven years—i.e., £4,000 to £5,000. This is paid out of taxable income, which means that about £10,000 has to be earned.

Would it not be fair to consider such a dependant as a trainee, for which there could be tax relief? Boys in other trades and professions are often apprenticed or articulated to their fathers, when payment is made out of non-taxable income. The number of doctors able to afford to enter their children for the medical profession is diminishing, and will continue to do so as long as higher education is taxed as a luxury.—I am, etc.,

Newport, Mon.

J. T. RICE-EDWARDS.

Poliomyelitis Vaccinations

SIR.—I read in my newspaper that the next stage in the poliomyelitis immunization campaign is to offer injections to all persons up to the age of 25. This is very desirable, but let us suppose a practitioner with a list of 3,000 has 800 patients within this age group and see what it means in terms of "unpaid" work. If we allow three minutes per injection (this time to include sending for the patient, fetching the vaccine, and filling in the forms) and assume, as is likely, that three injections will be given in six months, then $800 \times 9 = 7,200$ minutes = 120 hours. On the basis of a 40-hour week, this amounts to three weeks' work. As we all know, the payment for this is deducted from the central pool, so it is virtually unpaid work. Taking the argument a stage further and supposing that 18,000 doctors give this service, then $3 \times 1,800 = 54,000$ weeks = 1,080 years' work (assuming two weeks' holiday per annum), all unpaid. I should not expect to pass an examination in logic with this exposition, but I do think it is an interesting way of looking at the problem. Do we still want to keep the "solid" advantages of Spens and ignore the hours of work we are putting in to earn our living (see my letter, *Supplement*, February 8, p. 63)?—I am, etc.,

Cosham, Hants.

V. H. MARTINDALE.

M.O.H.s and the N.H.S.

SIR.—Just about a year ago the Association expressed its concern that the public health doctors, though forming an integral part of the National Health Service, had been excluded from consideration by the Royal Commission. Last week you published a special National Health Service *Supplement* (July 5). I have searched it in vain for some review—critical or otherwise—of developments within the local health authority services. Have you forgotten, Sir, that these services exist, or are you under the impression that nothing fresh has happened in their sphere during the last 10 years?

Let me remind you of only some few of these developments: the closer working relationship between family doctors and health visitors, underwritten by a policy decision at the A.R.M. of 1953, the widening scope of mental health education, the increasing deployment of home help not only to support the sick and infirm but also to avoid the splitting up of families and to assist in the rehabilitation of families with social problems, and the ascertainment of severe handicap in early childhood, for which new screening techniques offer increasing scope.

Why then, Sir, was the public health service left out entirely of your so-called National Health Service *Supplement*? Have you, too, ceased to consider us as full members of the Health Service's team?—I am, etc.,

London, N.10.

WILFRID G. HARDING.

H.M. Forces

REGULAR ARMY RESERVE OF OFFICERS

Major-General D. Bluet, C.B., O.B.E., O.H.P., late R.A.M.C., from Active List, to be Major-General. (Substituted for the notification in a *Supplement* to the *London Gazette* dated May 2.)

ROYAL ARMY MEDICAL CORPS

Captain (War Substantive Major) (Honorary Lieutenant-Colonel) D. N. Keys has ceased to belong to the Reserve of Officers, retaining the honorary rank of Lieutenant-Colonel. Captain (War Substantive Major) J. A. G. M. Lynch has ceased to belong to the Reserve of Officers.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Majors J. R. Horler and R. Bennett, T.D., have been granted the acting rank of Lieutenant-Colonel. Captain R. J. O. Catlin, Reserve of Officers, to be Captain, and has been granted the acting rank of Major.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel (Honorary Brigadier) J. G. Morgan, C.B.E., T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., retaining the honorary rank of Brigadier.

ROYAL AIR FORCE

Air Commodore (Acting Air Vice-Marshal) G. A. M. Knight, C.B.E., to be Air Vice-Marshal. Group Captains W. K. Stewart, C.B.E., A.F.C., and J. F. Dales to be Air Commodores.

Wing Commanders G. D. Campbell, G. R. Gunn, O.B.E., and E. B. Bright, A.F.C., to be Group Captains. Squadron Leaders E. O. Barnes and A. J. K. Gallagher to be Wing Commanders.

Flight Lieutenants H. K. Mason, J. D. Campling, and P. D. W. Wickenden have been transferred to the Reserve, retaining the rank of Squadron Leader.

Flight Lieutenants J. B. Parsons and J. L. Milligan to be Squadron Leaders.

ROYAL AIR FORCE RESERVE OF OFFICERS

Wing Commander G. P. Flew has relinquished his commission, retaining his rank.

Squadron Leaders L. L. Ingram, J. P. F. Whelan, S. G. Gordon, and V. A. F. Martin have relinquished their commissions, retaining the rank of Wing Commander.

Squadron Leaders G. K. Taylor, J. C. Groves, and A. Wardale have relinquished their commissions, retaining their rank.

Flight Lieutenant K. E. Mortimer to be Squadron Leader. Flight Lieutenant F. T. Moore, O.B.E., has relinquished his commission, retaining the rank of Squadron Leader.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Arey, L. B.: *Human Histology: A Textbook in Outline Form*. 1957.
Banks, A. L., and Hislop, J. A.: *Health and Hygiene*. 1957.
Bregat, P.: *L'Œdème Papillaire*. 1956.
Brusch, H. G.: *Rheumatic Diseases, Rheumatism and Arthritis*. 1957.
Cogan, D. G.: *Neurology of the Ocular Muscles*. Second edition. 1956.
Dati, T.: *Endocrinologia Sexuale*. 1955.
Dobson, J., and Wakeley, Sir C.: *Sir George Buckton Browne*. 1957.
Dodson, A. I., and Hill, J. E.: *Synopsis of Genitourinary Diseases*. Sixth edition. 1956.
Eastman, N. J.: *Expectant Motherhood*. Third edition. 1957.
Eeman, N. J.: *Technique of Conscious Evolution*. 1956.
Ewalt, J. R.: *Mental Health Administration*. 1956.
Eyre, J. G.: *Tuberculosis Nursing*. Second edition. 1957.
Ferguson, T., and Cunnison, J.: *In Their Early Twenties: A Study of Glasgow Youth*. 1956.
Fields, W. S. (Editor): *Brain Mechanisms and Drug Action*. 1957.
Folley, S. J.: *Physiology and Biochemistry of Lactation*. 1956.
Frobisher, M.: *Fundamentals of Microbiology*. Sixth edition. 1957.
Gathercoal and Wirth's *Pharmacognosy*. Third edition by E. P. Claus. 1956.
Genne, W. H.: *Husbands, Wives, and Pregnancy: A Handbook for Expectant Fathers*. 1957.
Gifford's *Textbook of Ophthalmology*. Sixth edition by F. H. Adler. 1957.
Green, J. R., and Steelman, H. F. (Editors): *Epileptic Seizures*. 1956.
Gregg, A.: *Challenges to Contemporary Medicine*. 1956.
Henry, W. E.: *Analysis of Fantasy*. 1956.
Hunt, A. H.: *Contribution to the Study of Portal Hypertension*. 1958.
Jesse, F. T. (Editor): *Trials of Timothy John Evans and John Reginald Halliday Christie*. 1957.
Jones, M. V.: *Speech Correction at Home*. 1957.
Kerr, D. J. A.: *Forensic Medicine*. Sixth edition. 1957.
Kerr, W. G.: *Surgery: A Guide to Surgical Diagnosis and Treatment, including Tropical Surgery*. 1957.
Liebman, S. (Editor): *Management of Emotional Problems in Medical Practice*. 1956.
Ligon, E. M.: *Dimensions of Character*. 1956.
Linton, R.: *Culture and Mental Disorders*. Edited by G. Devereux. 1956.
Macintosh, Sir R., et al.: *Physics for the Anaesthetist*. Second edition. 1958.
Mackenzie, C.: *Sublime Tobacco*. 1957.
Modern Trends in Gastroenterology. Second series edited by F. Avery Jones. 1958.
Reynolds, V.: *Précis d'Epidémiologie et Prophylaxie des Grandes Endémies Tropicales*. 1955.
Rhine, J. B., and Pratt, J. G.: *Parapsychology: Frontier Science of the Mind*. 1958.
de River, J. P.: *Sexual Criminal: A Psychoanalytical Study*. Second edition. 1956.
Rolph, C. H. (Editor): *The Human Sum*. 1957.
Rosenthal, S. R.: *B.C.G. Vaccination Against Tuberculosis*. 1957.
Savater, R., et al.: *Traité de Droit Médical*. 1956.
Short, C. L., et al.: *Rheumatoid Arthritis*. 1957.
Simpson, J. F., et al.: *Synopsis of Otorhinolaryngology*. 1957.
Snapper, I.: *Bone Diseases in Medical Practice*. 1957.
Sonnar, E.: *Chirurgische Propädeutik*. 1957.
Talbot, J. H.: *Gout*. 1957.
Thouless, R. H.: *General and Social Psychology*. Fourth edition. 1958.
Walshe, F. M. R. (Editor): *Selected Papers of Sir Gordon Holmes*. 1956.

Association Notices

CHANGE OF NAME OF CLEVELAND DIVISION

Notice is hereby given by the Council of the Association that the name of the Cleveland Division of the Tees-Side Branch has been changed to Cleveland and Middlesbrough.

ADJUSTMENT OF AREA OF GATESHEAD AND DURHAM DIVISIONS

Notice is hereby given by the Council to all concerned that it is proposed to transfer the Urban District of Washington from the Area of the Gateshead Division to that of the Durham Division.

Any member affected by this proposal and objecting thereto should write to the Secretary of the Association not later than August 16, 1958.

NIGERIA BRANCH

Notice is hereby given by the Council to all concerned that it is proposed to reconstitute the existing Nigeria Branch, at the present time one without Divisions, into a Branch with three Divisions with the following titles and areas.

- (a) Eastern Division, comprising the eastern region of Nigeria.
- (b) Lagos Division, comprising the Federal Territory of Lagos.
- (c) Western Division, comprising the western region of Nigeria.

Any member affected by this proposal and objecting thereto should write to the Secretary of the Association by Friday, August 29, 1958.

A. MACRAE,
Secretary.

Diary of Central Meetings

JULY

- 23 Wed. Central Ethical Committee.
- 24 Thurs. G.M.S. Committee, 10.30 a.m.
- 24 Thurs. Staff Side, Committee C, Medical Whitley Council (at 14, Russell Square, W.C.), 10.30 a.m.
- 24 Thurs. Full Committee C, Medical Whitley Council (at 14, Russell Square, W.C.), 11.15 a.m.
- 28 Mon. Staff Side, General Whitley Council (at 14, Russell Square, W.C.), 10.30 a.m.
- 28 Mon. Full General Whitley Council (at 14, Russell Square, W.C.), 12 noon.
- 29 Tues. Staff Side, Committee B, Medical Whitley Council, 10.30 a.m.
- 29 Tues. Full Committee B, Medical Whitley Council, 2 p.m.

AUGUST

- 8 Fri. Planning Subcommittee, Occupational Health Committee, 2 p.m.

Meetings of Branches and Divisions

ASHTON-UNDER-LYNE DIVISION

At the annual general meeting on April 23 the following officers were elected:

Chairman.—Dr. J. E. R. Keyms.
Vice-Chairman.—Dr. A. T. Wilson
Honorary Secretary.—Dr. J. E. Morris.
Honorary Treasurer.—Dr. M. J. Twomey.

BROMLEY DIVISION

The annual general meeting was held on April 2. The following officers were elected:

Chairman.—Dr. C. R. G. Bannington.
Vice-chairman.—Dr. R. M. Penny.
Honorary Secretary.—Dr. J. Fry.

CAMBERWELL DIVISION

The annual general meeting was held at Dulwich Hospital on April 1. Thirty members were present. The following officers were elected for 1958-9:

Chairman.—Dr. R. J. Rosborough.
Vice-chairman.—Dr. B. H. Pentney.
Honorary Secretary.—Dr. W. B. J. Pemberton.
Dr. D. P. Stevenson, deputy secretary of the Association, addressed the meeting on "A Review of the Problems Facing the Medical Profession after Ten Years of the National Health Service."

CITY OF DUNDEE DIVISION

The annual general meeting was held in the Queen's Hotel on May 2. The following officers were elected:

Chairman.—Mr. J. F. O. Mitchell.
Vice-chairman.—Dr. J. B. Barnet.
Honorary Secretary.—Dr. J. M. Langlands.
Honorary Treasurer.—Dr. G. M. Grant.

DARFORD DIVISION

At the annual general meeting on April 22 the following officers were elected:

Chairman.—Dr. H. C. Calvey.
Vice-chairman and Honorary Treasurer.—Dr. Wm. Reversion.
Honorary Secretary.—Dr. C. F. Bolton.

KENYA BRANCH

The following officers have been elected for 1958:

President.—Dr. K. V. Adajia.
Vice-president.—Dr. G. C. Dockeray.
Honorary Secretary.—Mr. Andrew Hicks.
Honorary Treasurer.—Dr. A. Hargreaves.
Editor, East African Medical Journal.—Dr. J. A. Carman.

LEWISHAM DIVISION

At the annual general meeting the following officers were elected for 1958-9:

Chairman.—Dr. S. Ida Fisher.
Vice-chairman.—Dr. C. W. Robertson.
Secretary and Treasurer.—Dr. R. L. Meyrick.

NORTH-EAST ESSEX DIVISION

The following officers have been elected:

Chairman.—Dr. T. Brady.
Vice-chairman.—Dr. J. Steeds.
Secretary and Treasurer.—Dr. W. E. Corringham.

SHEFFIELD DIVISION

The annual general meeting was held on March 28. The following officers were elected:

Chairman.—Dr. Andrew Stephen.
Vice-chairman.—Dr. D. H. Anderson.
Honorary Secretary and Treasurer.—Dr. T. Lodge.
Honorary Assistant Secretary.—Dr. I. A. J. Ross-Smith.

SOUTHAMPTON DIVISION

At the annual general meeting held on April 16 the following officers were elected:

Chairman.—Dr. R. S. Russell Smith.
Vice-chairman.—Dr. H. K. Meller.
Secretary and Treasurer.—Dr. J. G. McDowell.
Assistant Secretary.—Dr. W. H. N. Angus.

SUNDERLAND DIVISION

The annual general meeting was held on April 18. The following officers were elected:

Chairman.—Dr. I. M. Jones.
Vice-chairman.—Dr. R. H. Vasey.
Honorary Secretary.—Dr. C. W. Bewick.

TYNESIDE DIVISION

At the annual general meeting the following officers were elected for 1958-9:

Chairman.—Dr. I. O. B. Spencer.
Vice-chairman.—Dr. R. M. S. Parker.
Honorary Secretary.—Dr. J. C. Knox.
Honorary Treasurer.—Dr. Betty Cowling.

WEST SUFFOLK DIVISION

The following officers were elected on March 25:

Chairman.—Dr. J. L. McNeill.
Deputy Vice-chairman.—Dr. J. W. E. Cory.
Honorary Secretary and Treasurer.—Dr. S. Blaxland.

WESTERN AUSTRALIA BRANCH

The annual general meeting was held on March 22. The following officers were elected:

President.—Dr. C. W. Anderson.
Vice-president.—Dr. D. D. Keall.
Honorary Secretary.—Dr. R. L. Leedman.
Honorary Treasurer.—Dr. D. E. Copping.
Honorary Assistant Secretary.—Dr. F. C. Macaulay.
Chairman of Convocation.—Dr. B. W. Buttsworth.
Drs. C. W. Anderson and D. M. Clement were elected Federal Councillors for 1958.

YORKSHIRE BRANCH

The following officers have been elected for 1957-8:

President.—Dr. T. K. Cooke.
President-elect.—Dr. L. V. Broadhead.
Vice-president.—Dr. J. A. L. Vaughan Jones.
Honorary Secretary and Treasurer.—Dr. J. H. E. Moore.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

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British Medical Association

ANNUAL REPRESENTATIVE MEETING, BIRMINGHAM, 1958*

FOURTH DAY (continued)

Monday, July 14

OTHER MOTIONS BY DIVISIONS AND BRANCHES (continued)

A motion by Marylebone asking the Meeting to instruct Council to convene a mass meeting of all professions to discuss improvements in the presentation of their ideals and methods of service was not discussed. A motion from the floor to pass to next business in view of the impracticability of the Marylebone motion was carried.

Dr. G. D. WILD (Derby (with West Derbyshire)) moved that the Representative Meeting "deplores the difficulty experienced in obtaining locumtenent services for both principals in general practice and the hospital services." The sole purpose, he said, was to advertise the difficulty common to all branches of the profession in the hope that in time some means of circumventing it would emerge.

The motion was carried.
Dr. S. G. BROOK (Barnstaple) moved that the time-table of the Annual Representative Meeting be altered when practicable so that it did not include a Sunday. If the motion were carried it would, he said, effect a financial saving to the Association of some £1,000. Attendance figures showed that, of 387 representatives last year, 101 were not present on the Monday. The main reason for their absence was the difficulty in obtaining locumtenents.

The motion was carried as a reference to Council.
Dr. R. H. MOORE (North Middlesex) moved:
That this Meeting recommends that, when a Chairman of a Committee of Council wishes to withdraw any portion of his report to the Representative Body, all Divisions having motions appertaining to that section of the report should be given prior notice of this fact; that is, on the morning prior to the commencement of business, and not during the actual presentation of the report.

He said that his Division wished it to be clearly understood that the motion was not a reflection on the Chairman of Council or Committees. It was designed to ensure that when any member of any Division or group of members

*The first part of this report appeared in last week's Supplement.

brought a matter before the Representative Body it would have a chance of reaching it.

Dr. WAND said that for years those concerned had conducted the business in a businesslike manner without having instructions of the kind set out. It might well be that new matters would be brought forward which would mean that the Chairman of Council or of a Committee would feel that it was only right and proper that something should be withdrawn. The object of the Representative Body was to make the right decisions and not to be hidebound by regulations.

A motion to pass to next business was carried.

Dr. J. H. STRANGER (North Glamorgan and Brecknock) moved a motion asking the Meeting to express the opinion that free university education should be available to all, irrespective of parents' income, in view of the fact that owing to the present economic position of the profession medical men found it difficult to finance the university education of their children. He said that an increase in the allowance made on income tax and the abolition of the means test by many local authorities could do much to relieve the situation; but his Division felt that free university education was a simpler and more straightforward answer. Mr. J. T. RICE EDWARDS (Council) moved by way of amendment that in view of the present economic position the cost of university education should be relieved of taxation. It cost approximately £600 a year, he said, to have a son or daughter at university, which, with the addition of income tax, meant £1,200 a year. In the case of medical students who took seven years, it means that parents paid £5,000 for the course plus tax, which meant £10,000. The difference between grant-aided students and the people who had to be paid for was far too great.

Dr. W. R. KING (North Glamorgan and Brecknock) said it was interesting to note that for the first time in its long history Aberdeen University this year had failed to obtain its full quota of medical students. It might well be a sign of the times. It was realized that technically there was no such thing as "free education," but it was being urged that the anomaly should be removed whereby some people get their children educated free, and the heavily taxed professional classes had to pay twice.

Dr. WAND said he was not clear what the amendment meant. Did the words "in view of the present economic position" mean that as soon as the Bank Rate went down to 4% there was no further action? he asked. Did it mean that as soon as 6d. was taken off income tax there was no further action? Did it apply only to the medical profession? He suggested that it was a badly thought out amendment.

A motion to pass to next business was carried.

GENERAL MEDICAL SERVICES (continued)

Prescribing in General Practice

The Meeting proceeded to consider the remainder of the report under General Medical Services.

Dr. A. REZLER (Leamington) moved that the Council should inquire into the whole question of prescribing in general practice. Every year hundreds of warning letters were sent to doctors, about 700 doctors were seen by R.M.O.s, and a few doctors were fined heavily. What was the doctor to do when the R.M.O. had visited him and told him that he must reduce his costs? Some doctors removed from their lists those patients who required too much in the way of prescriptions; some doctors cut down their surgery hours and hid so that they were not there to give prescriptions. The Council could look into the matter by means of a questionnaire—with anonymity—to see how much those factors affected practitioners.

Dr. DAVIES, in reply, said, come what may, the Committee always stood for complete freedom for the doctor to prescribe what he thought best for the patient, irrespective of cost; but the G.M.S. Committee was satisfied that the existing machinery was fair, and in fact evidence had been given on the subject to the Hinchliffe Committee. It would be wise, therefore, to await that Committee's report.

Dr. B. BURNS (Sheffield) expressed the hope that the Representative Body would not permit the motion to be flattened by the big guns. "We have a responsibility to avoid waste and extravagance in prescribing," he said, "and few will deny that there is room for improvement in this respect; but if we are to have the full co-operation of the general practitioner in this matter it will be necessary to remove certain absurdities and injustices from the existing procedure." The much-vaunted freedom to prescribe whatever the doctor considered necessary was illusory. The Cohen recommendations imposed a limitation. The general practitioner was theoretically free to prescribe, but if he dared to prescribe a certain list of products he would have the cost deducted from his pay. The junior hospital doctor had *carte blanche*, yet every prescription issued by the general practitioner was subjected to every scrutiny. Dr. R. P. HENDRY (Rugby (with South Warwickshire)) supported the motion. The present position was quite chaotic, he said, and it was time that it was fully investigated. Dr. J. S. McLAREN ORD (Glasgow) opposed the motion, suggesting that Council had enough on its plate already. "I am sure that if a doctor prescribes with common sense he will not get into any serious trouble," he added. Dr. F. GRAY (St. Pancras) said that the doctor was a responsible person and had to make his own decisions at present. He asked the Representative Body whether it wanted that freedom curtailed. The practitioner was free at the moment, subject to justifying what he had done.

Dr. REZLER, in reply, said that it was only when a certain stage was reached above an average that doctors were guilty and were accused of extravagance and incompetence. They were grave charges made by their own colleagues, and an opportunity must be given to change the position.

The motion asking Council to inquire into the whole question of prescribing in general practice was lost.

Dr. R. REID moved a motion on behalf of Nottinghamshire asking the Annual Representative Meeting to consider that calculation and comparison of individual doctor's prescription costs was misleading unless there was also an estimate made of the related cost of sickness benefit and reference to hospital. Dr. DAVIES said that good prescribing

might well save money, but it did not necessarily follow that costly prescribing did so. He had no idea how the G.M.S. Committee should go about obtaining the information to justify or to refute the suggestions made in the motion.

Dr. REID said the implication was that if a doctor prescribed normally he would obtain reasonable costs; but sometimes antibiotics, which were initially expensive, reduced the time off work and hospitalization.

The motion was lost.

A motion by Tunbridge Wells, "That this Meeting deplores the fining of doctors for over-prescribing without an accurate knowledge of what that doctor has saved in public money by (a) keeping people out of hospital, and (b) keeping people at work," was moved from the Chair.

Dr. F. GRAY (St. Pancras) pointed out that under the National Health Service a doctor could be found guilty of unnecessary cost in prescribing only on specific items. He was innocent until he was found guilty. Therefore, whatever he had done about sending people to hospital or not was irrelevant.

In the light of Dr. Gray's explanation, the motion was, by leave, withdrawn.

Dr. W. N. LEAK (Mid-Cheshire) moved that 5-ml. syringes should be allowed for administration of streptomycin for patients. Dr. DAVIES said that injections of streptomycin and similar injections were given by district nurses, and he understood that the 5-ml. syringes were provided by the local authority and were used by the nurses in that way.

The motion was lost.

Dr. E. COLIN-RUSS (City) moved that restrictions on transfer of patients should be abolished. The motion, referred, he said, to transfers where there had been no change of residence. It had been held that the delay which was put upon a patient was necessary to exert some sort of control over prescribing. It was also said that patients importuned young doctors in particular for drugs and dressings to which they were not entitled, and those doctors were unwilling to refuse the prescriptions because the patients would run round the corner and get them elsewhere. That was a wrong point of view. The Government should teach people that they were entitled to drugs and dressings which their doctor considered necessary for their treatment.

Dr. A. REZLER (City) added that the reasons given for the regulations were perhaps good in 1950, but they were not good now. Dr. DAVIES said that if the motion were carried it would clash not only with previous A.R.M. policy but also with the policy of the Conference of Local Medical Committees. The fact that a patient had to write a letter of explanation had undoubtedly stopped very many frivolous transfers.

Dr. COLIN-RUSS said, in reply, that he did not know how one defined "frivolous transfer." At the beginning of the scheme possibly there was a fair amount of coming and going, but it had probably now settled down.

The motion was lost.

Dr. K. C. BAILEY (West Somerset) moved that the Meeting express dissatisfaction with the present system of filling vacancies in general practice in England, which allowed a lapse of a period of up to four months between advertising a vacancy and its fulfilment. He asked that the Meeting recommend as a matter of urgency that the present system be overhauled with special reference to the arrangements in force in Scotland, which worked more rapidly. He pointed out that in England application was made to the executive council; there was one month's wait for appeal to the Medical Practices Committee and another month for appeal to the Minister. In Scotland, on the other hand, application for appointment was made to the executive council and appeal was made to the Medical Practices Committee. Dr. L. F. KEENAN (Harrow) supported the motion.

Dr. DAVIES said that the matter had been taken to the Ministry at the request of the Representative Body many times, and in 1957 both the Representative Body and the Conference of Local Medical Committees accepted the recommendation that the matter should not be pursued any

further. As a result of representations to the Ministry there had undoubtedly been a great improvement, and he understood that the average time taken now was about two months compared with four months some two or three years ago.

The motion was lost.

The following motion by Harrogate was accepted as a reference to Council: "That medical records returned by practitioners to the executive council in respect of patients leaving this country be retained by the executive council concerned for a period of five years for use should the patient return to this country during that period."

Dr. J. C. ARTHUR (Gateshead) moved that municipal dental clinics be liable to pay for the arrest of dental haemorrhage as was a private dentist. He said that it left a gap in an otherwise admirably working scheme. Dr. H. M. COHEN (Birmingham) pointed out that as far as the school health service was concerned payment was made for the arrest of dental haemorrhage. Dr. DAVIES said that in view of the co-operative attitude of the Ministry on the matter he did not feel that it should be pursued any further; but if any difficulty arose in any area the G.M.S. Committee would gladly take it up again.

The motion was carried.

Merit Awards for General Practitioners

The CHAIRMAN moved on behalf of Trowbridge: "That this Meeting considers that 'Merit Awards' should have no place in the method of remuneration of general practitioners in the National Health Service."

Dr. J. G. FREEMAN HEAL (Willesden) moved by way of amendment: "That this meeting considers that there should be no merit award in general practice of the type at present existing in the consultant services." He suggested that the words "Merit Awards should have no place in the method of remuneration of general practitioners" could be interpreted as meaning that the principle of differential payments to general practitioners for distinction or merit should have no place in their future remuneration. The principle of differentials was incorporated in Spens and had been accepted by the profession.

Dr. J. A. PRIDHAM (Dorset) asked the Meeting to throw out the amendment and pass the original motion. The amendment contained a sting in that it suggested that merit awards for consultants were unpleasant. Every general practitioner would probably agree that merit awards of any type were not suitable to general practice. Dr. O. C. CARTER (Bournemouth), speaking, he said, as a member of the Spens Committee, disagreed with the mover of the amendment that the motion, as set out, was contrary to the spirit of Spens. It was nothing of the sort.

Dr. DAVIES said that both the Chairman of Council and himself were in some difficulty, because after giving evidence to the Royal Commission they were specifically asked to go back and prepare some notes about a possible merit award scheme for submission and consideration by the Royal Commission. The Royal Commission was aware of some of the criticisms which had been voiced by the profession about consultants' merit awards, and there was difficulty also about merit awards and the Pool method of payment. Nevertheless, if circumstances arose in which the Royal Commission had met the profession's claim as a whole, and over and above that wished to give money to the profession for a purpose which it might recommend in the form of merit awards, who was he to refuse it? Therefore Dr. DAVIES expressed the hope that the Meeting would keep the door open, because it was necessary to appear before the Royal Commission again and support the amendment in preference to the motion.

Dr. WAND said that the amendment asked the Representative Body to make a clear-cut decision on whether general practitioners would favour what he would call the secret giving of merit awards to general practitioners. The type of award was to take a certain percentage, and to give the

awards by allowing a committee to go round and make decisions, and then for those decisions to be carried out and for the awards not to be known. If the Meeting turned that down he would take it that Representatives would not in any circumstances wish that type of merit award to apply in the general practice field. If the Meeting passed it he would take it that Representatives raised no objection to that type. "We want to know how you would feel about this, particularly as the Royal Commission is asking for evidence on the possibility of applying a merit award scheme," he continued. A scheme could be devised, but Council wanted to know whether a well-devised scheme, complicated as it might be, would commend itself to the Representative Body if Representatives knew the basis on which merit awards were given.

Dr. FREEMAN HEAL said that passing the amendment would not entirely close the door but would leave opportunity for further discussion and agreement. The motion as it stood was much more final and dogmatic.

The amendment was carried in the following form:

That this Meeting considers that there should be no "Merit Awards" in general practice of the type at present existing in the consultant services.

Dr. J. S. MOFFAT (Cumberland) said that the subject seemed to evoke high feeling and a certain amount of muddled thinking. Merit awards were seen as a threat to the overall remuneration of general practitioners, but a properly adjudged and apportioned merit award scheme should never prejudice a proper level of overall remuneration. Brilliance and application ought to be rewarded, especially when remembering the discrepancies which existed in the real incomes of medical practitioners compared with those of other occupations. He felt that a board of consultants in any area could tell in five minutes who should have general-practitioner merit awards, while consultant merit awards could be very nicely apportioned by a board of general practitioners.

Dr. J. E. MILLER (Glasgow) hoped that the Meeting would reject any idea of merit awards for general practitioners. Such schemes in the consultant fields had created great discontent throughout the profession, causing suspicion and alarm in many places. To introduce it to the general-practitioner field would create different grades of practice throughout the country. If a practitioner required a monetary incentive for good work it should reflect itself in the number of patients he would attract to his list by being a good general practitioner.

Dr. R. M. S. MCCONAGHEY (Torquay) said that, with due deference to what the Chairman of Council had said, the last day of the A.R.M. was no time to consider the pros and cons of such a question—one of the most important subjects which the A.R.M. had had to consider during the last four days. The Representative Body, thinly represented and without the mover of the motion, would be wise to refer it back to Council for discussion next year after the Royal Commission had reported.

Dr. WAND said he hoped that the issue would not be dodged in that way. The Council wanted an expression of opinion from the R.B., and he would suggest as a form of words: "That this Meeting can see no objection to a merit award scheme for general practitioners, provided a practicable scheme can be devised and subsequently approved by general practitioners." Dr. FREEMAN HEAL said he would be prepared to move such a wording, and proposed: "That this Meeting can see no objection to a merit award scheme for general practitioners, provided a practicable scheme can be devised and subsequently approved by the Representative Body." That would provide a scheme which general practitioners throughout the country could debate and modify if necessary.

Dr. C. P. WALLACE (Guildford) said that the R.B. was being dragged by the Chairman of Council into deciding a matter of the gravest importance at a moment's notice, whereupon the CHAIRMAN said he could not allow such language to be used against either the Chairman of Council

An East Denbigh and Flint motion asking that practice compensation should be payable at the age of 70, irrespec-

The motion was lost.

Artificial Insemination

Dr. H. G. DOWLER (Gloucestershire) moved:

That this Representative Meeting is opposed to the practice of artificial insemination by donors (A.I.D.).

He regretted that this matter came so late in the Meeting that there was not much time to discuss it. He explained that the motion was only concerned with artificial insemination of human beings and referred only to artificial insemination by a donor and not by the husband. He brought it forward for two reasons. First, it was a matter with which as doctors they were bound to be concerned. Secondly, in a matter of great public importance such as this a learned profession might be expected to bring forward views on the rights and wrongs, the desirability or the undesirability of it. The individual attitude would depend on many different factors. There were those more concerned with the practical angles and those more concerned with the religious and moral angles. On the practical aspect, doctors were the ones who had to carry out the practice, and in doing so they were forced to subscribe to the making of false statements on the register of births and deaths, which was surely undesirable. There were also the legal considerations. It was necessary to think of the effect on the children if or when they found out. There was the remote risk of incestuous marriage. More important was that of the nominal father later turning against the child which was not his own. The religious side was for each individual to decide for himself. Dr. Dowler admitted that he was most concerned with the moral side. He considered that A.I.D. was tantamount to adultery, and that was the view taken in the House of Lords. He knew that there was another side. There were the sad cases of couples who were unable to have children, but he did not think that any reason to condone something which one considered to be wrong. Dr. Dowler said that whatever decision was made by the Representative Body it was only an expression of opinion. The Meeting had no power of compulsion over any doctors. Doctors must decide for themselves.

Dr. L. F. KEENAN (Harrow) moved an amendment to delete the words after "insemination." He explained that his Division did not have an opportunity before the Meeting to form an opinion. He put forward the amendment as a responsible member of the Representative Body. Artificial insemination in any form was an unnatural act. It was the duty of doctors in advising their patients to assist the natural law and not to encourage breaking it for any purpose whatever. If it was accepted that it was wrong to interfere with the natural law, any breach of it must be wrong. He asked the Meeting to support the amendment.

Dr. C. E. G. GILL (Cardiff) said they stood on the brink of the dangers of the "brave new world," of which A.I.D. was typical. It was not only against nature and Christian morals, but against all the best traditions of British medicine. Dr. F. A. BELAM (Guildford) said there were some cases where normal sexual intercourse was not possible and both partners were keen to have children of their own. Why should that be denied? He was against A.I.D. Dr. C. O'DONOVAN (Leicestershire and Rutland), asking the Meeting to support the amendment, declared that once A.I.D. was allowed in any form the door was opened to a very grave sin. Dr. A. A. VICKERS (Worcester and Bromsgrove) described the amendment as absolute nonsense. Ninety-nine hundredths of what doctors did in their practices in the way of therapeutics was "unnatural." Mr. NICHOLSON-LAILEY hoped the Meeting would not accept the amendment, which fogged the issue.

The amendment was lost.

A further amendment was moved by Dr. C. P. WALLACE (Guildford) to make the motion read:

This Representative Body views with grave concern the increase in the practice of A.I.D.

Lord Blackburn had recently stated that there were 7,500 A.I.D. children in this country at present. One doctor had disclosed that she had been responsible for arranging for 69 such births; another doctor had been mentioned as

having arranged for 1,000. It had all been arranged in a secret, undesirable way. He could not recall the leader of any religious body in this country condemning A.I.H., but the question of A.I.D. was totally different. "Here we are depriving the unborn baby of a father," he said. "We have heard in the last 25 years—and rightly so—a great deal about maternity and motherhood; I suggest to this Meeting that we, as family doctors, we, as specialists, who know about the illnesses of mankind, know also about the importance and the influence and responsibilities of a father." Dr. F. A. BELAM (Guildford) said there was the question of the father afterwards finding it extremely difficult to accept a child born in that way. If people wanted children really badly and could not have them themselves, how much better it was to adopt them, when both parties knew what they were doing.

Dr. V. COTTON CORNWALL (Liverpool) preferred the amendment to the original motion. It would be wrong at this stage to say, with any qualification, that in no circumstances at all did the Association believe that A.I.D. was allowable or desirable. "We should not give Council the idea that they should go before any Government committee and say that this is the policy of the British Medical Association," he said. Dr. J. S. McLAREN ORD (Glasgow) agreed wholeheartedly. In so important a matter it was not right completely to close the door.

Dr. Wallace's amendment, "That this Representative Body views with grave concern the increasing practice of artificial insemination by donors," was carried by 101 votes to 84.

Speaking as Doctors

Opening the debate on the amendment as a substantive motion, Dr. DORIS ODLUM (Bournemouth) said the Association was being asked to speak primarily as doctors and not to have regard to the emotional side. If its members were asked to give evidence before the committee of inquiry they would be asked to speak as doctors. The medical point of view would have to be considered first and secondly the medico-social aspect. Medically, the profession had no knowledge whether A.I.D. was good or bad, dangerous or helpful; on the medico-social side the question had not received anything like adequate consideration. "If we condemn A.I.D., any child born by it will be socially handicapped," she said, "a handicap created by us, by our condemnation, just as we do with the illegitimate child. If we disapproved of it we shall certainly drive it underground and lose control of it." The fact remained that it was being carried out by reputable doctors. The Representative Body must therefore have careful regard to the fact that its function was to speak medically and medico-socially; it would make itself look very foolish and undignified if it came down into the arena of personal emotions. It would probably be safer to pass the matter to Council for further investigation.

Dr. K. M. TOMLINSON (Gloucester) said he had been surprised to hear the last speaker say that A.I.D. would be considered socially wrong. No figures were yet available, because the children so born had not yet reached the age of 5. If any mother's desire for her own child was so overwhelming that she would allow A.I.D. in preference to the well-tried method of adoption, did that not suggest to practical doctors that there was some degree of pathological adjustment? he asked. Or had the desire to educate been modified by some unrecognized power of direction? But both those considerations paled before the possible effect upon the child—and that was a matter upon which practitioners could have no doubt. Day in and day out doctors saw tragedies of maladjustment due to emotional conflicts during early life. It was an established practice for children to be told they had been adopted, but was it possible to tell a child at any stage, before or after puberty, that it was of artificial origin? "I say 'No,'" he said. "To help one unhappy woman does not, to my mind, justify our help in the production of an almost certainly unhappy child. Support this motion, and, in its condemnation, encourage the Government to make the procedure illegal."

Dr. H. RYAN (Glasgow) said the R.B. ought not to refer the matter to Council but should make up its mind at once and give the Council some guidance. The way to do that was to carry the motion as amended. Dr. A. BARKER (Council) asked for a reference to Council. The meeting was in danger of being swayed by emotion. He could not believe that at the moment the R.B. could, entirely without emotion or bias, come to a firm decision.

Dr. WAND said that enough had been said so far to give the Council a picture of what was in representatives' minds. "You are worried about this business," he said; "you cannot determine what your lay attitude of mind is towards it. On the purely medical aspect you are probably prepared to give any assistance you can to any committee that may be formed, if requested. On the religious, legal, and emotional issues you are not too anxious to give a firm opinion on this subject." (*Cries of dissent.*) Dr. WAND said that if he had not interpreted the feeling of the meeting correctly, perhaps somebody would produce a motion which would clarify any of those points. He had thought that what would ultimately come from the discussion would be an authorization to Council to give any evidence that might be requested by a Government department on the subject, provided that such evidence was limited to the medical aspect—which included the psychological aspect also.

Dr. H. G. DOWLER (Gloucestershire) said that the Representative Body was quite capable of making up its mind on such a matter, difficult as it was. To argue in favour of A.I.D. because it brought happiness in some cases was false. Doubtless there were many bigamists whose action had brought great happiness; but that was no argument for bigamy. Dr. A. R. FRENCH (Marylebone) pointed out that, while bigamy was illegal, A.I.D. was not, as yet. As to the giving of false notifications, no doctor could be forced to do something illegal, for that would be perjury. The only legal aspect of A.I.D. so far as the doctor was concerned was that he might be placed in a position, under the Notification of Births and Deaths Act, of being under a statutory duty to give information to the Registrar relating to the birth, which would include the name of the father. If the informant of the registrar, who was usually a relative, did give the name of a husband in a case of A.I.D., that would be a perjured statement. The doctor attending the birth might not know the name of the putative father, because he might not have arranged the A.I.D. Obviously, in such a case that doctor would say, "I do not know the name of the father," or "I am not prepared to give it to you." But he could not be forced to perjure himself.

The CHAIRMAN put the motion, "That the matter be referred to Council," and this was defeated.

Dr. J. R. BAKER (Scunthorpe) said he had been willing to accept the elimination of the words "by donor," and that had been turned down; he had then been asked to vote that he "viewed with concern this increasing practice," but to say that would mean that he partially accepted it; to say "I do not view with increasing concern . . ." would mean that he approved of it. The amendment had put a lot of representatives in a quandary, and he associated himself with those who wished to have the matter referred to Council.

Dr. R. LL. MEYRICK (Lewisham) moved, as an amendment to the substantive motion under discussion:

That this Representative Body does not oppose A.I.D. in carefully selected cases and is prepared to support Council in giving evidence to any legitimate body in so far as the evidence is confined to the medical aspects alone.

While he was anxious to avoid any emotional or religious conflicts, it was clear that by confining consideration to the medical aspects the only conclusion which could be reached was that there were indeed cases—few or many, but some cases—where A.I.D. was allowable and acceptable. Dr. G. S. R. LITTLE (Greenwich and Deptford) seconded. He agreed that the emotional aspects should be kept out of the question, for that could be discussed in other quarters.

Incidentally, the "woman"—the person who was most concerned—had hardly been mentioned in the discussion. Dr. KEENAN said that the other day the R.B. had discussed the case of a German doctor being reinstated: was that emotionalism? Was it emotionalism to distinguish between right and wrong? There had been too much talk of emotionalism. "We are either right or wrong. Get on with it," he said.

Dr. E. A. GERRARD (Manchester) opposed the Lewisham amendment, on the ground that there were no cases where A.I.D. was justified. No one, whether wife or doctor, had the right to bring into the world what would in fact be an illegitimate child. Furthermore, it should be asked whether or not there was something peculiar in the mentality of a man who would serve as a donor. "It is contrary to the law of God, and I hope it will soon be contrary to the law of man," he said. Dr. K. M. TOMLINSON (Gloucestershire) thought the amendment was "mucking the meeting about." "Surely we can make up our minds whether we like it or not, say so, and get out of this hall," he said. Dr. F. A. BELAM (Guildford): "I understood that psychiatry was part of medicine? What about the psychological angle to the child born in this way and to the husband of the woman? Is that medical or is it not?" Dr. A. A. COCHRANE (Dartford) said that in view of the tremendous religious and legal importance of the motion, and the fact that over half the seats in the hall were empty, he did not feel that the R.B. should attempt to make any decision on the matter but should refer it to Council.

The CHAIRMAN pointed out that it had already been decided not to refer the matter to Council.

Dr. K. C. BAILEY (West Somerset) said of course it was a psychological question. There really was not enough information about the matter yet. It seemed quite impossible that any body of men, medical or otherwise, could give an unbiased opinion at this stage. Some felt it would be better to set up a committee to inquire into the matter. Obviously there were psychological implications, but nobody knew what they were.

Dr. WAND said the debate was getting to the stage when it would be difficult to vote for or against the motion. He suggested as a new form of wording:

That this meeting, while making no pronouncement on the non-medical aspects of A.I.D., authorizes the Council to submit evidence to the Government committee on this subject from the medical point of view if so requested.

Dr. MEYRICK agreed to withdraw his amendment in favour of the text proposed by Dr. Wand. The latter was then carried as a substantive motion.

"BRITISH MEDICAL JOURNAL"

Dr. J. G. M. HAMILTON (Chairman of the Journal Committee) moved the Annual Report of Council under "British Medical Journal."

Supplement to B.M.J.

Dr. R. H. MOORE (North Middlesex) moved:

That this Meeting deplores the fact that the Annual Report of Council makes no reference to the editorial matter contained in the *Supplement* of the *British Medical Journal*, which in our opinion is not presented in a sufficiently readable condition.

He said that great surprise had been caused in his Division by the Council's failure to make use of the *Supplement* as a means of communicating information to the periphery, particularly for the benefit of those who could not or did not attend Divisional meetings.

Dr. HAMILTON said that the *Journal* and its *Supplement* had always been subject to criticism, and the *Journal* staff were at all times prepared to consider complaints from readers as to the form in which the material was set out; but they were highly expert in their own journalistic field, and the idea that Divisions, or possibly the members of the Representative Body, could edit the *Supplement* or any

other part of the *Journal* had only to be mentioned to be shown to be ridiculous. It would also be remembered that the Tunbridge Wells "Gallup Poll" had disclosed that an overwhelming majority considered the *Supplement* to be adequate. That was not to say that the whole country must necessarily think like Tunbridge Wells, but no other Division had produced any facts. Supposition and opinion were meaningless. If any other Division produced facts and figures relating to the readership of the *Supplement*—fair and good.

Dr. MOORE still felt that the *Supplement* should be used as a means of communication weekly from the centre to the periphery, and he had felt that his motion had been a constructive one.

The motion was lost.

Mr. F. W. SHEPHERD (Huddersfield) moved:

That this Meeting recommends that a short journalistic column of the *Supplement* be devoted each week to summarizing, discussing, and commenting on medico-politics, and not necessarily reflecting official policy in its views, aimed at stimulation of interest in these matters by popular presentation.

The motion was not intended as a criticism of the *Supplement*, but it had been felt that more members would be encouraged to read the *Supplement* and get themselves informed on medico-political matters if there were a bright and breezy column devoted to them each week. Something informal and easily digested was required that would improve intraprofessional relationships.

Dr. S. NOY SCOTT (Council) said he failed to see how anything not reflecting official policy would help intraprofessional relationships in any way. A "bright and breezy" column would be reducing the *Journal* to a popular weekly. "Do you want meetings attended by a song-and-dance act?" he asked.

Dr. HAMILTON said he did not regard the motion as anything but a helpful suggestion of the sort which the *Journal* staff were always content to receive; what they quite rightly objected to was being given instructions. He would be quite content for the motion to be carried.

Mr. SHEPHERD said that if more members of the profession took the trouble to read such a column and learn what was going on, that would improve intraprofessional relations.

The motion was carried.

A Bromley motion suggesting that the R.B. should be informed on the methods of selection and source of information of the "To-day's Drugs" section of the *Journal* was, by leave, withdrawn.

ARMED FORCES

Air Vice-Marshal W. E. BARNES (Chairman of the Armed Forces Committee), moving the Annual Report of Council under "Armed Forces," reminded the R.B. that his Committee included serving, reserved, and retired members of all the three Services. Its greatest effort since the war had been the preparation of the Association's evidence to the Waverley Committee in 1954, the fruits of which were still being gathered.

The report was adopted.

ESTATES

The Report of Council under "Estates," moved by Mr. L. DOUGAL CALLANDER (Chairman of the Estates Committee), was adopted.

"FAMILY DOCTOR"

Dr. O. C. CARTER (Chairman of the Family Doctor Committee) moved the Report of Council under "Family Doctor."

In reply to a criticism of the report on the ground that it did not give a fair representation of a paper's financial position, Dr. Carter said he did not know how that could be said. For four consecutive years *Family Doctor* had

been produced at no expense to the Association and had accrued a surplus over its budgeted figure which had been incorporated in the Association's accounts. This year had been one of success for the enterprise, which had as its object the education of the public in matters essential to health.

The report was adopted.

REFORM OF THE NATIONAL HEALTH SERVICE

Dr. H. H. D. SUTHERLAND (Council) moved the reception and approval of the Report of the Amending Acts Committee, of which he is chairman, and sought the permission of the Representative Body to outline some details which Council had not yet considered. Dr. WAND said that, as the Council had not debated the report to which the chairman of the Committee had referred, it therefore had no recommendations on the subject but would consider the subject-matter in November. While it was proper for a chairman to indicate the lines on which a report would be made, when the Council had not had an opportunity of studying the details it was not proper that those should come from the Committee's chairman.

The report was approved.

A Bournemouth motion viewing with alarm the absence of any proposals for an alternative service was, by leave, withdrawn.

SCOTLAND

Dr. W. M. KNOX (Chairman of the Scottish Council) moved the reception and approval of the Annual and Supplementary Reports of Council under "Scotland." He said that that Committee's main business during the past year had been largely that of arranging the Stated Case on the contractual validity of Spens so far as it applied to Scotland. As Representatives had already been told, it had now been received by the Secretary of State for Scotland.

The report was approved.

OTHER ASSOCIATION ACTIVITIES

The CHAIRMAN OF COUNCIL (Dr. S. Wand) moved the reception and approval of the Annual and Supplementary Reports of Council under "Other Association Activities."

A motion by Morpeth dealing with "Recruitment to the Nursing Profession" and two by Marylebone on the subject of "Catering" were formally referred to Council.

Remainder of Report

Dr. DORIS ODLUM (Bournemouth), speaking as chairman of the Joint Committee of Doctors and Magistrates, reported that, in accordance with instructions, the Committee had considered the question of the legal attitude to attempted suicide and had produced a report. The matter was one on which questions had been asked in *The Times*. There was now a very good chance of securing legislation on it in the coming session, probably in connexion with the legislation on the mental health services. Discussion had also taken place on the subject of medical reports to the courts, on which ill-feeling often existed between doctors and magistrates. The Committee had now drawn up a brief account of what the Committee considered might be acceptable to both sides.

The remainder of the report was approved.

VOTE OF THANKS TO CHAIRMAN

Dr. W. G. HARDING then moved a cordial vote of thanks to the Chairman on behalf of the Meeting for having acted as "guide, philosopher, and friend" during the last four days—the last quality calling for particular emphasis.

The vote of thanks was carried with acclamation, and the proceedings of the Annual Representative Meeting concluded, after the Chairman had paid a tribute to the work of the entire staff of the Association.

COUNCIL MEETING

At the conclusion of the Annual Representative Meeting, the new Council met at the Queen Elizabeth Hospital, Birmingham. Dr. S. WAND, Chairman of Council, took the chair.

The following motion, moved by Dr. A. BEAUCHAMP, Chairman of the Representative Body, was carried by acclamation:

That the period of office of Dr. Wand as Chairman of Council, which terminates immediately after the Annual Representative Meeting at Edinburgh, be extended by one year so that there may be no uncertainty as to the identity of the Officer of the Association who will hold this office during the Joint Meeting with the Canadian Medical Association.

The CHAIRMAN extended a cordial welcome to the new members of Council: Dr. B. Burns (Sheffield), Dr. R. Cove-Smith (London), Mr. J. T. Rice-Edwards (Newport, Mon.), and Dr. F. Gray (London).

Minutes of A.R.M., 1958

Council agreed that a Referendum was not expedient on any resolution of the Annual Representative Meeting, 1958, and on the motion of the CHAIRMAN Council agreed that the Chairmen of the Representative Body and the Council be authorized to refer the resolutions of the Annual Representative Meeting to the appropriate Committees.

Election of Standing Committees

The Council then proceeded to deal with the business of electing its representatives on the standing committees, the appointment or reappointment of many special committees, and the representation of the Association on outside bodies.

Appointment of Deputy Secretary

A recommendation by the Staffing Committee that, with effect from November 12, 1958, Dr. WALTER HEDGCOCK be appointed Deputy Secretary of the Association was adopted.

Medical Director of Medical Advisory Bureaux

The recommendation was also adopted that the appointment of Dr. R. A. PALLISTER as Medical Director of the Commonwealth and International Medical Advisory Bureaux be confirmed.

Appointment of Assistant Secretaries

Council appointed Dr. D. L. GULLICK and Dr. J. D. J. HAVARD as Assistant Secretaries of the Association.

Intraprofessional Relations

The CHAIRMAN recalled that consideration of a recommendation made by the Organization Committee was deferred by Council at its meeting on July 9 to the present meeting. The recommendation asked Council to authorize the appointment of a member of staff of graduate or equivalent status as personal assistant to the Secretary of the Association, with the object of ensuring an efficient interchange of information between the periphery and Headquarters.

At the suggestion of the CHAIRMAN, Council agreed that the Organization Committee should be asked to present the Secretary of the Association with a clear exposition of that which it had in mind and wished to be done. The Secretary could then proceed to devise means of carrying out those wishes.

BRITISH MEDICAL GUILD

The meeting of Council was followed by a meeting of the trustees of the British Medical Guild.

Dr. S. Wand was appointed Chairman of the Board, Dr. C. Harrower was appointed Treasurer, and the other officers, staff, and executive committee were reappointed.

The financial statement was approved.

ANNUAL GENERAL MEETING

The 126th Annual General Meeting of the British Medical Association was held in the Great Hall, University of Birmingham, on July 14, at 12.30 p.m., with the retiring President of the Association, Mr. WELDON P. T. WATTS, in the chair.

The notice of the meeting, published in the *Supplement* of May 31, was taken as read. The minutes of the last Annual General Meeting, held in Newcastle upon Tyne on July 15, 1957, were taken as read and were confirmed as correct. The balance-sheet and income and expenditure account for the year ending December 31, 1957, were approved. Messrs. Price, Waterhouse & Co. were appointed Auditors of the British Medical Association until the next Annual General Meeting.

The PRESIDENT announced that the President-elect, Professor A. P. Thomson (Birmingham), would be inducted into office at the adjourned Annual General Meeting later in the day. It was also reported that H.R.H. Prince Philip, Duke of Edinburgh, had been elected by the Representative Body as President of the Association for 1959-60.

The Meeting then stood adjourned until 8.15 p.m.

Extraordinary General Meeting

At the conclusion of the Annual General Meeting an Extraordinary General Meeting was held, at which the Articles of Association of the British Medical Association were amended in accordance with the Notice which was published in the *Supplement* of May 31, 1958.

ADJOURNED ANNUAL GENERAL MEETING

The Adjourned 126th Annual General Meeting of the Association was held in the Great Hall, University of Birmingham, on July 14, at 8.15 p.m. The retiring President, Mr. WELDON P. T. WATTS, presided, and among the many distinguished guests present were the Lord Mayor and Lady Mayoress of Birmingham and the Vice-Chancellor of Birmingham University (Dr. R. S. AITKEN) and Mrs. AITKEN.

Induction of President

In installing his successor, Professor A. P. Thomson, as President of the Association for 1958-9, Mr. WELDON WATTS said that he was born in British Guiana, the son of a colonial administrator, and it was probable that Professor Thomson had inherited part of his great administrative ability from his father. Educated at Dulwich College, Professor Thomson studied medicine in the University of Birmingham. During his student career he won many prizes and was the first student in the university to obtain a first-class in the examination for Bachelor of Medicine. Qualifying in 1915, he entered the Army as a surgeon, and was awarded the Military Cross. After the war he spent some time working in the Departments of Pathology and Pharmacology, and no doubt there laid the foundations of his interest in therapeutics.

In 1916 Professor Thomson obtained Membership of the Royal College of Physicians, and was elected Physician to the General Hospital and other local hospitals, where he spent his entire active career in medicine. He became a Fellow of the Royal College of Physicians in 1929. All his active life he had taken a special interest in medical administration, and during his hospital career he served on many committees. As a result of that interest he was elected Chairman of the Planning Committee in the Birmingham Region and had therefore been largely responsible for the development of the new university site.

In the University of Birmingham he was Professor of Therapeutics. In 1951 he was elected Dean of the Faculty

of Medicine and soon afterwards became Vice-Principal of the University. As a result of his tenure of the latter office he had taken a great interest in international university affairs and had attended numerous conferences abroad. He was also a member of the General Medical Council.

"Professor Thomson is a man who holds very definite views and is not afraid to press these views in spite of opposition," concluded the retiring President. "He is an excellent and persuasive speaker. He is a man of many outside interests. He is a keen pedestrian, and he is very interested in archaeology and the arts. There is no doubt that he will make a stimulating President of the Association."

Mr. Weldon Watts then inducted Professor A. P. Thomson as President of the Association, and invested him with the President's Badge of Office.

Tribute to Mr. Weldon Watts

Dr. S. WAND, Chairman of Council, in moving a vote of thanks to the retiring President, said that over many years he could remember no President who had attached himself to the job more conscientiously than Mr. Weldon Watts. "He has attended a greater number of central meetings than I can recall in the case of any previous President," continued Dr. Wand, "and he has shown a great interest in the affairs of the Association, and a friendliness and approachability which has endeared him to us all." That, however, was only to be expected, because Mr. Weldon Watts had been a member of Council for many years, and had been known throughout that time as a great friend of the Association.

Mr. Weldon Watts had represented the Association at many functions, and, together with Mrs. Weldon Watts, had added prestige to the Association. All who were present would recall the meeting at Newcastle upon Tyne, where Mr. and Mrs. Weldon Watts had made everyone feel so much at home and made the visit one which would always be remembered.

Perhaps the most interesting comment on Mr. Weldon Watts's character was the fact that he had endeared himself so much to his pupils. They all loved him very much indeed.

The Association was grateful to Mr. Weldon Watts for all that he had done, and was also very grateful to Mrs. Weldon Watts for the part she had played.

The vote of thanks was carried by acclamation.

In a brief reply, Mr. Weldon Watts said he very much appreciated Dr. Wand's kind remarks and the way in which the company had received them. It had been a great honour to serve as President of the Association, and the best he could wish his successor was that he would enjoy his year of office as much.

Delegates and Overseas Representatives

The following delegates from kindred associations were then introduced to the President by the CHAIRMAN OF COUNCIL:

Dr. Charles Jacobsen (World Medical Association and Danish Medical Association); Dr. J. D. Cottrell (World Health Organization); Dr. H. Grant-Whyte (Medical Association of South Africa); Dr. Bruno Maia (Brazilian Medical Association); Dr. K. M. Gyi (Burma Medical Association); Dr. Tapani Kosonen (Finnish Medical Association); Dr. Valtir Albertsson (Icelandic Medical Association); Dr. Ludwig Nelken (Israel Medical Association); Dr. Fe Del Mundo and Dr. Rosita R. Ramirez (Philippine Medical Association); Dr. D. W. Swijman (Royal Netherlands Medical Association); and Dr. Hayati Sevgen (Ministry of Health of Turkey).

The following representatives of Overseas Branches were next introduced:

Dr. John A. Carman and Dr. W. S. Haynes (Kenya Branch); Dr. I. A. Moollan (Mauritius Branch); Dr. E. M. Clark and Dr. A. Kagwa (Uganda Branch); Dr. Leonard Holroyd (Zambesi Branch); Dr. O. Adeniyi-Jones (Nigeria Branch); Dr. A. S.

Valentine (Sierra Leone Branch); Dr. R. C. Geeves, Dr. A. A. Moon, and Dr. K. C. T. Rawle (New South Wales Branch); Dr. W. J. Hamilton, Dr. H. S. Waters, and Dr. A. P. Crawford (Queensland Branch); Dr. M. E. Chinner, Dr. B. S. Hanson, and Dr. Charleton Yeatman (South Australian Branch); Dr. K. J. Friend (Tasmanian Branch); Dr. K. L. Chambers, Mr. J. Leon Jona, and Mr. R. N. Howard (Victorian Branch); Mr. A. Daly Smith (West Australian Branch); Dr. J. A. D. Iverach and Professor J. L. Wright (New Zealand Branch); Dr. Z. Lett and Dr. George Choa (Hong Kong Branch); Dr. J. D. Llewellyn Jones (Malaya Branch); Dr. N. Dolan, Professor E. N. MacDermott, and Dr. Noel Reilly (Branches in the Republic of Ireland); Mr. D. J. Toomey (Gibraltar Branch); Dr. M. G. Constantiniades (Cyprus Branch); Miss Betty Underhill (Middle East Branch); Dr. W. F. Townsend-Coles (Sudan Branch); Dr. N. J. Abbensetts (British Guiana Branch); Dr. Gweneth O'Reilly (Leeward Islands Branch); Dr. Harry A. Munro (St. Vincent Branch); Dr. A. Dunstan McShine (Trinidad and Tobago).

Fellows of the Association

The CHAIRMAN OF COUNCIL presented to the President the following Fellows of the Association admitted to the Roll in 1958, the first year in which awards had been made, and who were present at the Meeting.

Dr. T. Beaton (Portsmouth Division); Dr. A. Beauchamp (Birmingham Division); Dr. J. A. Brown (Birmingham Division); Dr. J. N. Collins (Peterborough Division); Dr. E. W. Goodwin (Leicestershire and Rutland Branch); Dr. I. G. Innes (East Yorkshire Branch); Dr. J. Kerr (South Lancashire and East Cheshire Branch); Dr. P. A. McCallum (Torquay Division); Dr. H. C. Orr (South Staffordshire Division); Dr. J. A. Pridham (Dorset Division); Dr. E. P. Rees (N. Glamorgan and Brecknock Division); and Dr. Mary B. Stone (Birmingham Division).

Other Fellows admitted to the Roll in 1958 were:

Dr. P. V. Anderson (Bishop Auckland Division); Mr. R. H. Balfour Barrow (Winchester Division); Dr. B. E. A. Batt (West Suffolk Division); Dr. H. Brown (Sheffield Division); Dr. R. S. Elvins (Scarborough Division); Dr. S. A. Forbes (Croydon Division); Dr. C. Frier (Lincolnshire Branch); Dr. P. J. Gibbons (Liverpool Division); Dr. J. B. S. Guy (Cleveland Division); Mr. R. W. Knowlton (Southampton Division); Dr. P. Y. Lyle (Southport Division); Dr. W. A. Mackay (Southport Division); Dr. N. W. MacKeith (Southampton Division); Dr. L. A. Parry (Sussex Branch); Dr. I. M. Pirrie (Mid-Essex Division); Mr. E. C. Tamplin (Portsmouth Division); Dr. G. W. Taylor (Leicestershire and Rutland Branch); Dr. J. G. Warnock (Cleveland Division); Dr. J. Wilkie (Lancaster Division); and Dr. A. S. Wilson (Lincolnshire Branch).

Lord Adrian

On November 5, 1957, the Council resolved that the Gold Medal of the Association for Distinguished Merit be awarded to Lord ADRIAN in recognition of his distinguished services to medicine and particularly his research in the physiology of the nervous system.

Before the PRESIDENT presented Lord Adrian with the Gold Medal of the Association, Dr. WAND read the following citation:

Ninth medical man to have been President of the Royal Society; among the youngest to have received that coveted honour, the Order of Merit; Master of the famous Cambridge college that nurtured Isaac Newton, whose rooms by Great Gate you once occupied; successor to Michael Foster, Nobel Prize and Joseph Barcroft in the Chair of Physiology; pupil winner jointly with Charles Sherrington; Vice-Chancellor of Oxford; of Keith Lucas and, to follow Robert Boyle's description of Pascal, "noble experimenter"—you have, Lord Adrian, received so many honours in so many lands that you honour your Association in coming here to-night to receive its Gold Medal for Distinguished Merit.

From your earliest days at Cambridge—where you created a record for the number of subjects in which you gained top marks in the 1st part of the Tripos—you concentrated your finely tempered mind on the behaviour of the nerve impulse as shown by the electrical concomitants of its passage along the nerve fibre and its origin in the nerve cell. The climax to much of your work came when, with your colleagues, you confirmed the work of Berger on those rhythmical changes in potential in the brain which, through the modern practice of electroencephalography,

yield so much valuable information to neurologists and, from time to time, evidence that tends to confuse the judge in the criminal court.

But the laboratory has not been for you, Lord Adrian, a cloister which separates you from the world of affairs. Your great gifts of mind and personality have been put to the service of your country, not least during the war of 1939-1945. You have served on the Medical Research Council and we are now anxiously awaiting the report of the Adrian Committee on the effects of radiation on patients. Your elevation to the peerage in 1955 strengthened in many ways the representation of science and medicine in the House of Lords.

Yet generations of medical students at Cambridge must have had a picture of you that is probably different from that conjured up by these almost overwhelming distinctions of mind and office, up by these almost overwhelming dimensions. It is a picture of a man bicycling from the Great Gate of Trinity to the laboratory and the lecture theatre, where the complexities of the central nervous system were made to seem even attractive by your skilful use of clinical neurology as an aid to understanding: a picture of a man for whom a host of students have felt affection as well as veneration.

In this great city we may be pardoned if we boast that a distinguished daughter of Birmingham—the late Dame Ellen Pinsent—herelf had a distinguished daughter, who is your wife. We rejoice in this, and, too, we rejoice that activities such as yours have been devoted, in Sir Henry Dale's words, "through so many years to the single-minded pursuit of fundamental knowledge concerning the physiology of the central nervous system."

Association Prizes

The PRESIDENT then presented the Association Prizes. The Nathaniel Bishop Harman Prize, 1958, was presented to Dr. Anthony Leonard Woolf, of Smethwick, Staffs; the Sir Charles Hastings Clinical Prize, 1958, was presented to Dr. William Hugh Lyle, of Newton-le-Willows; the Charles Oliver Hawthorne Clinical Prize, 1958, was divided equally and presented to Dr. Douglas George French, of Kildgrove, the Staffs, and Dr. Robert Smith, of Stanwell, Middlesex. The Middlemore Prize, 1958, was presented to Mr. Derek Ainslie, of London. The Provisionally Registered Medical Practitioners Prize was presented to Dr. William Watson Littler.

Scientific Exhibition, 1957

Awards for exhibits at the Scientific Exhibition, 1957, were presented to Dr. D. Geraint James and Dr. A. D. Thomson, of the Middlesex Hospital, London, Institute of Clinical Research; to Dr. R. O. K. Schade and Dr. Ernest W. Walton, of the Royal Victoria Infirmary and King's College, University of Durham; and to Dr. D. A. Pond and Dr. W. A. Kennedy, of the Maudsley Hospital, London, Institute of Psychiatry, Departments of Clinical Neurophysiology, Neurosurgery, and Neuropathology.

President's Address

The PRESIDENT then delivered his Address, which was published in full in last week's issue of the *British Medical Journal* (p. 119).

Dr. A. BEAUCHAMP, Chairman of the Representative Body, proposed a vote of thanks to the President.

The vote of thanks was carried by prolonged acclamation, and the company then adjourned to Nuffield House, Queen Elizabeth Hospital, where members and guests were received by the President.

RELIGIOUS SERVICES

BISHOP'S VIEW ON SOCIAL PROGRESS

A warning against the tendency of welfare schemes to subordinate the spiritual to the material was voiced by the Bishop of Birmingham (the Right Rev. LEONARD WILSON, D.D.), at the official religious service held in Birmingham Cathedral on Tuesday, July 15, for members attending the Annual Meeting.

Speaking of the Welfare State, he said: "The framers of constitutions and social reforms are guided, no doubt, by principles; but what principles are they proceeding on? Is it that the only things that matter are the things which touch the senses, or is it that the things which matter most

are those which are only perceived by mind and spirit? We wish to be fair to the present as well as to the past, but surely it is not unjust to say that most schemes subordinate the spiritual to the material. We often display a spirit which is as self-centred and materialistic as the system that we want to avoid. If our social services and education are leaving out any value which we might call spiritual or of divine origin, then I am not sure that the world that is going to come into being will be very much better than the old."

The utopias which the world sought to build were squalid and would not call forth men's greatest energy or noblest devotion. He was not despising humanistic qualities, nor did he want Christians to separate themselves from enjoyment, but he doubted the value of humanistic endeavours to build a better world if the spiritual qualities were omitted; they would not produce the New Life which God had intended, but rather a continuance of the old ideas which had brought the world near to doom.

"I hope I am not being too pessimistic in seeing little hope of change without a revival and renewal of outpouring of the spirit of God responded to by the spirit of man in creating something which is much more worth while," he said. Singleness of thought, humbleness of spirit, and the worship of God were the things that were needed.

Taking as his text the words of St. Paul, "While we look not at the things which are seen but the things which are not seen; for the things which are seen are temporal but the things which are not seen are eternal," the Bishop went on to describe the contrast between the pagan and early Christian worlds. The pagan world of that time was frankly materialistic, and in many parts it was an age of comfort and personal security; the Christian renounced such privileges, and if he turned his gaze from those things to the vision of eternity it was not because his lot was wretched but because he felt that a deeper and better life was to be found in the things of the spirit. It was a facile generalization which was not true to the facts to say that the Christian found in his religion a refuge from the misery of the world; he had a good deal to enjoy in this world, and if he rejected much he was not running away from its miseries; it was not a religion of "pie in the sky."

"How would St. Paul judge this world of ours," he asked, "with its manifest and absorbing interests, our books and plays, newspapers and novels? Must it not have seemed to him that our view of life was as materialistic as that of the pagan?"

The Inevitability of "Progress"

When contemplating the achievements of the last hundred years in the realm of science and conquests over the forces of nature, it was perhaps inevitable that men's minds should be preoccupied with material things. For more than a century man's inventive genius and skill had been the object of universal admiration, and those things had been relied upon to produce a better world by inevitable and automatic progress. Many were now coming to see that the boasted scientific civilization was in many ways a failure, that the solution to to-day's difficulties lay not in the mastery of the material realm but in the spiritual realm being allowed to master mankind. While to preachers and writers that might sound a commonplace platitude, in fact most people did not believe anything of the kind. Many agreed that the spiritual was important, but they still regarded it as secondary, thinking that the wisdom of this world would solve their problems.

"It is sometimes taken for granted that Fascism and Communism are the only materialistic philosophies," he said, "but our own political aspirations have contributed to the fact that our spiritual vision has become blurred and dim. Democracy has not been all clear gain. In its advance it has swept aside the barriers that impeded the activities of wealth and has assured to wealth a power and influence that it did not have before. All over the world the keenest intellects are enlisted in its service, and most forms of government are made subservient to its ends. Money, from being a measure of value, threatens to become the

measure of *all values*. A library of books, a collection of pictures, these are no longer the standard of the taste and skill of the collector, but rather exhibit the power of his purse."

Where there were so many things worth having that only money could buy, it was not surprising that men should arrive at the conclusion that there was nothing worth having that money could not buy. Students of history were inclined to put everything down to economic causes and physical environments, believing that character was determined only by such external, chemical, and biological matters, forgetting that there had been times in history when other ideals were involved—spiritual ones—the right of conscience, the divine principle of authority.

Jesus Christ had said that He was the Truth. Here, science played its part. Ecclesiastical opposition to the findings of science was a familiar and often-deplored fact. But, after all, it was not so strange, because science was not religion's specialty, and in opposing new scientific findings on their first appearance religious leaders had done what the older scientists themselves had often done. When Harvey had discovered the circulation of the blood it was said that no scientist over 40 years of age had credited his findings. The morals, principles, practices of the scientific life were of the very stuff of religion, and when they moved ahead and religion lagged behind a situation arose which caused religious people desperate concern. One of the major functions of religion was to bestow interior security and steadiness upon individual souls; one of the most mysterious facts about the body was that it would maintain a steady temperature of about 98.4° no matter what weather was outside, from Greenland to the Equator; but man's spirit had no such automatic guardianship against the heats and colds of this feverish and troubled world, and religion endeavoured to supply that need. The need which religion served in giving what St. Paul had called "the Peace of God which passeth all understanding" was real and enduring, but if it merely tried to maintain a steady temperature it would only become a means of establishing the *status quo* and the enemy of all change; so while science went forging ahead and fighting for a definite social order the Church was often lagging far behind the line, trying to give a spiritual temperature to a few individuals at 98.4°.

Science was not only intellectual or inventive; it was a moral matter. Specialization made it impossible to get the whole truth, but there was in science at its best a certain rigorous honesty about facts and the statements made about them which constituted one of the noblest things of to-day, whereas Christians often lagged far behind. That fact hurt. The Churches could sometimes be excused for failing to see behind the achievements of pioneering investigators, but that religions of the times should be less honest than the scientists was deplorable.

"Wherein lies the glory of the life that you help to bring into the world and prolong?" he asked the assembled doctors. "Is it only in its prolongation—keeping alive? Surely not. Behind its disguises of theory and ritual all great religion has one common factor: it sees human life as the adventure of the soul. The most important truth about man is that he has been entrusted with himself, capable on the one hand of dismal failure and, on the other hand, of high adventure in the life which is Life indeed. All great religions set men the task of grappling with themselves, supplying the motive and the driving power, the insight, and the hope, and it is this hope that will lead men to a place where they wrestle not so much with themselves but with the Spirit from whom their spirit came, to be conquered by whom is victory and to serve whom is perfect freedom."

A large congregation of doctors in academic robes occupied the nave of the cathedral.

Accompanying the Lord Mayor of Birmingham (Alderman DONALD JOHNSTONE) were the Association's incoming President (Professor A. P. THOMSON) and the Chairman of Council (Dr. S. WAND).

Evensong was conducted by the Provost (the Very Rev. MICHAEL CLARKE, M.A.), and the cathedral choir was under

the direction of Dr. WILLIS GRANT, F.R.C.O., organist and master of the choristers. The lessons were read by Professor THOMSON and Dr. WAND.

ROMAN CATHOLIC SERVICE

The importance of close co-operation between doctors and priests was emphasized by the Right Rev. Mgr. VALENTINE ELWES, M.A., on Sunday, July 13, when addressing Catholic doctors at the Association's annual Roman Catholic service.

Over 120 doctors, many accompanied by their wives, attended Pontifical High Mass in St. Chad's Roman Catholic Cathedral, Birmingham, celebrated by the Most Rev. Dr. F. J. Grimshaw, D.D., Roman Catholic Archbishop of Birmingham. Those present included the Association's President for the 1958-9 session, Professor A. P. Thomson.

"We priests have the care of souls; you have the care of bodies; body and soul make up the whole man," said Mgr. Elwes. The teacher dealt only with the child, the youth, and the adolescent; the lawyer dealt mostly with people in trouble—such as financial difficulties—but doctors and priests looked after the man all through his life, from birth to death, from baptism until he passed from this life to the fulness of the life to come.

"We must work together and thank God that there are so many magnificent Catholic doctors," he continued. "Any priest who has a really good Catholic doctor in his parish often thanks God for it—and there are many such."

Doctors and priests often had the same battles to fight, the same problems to face. They must fight side by side, on God's side, against the teaching of false prophets.

"You, because you are men of science, really have a greater impact on the world than we," he added. "We priests are regarded so often merely as bigoted men of God. But you are men of science, and if you are not only a man of science but also a man of God your power is greater than ours in influencing people."

The insidious false prophet was like a willowy lamb—charming and attractive, but was really a ravenous wolf—ravenous not for bodies, but for souls; his ideas looked attractive, luscious, delicious, like cherries, grapes; in fact they were deadly nightshade—poisonous to the soul.

"You probably have to face therapeutic abortions," he added. "All right for the body: but what about the soul? You see it wounded, bleeding to death, dying."

Birth prevention, he said, solved a problem so far as the body was concerned, but marriage was a union of two joined together by God, and the cement which joined them was His love; that love, which was a real, deep love of the soul, was the foundation upon which the whole edifice of Christian civilization was built. But with birth prevention that love was seen to be corroding, crumbling, dying. Wherever human love fell away from divine love it was always human love that died. Winston Churchill had described birth prevention as "the most pernicious invention of modern times."

"God has work for you to do and he has work for us priests to do," he said. "We are a little corner of His vineyard where he has placed us. Jesus Christ needs you in that corner of his vineyard and you need him. Without Him you can do nothing."

The mass was sung to the ninth Gregorian setting, "Cum Jubilo," the offertory motet being the plainsong "Christus Vincit."

The green, gold, and purple vestments of the officiating Archbishop and the clergy blended colourfully with the academic robes worn by the doctors assembled in the nave.

A reception and luncheon given by the Midland Catholic Medical Society in the Medical Institute Hall, Harborne Road, Edgbaston, followed the service.

JEWISH SERVICE

The apparent popularity of medicine as a profession among Jews was explained by the Rev. Dr. CHAIM PEARL, chief minister of the Birmingham Hebrew Congregation, at the service at Singers Hill Synagogue on July 12.

The all-embracing concern of Judaism for the whole of man, his physical well-being and his spiritual peace, his material needs and his religious longings, his body and his soul, life in this world and his existence in the next, was one of the unique features of the Jewish religion, he said. "We are not afraid to put man's physical well-being side by side with his spiritual perfection," he explained. "We ask for a life of bodily health as well as one characterized by the love of God and the fear of Heaven."

Connexion Between Religion and Medicine

Dr. Pearl noted that increasing recognition was given to the connexion between religion and medicine, between faithfulness to God and to the laws of health. True health was that state of wholeness in man which was pursued when body and mind were obeying the laws which God laid down as the foundation of this world. Furthermore, medical science had long ago recognized that one of the greatest factors leading to man's recovery to health was the patient's own state of mind, his determination to recovery, his will to live. "Ultimately such a mental state rested on faith. Faith in God, an all-knowing, all-good healer—the source of life."

Turning to the comparative popularity of medicine as a profession among Jews, Dr. Pearl quoted from the *Jewish Encyclopaedia*: "Medicine was an integral part of the religion of the Jews." He commented: "We can see why this should have been so with Judaism, which has something to say on so many aspects of our physical life."

Abraham's Hospital

There was a tradition in Jewish folklore that Abraham set up a hospital at Beersheba for the care of the sick and the needy. Whether there was much historical value in such a legend was not so important as the fact that it was told, not only to praise Abraham, but also to inspire an example in his followers.

"Even God Himself is described in the Bible as 'the great physician,'" continued Dr. Pearl, "and the Jewish religious ethic of *imitatio Dei*—imitating God—would apply here too. As we conceive of God as a healer so we follow His ways in acts designed to bring healing and relief to our fellow men. I think it fits in well with the character of the Jews, who are described as 'merciful children of a merciful father.'"

Maimonides the Physician

In the Middle Ages, otherwise characterized by ignorance, superstition, and plagues, the Jew often brought his wisdom and charity to the act of healing. Perhaps the most famous was Moses Maimonides, the twelfth-century scholar and sage who was court physician to the Caliph in Cairo and whose services were looked for by King Richard I of England. Like many others, Maimonides practised as a physician from the religious point of view, declining to earn a livelihood from his knowledge; he regarded his skill as a way open to him to serve his fellow men.

In a letter describing his day Maimonides wrote: "Patients go in and out until nightfall, and sometimes even, I solemnly assure you, until two hours or more in the night. I converse with and prescribe for them while lying down from sheer fatigue, and when night falls I am so exhausted that I can scarcely speak."

Maimonides was typical of numerous loyal Jews who practised medicine as an expression of the ideal of service. It was more than probable too that their Judaism emancipated them from superstition and from crude or erroneous notions of nature which held the rest of the world in chains for centuries.

The Place of Optimism

"And finally," said Dr. Pearl, "there is an optimism about Judaism which strengthens the work and spurs the efforts of medical men. In Jewish teaching this world is good, very good. But not perfect. Judaism does not teach us to negate, reject, or withdraw from the material world, in spite of its imperfections. God made it. And if in our

eyes it is imperfect, it is a challenge to man to work as a co-partner with God in completing the act of creation—in ridding the world of disease and illness."

A long time ago a great Talmudic sage suggested that God created the remedy before bringing on the illness. What he meant was that in the economy of the universe an antidote existed for every affliction. There was somewhere a cure for all ills. That was perhaps a natural law. All that was required was that the energy, inventiveness, and faith of man should discover what already existed.

God's Will

"That God leaves us to do the discovery is, we believe, God's will in granting man freedom to think and to act," concluded Dr. Pearl. "This then is also an element in Jewish optimism, which looks to the day when, strengthened with knowledge and encouraged by his faith, man will have learned to overcome all powers of evil that afflict the mind and body of human beings—humanity will be at peace and the true Kingdom of God established on earth."

After the service a reception was held in the communal hall of the synagogue.

OVERSEAS CONFERENCE

The Overseas Conference in connexion with the Association's Annual Meeting was held at Birmingham on July 16, Professor D. E. C. MEKIE, Chairman of the Overseas Committee, occupying the chair. Dr. S. WAND, Chairman of Council, and the Secretary attended the conference.

The CHAIRMAN explained that the conference could not be fully representative of all overseas Divisions and Branches and therefore could not have executive power or come to decisions, but the opinions expressed were of the utmost value. Overseas Branches were divided into two groups. The first consisted of those in countries with full autonomy, in which the Divisions and Branches of the Association also possessed such powers; the second consisted of Divisions and Branches in those countries for which the Council of the Association in London had a direct responsibility.

Assistant Secretary's Report

Dr. E. G. GREY-TURNER (Assistant Secretary), presenting his annual report, said he would try to explain how the Association attempted to look after the interests of its overseas members. The overseas Branches were all represented in the Representative Body, which had just met and which was the ultimate controlling authority of the Association. Every overseas Branch formed a constituency in the Representative Body except for the Irish Medical Association—a group of 26 branches of the B.M.A. which together formed one constituency. The overseas Branches were also represented on the Council by seven members. The Overseas Committee, which handled most of the day-to-day affairs of overseas members, consisted of the four chief officers of the Association *ex officio*, the seven overseas representatives on the Council, two members appointed by the Council to act as additional spokesmen for overseas in the Council, two members appointed by the Representative Body for the same purpose, one member appointed by the Organization Committee, and two co-opted members. In London, the Committee negotiated with the Colonial Office, Commonwealth Relations Office, occasionally the Foreign Office, the head offices of big commercial firms, and other authorities, but with the granting of more and more self-government in the British Commonwealth less and less authority and responsibility was retained in London; more and more negotiations on behalf of members were undertaken by the local B.M.A. Branches. The officers of the overseas Branches in nearly all cases were busy practising doctors who had little time to cope with the amount of work required. Yet, if matters were referred to Headquarters in London, the authorities with whom it dealt were no longer the real adversary. The real adversary was some

remote overseas Government. Most overseas Branches could not think of affording full-time officials.

For the next 10 to 15 years the problem would present great difficulties. One solution was that, when a problem arose which could not be handled in London, head office would send an official out to the area in question. Another solution might be the appointment of part-time medical secretaries to do the routine work. East Africa seemed to be a region where the Branches might be thinking along such lines. In due course, it might be that overseas Branches would have to have full-time officials in their areas. Dr. Grey-Turner went on to report on such problems as the supply of information to candidates for overseas appointments, private practice overseas, and salary revisions and gave representatives inside information on the difficulties that had to be surmounted. "We at the head office are very well aware that we had something like 25,000 overseas members," he concluded, "and that they expect us, quite rightly, to take just as much interest in their affairs and trouble over their problems as do the members in the United Kingdom, and I assure you that we try to do so."

Discussion

Dr. LLEWELLYN JONES (Malaya) said that Malaya had recently joined the Commonwealth as a full member. He said how indebted he felt to the Overseas Committee for the reception that they had given him personally and every other member of the meeting. He represented both the Asian and the expatriate members. They worked together with great cordiality and amicability. There had formerly been two separate bodies representing the doctors in Malaya: the Malayan branch of the British Medical Association and the Alumni Association. Since independence great interest had been shown in the formation of a Malayan Medical Association; he thought it was inevitable that that would come about, and it was proper that it should. Many hoped for cordial and continuing links with the British Medical Association. Whether it was to be separate, affiliated, or incorporated would be decided by a meeting to be held in September or October. It was his own hope, and that of the Malaya Branch, that the majority of doctors in Malaya who formed the new association would plump for incorporation. However, he felt that any increase in the Association's overseas subscription would affect adversely the continuation of the Malaya Medical Association as an incorporated body with the British Medical Association. He asked that the matter receive the consideration of the Overseas Committee, and, possibly, of the Council. There were many who did not wish to see the new body separate, but little matters, particularly of finance, might have a greater effect than could be imagined from the United Kingdom.

Dr. Jones said he had been interested in the suggestion of Professor Wells that some registrars and consultants might be seconded from Britain for service overseas; the value to the individual and to the country he went to work in would be immense. There was little in the professional world that Britain could do to-day which was of more importance than such interchanges. It was being found in S.E. Asia, and outside Malaya even more so, that charity was resented but technical help was appreciated. Such a proposal would be technical help in the best possible way.

Great anxiety was being felt about the Overseas Civil Service. He believed that the Commonwealth concept was of the utmost value to the doctors and all others serving in his territory and that the interchange of persons between the countries of the Commonwealth was of the greatest importance. Two great countries, the U.S.A. and Russia, faced each other, but there was also a third force: the moral, political, and intellectual force of the Commonwealth. It was something that should be fostered. He asked that the Association should try to hammer out a scheme of service whereby there could be full interchange

possibly between the National Health Service and the services in the Commonwealth countries. That would be the most valuable thing that the Association would have done on overseas matters certainly over the last 25 years.

Sense of Insecurity

Dr. J. A. CARMAN (Kenya) said that there was throughout the colonial medical service a deep and increasing sense of insecurity and a manifest lack of new recruits for that reason. It was not really very surprising. If he were a young man again he would not go out to the colonies with the same feeling of exuberance as he had done 32 years ago. There was a need for a scheme whereby a man could feel that if his job fell through he would not be "on the beach" for five or ten years. Unless a reasonable answer was found, the chances of continuing to staff the colonial dependencies would grow increasingly remote. Those already there were young men with perhaps 10 years' service, who had wives and children to educate, and they were wondering what would happen to them in ten years' time.

The alterations to salary scales suggested were fairly satisfactory, but there was a feeling that the idea of supplementary pay for those engaged overseas should be retained. If the retirement age were raised a lot of people would complain that it stopped promotion; but they could not have it both ways. The consensus of view was that the age should be raised or that a man should remain in the service until he had earned the maximum pension.

With regard to private practice, said Dr. Carman, people were still allowed, particularly in his own field of anaesthesia, to earn money in private practice, so there was competition with those trying to supplement a Government pension; sometimes that competition was a little unfair when those doing private practice were using Government facilities.

He was absolutely confident that, if the reasons were explained to them, those in the Kenya area would certainly feel that there was every justification for paying the suggested increase in the subscription. It was, after all, much less than those in England were called upon to pay and he thought it was entirely justified.

Dr. O. ADENIYI JONES (Nigeria) said that a lot of attention was being paid in his area to developing the local B.M.A. Branch. While they could not hope to attain the heights achieved in Australia and New Zealand, he thought they might have separate offices, libraries, and funds. The parent body was unable to do anything about negotiating now that Government responsibility had been transferred to local areas, but perhaps they could give some help in such matters as libraries and loans. He appealed to all doctors in colonial countries to realize that they had a special responsibility to take an interest in matters other than purely clinical. They came out to the colonies as men who were trained and educated and must consider themselves leaders and teachers in a much wider sense of the word than would be required in Britain. But even here it was time that all doctors took an interest in the day-to-day life of people among whom they lived. If each doctor did that in his own territory it would resolve many of the differences between Europeans and Africans. He was happy to say that such relations were blossoming in his own country, and he hoped that that would set an example to several other countries, showing that it was possible for people of different races and backgrounds to work together amicably.

The Nigeria Branch's greatest strength lay in the parent body; without it they could not face the Nigerian Government. Nigeria was anticipating independence in two years, but there was no idea of kicking people out. No one with any degree of honesty could say, "We don't want doctors or engineers or anything like that." Politicians merely copied what they imagined the people in power before them had done; often they copied it wrongly. The difficulty could only be dealt with by having people to point things out to them.

It was hoped that in a few years there would be a Nigerian Medical Association which would be an associate member of the B.M.A. Nigeria had everything to gain from the Association and nothing to lose.

Transfer of Officers

The CHAIRMAN, dealing with the problem of security for those entering H.M. Overseas Civil Service, said there were some territories where the rate of development was slow and where they could continue to employ expatriate doctors. For instance, there had been no move to have a local service for St. Helena or Ascension Island. It might be possible to transfer officers from an area attaining its own independent service to other territories which needed them, to have a more widespread Commonwealth service. In the past officers had been able to select their areas; in the future they might be unable to do so.

Dr. Z. LETT (Hong Kong) explained that the reason why Hong Kong was on the "black list" was that the doctors there were subject to the same conditions as all other Government servants and therefore to the policy of the Hong Kong Government of discriminating between male and female civil servants; it was improbable that any exceptions would be made in the case of doctors, so the disparity would be cured only if the discrimination was abandoned throughout the whole of the Government Service. He had received a wire from his Branch stating that the Branch Council in Hong Kong agreed to the increased overseas subscription in the circumstances.

All registered practitioners in Hong Kong were eligible for membership of the Association and could attend all the functions, whether scientific or social. His members very much appreciated visits by B.M.A. officials at any time, but felt it was best that, if possible, such visits should be restricted to the occasions when advice and help on negotiations were specially needed.

Miss B. UNDERHILL (Middle East) said that in her district there was a very active B.M.A. Branch, ranging from Tehran, in the north-east, to Beirut, in the west. Most of the people not living in the city concerned had a journey of anything up to 1,000 miles in each direction in order to attend meetings; despite this, more than 400 had turned up at the annual meeting in Basra last November and December. There had been two eminent guest speakers from England. The members had been wonderfully entertained by their very good friends the Iraqi people. She had had a letter from Dr. Kinsella, the Branch Secretary, saying that the Branch agreed to the increased subscription because it was thought to be only reasonable in view of the postage.

Dr. A. S. VALENTINE (Sierra Leone) also commended the suggestion about consultants being seconded overseas for a short while. He wondered whether the Overseas Committee could produce some sort of scheme ensuring for all some sort of security of tenure. The Colonial Office had given him useful information before going to Sierra Leone; they had put him in touch with two or three people who had been most helpful. He asked whether the Commonwealth Advisory Bureau could do something on similar lines, as there were always doctors on leave from territories to which others were going.

His Branch had decided that they had no objection to the overseas subscription being raised, and he was quite sure it would not result in any reduction of membership there.

Dr. H. A. MUNRO (St. Vincent) expressed his thanks to the Overseas Committee on behalf of "a very tiny Branch in the West Indies." The Branch secretary had written to him saying that the members agreed entirely with the views set out in the letter recently received from the Overseas Secretary on the subject of increased rates and were happy to be able to say that they could pay the additional guinea. He thought private practice would continue in his area until the Governments decided not to pay retaining fees but to give appointees a decent living salary.

Mr. K. C. T. RAWLE (New South Wales) said that Australian subscriptions to their own Branches varied between

12 and 15 guineas, which had to be paid in addition to the Association's overseas subscription; members were "not quite so keen" on paying that extra guinea. They did not wish to be subsidized by the parent body to the extent of some £25,000—having some pride, they wanted to pay their way—but they had to go cautiously. The Australian Branches had considerable autonomy over the question of fees, but the Branch council could not raise the subscription without an annual meeting of members. He thought that his members would not object unduly to the extra guinea if they could be shown why it should be paid, but the matter would have to be decided by a general meeting and he was unable to guarantee anything at the present stage.

Dr. L. H. HOLROYD (Zambesi) also thanked the committee for the entertainment he had enjoyed in Birmingham. In areas where the Government doctor was the only one for many hundreds of miles around or where his only colleagues might be missionary doctors 50 or 100 miles away, there was no question of "selecting" private practice; he just had to do it. It was quite impracticable to do it out of Government hours, because he might be called out at any time, irrespective of his normal hours of duty; in any case, full-time Government practice meant 24 hours a day. He thought the Southern Rhodesian Government had hit upon the best solution—giving doctors a private practice allowance of £200 a year in lieu of private practice. The doctor could do private practice to any extent to which he was called upon for it, and if his earnings from that fell short of £200 the Government would make up his allowance to that amount. That system did recognize that a certain amount of private practice had to be done, but it did not place the doctor who did it in an advantageous position over his fellow-doctors situated in a town area where there were private practitioners.

Transferring doctors from one area to another, as had been suggested, would create considerable difficulties in cases where a doctor had spent many years in a particular part, had his roots there, and was educating his children there.

The CHAIRMAN said that, once again, it had been a most valuable meeting. He reassured members of the interest that his committee took in overseas affairs. Three matters, he explained, were exercising the thoughts of the Overseas Committee at present. First, they wanted to ensure that overseas Branches and Divisions had the necessary mechanism—particularly in the "development" countries—to enable them to talk to the local Governments with adequate powers. Secondly, they were concerned at the difficulty which doctors coming back from abroad experienced in getting employment in the U.K. The Committee felt that the Government which recruited those doctors should take a far greater degree of responsibility for the security of their future careers. Thirdly, the Committee felt that there was still a job for doctors from this country to do overseas; it was part of Britain's great heritage. "We are doing all we can to ensure that that will be possible, but we do not want it to be at the sacrifice of the individual man; we think that is unfair," he said. "You can't tell him to go overseas when you know that in five years' time he will be 'on the beach.'"

Professor MEKIE closed the meeting with the words, "Let us know what we can do for you, but tell us what you want us to do, because we are not going to interfere with affairs which are properly run."

OVERSEAS LUNCHEON

The luncheon to overseas representatives was held at Edgbaston Golf Club on July 11, when some 60 representatives were present. The Chairman of the Representative Body, Dr. A. Beauchamp, welcomed the visitors, and Dr. M. E. Chinner (Adelaide, South Australia) replied.

HONORARY DEGREES AT BIRMINGHAM

At a congregation of the University of Birmingham on July 17 the vice-chancellor, Dr. ROBERT AITKEN, conferred honorary degrees on three medical men, Professor J. S. MITCHELL, Regius Professor of Physic in the University of Cambridge, Dr. IAN GRANT, President of the College of General Practitioners, and Lieutenant-General Sir ALEXANDER DRUMMOND, Director-General of Army Medical Services.

Presenting Professor Mitchell for the degree of Doctor of Science, the Public Orator, Professor O. Hood Phillips, said that, although still in the prime of life, he had long reached a pre-eminent position in English medical science, being in the front rank both as a clinician and as a research worker. He had done more than any other Englishman to further the study of the therapeutic effects of radiation. In all his research he relaxed none of the vigorous discipline that belonged to a Fellow of the Royal Society. Concluding the citation, the Public Orator said: "Achievements of this kind, allied to the qualities of gentleness and humility, are such that the University would be pleased to honour in any man; but when they are found in one of our former undergraduates the University takes a special delight in decreeing that he shall proceed straight to his Doctorate."

After describing the career of Dr. Ian Grant, who received the degree of Doctor of Medicine, the Public Orator said that his genial disposition had made him a successful ambassador of the B.M.A. in various excursions overseas. His reputation was not confined to Western Scotland, where he had been in practice for nearly forty years, but extended throughout Britain and to many Commonwealth and foreign countries. In support of the College of General Practitioners his work had been remarkable, and he had sought to end the divorce between general practitioners and hospitals. Described by his colleagues as "the ideal general practitioner," Dr. Grant had given the whole of his leisure to the voluntary service of his profession.

Presenting General Drummond for the degree of Doctor of Laws, the Public Orator said: "In this diamond jubilee year of the Royal Army Medical Corps it is proper for the University to do honour to the Service in the person of its Commanding Officer." After describing the remarkable progress of Army medicine, he mentioned General Drummond's encouragement of scientific and clinical work in the R.A.M.C. and of improvements in the appearance and atmosphere within military hospitals. An Army doctor was a member of two ancient professions, and General Drummond was a soldier and surgeon who had distinguished himself in both.

Correspondence

Representative Meetings

SIR,—From conversations with other representatives in Birmingham there appears to be general agreement that something should be done to improve the conduct of future meetings. In saying this it should be made clear that there is no criticism of Dr. Beauchamp or Dr. Talbot Rogers, who did everything possible to conduct the business of the recent meeting with dignity and dispatch, but it is felt that the problem must be tackled before the agenda is printed and circulated. The following suggestions are therefore made in the hope that they will be regarded as constructive.

(1) When motions are received from Divisions and Branches which are in agreement with the policy of the Association these should be returned to their sponsors with an explanatory letter. I understand that the Agenda Committee has this power already, and if it were used ruthlessly it would automatically exclude motions commencing "This Meeting reaffirms . . ." (2) The Agenda Committee when the agenda is finally decided should take into consideration

the hours available for the meeting and the number of items to be dealt with, and, if the appropriate stage has not been reached by midday on any day, arrangements should be made to reduce the time of speeches for the rest of that day. (3) Speakers should assume that representatives have read and studied both the agenda and the report of Council, and it should not be necessary to refer to a motion or amendment on the agenda other than by number and it should not be necessary for a chairman of a committee in presenting the committee's report to repeat matter which has already been circulated. (3) Representatives should remember that "brevity is the soul of wit," and that self-explanatory items should be moved formally, and that of the others those commended briefly are far more likely to receive the approval of the Representative Body.—I am, etc.,

Atherstone, Warwicks.

DOUGLAS S. PRACY.

SIR,—The debate on A.I.D., which I had the honour to open at the A.R.M., was a cause of profound dissatisfaction to many of those representatives who were present when it took place. If I interpret their feelings aright, there were two causes for this dissatisfaction.

First, there was strong feeling that the agenda should have been so arranged that the matter came up for discussion much earlier in the meeting. The responsibility for this must rest on the shoulders of the Agenda Committee. Some members of the Committee stated that this had not proved possible, but surely that statement is ridiculous. The purpose of having an Agenda Committee is to ensure that the agenda is satisfactorily arranged, and the plain fact is that in this case that was not carried out. It may be retorted, and with justification, that I, as mover of the resolution, should have asked the meeting to permit a rearrangement of the agenda to enable this motion to be taken earlier and that I failed to do so. Nevertheless, it remains a fact that the Committee placed almost at the end of the agenda a resolution which, it must have realized, was certain to produce a lively debate and to invite the active interest of the press.

The second cause of complaint—in my view the more serious one—was that in the outcome the meeting was prevented from expressing any opinion on the subject of the resolution. This may have stemmed in part from the lack of available time; but it must be admitted that the avoidance of reaching definite decisions and of expressing clear opinions on matters of great moment is becoming all too common, and not only in our profession. It was submitted, and I think widely agreed, that we, as one of the learned professions, have a duty to express an opinion for or against the practice of A.I.D. To our shame we failed to do so. Instead we avoided the moral problem and merely expressed readiness to give evidence before a Government committee if invited to do so. So the public has no means, and will have no means, of knowing what we as doctors think about a matter that is becoming increasingly important, one with which some of us are forced to be intimately concerned. The result of such timidity can only be a loss of respect in the eyes of the public.

If there are any lessons to be learned from this episode, they are that the Representative Body must in future ensure that it has adequate time in which to debate important matters, and that it must not allow itself to be put off facing issues squarely by accepting platitudinous amendments that by-pass the core of matters under discussion.—I am, etc.,

Gloucester.

H. G. DOWLER.

The cost of social security health benefits in New Zealand last year was £478,093 below the estimate, reports Mr. H. G. R. Mason, the Minister of Health. Contrary to expectation the pharmaceutical benefits cost £106,016 less than the previous year, and £510,059 less than estimated. In all other items of health benefits the expenditure was about the same as the previous year, taking into account an increased population and rising costs. In 1956 there had been an increase of more than £500,000 in the drug bill and in 1955 the increase was almost £1m.

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MEDICAL STAFFING OF HOSPITALS

The joint working party on medical staffing of hospitals has elected Professor Robert Platt, P.R.C.P., as its Chairman. The working party was appointed by the Minister of Health, the Secretary of State for Scotland, and the Joint Consultants Committee to study, in the light of experience of the hospital service since 1948 and of all other relevant considerations, the principles on which the medical staffing structure in the hospital service should be organized. The members of the working party appointed by the Minister are: Dr. R. R. Bomford, Sir Kenneth Cowan, Mr. H. C. Edwards, Dr. G. E. Godber, Mr. Norman Graham, and Mr. J. E. Pater. The members appointed by the Joint Committee are: Professor John Bruce, Dr. J. D. S. Cameron, Professor Andrew Claye, Dr. T. Rowland Hill, Professor Robert Platt, and Mr. T. Holmes Sellers. The joint secretaries are Mr. N. C. Rowland, Ministry of Health, and Dr. D. P. Stevenson, British Medical Association.

The working party is inviting regional hospital boards, professional organizations, including organizations of specialists, and the associations of hospital authorities to submit evidence. Any other body or person who wishes to submit evidence should notify one of the joint secretaries before the end of October.

APPOINTED FACTORY DOCTORS' FEES

From August 1, fees payable by occupiers of factories to appointed factory doctors for various services under the Factories Acts have been increased.¹ This follows representations made by the B.M.A. to the Ministry of Labour and National Service. The fees are those payable for (1) examinations of young persons as to their fitness for employment in a factory or other workplace covered by the Factories Acts, and (2) periodic medical examinations of persons employed in various processes involving special risks to health. For both (1) and (2) the fee for the first person examined on the occasion of any one visit by the doctor to a factory has been increased from 7s. 6d. to 10s. 6d. Fees for every other examination under (1) have been increased from 4s. to 6s., and under (2) from 2s. 6d. to 3s. 6d. The scales of fees determined by the new order can be varied by agreement between the appointed factory doctor and the occupier of a factory.

The fees payable to appointed factory doctors for which the Ministry itself is responsible (investigations and reports

¹S.I. 1156, 1958. H.M.S.O., London. Price 3d. net.

in cases of notifiable industrial diseases and certain accidents) were increased by the Ministry from June 1. With a few minor exceptions, the new fees payable by employers and by the Ministry are in accordance with the Association's recommendations.

LIFE INSURANCE EXAMINATIONS

Agreement has been reached on a fee increase for certain life insurance examinations as a result of recent discussions between representatives of the B.M.A.'s Private Practice Committee and the Life Offices Association, the Industrial Life Offices Association, and the Associated Scottish Life Offices. When the amount of the proposed sum assured does not exceed £500, and the agreed short form of examination is adhered to strictly, the fee for examination and report on this form will now, from July 1, be £1 1s. The fee for examination and report on an office's ordinary form will continue to be £2 2s.

WAS IT A DRUG?

Whether "complan" was a drug which the executive council was bound to provide was the subject of an appeal to the referees in four cases recently. In two cases they decided that it was, and in two cases that it was not a drug but a food.

For

In the first case, an appeal by the Minister, the patient was suffering from intractable diarrhoea and was being given hydrocortisone and potassium chloride. The full dose of 45 gr. of potassium chloride, however, caused nausea, and 2 oz. of complan was given daily for its potassium content. Under this regime it was possible to reduce the potassium chloride from 45 to 30 gr. a day—a dose which the patient could tolerate. The referees decided that in this case the real purpose of the complan was not to supplement a high-protein diet but to give the patient potassium in a form which he could take, and therefore it was a drug which the executive council was bound to supply—a decision upholding that of the local medical committee.

The other case, in which the referees ruled against the Minister and upheld the local medical committee's decision that complan was a drug which the executive council was bound to supply, was one in which it had been prescribed for a patient suffering from severe nephrosis and other ailments from which he shortly died. For the local medical committee it was contended that the patient's only chance

of survival was to replace protein and vitamins in easily assimilable form, and complan was found to be the only substance of the kind which he could retain. The Minister's representative thought that other preparations would have done as well. The reasons for the referees' decision were not affected by this consideration. It was true, they said, that over a period protein is necessary for human life, that the remedy for protein deficiency is a high-protein diet, and that executive councils had no duty to provide dietary treatment. This prescription, however, they felt could hardly be called dietary treatment. The patient's life was in danger and he needed a rapid accession of strength to meet the crisis. Complan was not given to replace or supplement his ordinary food. They therefore decided that the executive council was bound to provide it.

Against

Of the two cases in which the referees decided that complan was not a drug which the executive council was bound to provide, one was a patient with a gastric ulcer, and the other a patient with a fractured jaw. In the former case it was admittedly prescribed as an addition to a high-protein diet and therefore came under the heading of a food. In the latter case the referees were satisfied that the only reason for giving complan was that the patient had to have his food in a liquid form. It was therefore a food and not a drug which the executive council was bound to provide.

"Johnson's Baby Powder"

A doctor appealed to the referees against a decision of the local medical committee, upholding a decision of the executive council, that Johnson's baby powder was not a drug which it was bound to provide. The patient had an amputation of a leg. The referees upheld the doctor's appeal and decided that in this case the powder was used as part of the treatment for an amputation and not for toilet purposes.

Northern Ireland News

GENERAL HEALTH SERVICES BOARD'S REPORT

The Northern Ireland General Health Services Board has recently issued its report for 1957-8.¹ The Board's principal function (under the National Health Service (N. Ireland) Act, 1948) is to arrange for the provision of and administer the general medical, general dental, pharmaceutical, and eye services in N. Ireland. Not less than one-quarter of its members are medical practitioners. As it is its tenth annual report the Board briefly surveys the ten-year period since the beginning of the Health Service.

Virtually the whole population is now on doctors' lists. The number is now 1,398,250, compared with 1,311,651 in 1949—an increase of over 86,000. The number of general-practitioner principals has also increased, from 704 in 1949 to 737 in 1958. Forty-eight per cent. of the latter are members of partnerships. The average number of patients on doctors' lists in 1950 (the first year for which the figure is given) was 1,890 and to-day it is 1,889. The cost of the general medical services has risen from £881,175 in 1949 to £2,026,751 in 1958.

Prescribing Costs

The demand for drugs, medicines, and appliances is stated to show no signs of lessening, and the cost continues to rise. In the Board's view, one of the obstacles to economy appears to be "the still widely held belief that the National Insurance payment covers Health Services costs and entitles

¹Northern Ireland General Health Services Board, Tenth Annual Report, Year 1957-1958, 1958. Belfast.

the contributor to everything he wishes." During the year 1957-8 doctors whose prescribing averages were high were visited by the Board's medical adviser. No cases, however, were referred to the Central Medical Committee on a complaint of excessive prescribing. The three main factors which, in the Board's view, contribute to the excessive cost of prescribing are (1) the tendency, more marked, apparently, in younger doctors, to order expensive proprietary preparations when there are cheaper official preparations of equal therapeutic value; (2) the ordering of unnecessarily large quantities; and (3) the ordering of a number of items on a form when one or two would suffice.

Complaints Against Doctors

During the year complaints against 11 doctors were investigated, 7 of whom had failed to return with reasonable promptness (as required by their terms of service) clinical records of patients when asked to do so. Two doctors had £25 deducted from their remuneration on this account and the remaining five were warned or reprimanded. One doctor was required by the Committee to ensure that his prescriptions were legible. Only two complaints against doctors came from the public.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Home Confinement Grants

SIR,—I am trying to remedy what I believe to be an injustice in connexion with the non-payment of home confinement grants. A recent case will explain this matter.

A woman wished to have her second baby at home, and this would have been quite in order were it not for the history of some difficulty with the first labour. Clearly it was desirable that she should be confined in hospital, but there was no need for her to lie in there afterwards. I therefore advised hospital delivery, explaining that she would be able to return home a day or so after delivery. At once difficulty presented. She had promised the home confinement grant to those who were going to be her home helps, but if I were to persist with the above arrangements she would not be eligible for this grant even though she would still need almost as much help.

We have here then a situation in which a financial regulation, besides interfering with the proper medical care of a pregnant woman, is encouraging an uneconomic use of precious hospital beds. I have already asked (so far unsuccessfully), and will continue to ask, that the regulation be modified: if all those who agree with me will do likewise then something may be achieved sooner rather than later.—I am, etc.,

Sheffield, 3.

C. SCOTT RUSSELL.

Representative Meetings

SIR,—The Annual Representative Meeting in Birmingham followed what has become a set pattern in recent years in the last-minute rush with which it attempted to complete its business. As usual, on the last day, many items were withdrawn with the permission and evident relief of the meeting, while most others were inadequately and hurriedly discussed by a depleted Representative Body. Two major items and a large number of minor items remained on the agenda on Monday, the last day of the meeting. Although a fair amount of time was spent on each of the major items (merit awards for G.P.s and Gloucestershire's motion on A.I.D.), they were both debated with a sense of hurry which inevitably prevented them being considered as carefully as their importance deserved.

Mr. D. S. Pracy and Dr. H. G. Dowler (*Supplement*, July 26, p. 106) have ably expressed their views on this

subject. I am in full agreement with these except that I do not altogether like Mr. Pracy's suggestion that, "if the appropriate stage has not been reached by midday on any day, arrangements should be made to reduce the time of speeches for the rest of that day." This takes no account of the importance or otherwise of the remaining business for that day. The R.B. often finds it necessary to reduce the time limit for speeches. This is done with the wrong object—namely, to get through more items in a given time. The correct object should be to allocate shorter time limits to speeches on matters of lesser importance in order that the full time may be given to major issues. The following is therefore suggested for the consideration of Council.

(1) That items on the agenda should be designated by the Agenda Committee as "special," "ordinary," and "formal." (2) "Special" items would be those of a policy nature or of major professional or public interest. These would be dealt with early in the meeting and speakers would be given the full time permitted by standing orders. (3) "Ordinary" items would be those reaffirming previous decisions of the R.B., or those of an obvious or simple kind requiring little discussion. It would be necessary to ensure that items in this class were not regarded as unimportant. Some matters of considerable importance do not require lengthy discussion and an example would be the motion on inflammable clothing at this year's meeting. The time limit for speeches on these "ordinary" items would be drastically curtailed. (4) "Formal" items would be those requiring no discussion beyond a formal motion. They would include motions by chairmen of committees to receive and adopt sections of the annual report to which no amendments had been tabled. There should rarely be need for chairmen of committees in such cases to elaborate what has already been said in the annual report. (5) Constituencies putting forward motions and amendments for inclusion in the agenda need not feel that there would be risk of them being stifled by the above procedure. It would be open to the proposer or indeed to any member of the R.B. to move that an item should be redesignated during the meeting, and, provided the meeting approved, that would be done.

The foregoing, if adopted, would not materially shorten the proceedings of the A.R.M., and it is not in fact designed to do so. It would, however, ensure that the really important issues receive the full and careful attention of an alert, unhurried, and undepleted Representative Body.—I am, etc.,
J. E. MORRISON.
Stirling.

SIR,—I do not think Dr. H. G. Dowler (*Supplement*, July 26, p. 106) goes far enough in his letter on the A.I.D. debate. I should like to point out that, with the Guildford amendment, the Gloucestershire motion passed by 101 to 84 votes. It should then have been put to the meeting as a substantive motion and voted upon as such. The "amendment" put by the Chairman of Council was not a true amendment at all, but a different motion raising a new issue—namely, the question of giving evidence before a committee of inquiry which has not yet been appointed. It is under these circumstances that I maintain that the original motion, as set out and passed as amended, should have been put as a substantive motion and voted upon as such. Many people were very disturbed at the fact that a clear lead from the medical profession on A.I.D., for which Dr. Wand had earnestly asked, was not given, and the public are still in ignorance of what the profession thinks, though 101 to 84 would have told them.—I am, etc.,
Guildford.

F. A. BELAM.

Operating Theatre Technicians

SIR,—Twelve years ago the surgical staff of the Birmingham Accident Hospital, faced with the responsibility of providing an efficient 24-hours-a-day service in its operating theatres, accepted the need for well-trained male operating theatre technicians to work alongside the ever-changing theatre nursing staff. Among the reasons for this decision were: (1) The increasing mechanical complexity of modern surgical and anaesthetic equipment requiring the continuous maintenance attention of well-trained technicians prepared to make this work their life career. (2) The acceptance of the fact that theatre nursing staff are not trained to meet

these engineering maintenance responsibilities, are seldom attracted to theatre work for more than a few months or years, and, relying on them alone, the efficient night-staffing of theatres is extremely difficult if not impossible. (3) Our considered view was that theatre equipment would continue to develop along more complicated mechanical lines and that operating theatre technicians must eventually become "key men" in all modern operating theatres.

For these reasons we concluded that an effort should be made to attract men of the necessary educational standard to this work. Our long-term plan was to provide each of our operating theatres with technicians for both day and night work and finally to appoint a head technician in charge of these men and the maintenance workshop we set up alongside our main operating theatre suite. We welcomed in 1946 the formation of the Association of Operating Theatre Technicians and fully support the need for this Association. With its advice we appointed a senior operating theatre technician in February, 1948, who already had 20 years' previous experience in this work, mainly in the Army.

This appointment has been fully justified. By his maintenance of theatre, resuscitation ward, and surgical ward mechanical equipment he has saved this hospital many hundreds of pounds each year. Further, this service has reduced the number of spares we would otherwise have been forced to stock. Our surgeons and anaesthetists completely rely upon him to keep in first-class condition their expensive equipment (at a conservative estimate its capital cost is in excess of £10,000). In addition to this he assists at major operations requiring power-driven tools. His salary on appointment was that of an ordinary theatre sister. We then told him, as his responsibilities increased, that his salary would eventually bear a reasonable relation to the value of his work. In this respect we promised something that now we have not the power to implement. This senior operating theatre technician, after almost ten years of first-class service, remains at the same salary as that of an ordinary theatre sister—namely, £529 a year. The majority of this sum he returns to the national hospital service by a saving in the maintenance of our equipment. Through loyalty and a love of his job he has stayed with us. Now he can afford to stay no longer. In this unwilling decision he is following the example of many technicians who have trained under him and have subsequently gone to better-paid appointments at hospitals abroad, instrument firms, and the Services.

The Association of Operating Theatre Technicians has, after years of effort, failed to obtain recognition of their graduates by the Professional Council of the Whitley Council. This would give them reasonable remuneration for their vital hospital service. The Whitley Council still restricts their remuneration ceiling to approximately £500 a year and classifies them as theatre attendants class I, a status little different from that of an untrained nurse. The Whitley Council has, so far, failed to appreciate the present and future staffing needs of modern operating theatres. The impending resignation of our senior technician will increase the running costs of our theatres, result in the downgrading of their services, and considerably delay the development of the theatre organization we planned 12 years ago.

This decision of the Whitley Council is yet another example of the planning difficulties experienced by medical men with direct treatment responsibilities. Their efforts to provide an efficient and economic service are completely discounted by such decisions of central councils with executive power but far removed from the quality of treatment responsibilities. Though it is accepted that this is the period of the adolescence of our national hospital service, how long must medical men continue to wait before central councils examine potential improvements in our hospital services *on the spot*, before arriving at decisions that can, and in this hospital have, considerably delayed vital progress?—I am, etc.,
Birmingham, 15.

WILLIAM GISSANE.

Scottish Case

SIR,—The prospect of the B.M.A. and the Secretary of State mutually agreeing to lay their differences before the Court of Session holds out very little hope to the profession of an early settlement. I understand that such a procedure, even with full co-operation from the Secretary of

State—which has not as far as I am aware been so far promised—might drag on for months. If the B.M.A. is as sure of the justice of its case and the contractual obligation accepted by the Government in the Spens Report, why has it not sent up a test case, simply suing for the amount involved?—I am, etc.,

Kinlochleven, Argyll.

S. K. LIVINGSTON.

Professional Unity

SIR,—My excuse for offering these reflections is that the need for unity is now the chief theme of the Association's representatives and all routes leading towards that end may be regarded as worthy of scrutiny.

Up until the moment when action in the campaign for increased remuneration was called for, it had been assumed, with the sanction of long practice, that the opinion of the majority of members present at Branch meetings of the Association represented unanimity in the profession. The reality—that there existed a large gap (sufficient at any rate to preclude the implementation of policy devised at the centre and supported by local Branches) between majority opinion and unanimity of viewpoint—emerged only when the issue at stake was one affecting equally every member of the Association.

Considering the general practitioner only, may there not be a simple but cogent reason for the discrepancy in so far as it affected the G.P. vote? General practitioners can roughly be divided into two groups: (1) those in whose weekly routine leisure is a definite and fixed entity; (2) those who have no assistance in their practice and are committed 24 hours a day. Regular attendance at meetings of the Association, where majority opinion is elicited, presupposes a certain amount of fixed leisure. It follows, therefore, that the doctors in group 2, who cannot with reasonable certainty make engagements days or weeks ahead, are precluded from participation in the business of the Association, from undertaking the responsibilities of an office-bearer, and from investing in tickets for social functions they have little hope of attending. The natural consequences are: (1) It falls upon the members of group 1 to carry the burdens of government and to be in pre-dominance on all occasions, scientific, cultural, business, social. (2) In time the members of group 2, although loyal members of the Association, find their connexions with its policies becoming rather tenuous, limited, more or less, to payment of the annual subscription and receipt of the minutes of their local meetings and the weekly *B.M.J.* Nevertheless, they are still alive and voting members. It requires the magnet of a paramount issue to draw them from backstage. But the impact of their decisions rocks the majority caucus.

If this, the question of leisure, is indeed a factor in the profession's inability to attain unanimity of opinion and action, is it not necessary to look at the situation squarely? Is what has been called indifference really inability to find time, under present circumstances? The interests of the two groups might easily differ widely in many spheres, let alone remuneration. Perhaps one of the easiest ways in which to test the existence of these two groups is to take a census of the members who attend the Annual Meeting of the Association. If, apart from the variation in attendance resulting from the yearly change of site, the turnover of members' attendance does not suggest that once in two or three years every doctor takes advantage of the valuable scientific and cultural opportunities these meetings provide, that, in fact, the same members tend to go, year after year, then, in the midst of a learned profession, we have a depressed class. In such circumstances, expensive fees for counsel's opinion are less likely to make the profession one than attempts to smooth out the inequalities of opportunity and standards of living. From evidence given before the Royal Commission it would appear that some of our representatives are not unaware of the existence of group 2, but prefer to ignore its implications.—I am, etc.,

Crocketford, Dumfries.

LEILA SUTHERLAND.

Cost of Prescribing

SIR,—It was interesting to read the comments of Dr. Gerald Gibbens (*Supplement*, July 19, p. 86) concerning the *Prescribers List of Ethical Products* which is published by Unichem Ltd. on behalf of the Unichem Association of Privately Owned Pharmacies. As your correspondent points out, the prices are retail, plus tax, and this is in accordance with the recommendation in the interim report of the Hinchliffe Committee. In point of fact this gives a clearer indication of the cost than the so-called N.H.S. basic price, because on-cost and dispensing fee have to be added to the latter and the normal retail price approximates the actual cost to the National Health Service.

A limited number of copies of the *Prescribers List* for 1958 are available and will be sent without charge to any doctor who cares to apply for one, and a copy of the 1959 list will be sent when published to any doctor who sends his name and address to us at 3, Broadwater Road, S.W.17.—I am, etc.,

London, S.W.17.

F. LEWIS WATSON,
Managing Director,
Unichem Limited.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Archer, W. H.: *Manual of Oral Surgery*. Second edition. 1956.
Baron, D. N.: *Essentials of Chemical Pathology*. 1957.
Beaumont, O. E.: *Medicine: Essentials for Practitioners and Students*. Seventh edition. 1958.
Bensley, E. H., and Joron, G. E.: *Handbook of Treatment of Acute Poisoning*. Second edition. 1958.
Berg, C.: *Being Lived by My Life: A Sort of Biography*. 1957.
Blacklock and Southwell's *Guide to Human Parasitology*. Sixth edition revised by T. H. Davey. 1958.
Brecher, G. A.: *Venous Return*. 1956.
British Pharmacopoeia 1958. 1958.
Brocq, P., and Beclere, C.: *Précis de Gynécologie*. 2 volumes. 1956.
Burwell, C. S., and Metcalfe, J.: *Heart Disease and Pregnancy*. 1958.
Cazal, P., and Elliott, J.: *Les Groupes Sanguins du Système Rh.* 1955.
Clark, W. E. Le Gros: *Tissues of the Body*. Fourth edition. 1958.
de Coul-Marsch, C.: *Rheumatism and Arthritis: the Conquest*. 1958.
Craig, C. F., and Faust, E. C.: *Clinical Parasitology*. Sixth edition by E. C. Fauster and P. F. Russell. 1957.
Davison, W. C., and Levinthal, J. D.: *Complicat. Pediatrician*. Seventh edition. 1958.
Decourt, J., and Gilbert-Dreyfus (Editors): *Trente Exposés sur des Sujets Actuels d'Endocrinologie*. 1956.
Doell, E. W.: *Hospital in the Bush*. 1957.
Douglas, J. W. B., and Blomfield, J. M.: *Children Under Five*. 1958.
Elbel, H.: *Blutalkohol*. 2 Auflage von H. Elbel und P. Schleyer. 1956.
Florey, Sir H. (Editor): *General Pathology*. Second edition. 1958.
Greenfield, J. G., et al.: *Neuropathology*. 1958.
Hoffmann-Ostenhof, O.: *Enzymologie*. 1954.
Illingworth, R. S.: *Normal Child: Some Problems of the First Five Years and Their Treatment*. Second edition. 1957.
Johnstone, R. W.: *Textbook of Midwifery*. Seventeenth edition revised by R. J. Kellar. 1957.
Kraimes, S. H.: *Mental Depressions and Their Treatment*. Second edition. 1957.
Leopold, S. S.: *Principles and Methods of Physical Diagnosis*. Second edition. 1957.
MacBryde, C. M. (Editor): *Signs and Symptoms: Applied Pathologic Physiology and Clinical Interpretation*. Third edition. 1957.
Marius' *Gynecological Operations*. Translated and edited by M. L. McCall and K. A. Boken. 1957.
Modern Pharmaceuticals in Japan. 1958.
Modern Trends in Endocrinology. Edited by H. Gardiner-Hill. 1958.
Moll, W.: *Klinische Rheumatologie*. 1958.
Morton, L. T.: *How to Use a Medical Library*. Third edition. 1957.
Myers, J. A.: *Tuberculosis: Every Physician's Problem*. 1957.
Nabarro, J. D. N.: *Biochemical Investigations in Diagnosis and Treatment*. Second edition. 1958.
Novak, E., and Novak, E. R.: *Gynecologic and Obstetric Pathology*. Fourth edition. 1958.
Ott, V. R., and Wurm, H.: *Spondylitis Ankylopoetica*. 1957.
Partipilo, A. V.: *Surgical Technique and Principles of Operative Surgery*. Sixth edition. 1957.
Plotz, M.: *Coronary Heart Disease: Angina Pectoris; Myocardial Infarction*. 1957.
Schellen, A.: *Artificial Insemination in the Human*. 1957.
Sinclair, D.: *Introduction to Functional Anatomy*. 1957.
Stamm, T. T.: *Foot Troubles*. 1957.
Standard of Japanese Pharmaceuticals. 1958.
Stirling, W. B.: *Aortography: Its Application in Urological and Some Other Conditions*. 1957.
Todd, R. McL.: *Child Health and Paediatrics: For Nurses, Health Visitors and Social Workers*. 1958.
Treves' *Surgical Applied Anatomy*. Thirteenth edition revised by L. C. Rogers. 1957.
Wechsler, I. S.: *Textbook of Clinical Neurology*. Eighth edition. 1958.
Yellowlees, H.: *Frames of Mind*. 1957.

Association Notices

PRIZES FOR NURSES, 1959

The Council of the British Medical Association is prepared to consider the award of prizes for essays submitted in open competition by nurses in the following categories: *Category (1)*.—Open to student nurses undergoing a course of training at a hospital. Essay subject: "The nurse's part in the patient's adjustment to a period in hospital." *Category (2)*.—Open to State-registered nurses (within five years of registration with the General Nursing Council) working in hospital. Essay subject: "The qualities and attitudes desirable in the newly qualified nurse." *Category (3)*.—Open to State-registered nurses working outside hospital—for example, district nurses, private nurses, occupational health nurses, public health nurses. Essay subject: "The social services and how to use them." *Category (4)*.—Open to all members of the nursing profession. Essay subject: "The art of delegation and its part in successful nursing administration."

Certificates and prizes will be awarded in each category as follows: 25 guineas for the best essay; 10 guineas for the second best essay. Should the Council decide that no essay entered is of sufficient merit, no award shall be made.

The purpose of this competition is the promotion of systematic observation among nurses. In awarding the prizes due regard will be given to evidence of personal experience. No essay that will be given to evidence of personal experience. No essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize. Previous prizewinners may compete for a second award. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final.

The essay should be typewritten, if possible, but a legibly written manuscript will receive equal consideration. It must be written in the English language, on one side of the paper only, must be unsigned, but have with it a detachable note containing the name, address, and category of the candidate. Essays, which, it is suggested, should consist of 2,000 to 5,000 words, must be forwarded so as to reach the Secretary of the British Medical Association not later than January 31, 1959. Preliminary notice of entry for this competition is required and a special form for this purpose is obtainable from the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

A. MACRAE,
Secretary.

Diary of Central Meetings

- AUGUST
- 8 Fri. Planning Subcommittee, Occupational Health Committee, 2 p.m.
- 13 Wed. Royal Commission Evidence Committee, 2 p.m.
- SEPTEMBER
- 12 Fri. Central Consultants and Specialists Executive, 10.30 a.m.
- 18 Thurs. G.M.S. Committee, 10.30 a.m.
- 18 Thurs. Medical Members of the Editorial Subcommittee. Joint Formulary Committee, 11 a.m.
- 26 Fri. Hospital Junior Staffs Group Executive Committee, 2 p.m.

Meetings of Branches and Divisions

ABERDEEN AND KINCARDINE COUNTIES DIVISION

At the annual general meeting held on May 29 the following officers were elected:

Chairman.—Dr. I. M. Scott.
Vice-chairman.—Dr. W. Sutherland.
Honorary Secretary.—Dr. J. M. Gill.

ARGYLL DIVISION

At the annual general meeting on May 25 the following officers were elected:

Chairman.—Dr. A. B. Fordyce.
Vice-chairman.—Dr. A. S. Hutcheson.
Honorary Secretary and Treasurer.—Dr. A. Crawford Mayer.

BARNSTAPLE DIVISION

At the annual general meeting held at the North Devon Infirmary on May 28 the following officers were elected:

Chairman.—Dr. A. H. Morley.
Vice-chairman.—Dr. W. Ruddock.
Secretary.—Dr. S. G. Brook.
Treasurer.—Mr. K. G. W. Saunders.

BLACKBURN DIVISION

The following officers have been appointed:

Chairman.—Dr. F. C. Simpson.
Vice-chairman.—Dr. C. Royle.
Honorary Secretary and Treasurer.—Dr. T. A. I. McQuay.

BLYTH DIVISION

The annual general meeting was held on May 5. The following officers were elected:

Chairman.—Dr. R. J. P. R. Campbell.
Vice-chairman.—Dr. A. Donaldson.
Honorary Secretary.—Dr. E. B. Ross.

BURNLEY DIVISION

The following officers were elected at the annual general meeting on May 14:

Chairman.—Dr. A. W. R. Eardley.
Vice-chairman.—Dr. D. Heap.
Secretary and Treasurer.—Dr. T. C. Corson.

CITY OF ABERDEEN DIVISION

At the annual meeting the following officers were elected:

Chairman.—Dr. J. S. Finnie.
Vice-chairman.—Dr. R. G. Fullerton.
Honorary Secretary and Treasurer.—Dr. W. H. Galloway.

CITY OF EDINBURGH DIVISION

The annual general meeting was held on April 29. The following officers were elected:

Chairman.—Dr. J. G. M. Hamilton.
Vice-chairman.—Miss Gertrude Herzfeld.
Honorary Secretary and Treasurer.—Dr. R. Traquair Thin.

CONSETT DIVISION

A meeting was held on May 23, at which the following officers were elected:

Chairman.—Dr. W. Jack.
Vice-chairman.—Dr. J. B. Fox.
Honorary Secretary and Treasurer.—Dr. N. E. Wood.

COVENTRY DIVISION

The following officers have been elected:

Chairman.—Dr. J. E. Glasgow.
Vice-chairman.—Dr. G. Vaughan.
Joint Honorary Secretaries.—Dr. G. W. Forrest and Dr. J. R. W. Catto.
Honorary Treasurer.—Dr. J. L. Ballantyne.

EAST MIDLOTHIAN DIVISION

The annual general meeting was held on May 8. The following officers were elected:

Chairman.—Dr. M. M. Scott.
Vice-chairman.—Dr. G. W. Ireland.
Honorary Secretary and Treasurer.—Dr. J. C. G. Mercer.

EAST YORKSHIRE BRANCH

At the annual general meeting on May 14 the following officers were elected:

President.—Dr. C. Groves.
President-elect.—Dr. E. H. Milner.
Vice-president.—Mr. M. S. Campbell.
Honorary Secretary and Treasurer.—Dr. K. W. Beetham.

FOLKESTONE AND DOVER DIVISION

A general meeting was held on May 14 at the Esplanade Hotel, Folkestone. The president took the chair and 10 members attended. Dr. D. W. J. Radcliffe was elected as the Division's representative on the Representative Body.

FURNESS DIVISION

At the annual general meeting the following officers were elected:

Chairman.—Mr. A. W. B. Strahan.
Vice-chairman.—Dr. J. R. Turner.
Honorary Secretary.—Dr. J. W. Rogerson.
Honorary Treasurer.—Dr. H. R. Turner.

GATESHEAD DIVISION

At the annual meeting on May 19 the following officers were elected:

Chairman.—Dr. W. G. A. Riddle.
Vice-chairman.—Dr. W. F. M. Hudson.
Honorary Secretary and Treasurer.—Dr. J. C. Arthur.

HOLLAND DIVISION

At the annual meeting on June 13 the following officers were elected:

Chairman.—Dr. A. S. Wilson.
Vice-chairman.—Dr. W. O. Nowlan.
Honorary Secretary.—Dr. J. E. Darlow.

KENSINGTON AND HAMMERSMITH DIVISION

The annual general meeting was held at St. Mary Abbot's Hospital, Kensington, on April 25. Dr. J. F. L. King took the chair and 19 members were present. The following officers were elected:

Chairman.—Dr. H. S. Pasmore.
Deputy Chairman.—Dr. O. Moses.
Honorary Secretary.—Dr. J. D. W. Whitney.
Honorary Treasurer.—Dr. C. L. Collins.

KESTEVEN DIVISION

The following officers were elected at the annual meeting:

Chairman.—Dr. I. W. S. Gibb.
Vice-chairman.—Dr. G. B. Pimblett.
Treasurer.—Mr. F. J. Jauch.

MERSEYSIDE BRANCH

The annual general meeting was held on June 4 on the premises of Messrs. Cadbury Brothers Ltd., at Moreton, Wirral. Ninety-five members were present. The following officers were elected:

President.—Dr. E. A. K. Hoppins.
President-elect, Secretary, and Treasurer.—Dr. V. Cotton Cornwall.
Vice-presidents.—Dr. T. R. Robertson and Dr. N. S. Walls.
Members were entertained to lunch by Messrs. Cadbury Bros. and toured their chocolate and chocolate biscuit factory in the afternoon.

MOMBASA DIVISION

A meeting was held at the Coast General Hospital on May 12. Mr. S. R. Keating took the chair and 18 members were present. Mr. Kirkaldy-Willis gave an address on "Tuberculosis of the Bone."

NEWCASTLE UPON TYNE DIVISION

The following officers were elected at the annual meeting on May 20:

Chairman.—Dr. R. Wear.
Vice-chairman.—Dr. T. H. Boon.
Honorary Secretary and Treasurer.—Dr. G. W. Anderson.
Honorary Assistant Secretary and Treasurer.—Dr. G. Cormack.
Honorary Students' Secretary.—Mr. Weldon Watts.

NORTH GLAMORGAN AND BRECKNOCK DIVISION

The annual general meeting was held at the Black Lion Hotel, Aberdare, on May 21. The following officers were elected:

Chairman.—Dr. J. W. R. Battaram.
Vice-chairman.—Dr. J. L. Ryce.
Secretary and Treasurer.—Dr. F. J. Doherty.

NORTH STAFFORDSHIRE DIVISION

At the annual general meeting on May 20 the following officers were elected:

Chairman.—Mr. P. J. M. Kent.
Vice-chairman and Secretary.—Dr. J. M. Johnstone.
Joint Secretary.—Dr. W. Livingstone.
Treasurer.—Dr. J. Manuel.

PRESTON DIVISION

At the annual general meeting on May 20 the following officers were elected:

Chairman.—Dr. A. L. Williams.
Vice-chairman.—Dr. D. M. Anderson.
Honorary Secretary and Treasurer.—Dr. W. M. Thomas.
Assistant Honorary Secretary.—Dr. W. H. Tod.

READING DIVISION

The following officers have been elected:

Chairman.—Dr. Harley Stevens.
Vice-chairman.—Mr. G. L. Bohn.
Honorary Secretary and Treasurer.—Dr. P. W. F. McIlvenna.

REIGATE DIVISION

At the annual general meeting on May 20 the following officers were elected:

Chairman.—Dr. L. A. Gibbons.
Vice-chairman.—Dr. H. S. Atkinson.
Honorary Secretary and Treasurer.—Dr. J. R. Partridge.

ST. PANCRAS DIVISION

The following officers have been elected for 1958-9:

Chairman.—Dr. J. Wigg.
Vice-chairman.—Dr. D. Blend.
Honorary Secretary and Treasurer.—Dr. J. Hodson.

SOUTH STAFFORDSHIRE DIVISION

The following officers have been elected:

Chairman.—Dr. L. B. Paling.
Honorary Secretary and Treasurer.—Dr. H. R. Chapman.

SOUTH-WEST WALES DIVISION

The annual meeting was held on May 4. The following officers were elected:

Chairman.—Dr. D. Gwyn Jones.
Chairman-elect.—Dr. D. F. Lloyd.
Honorary Secretary.—Dr. J. E. Crane.

SWANSEA DIVISION

The annual meeting was held on June 5 at the Swansea General Hospital. Dr. H. William Howell was in the chair. The following officers were elected:

Chairman.—Dr. T. Hamilton Anderson.
Vice-chairman.—Dr. Glyn M. Jones.
Senior Secretary and Treasurer.—Dr. T. Oakley Lewis.
Junior Secretary.—Dr. A. M. Revie.

TORQUAY DIVISION

The annual general meeting was held on May 13. The following officers were elected:

Chairman.—Dr. A. Everard.
Vice-chairman.—Mr. J. MacPherson.
Honorary Secretary.—Dr. K. M. Fergusson.
Honorary Treasurer.—Dr. H. W. Thompson.

TYRONE DIVISION

The following officers have been elected for 1958-9:

Chairman.—Dr. J. M. Garvin.
Vice-chairman.—Dr. Eileen O'Kane.
Honorary Secretary.—Dr. Knox Henry.
Honorary Treasurer.—Dr. L. A. Lyle.

WALLASEY DIVISION

The following officers have been elected for 1958-9:

Chairman.—Dr. E. A. K. Hoppins.
Vice-chairman.—Dr. M. J. Conlon.
Honorary Secretary.—Dr. D. W. Townley.
Honorary Treasurer.—Dr. A. Colson Hay.

WANDSWORTH DIVISION

At the annual general meeting on April 29 the following officers were elected:

Chairman.—Dr. G. R. Boyes.
Vice-chairman and Honorary Secretary.—Dr. T. J. Lee.
Honorary Assistant Secretary.—Dr. G. J. R. Clarke.
Honorary Treasurer.—Dr. J. Tudor Lewis.

WEST SOMERSET DIVISION

The following officers were elected at the annual general meeting:

Chairman.—Dr. T. L. H. Shore.
Vice-chairman.—Mr. R. D. Rowlands.
Chairman-elect.—Dr. D. Hague.
Honorary Secretary.—Dr. D. G. Kibblewhite.
Honorary Assistant Secretary.—Dr. L. Fay.
Honorary Treasurer.—Dr. Isabella C. F. Hungerford.

WEST SUSSEX DIVISION

At the annual general meeting on May 11 the following officers were elected:

Chairman.—Dr. T. L. Scott.
Vice-chairman.—Mr. A. G. Ross and Dr. J. Lipsey.
Honorary Secretary and Treasurer.—Dr. T. P. Mulcahy.

WIGAN DIVISION

At the annual general meeting on May 22 the following officers were elected:

Chairman.—Dr. J. E. T. Shirlaw.
Vice-chairman.—Mr. R. L. Hartley.
Honorary Secretary.—Dr. F. G. Ince.

Correction.—The motion by East Denbigh and Flint at the A.R.M., reported as carried under "Compensation at Age of 70" (*Supplement*, July 26, p. 93), was in fact amended, and the resolution adopted by the meeting should read: "That this Meeting considers that practice compensation should be payable at 65 years of age irrespective of retirement, as well as at retirement or death."

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 23 1958

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B.M.A. SPECIAL GROUPS

There are 12 specialist groups in the Association. Their purpose is to ensure that members of the Association who have special interests, but whose numbers are so few, or who are so distributed that they cannot command anywhere a majority, or perhaps not even an influential minority, are able to make their opinions known. The following is a list of the specialist groups with their membership given in brackets: Dermatologists (174); Ophthalmic (439); Orthopaedic (258); Otolaryngologists (196); Physical Medicine (136); Psychological Medicine (318); Radiologists (337); Tuberculosis and Diseases of the Chest (506); Anaesthetists (705); Consulting Pathologists (251); Venereologists (140); and Full-time Non-professional Medical Teachers and Research Workers (581).

Conditions of Membership

Each group has its own criteria for membership and its own rules. Generally speaking a member must be predominantly employed in the practice of his specialty to qualify for membership of a group. This applies to the first eight groups in the above list. The Anaesthetists Group consists of members of the Association who are under contract as anaesthetists with a regional hospital board or board of governors on either a whole-time or regular sessional basis, or who are anaesthetists on the staff of recognized hospitals outside the National Health Service. The Consulting Pathologists Group likewise consists of members who hold permanent appointments as pathologists in the National Health Service or who, not being in that service, have devoted at least five years to the postgraduate study and practice of pathology and continue to be engaged predominantly therein. The Venereologists Group consists of members of the Association who have been qualified for at least five years and who are—and have been for at least three years—either engaged predominantly in the practice of venereology or are in charge of venereal diseases clinics, though not engaged predominantly in that specialty. Finally, the Group of Full-time Non-professional Medical Teachers and Research Workers consists of those who are full-time members of a university staff or full-time salaried research workers in university departments or other institutes.

"Grade" Groups

In addition to the specialist groups there are two different types of group—the Senior Hospital Medical Officers Group and the Hospital Junior Staffs Group. Any member of the junior staff of a hospital is entitled to participate in the activities of the latter group, which has no formal roll of

members. Their membership is welcomed during the holding of their temporary appointments. They are entitled to attend meetings called in their regions and to take part in the appointment of representatives to serve on the central council of the group.

Group Committees

All the groups appoint their own committees which watch the special interests of members and from which representatives are appointed to sit on the Central Consultants and Specialists Committee.

Application for membership of the specialist groups and the S.H.M.O.s Group should be made on the appropriate form obtainable from the Secretary of the Association.

COMMITTEE OF PUBLIC ACCOUNTS

CHEMISTS' REMUNERATION AND HOSPITALS' SPENDING CRITICIZED

In its third report for the session¹ the Committee of Public Accounts states that it is "disturbed" both by the rates of chemists' profits disclosed in a pilot inquiry in 1957 and by the fact that they have continued to enjoy these profits for such a long period after the Treasury had drawn attention to the matter in 1954. The report also records the Committee's serious concern that the Board of Governors of the Radcliffe Infirmary, Oxford, under "extreme pressure by the university," should have been able to commit the Ministry to considerable extra expenditure for adaptations and new construction at the Infirmary without prior approval.

Chemists' Remuneration

The Committee points out that chemists receive for each prescription a payment to cover the actual cost of the ingredients used in making it up; an addition for "oncosts" of 25%; certain allowances; and a dispensing fee. The payment intended to cover the actual cost of ingredients is determined in accordance with a drug tariff based on wholesalers' price lists. In consequence chemists who can obtain discounts from list prices may make a profit from reimbursement at Drug Tariff rates, although the Departments had assumed when agreeing the terms of their remuneration that no such profit would accrue.

The Treasury brought this possibility to the notice of the Ministry of Health in June, 1954, and early in 1955

¹ *Third Report from the Committee of Public Accounts, Session 1957-58, 1958. H.M.S.O., London. Price 1s 6d. net.*

² See annotation, *Brit. med. J.*, 1958, 1, 332.

expressed the view that vigorous efforts should be made to secure for the Exchequer the benefit of any discounts the chemists might receive, a view fully endorsed by the Committee of Public Accounts for the session 1955-6. A pilot inquiry into actual prices paid by chemists was undertaken in England and Wales in May, 1957. The Ministry reported that the results afforded impressive evidence that the prices paid for most of the 30 drugs inquired into were, on average, well below the Drug Tariff rates, and that for 24 of them the results indicated that the rates afforded chemists a concealed profit averaging 14%. From the results of a similar but smaller-scale inquiry in Scotland the Committee suggests that the chemists made a concealed profit of 19%.

The report goes on to say that, so long as information is lacking on the prices actually paid by chemists for drugs used in Health Service dispensing, there can be no assurance that their remuneration is no more than fair and reasonable. A speeding up of further inquiries is recommended, and meanwhile the Committee considers that some immediate general reduction of the Drug Tariff is justified.

Radcliffe Infirmary

The Committee is severely critical of the Board of Governors, the University of Oxford, and the Ministry of Health for their handling of the scheme for the extension and modernization of the Radcliffe Infirmary.² Early in 1955 the Ministry obtained Treasury approval for an expenditure of £434,390. In August, 1956, the Treasury was informed that the estimate had risen to £815,000 and that the Board of Governors had proceeded with a considerable amount of work without the Ministry's prior authority. The Treasury agreed that the scheme should continue, and Ministry authority was given to proceed with works already begun, together with an instruction that any expenditure in excess of the approved limits was not to be incurred without the Minister's consent. Despite this direction, and owing to what a committee of inquiry reported to be a "genuine misunderstanding" on the part of the administrative staff, the Board subsequently placed a contract for work not covered by Ministry authority. The complete scheme, the Committee of Public Accounts reports, originally estimated to cost £434,390, will now cost slightly more than £1 million.

The Ministry, while not defending the Board's methods, told the Committee that it was satisfied that the scheme had not cost substantially more than it would have done had it been properly planned. The Committee, however, thinks otherwise and has no doubt that substantial economies would have resulted had the work been properly planned in advance and had the various additions during the course of the work been critically examined by the Ministry and the Treasury before being put in hand. That the disregard of the Ministry's instructions did not result in the Exchequer being committed to expenditure which would not have been approved by the Ministry or the Treasury, the Committee believes to be fortuitous. It considers that the Ministry's supervision of their agents, the Board, has been ineffective, and that the conduct of this scheme both by the Board of Governors and by the Ministry has considerably weakened Treasury control over the expenditure.

It recommends that the Ministry's arrangements for financial control of large building projects, particularly of teaching hospitals, where there is a division of responsibility between a board and a university, should be reviewed so as to ensure that in future the Ministry is fully informed of any developments in sufficient time.

MIDDLE EAST BRANCH ANNUAL MEETING

Owing to unforeseen circumstances the annual meeting of the Middle East Branch, which was tentatively fixed for November 3, has had to be postponed. Dr. F. Kinsella, honorary secretary of the Branch, hopes, however, that it will be possible to hold the meeting later in the year. Members will be kept informed of further developments.

AMENDMENTS TO BRITISH NATIONAL FORMULARY

General practitioners will shortly receive a note from their executive council calling attention to amendments to the *B.N.F.*, 1957, which have been made in accordance with the *British Pharmacopoeia*, 1958. The changes will take effect from September 1, the date on which the *B.P.*, 1958, becomes official. The executive council note calls attention in particular to the following amendments.

(1) Since the strength of ipecacuanha tincture has been doubled in the *British Pharmacopoeia*, 1958, the dose of this preparation has been halved in *British National Formulary* preparations containing it.

(2) Streptomycin injection is now the stabilized preparation, and the strength to be dispensed, unless otherwise directed, is altered from 250 mg. per ml. to 330 mg. per ml.

(3) The paragraph on the intramuscular use of aminophylline injection has been deleted. The strength to be dispensed, unless otherwise directed, and the dose now refer only to intravenous use.

(4) The monograph on prednisone acetate tablets has been deleted. The monograph on prednisone tablets states the procedure which pharmacists should follow when prednisone acetate tablets of a stated strength are prescribed. The monographs on prednisone tablets and prednisolone tablets contain revised instructions about the preparations and strengths to be dispensed unless otherwise directed.

(5) The labelling for glyceryl trinitrate tablets has been amended to: "The tablets should be allowed to dissolve in the mouth." The colour of the tablet has been changed as a result of replacing the chocolate base with mannitol to increase the stability.

(6) The amendment lists preparations for which amended statements of dosage are given in the *British Pharmacopoeia*, 1958.

JOINT CONSULTANTS COMMITTEE NEW CHAIRMAN APPOINTED

At a meeting of the Joint Consultants Committee on July 30, Sir RUSSELL BRAIN intimated that he did not wish to continue in the chair. Mr. T. HOLMES SELLORS was elected to succeed Sir Russell Brain as chairman of the Committee, and he will assume office at its next meeting on October 29. Mr. Holmes Sellors is the present chairman of the Association's Central Consultants and Specialists Committee and is one of the B.M.A. members of the Joint Consultants Committee.

N.H.S. ADMINISTRATIVE STAFF'S PAY INCREASE

The Industrial Court has awarded considerable pay increases to the 33,000 lower-paid members of the administrative and clerical staff in the N.H.S. whose 3% increase, awarded by the Whitley Council last autumn, was vetoed by the Minister of Health (*Supplement*, November 9, 1957, p. 145). The Minister's veto of the Whitley agreement led to a deputation of protest to the Prime Minister from all organizations, including the B.M.A., forming the Staff Sides of the Whitley Councils for the Health Service (*Supplement*, November 23, p. 174), who expressed "grave concern" at the Minister's destructive blow at the system of collective bargaining, and it also led to the operation of a ban on overtime by some of the clerical staff unions concerned.

The present pay increases awarded by the Industrial Court vary from £22 to £106 a year (from 4 to 20%) and are backdated to July 1. There will be further increases on July 1 next year, and some of the higher-paid members of the staff will receive further equal increases in 1960 and 1961. The lowest total spread-over increase will amount to about 8%, and in the higher grades to 60% over four years. The estimated cost of the court's award when fully applied is £2,200,000 a year. The new salaries will be attached to a new grading structure along the lines of Sir Noel Hall's recommendations' (*Supplement*, December 7,

¹ Report on the Grading Structure of Administrative and Clerical Staff in the Hospital Service, 1957. H.M.S.O.

1957, p. 188), which were to reduce the present number of grades from eight to five. Negotiations on the pay of some 10,000 senior administrative officers, including hospital secretaries, are continuing. Their increases will be of the same order and will also date back to July 1.

Scottish News

MEDICAL PRACTICES COMMITTEE

The following is a list of districts where, in the opinion of the Scottish Medical Practices Committee, additional doctors are required:

Ayr.—Kilbirnie/Glengarnock; Kilwinning.
Caithness.—Thurso.
Dumfries.—Dumfries Burgh.
Dunbarton.—Clydebank; Vale of Leven.
Fife.—Burntisland; Cupar.
Galloway.—Castle Douglas.
Lanark.—Bellshill; Larkhall; Shotts.
Lothians and Peebles.—Linlithgow/Bo'ness; Prestons/Port of Tranent; Gorebridge/Easthouses/Newtongrange.
Orkney.—Kirkwall.
Stirling and Clackmannan.—Clackmannanshire; Polmont.

NEWS IN BRIEF

MEDICAL LISTS TO DRUG HOUSES.—The Minister has told executive councils that he agrees with the recommendation in the interim report of the Hinchliffe Committee on the Cost of Prescribing (*Supplement*, June 28, p. 382) that the supply by executive councils of medical and pharmaceutical lists to drug houses is undesirable. Those councils who may hitherto have provided lists in this way have been asked to discontinue the practice.

PUBLIC HEALTH SUBSISTENCE ALLOWANCES.—Committee C of the Medical Whitley Council has amended the scheme of subsistence allowances for public health medical officers in England and Wales. The revised allowances, which the Committee recommends should be applied from April 1, 1958, are set out in M.D.C. circular No. 41 to all local authorities in England and Wales.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Royal Commission Questionaries

SIR,—I was interested to read the letter from Dr. Douglas White (*Supplement*, August 16, p. 122) in which he stated that a patient of his, a radio engineer, had received a questionnaire from the Royal Commission approximately one year ago asking for details of his income, a duplicate form six months ago, and a further form four months ago, with a follow-up quite recently. I think that the engineer must be mistaken, at least in the timing of these forms, since the first forms to engineers were sent out only three months ago, that is to say, in May, 1958. The first forms of any kind asking for a reply were to doctors and the first of these went out last November, nine months ago.

The social survey makes great efforts to avoid duplication by using the lists of members of professional institutions. It is almost inevitable that there will be occasional duplication where a man belongs to more than one professional group, and therefore it is possible that someone might have been approached twice in error and that the second time a follow-up might have been issued, but scarcely any such cases have been reported.

Altogether over 36,000 individuals in the medical, dental, and other professions have been asked for confidential details of their earned income in the income-tax years

1954-6 in the course of a more extensive survey of the earnings of the professional classes than has been carried out in any other country hitherto. The response has exceeded expectations in almost every profession; of the doctors and surveyors approached, well over 70% replied; of the architects and accountants, over 80%; of the engineers and dentists, to whom questionnaires were sent out later and are still coming in, between 60% and 70% have already replied; certain other professions are still to come, and very useful information is at present being obtained about graduates in industry. In all cases so far, as far as can yet be judged, the replies are representative.

I would like to take this opportunity, through your columns, of thanking those many members of the medical profession who have so willingly helped by providing these detailed personal figures, and would also ask them to appreciate the public-spirited response of members of the other professions who might well have been reluctant to disclose these personal details since they are not directly involved in the Commission's eventual recommendations.—I am, etc.,

London, S.W.1.

HARRY PILKINGTON,

Chairman,

Royal Commission on Doctors' and Dentists' Remuneration.

Further Interim Adjustment

SIR,—Once again one begins to wonder whether or no the profession has been the victim of a confidence trick. After the Royal Commission had been sprung upon us, with such unseemly haste, with no prior consultation with the profession—or, one suspects (judging by the muddle over the terms of reference), with the Government's own legal advisers either—our leaders very properly expressed doubts as to the prospect of settling our claim within the ensuing year. The Minister reassured us and wrote on May 15, 1957, "I think, however, that should the chairman of the Royal Commission make a statement to this effect [that the Commission's report was unduly delayed] your Council can be assured that I would be prepared to consider any representations they may make." This we then accepted as *bona fide*; it was a material factor in inducing us to accept—on a short-term basis—the miserable 5% interim adjustment, and to co-operate with the Royal Commission. One now wonders was the assurance really given in good faith or was it just a piece of reprehensible quibbling. By events in the next few weeks we shall judge—but the Minister's letter to Dr. Wand received on July 9 (*Supplement*, July 19, p. 42) looks ominous. We must remind ourselves, and impress on the public, that our claim was lodged—after four months' notice—well over two years ago; it was for adjustment from the 1952 level. It has throughout been afforded "top priority procrastination treatment," culminating in the letter of July 9.

It absolutely astounds me that any responsible Minister can labour so mightily for some six months to produce so pitiful a sequence of limp excuses: (1) "A further increase would run the risk of prejudicing their [the Royal Commission's] work." This objection can surely be easily overcome—for what it is worth—by a specific agreement that it be "without prejudice." But an important matter of principle arises—the Government, within a few weeks of setting up the Commission, did make one interim adjustment; was this, by its patently contemptible inadequacy, a deliberate attempt to prejudice our claim? If so, it would have been a most un-British act; if not, by what possible token can the Minister claim that, although the first increase was without prejudice, to honour the spirit of the letter of May, 1957, with a second increment would be prejudicial? (2) "Circumstances since April and May, 1957, to date have not changed so greatly as to justify an increase." This is quite at variance with what the Chancellor stated at Oxford on July 11: "... that our economic

Classification	Total Personal Incomes in £m. (Before Tax)		% Increase
	1952	1956	
Employed Persons:			
Wages	5,455	7,375	35.1
Salaries	2,780	3,715	29.4
Armed Forces	342	398	16.3
Self-employed	1,508	1,697	12.6
Professions	230	253	10.0

Source: Annual Abstract of Statistics, 1957, Table 277.

position was better now than it had been for several years and that the balance between demand and resources had improved" (*The Times*, July 12, p. 6). Our claim should be settled on its merit, without it also having to be lodged at exactly the right moment between one financial crisis and the next. (3) "Moreover, no other people remunerated from the public purse who received a pay increase of 5% in April and May, 1957, have yet received any further award." This ignores the fact that the changes between 1952 and May, 1957, were too great by far to justify so niggardly an increment as was then given. Our forbearance in 1953, 1954, 1955, and 1956 should not be held against us in 1958. Official figures clearly show that a 5% increase between 1952 and 1956 is very much below the average (see Table).

It seems to me that two and a half years (the half-life of a Parliament) is quite long enough to settle a simple claim, clearly set forth with full supporting evidence. If not, then surely in all equity a reasonable interim adjustment should be given forthwith. I hope Council will approach the Minister during the next few weeks, pointing out the fallacies in his arguments, and pointing out that if he is not in honour bound by the spirit of the letter of May 15, 1957, to take action, then no more are we bound to inaction. It may not be quite time to rattle the sabres yet, but we must see that they are sharp and ready, and leave it to the good sense of Council, or the initiative of the Cumberland Division (see *Supplement*, October 27, 1956, p. 172), to take firm action if no reasonable satisfaction be obtained ere this year be out. Even our traditional good will, self-restraint, and patience are wellnigh exhausted; the way we have been exploited, duped, dragooned, and doodled around is deplorable.—I am, etc.,

Rugby.

R. PRESTON HENDRY.

Study for the D.P.H.

SIR,—Dr. J. Browning Alexander's letter (*Supplement*, August 2, p. 114) about part-time study for the D.P.H. examination is welcome, but it does not throw any light on a major problem. Perhaps it is not widely appreciated that it is difficult and often impossible for anyone who does not live in a university city or the surrounding district to attend a course, and thus under the present regulations cannot enter for the examination. Eminent members of the profession have stressed that there should be more candidates for the examination. Is there any good reason why the regulations should not be changed to allow a practitioner of, say, three years' standing to enter for the examination without attending a whole-time or part-time course? Evidence of attendance at a course is not a condition of entry for any other postgraduate degree or diploma.

I endeavoured to draw attention to this problem in a letter to the *Supplement* (July 2, 1955, p. 7), following a comment by Dr. Guy Dain that young doctors were not coming forward to take the D.P.H.—I am, etc.,

Swansea.

G. D. REES.

Representative Meetings

SIR,—As a representative who was present and also took part in the debate on A.I.D., I would like to give my whole-hearted support to the remarks made in Dr. Prosper Liston's wise letter (*Supplement*, August 16, p. 121). I trust that the Council will give serious consideration to the final paragraph, for I am sure that nobody wishes a repetition of the result of Council's previous handling of another matter—namely, marriage and divorce—which also aroused a great deal of emotion in the profession.

The result of the voting in a poorly attended gathering of representatives at the end of a long Representative Meeting, which was particularly tiring because of the appalling acoustics of the hall, cannot be taken as showing the Council that a large majority of members wishes that evidence should be given by the B.M.A. on A.I.D. In conclusion, may I add my plea that motions on the agenda that are controversial and likely to arouse a considerable amount of emotional reaction be placed by the Agenda Committee near the beginning of the agenda, so that they may be adequately discussed, and not at the end as so often happens at present?—I am, etc.,

Liverpool, 9.

V. COTTON CORNWALL.

A.I.D. and the R.B.

SIR.—It is a grievous thing that the discussion on A.I.D. (*Supplement*, July 26, p. 96) should have come at a stage in the Representative Meeting at Birmingham when many representatives had already left and the chairman and the rest of us knew we were pushed for time. In so far as such a subject is suitable for debate by such a body it was highly important that opinion of an Association such as ours should have been quietly and responsibly arrived at. In my view a therapeutic measure such as A.I.D. is a matter for the opinion of each individual doctor and not the proper subject for a body composed of doctors of all branches of the profession, many of whom do not come up against this kind of problem at all.

While the social implications involved in this problem are enormous, it is, surely, as a personal therapeutic measure that each doctor must advise his patient, and as such it is not a subject for the decision of a large body of representatives. It is well that the ultimate result of the debate was to leave the matter to a small body of people who can give considered thought to it.

But the question which must always be uppermost in our minds is, What shall it profit this woman if she has a child and lose her integrity?—I am, etc.,

Scunthorpe, Lincs.

J. R. LAKE.

Working Party on Hospital Staffing

SIR,—Mr. Harold Dodd's letter (*Supplement*, August 2, p. 114) draws attention to the anomalous position in which consultants in non-teaching hospitals now find themselves. More than two-thirds of the consultants in the National Health Service work in non-teaching hospitals where they do 80% of the clinical work, yet they have no representative by right on the important committees which decide such matters as staffing of hospitals, remuneration, and conditions of service. That a committee such as the working party on medical staffing of hospitals could be set up without including any member who has a practical knowledge of running a large clinical unit in a non-teaching hospital is a cause for alarm and misgiving among the thousands of consultants whose life's work is spent in this type of hospital. Mistrust breeds fear, and the gulf between teaching and non-teaching hospitals and the Ministry is, unfortunately, widened by policy of this sort, for it is obvious to all that there must be differences of viewpoint between those who work in these three very different spheres. The only body which can represent the consultants who work only in regional hospitals is the Regional Consultants and Specialists Association, but they need the active support of all those on whose behalf they labour.—I am, etc.,

London, W.1.

H. A. KIDD.

Association Notices

Areas of Gateshead and Durham Divisions

Notice is hereby given by the Council to all concerned that as from August 15, 1958, the area of the Urban District of Washington is transferred from the Gateshead Division to the Durham Division.

A. MACRAE,
Secretary.

Diary of Central Meetings

- | SEPTEMBER | |
|-----------|---|
| 1 Mon. | S.H.M.O.s Group Executive Committee, 2 p.m. |
| 4 Thurs. | Hospital Junior Staffs Group Executive Committee, 2 p.m. |
| 12 Fri. | Central Consultants and Specialists Executive, 2 p.m. |
| 17 Wed. | Alternative Service Subcommittee, G.M.S. Committee, 2 p.m. |
| 18 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 18 Thurs. | Medical Members of the Editorial Subcommittee, Joint Formulary Committee, 11 a.m. |

Branch and Division Meetings to be Held

SOUTH WARWICKSHIRE DIVISION.—At Board Room, Warneford Hospital, Tuesday, August 26, 8 p.m., annual general meeting.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 30 1958

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Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Chiropody Service

SIR,—At the A.R.M. an amendment was carried "that this meeting instructs Council to press for implementation of the service of domiciliary chiropody, which should become a facility under the National Health Service, and does not accept the opinion of Council that no useful purpose would be served by pressing the matter at this stage" (*Supplement*, July 19, p. 59). The proposer said that many retired people came to live in rural Hampshire, but that most of them were not well off and their feet did not take kindly to having to walk a mile or two to reach a shop; many of them were in ill-health. In my experience exceedingly few people retiring to rural Oxfordshire are so foolish as to live one mile from a shop, much less two, even if they have cars. Tradespeople and neighbours are wonderfully helpful to the elderly, who become increasingly unable to carry parcels short distances whatever the condition of their feet. There is far too much unrealistic, muddled, and emotional thinking and talking about chiropody.

An official service would have to depend on graduates of the Society of Chiropodists, who alone as a body can give proof of adequate training. Yet these total fewer than 4,000 in private practice in the United Kingdom, scattered irregularly over the country. The nearest qualified chiropodist to this rural medical practice is 10 miles away, in a town of 8,000 people with a dependent rural population of 2-4 times that number, including at least 3,000 people of pensionable age. In my home town, South Shields, in an industrial area with a population of 107,000, of whom at least 14,000 are of pensionable age, there are two qualified chiropodists. One may reasonably expect foot troubles to be at least as frequent in urban areas, with their hard pavements and smart shoes, as in rural ones. If this be so, then on the basis of the survey in my practice¹ on the condition of the feet of 120 elderly people, mostly of the working-class, in this district at least 1,200, and in South Shields 6,000, people of pensionable age could seek treatment under a free service. Relatively few would need it, but they all might want it if it were free (and surely a service would not be restricted to pensioners, because in my experience the people who clamour for chiropody are those in the late 50's and early 60's). To this must be added the "transport" many would require, especially in rural areas with their rapidly diminishing bus and train services.

Chiropodists are good, kindly people, and their earnings are not high. But in practice they can do nothing worthwhile for deformities, arthritis, hallux rigidus and valgus, and bunions, etc.—

the common painful conditions of ageing feet which cause disability and housefastness. Most confine their attentions in the elderly to corns on the toes, callouses on the soles, and the horny toe-nail if they have the equipment. Their usual methods of treatment are to pare and to pad (surely most unhygienic). With these they usually give a week of relative bliss, a fortnight of growing discomfort, and a week of anguish before the next monthly "treatment" is due. There are rare exceptions, but as a group they rarely cure anything except verrucas; and most of their clients are "regulars" who make their appointments for chiropody as they do for having their hair done. A national service would still be impossible under present conditions if every unqualified chiropodist (many of whom learned the art by a postal course) was also pressed into it. But what was asked for at the A.R.M. was a domiciliary service.

Yet late in life few suffer who cannot help themselves or be helped by common sense. In my survey I found that the most comfortable were those who once a week first soaked and then scraped their feet or got someone else to do it, thus removing the hard skin which, if it accumulates, is the usual cause of discomfort. Of the 120 I saw, only 15 visited a "chiropodist," and of the rest only six seemed to have inadequate home treatment. The last group, all aged over 65, were principally among those who lived alone, could not do it for themselves, and had no friend or relative to help. But it is doubtful if it would be possible to attempt to provide a service even for such hard cases, because it would be next to impossible to draw a line.

Chiropody, as an art, can get nowhere until it brings about a large proportion of cures after a limited number of treatments. It is handicapped—surely unnecessarily—by the present denial of the use of local anaesthetics. It seems to me that chiropodists much more than other professions qualify for something the vast majority can never approach practising. If this were altered, they could prevent much unnecessary pain; and if they were as far as possible to attempt and effect cures they could properly ask that the word "chiropodist" might refer only to those trained and qualified to cure as no mere corn-cutter possibly can. A limited national service might then be possible, at least to deal with the horny toe-nail, which is more common than is generally realized, is impossible properly to deal with at home, needs treatment only once or twice a year, and can be a painful and limiting disability (I found 26 cases of varying severity in the 120 people I examined, and 11 in the 55 who were aged over 70).

Suitably salaried and experienced Fellows of the Society of Chiropodists should also be introduced into consultant posts at orthopaedic hospitals and departments as specialists in chiropodeal orthopaedics. Few surgeons are interested in feet other than those which call for a knife or a hammer and chisel, and even then the vitally important "follow-up" treatment is often neglected. There is a great gap between the chiropodist and the orthopaedic surgeon which urgently needs to be filled, especially in prevention of the deformities of the feet of the young and the cure of the middle-aged and elderly.—I am, etc.,

Oxford.

GORDON SCOTT.

REFERENCE

¹ Scott, G., and Williams, C. R. S., "Old People Living Alone in Oxfordshire," *Oxford Times*, March 12, 1954.

Operating Theatre Technicians

SIR,—Mr. William Gissane's letter (*Supplement*, August 9, p. 117) expresses admirably the position of the operating theatre technicians, and I would like to endorse his letter, as we have, like a good many other hospitals, a similar type of problem. Twelve and a half years ago we engaged two excellent nursing orderlies who had 15 and 6 years' previous experience, mainly in the Army. These appointments were fully justified, and we have found them invaluable in the operating theatre, the anaesthetic room, and the plaster room. Both have been faithful to us, and they have been most reliable, both during the day and in the night and during the week-ends, when the theatre staff always seems to be at its minimum.

Our theatre superintendent and nursing staff are made up of part-time staff, and at least one or two of them get married every year, but our two operating theatre technicians are always willing to breach the gap—in spite of the fact that they do not get extra pay for it. Our two senior operating theatre technicians, after 10 years of first-class service, remain on a smaller salary than that of an ordinary staff nurse. As in the case of Mr. Gissane, our two loyal and trustworthy technicians have stayed with us for the love of the job. Neither of them can afford to stay on this pay. Up to eight months ago they were unable to get extra pay for overtime. One of them, however, has gone back in status, of his own free will, and is now theatre attendant class 1. By this means his initial salary, though lower, is increased by overtime and "on call" allowance. He is able to do this as he is now under the National Joint Council and not the Whitley Council.

It is high time that these key men should be appreciated and remunerated accordingly. It is useless to criticize these salaries without making some constructive suggestions. I feel that the men who devote themselves to this type of work, and on whom the surgeons depend, ought to command a salary in the region of £800 to £900 per year. In this way we would be able to retain the services of such men. I am, etc.,

Solihull, Warwicks.

P. QUINET.

SIR,—I would like to thank Mr. William Gissane (*Supplement*, August 9, p. 117) for his letter in support of operating theatre technicians. As a theatre technician in a busy theatre I find it is the love of our work and not the pay that attracts us, but this cannot go on for ever. With the cost of living continually increasing we too have to live, and find it quite a struggle on the present wages.

Our responsibilities are ever increasing in the operating theatre, and the anaesthetists and surgeons rely on us to keep the equipment in tip-top order, and often it is we who in the middle of an operation repair a small defect in the equipment which makes all the difference to saving a patient's life. Our surgeons and anaesthetists fully support our claim for a better status in the Health Service, but are unable to do much against the Whitley Council.

The Association of Operating Theatre Technicians is having a hard fight. May the day soon come when it will be rewarded.—I am, etc.,

Plymouth.

THOMAS R. PERKINS.

Home Confinement Grants

SIR,—I am in full agreement with Professor C. Scott Russell in his protest (*Supplement*, August 9, p. 116) against non-eligibility for this grant in the situation he mentions. It quite frequently happens that a patient, by reason of some possible complication in labour such as previous P.P.H., is safer to be confined in hospital but quite suitable for home puerperium, thus saving hospital beds. Some help must be organized at home for the puerperium, and this costs money when, as so often happens, there is no relation available to look after mother and baby. At times a domesticated husband can stay off work to do this, but this

means loss of earnings (a prearranged fortnight's holiday is usually upset by the baby's unpunctual habits).—I am, etc.,
VERA E. CLAXTON.

Hove, 3.

After-dinner Speeches

SIR,—I have now attended four B.M.A. Annual Dinners. At these functions I have heard only two good speeches (both by Anglican bishops) and a considerable number of frankly bad ones. Let us hope that the standard can be raised higher next year in compliment to our President-elect. We know we shall not be bored by him; we must try to make sure he will not be bored by us.

There must be a better way to propose the health of "Our guests" than the dreary recital of a long list of names which mean very little to most of the hosts.—I am, etc.,

Chesterfield.

H. E. POOLER.

NEWS IN BRIEF

AUSTRALIAN NATIONAL HEALTH SCHEME.—The Australian Government has endorsed the principle of giving Commonwealth assistance to special insurance funds set up by registered health insurance organizations for people who cannot be insured at normal rates because of their age, or pre-existing or chronic illness.

SOCIAL SECURITY CONVENTION WITH YUGOSLAVIA.—The social security convention between the United Kingdom and Yugoslavia ("News in Brief," *Supplement*, June 21, p. 345) has now been ratified and comes into force on September 1.

UGANDA BRANCH.—Dr. A. M. M. Wilson has resigned from the office of president of the Uganda Branch of the B.M.A., and Dr. R. L. Patel has been elected to take his place.

HOSPITALITY

A French surgeon has a daughter, aged 16, and a son, aged 14, who would like to make exchanges with British children next summer holidays. They would prefer somewhere near the sea, and in exchange would take the British children on holiday with them on the Mediterranean coast. Would anyone interested please get in touch with Dr. R. A. Pallister, International Medical Advisory Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Questions Answered

Hire or Purchase?

Q.—Is there any income-tax advantage in hiring as against purchasing a car for general practice use?

A.—The full cost of using a car in general practice, including repairs, general running costs, and depreciation, may be deducted from profits subject to a restriction for any portion of the cost applicable to private as apart from practice use. This restriction would also apply to hire costs, and therefore the only difference between hire and ownership would be the comparative cost. Income tax would enter into the question only in so far as the burden of the extra cost of either method would be reduced by being allowed for taxation, and in the case of a heavy surtax payer might therefore become negligible.

The obvious advantage of hiring is its simplicity, as there is a straightforward allowance of the cost of hire, whereas the special allowances for depreciation for a purchased car have an uneven effect on taxation liability. By reason of the initial allowance and annual allowance approximately one-half of the cost is allowed as an expense in the first

year but only approximately one-seventh in the second year, with reducing allowances each successive year. Should these allowances prove to be greater than the actual loss in value, any excess allowance is recouped by a balancing charge in the year of sale. It may therefore result that a practice with a regular level of income may show considerable variations in its assessments for tax purposes, and in the total tax liability could be affected. In the case of a car bought by hire-purchase the initial allowance is spread over the period in which the payments are made, thus giving a more even allowance.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Adams, J. C.: Outline of Orthopaedics. Second edition. 1958.
Allen, C.: Homosexuality: Its Nature, Causation, and Treatment. 1958.
Andreas-Friedl, R.: Schlank durch Diät. 1957.
Banerji, P.: Snake-bite: With a System of Treatment and Reported Cases and Notes. 1956.
Barbara, T. A.: Stuttering: A Psychodynamic Approach to its Understanding and Treatment. 1958.
Beal, J. M. (Editor): Manual of Recovery Room Care. 1956.
Bilecki, G.: Hoher Blutdruck. 1955.
Bray, W. E.: Clinical Laboratory Methods. Fifth edition. 1957.
Cantor, M. O., and Reynolds, R. P.: Gastro-intestinal Obstruction. 1957.
Centre International de l'Enfance: Les Gamma-globulines et la Médecine des Enfants. 1955.
Centre International de l'Enfance: Le Traitement de la Tuberculose de l'Enfant. 1956.
Cunningham's Manual of Practical Anatomy. Twelfth edition. Volume I. 1957.
Dartnall, H. J. A.: Visual Pigments. 1957.
Davies, M. B.: Hygiene and Health Education for Training Colleges. Seventh edition. 1956.
Donahue, W., and Tibbitts, C. (Editors): New Frontiers of Aging. 1957.
Dufault, P.: Diagnosis and Treatment of Pulmonary Tuberculosis. Second edition. 1957.
Eysenck, H. J.: Dynamics of Anxiety and Hysteria. 1957.
Feldman, M.: Clinical Roentgenology of the Digestive Tract. Fourth edition. 1957.
Garattini, S., and Ghetti, V. (Editors): Psychotropic Drugs. 1957.
Gedda, L.: Genetica Medica. 1954.
Halpern, B. N. (Editor): Physiopathology of the Reticulo-endothelial System: A Symposium Organized by C.I.O.M.S. 1957.
Harrington, D. O.: Visual Fields: A Textbook and Atlas of Clinical Perimetry. 1956.
Hewer, B. E.: Textbook of Histology for Medical Students. Seventh edition. Edited by C. L. Foster. 1957.
Hiller, A.: Practical Clinical Chemistry: A Guide for Technicians. 1957.
Himsworth, Sir H., and Delafresnaye, J. F. (Editors): Support of Medical Research: A Symposium Organized by C.I.O.M.S. 1956.
Himwich, H. E. (Editor): Tranquillizing Drugs: A Symposium. 1957.
Küchmeister, H.: Klinische Funktionsdiagnostik. 1956.
Lawler, S. D., and Lawler, L. J.: Human Blood Groups and Inheritance. Second edition. 1957.
L'Etoile, G., et al.: Statistica e Sociologia Sanitaria. 1956.
Leuret, F., and Bon, H.: Modern Miraculous Cures. 1957.
McIlwain, H.: Chemotherapy and the Central Nervous System. 1957.
Marriott, H. J. L.: Practical Electrocardiography. Second edition. 1957.
Mellor, A. H.: Introduction to Enzymology. 1957.
Mellor, R. C. (Editor): Analytical Pathology. 1957.
Morley, M. E.: Cleft Palate and Speech. Fourth edition. 1958.
Neary, G. J., et al.: Chronic Radiation Hazards. 1957.
Palmeri, A., and Giacca, S.: Le Sindromi Ipo-Ipersiderotiche. 1957.
Parish, H. J.: Antisera, Toxoids, Vaccines and Tuberculin in Prophylaxis and Treatment. Fourth edition. 1958.
Pearson, O. H. (Editor): Hypophysectomy. 1957.
Pigman, W. (Editor): The Carbohydrates: Chemistry, Biochemistry, Physiology. 1957.
Prévot, A. R.: Biologie des Maladies dues aux Anaérobies. 1955.
Roberts, G. F.: Comparative Aspects of Haemolytic Disease of the New-born. 1957.
Schulz, F. H.: Das Fibrinogen. 1953.
Scott, J. H., and Symons, N. B. B.: Introduction to Dental Anatomy. Second edition. 1958.
Sivasubramanian, P.: Student's Companion in Ophthalmology. 1957.
Trumble, H.: Collected Papers of. Edited by L. Cox. 1957.
World Health Organization Monograph Series No. 33: Meat Hygiene. 1957.
Wurm, K., et al.: Der Lungenboeck im Röntgenbild. 1958.

A medical officer in Devon (records the County Medical Officer in his annual report, *Devon's Health in 1957*), while discussing diet with the mother of a 7-months-old child at the welfare centre, was told that the child had a bottle of stout every day, prescribed by a "doctor in Ireland" when the baby was 3 weeks old. Further questioning revealed that the doctor had in fact prescribed the stout for the mother, who, assuming that it was doing the child good through her milk, continued to provide it on weaning—one-third stout, two-thirds milk in a bottle. The baby apparently enjoyed the mixture.

Association Notices

Diary of Central Meetings

SEPTEMBER

- | | |
|-----------|---|
| 1 Mon. | S.H.M.O.s Group Executive Committee, 2 p.m. |
| 4 Thurs. | Hospital Junior Staffs Group Executive Committee, 2 p.m. |
| 12 Fri. | Central Consultants and Specialists Executive, 2 p.m. |
| 17 Wed. | Alternative Service Subcommittee, G.M.S. Committee, 2 p.m. |
| 18 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 18 Thurs. | Medical Members of the Editorial Subcommittee, Joint Formulary Committee, 11 a.m. |
| 18 Thurs. | Charities Committee, 11.30 a.m. |
| 25 Thurs. | Grants Subcommittee, Organization Committee, 11 a.m. |
| 25 Thurs. | Organization Committee, 2 p.m. |
| 26 Fri. | Staff Side, Committee C, Medical Whitley Council, 2 p.m. |
| 26 Fri. | Staff Side, Committee C, Medical Whitley Council and Public Health Committee, joint meeting, 2.30 p.m., followed by meeting of Public Health Committee. |

OCTOBER

- | | |
|----------|---|
| 1 Wed. | Private Practitioners Subcommittee, Private Practice Committee, 2.30 p.m. |
| 2 Thurs. | Editorial Subcommittee, Joint Formulary Committee, 11 a.m. |
| 8 Wed. | Occupational Health Committee, 10.30 a.m. |

Branch and Division Meetings to be Held

ISLE OF WIGHT DIVISION.—At Unity Hall, Newport, Isle of Wight, Tuesday, September 2, 4 p.m., annual general meeting.
NORFOLK BRANCH.—At Cricket Ground, Brooke, Saturday, September 6, 4.45 p.m., annual meeting.
SUTTON COLDFIELD DIVISION.—At Sutton Coldfield Hospital, Monday, September 1, 9.15 p.m., business meeting.

Meetings of Branches and Divisions

ABERYSTWYTH DIVISION

The following officers have been elected:
Chairman.—Mr. E. Owen Lloyd.
Vice-chairman.—Dr. E. D. Clifford Jones.
Honorary Secretary.—Dr. J. H. Hughes.

BARNESLEY DIVISION

At the annual general meeting on May 30 the following officers were appointed:
Chairman.—Dr. L. Varley Broadhead.
Vice-chairman.—Dr. J. Aitken McEwen.
Secretary and Treasurer.—Dr. D. H. Pick.

BATH DIVISION

At the annual general meeting on July 2 the following officers were elected:
Chairman.—Dr. D. Pugh.
Chairman-elect.—Dr. A. K. Dougall.
Vice-chairman.—Mr. J. M. Sanson.
Honorary Secretary.—Dr. W. B. S. Crawford.
Honorary Treasurer.—Dr. E. Scott White.

BELFAST DIVISION

The following officers have been elected:
Chairman.—Dr. H. J. Cronhelm.
Vice-chairman.—Mr. H. Wilson.
Honorary Secretary.—Dr. R. A. McIlraith.
Honorary Treasurer.—Dr. G. T. C. Hamilton.

CAMBRIDGE AND HUNTINGDON DIVISION

The following officers have been elected:
Chairman.—Dr. A. Brown.
Vice-chairman.—Dr. C. W. Walker.
Honorary Secretary and Treasurer.—Dr. J. A. Sadler.

CITY DIVISION

The following officers have been elected:
Chairman.—Dr. J. Wiseman.
Vice-chairman.—Dr. D. G. Berry.
Joint Honorary Secretaries.—Dr. A. Rezler and Dr. S. Weinstein.
Honorary Treasurer.—Dr. J. M. Alston.

CORNWALL DIVISION

At the annual general meeting the following officers were elected:
Chairman.—Dr. F. D. M. Hocking.
Vice-chairman.—Dr. E. H. Eastcott.
Honorary Secretary and Treasurer.—Dr. E. Townsend.

CROYDON DIVISION

The following officers have been elected:
Chairman.—Dr. P. O'Flynn.
Vice-chairman.—Mr. V. Wilkinson.
Chairman-elect.—Dr. W. D. Glyn James.
Honorary Secretary.—Dr. G. Hirst.
Honorary Treasurer.—Dr. W. Hastings Hardy.

DARLINGTON DIVISION

The following officers have been elected:
Chairman.—Dr. D. J. H. Payne.
Vice-chairman.—Dr. J. W. Cathcart.
Honorary Secretary.—Dr. L. J. Rosin.
Honorary Treasurer.—Dr. L. E. S. Coghlan.

DORSET DIVISION

The annual general meeting was held on June 12. Eight members were present. The Secretary reported receiving a letter from the postmaster stating that delays in delivery of the *Journal* had now been rectified. The following officers were elected:

Chairman.—Dr. E. H. Parkinson.
Vice-chairman.—Dr. E. J. Gordon Wallace.
Honorary Secretary and Treasurer.—Dr. A. N. Blades.
 Three films were shown: "Venepuncture," "Woodpeckers," and "The Bayeux Tapestry."

FIFE BRANCH

At the annual general meeting on May 25 the following officers were elected:

President.—Dr. P. Aitken.
Vice-president.—Dr. D. Macdonald.
President-elect.—Dr. G. F. Cables.
Joint Honorary Secretaries.—Dr. A. M. Girvan and Dr. H. B. Muir.

GLASGOW DIVISION

A meeting was held in the Glasgow Regional Office on June 4. Dr. J. S. McLaren Ord took the chair and 28 members were present. Before the meeting began Dr. Ord drew attention to the new Glasgow Regional Office premises, saying that they were superior in every way to the old and provided excellent accommodation. Dr. R. L. Cormie suggested that in view of the extra accommodation it might be appropriate to start a library, and that members might like to contribute medical books, etc.

GUILDFORD DIVISION

The annual general meeting was held on June 19. The following officers were elected:

Chairman.—Dr. G. I. Watson.
Vice-chairman.—Dr. A. J. Whitaker.
Honorary Secretary and Treasurer.—Dr. F. A. Belam.

HALIFAX DIVISION

The following officers were elected at the annual general meeting:

President.—Dr. K. Marshall.
President-elect.—Dr. M. Goldin.
Honorary Secretary and Treasurer.—Dr. R. I. Lewis.

LANARKSHIRE DIVISION

At the annual general meeting the following officers were appointed:

Chairman.—Dr. G. S. Park Noble.
Vice-chairman.—Dr. R. J. Lumsden.
Honorary Secretary and Treasurer.—Dr. J. C. Macarthur.

LEEDS DIVISION

The following officers have been elected:

Chairman.—Dr. W. MacAdam.
Vice-chairman.—Dr. W. Adams.
Honorary Secretary.—Dr. J. H. E. Moore.
Honorary Treasurer.—Dr. E. C. Benn.

MACCLESFIELD AND EAST CHESHIRE DIVISION

The annual general meeting was held on May 14. The following officers were elected:

Chairman.—Dr. R. O. Payne.
Vice-chairman.—Dr. F. Wemyss Smith.
Honorary Secretary and Treasurer.—Dr. C. Shiers.

MID-GLAMORGAN DIVISION

The following officers have been elected for this new Division:

Chairman.—Dr. D. H. Isaac.
Vice-chairman.—Dr. A. Phillips.
Senior Secretary and Treasurer.—Dr. R. B. Body.
Junior Secretary.—Dr. H. Jones.

NORTH WALES BRANCH

The annual meeting was held on June 7, and the following officers were elected:

President.—Dr. J. Forbes.
President-elect.—Dr. G. Mansell Williams.
Honorary Secretary and Treasurer.—Dr. A. H. Holmes.

NORWICH DIVISION

The following officers were elected at the annual general meeting on July 1:

Chairman.—Dr. R. A. C. Rice.
Vice-chairman.—Mr. J. M. Ridley Thomas.
Honorary Secretary.—Dr. R. H. Scott.
Honorary Treasurer.—Dr. M. H. Clement.

OLDHAM DIVISION

The annual general meeting was held on June 2, and the following officers were appointed:

Chairman.—Mr. E. Henderson.
Vice-chairman.—Dr. M. Strang.
Honorary Secretary and Treasurer.—Dr. C. H. Strachan.

PERTH BRANCH

The following officers have been elected:

President.—Dr. C. J. Swanson.
President-elect.—Dr. W. M. Wilson.
Honorary Secretary and Treasurer.—Dr. J. Kelman.

RICHMOND DIVISION

The annual meeting was held on July 1. Fifteen members attended and the following officers were elected:

Chairman.—Dr. A. G. Manley.
Vice-chairman.—Dr. E. Pereira.
Secretary and Treasurer.—Dr. L. H. Worth.

SUFFOLK BRANCH

The annual meeting was held at Red House, Eye, on June 18. Mr. Derrick Martin presided and 19 members attended. The following officers were appointed:

President.—Dr. J. Shackleton Bailey.
President-elect.—Mr. Leedham Green.
Vice-president.—Mr. G. F. Langley.
Honorary Secretary and Treasurer.—Dr. W. P. Grieve.

SURREY BRANCH

The annual meeting was held on June 11, and the following officers were elected:

President.—Dr. A. G. Manley.
President-elect and Honorary Secretary and Treasurer.—Dr. L. A. Gibbons.
Vice-presidents.—Drs. W. N. Gilchrist and J. H. Lankester.

WARRINGTON DIVISION

The annual general meeting was held on June 27 in the Swan Hotel, Winwick, Warrington. Twenty-two members were present. The following officers were elected:

Chairman.—Dr. W. E. Bowden.
Vice-chairman.—Mr. D. H. Young.
Honorary Secretary and Treasurer.—Dr. A. H. Hollings.

WEST DENBIGH AND FLINT DIVISION

The following officers have been elected:

Chairman.—Mr. A. H. Holmes.
Vice-chairman.—Dr. W. McKendrick.
Honorary Secretary and Treasurer.—Dr. P. M. Anderson.

WEST LOTHIAN DIVISION

At the annual meeting held on June 26 at West Port Hotel, Linlithgow, the following officers were elected:

Chairman.—Dr. I. H. Thomson.
Vice-chairman.—Dr. A. M. Green.
Honorary Secretary and Treasurer.—Dr. M. Gardiner.

WEST NORFOLK DIVISION

At the annual general meeting on June 19 the following officers were elected:

Chairman.—Dr. Gwendolen M. O'Shaughnessy.
Vice-chairman.—Dr. C. R. F. Hewlett.
Honorary Secretary and Treasurer.—Dr. Nora M. Johns.

Corrections.—We are informed that Dr. G. R. Usmar has been elected vice-chairman of the Holland Division, not Dr. V. O. Nowlan as reported in the *Supplement* (August 9, p. 120).

The vice-chairman of the Enfield and Potters Bar Division is Dr. C. A. Birch, not Dr. C. Allan as reported in the *Supplement* (August 16, p. 124).

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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WORLD MEDICAL ASSOCIATION TWELFTH GENERAL ASSEMBLY

PRESIDENTIAL ADDRESS BY DR. CHARLES JACOBSEN

The Twelfth General Assembly of the World Medical Association was held in Copenhagen, August 15-20, when a large number of delegates from the fifty-five member associations met in the House of Parliament, Kristiansborg Palace. We print below a slightly abridged version of the Presidential address and the address given by the Director-General of the National Health Service of Denmark.

The Danish Medical Association celebrated its centenary last year. The liberal movement with the demand for political freedom which developed throughout Europe towards the middle of the last century resulted in the establishment of the Basic Law in Denmark in 1849 with the introduction of a free constitution and democracy and the maintenance of a constitutional monarchy. This political event was undoubtedly of great significance for the inauguration of the Danish Medical Association, as the liberal movement was in the ascendant, particularly in academic circles. In the proposals for inauguration the Danish medical profession was encouraged to unite "by mutual assistance to produce, develop, and maintain conditions under which the medical calling best can develop."

The most important task of every national medical association is to obtain decisive influence upon the solution of the problems concerned with the health of the community, both general and individual. An essential condition to obtain this influence is that the national medical association be united and that the entire profession be united in one organization. Progress of medical knowledge, particularly in recent years, has divided the profession into groups whose professional interests are not always identical. A central organization is therefore absolutely essential. Such an organization must include not only those who practise outside the hospitals, those who work in hospitals, young doctors during their training, but also research workers and doctors who work within public organizations such as public health administration and military organizations. Only on such a basis can the national medical association speak on behalf of the entire profession and exercise the necessary influence upon the organization of the health services, primarily in the interests of the patients. The Danish Medical Association, which includes practically the entire medical profession in Denmark on a voluntary basis, has achieved such an influence. Without the co-operation of the Danish Medical Association no important law or direc-

tive concerning our health services can be carried out. The Danish Medical Association has an excellent and productive co-operation with the Government and the local authorities, for whom it acts as an adviser on numerous occasions and with whom it has entered into voluntary agreements following negotiations.

International Medical Unity

In order that the World Medical Association can achieve the position and recognition necessary to fulfil its high aims at an international level the same factors must exist as for the national medical associations on a national level. The World Medical Association must include so many national medical associations that it is genuinely representative, and there must be unanimity concerning the general principles, despite the fact that there may be very great differences in the attitudes of the national medical associations towards many problems. We have good reason to assume, in advance, that the medical profession of the world can work together towards a common goal. Few or no professions have an education which is so uniform in its principles as the education of the medical profession. This education never ceases, because development is continuous. The practice of medicine is a lifelong study. For the medical practitioner more than for any other the work is based upon a personal relationship with his fellow men. If the work of the practitioner is to include not only medical science but medical art, he must get to know his fellow men, their environments, their sorrows and joys. Medical work is therefore a privilege. The relationship of mutual confidence between the doctor and his patients is unknown in many other realms. It is guided by ethics which have remained practically unchanged for 2,500 years, since the days of Hippocrates, and will remain as the basis for the practice of medicine for thousands of years to come. It may well be asked that if the medical professions cannot agree, then who can?

It is the right and the duty of the community to work for the maintenance of health and for the fight against disease, but it is also the right and the duty of the medical profession to exert a decisive influence upon this: a decisive influence upon the measures and ways "to assist all the peoples of the world to attain the highest possible level of health," and a decisive influence upon the conditions under which the medical calling can best be developed. The organization of the health services and the position of the doctor in this system will differ in different parts of the world. Opinions on this subject held by doctors and social politicians will also be divided. Geographical, political, economic, cultural, and traditional conditions, naturally, influence this to a varying degree. Arrangements which may be suitable and satisfactory under given conditions in one country may be less satisfactory or entirely unsuitable

in another country with quite other conditions. Certain ideals must, however, be stressed everywhere: the confidential relationship between doctor and patient is based upon the professional secrecy of the medical profession, and the right of the patient to choose his doctor must be defended. The independence of education and research from unrelated factors must be maintained.

750,000 Doctors

Since the first General Assembly in Paris in September, 1947, the World Medical Association has attained ever increasing recognition and prestige. Co-operation with a series of other international and significant organizations has been developed, and the influence of W.M.A. is of enormous significance to-day for 750,000 doctors in 55 member countries. This position would not have been achieved had it not been for a great number of prominent members of council and committees eminently led by our secretary general, Dr. Louis H. Bauer, who have carried out laborious work not least in collecting from and exchanging information with the member countries and overcoming resistance and misunderstandings frequently caused by the difficulty of finding definitions in a foreign language which completely cover the definitions in the original language.

Socio-medical affairs have occupied a great part of the working programme of the council and general assemblies of W.M.A. since its inauguration, and this part of the W.M.A.'s work has been of concrete practical value to national medical associations. It is particularly important that W.M.A., by means of common meetings with and in expert committees with international organizations such as W.H.O., I.L.O., and I.S.S.A., should be able to express the opinions of the medical profession throughout the world. This is important, because these large international organizations inform and advise the governments of the individual countries. It is also of significance that W.M.A. gives support to the International Federation of Medical Student Associations—to the medical students who are thus preparing themselves to carry on the work of the future.

The founders of the Danish Medical Association resolved in 1857 "to keep together, to keep on, and to show moderation; therein must an association such as that of the medical profession seek its strength and therein lies its strength." I see no reason why these words should not serve also as the motto for the activity of W.M.A. I hereby express my wish that the deliberations of the 12th General Assembly may proceed in such a way that this General Assembly will support and further develop the significance of W.M.A. for the medical professions of the world.

THE FAMILY DOCTOR AND THE HOSPITAL*

BY

JOHS. FRANDBSEN, M.D.

Director-General of the National Health Service of Denmark

Technical progress is intervening in industrial life with such force that revolutionary changes are happening before our very eyes almost from day to day, with consequences which not only affect the processes of production themselves but alter both the life of the individual and the entire structure of society. The profession of medicine, too, draws upon the world of physics and chemistry for its great progress in treatment, diagnosis, and prevention. To a certain extent it is subjected to the same evolution, open to radical changes in the daily medical work as well as in the working and living conditions of the individual physician

*The text of an address given at the opening session of the General Assembly of the World Medical Association on August 16, at Copenhagen.

and of the medical profession as a whole. It is justifiable to ask whether the condition for the complete utilization of the possibilities presented by physics and chemistry to the healing of the sick will be a constantly increasing centralization of that work, as in industrial life—a movement away from individual effort to the methods and conditions of modern industry.

Just over a generation ago it was really only surgery that needed hospitals with specially trained doctors. That is not so to-day. At a rapidly increasing rate in these last few decades specialization in our science and art has made demands on the hospitals for accommodation for other branches too—for all that technical apparatus which modern diagnostics and therapy need, and for a corresponding expansion of the specialist medical staff.

Centralization in the hospitals of an ever-growing part of the practice of medicine is an outstanding feature of the developments we are witnessing to-day.

Simultaneously, the costs of examination and treatment are rising. Only exceptionally, and only for well-to-do people, can modern medical treatment be met out of purely private means. Consequently, if the whole population is to be assured access to forms of treatment capable of utilizing all the modern adjuvants, that population must cope with the problem collectively. This is indeed recognized and implemented, or at any rate planned, in various countries, though perhaps on different scales.

Political Implications

Medical treatment is no longer a matter between doctor and patient alone. It is a social matter, whose problems are subjected to society's circumstances and stage of development, subjected, in other words, to various political ideas and ideals: a social matter of high priority everywhere in parliaments and governments.

The question that arises then is this: How is the doctor placed in this new development, and how far can he himself be allowed to influence it? The course of development may take place in different directions and in accordance with different principles. Will it serve the national health best to carry centralization through to the uttermost, or to make a halt on the road and inquire whether we are not running the risk of changing the art of healing so vitally that present developments ought to be checked or, if possible, directed along other paths?

The World Health Organization stands as the dynamic expression of the present-day interest in, and recognition of, the all-important significance of health services in the life of the community. That being so, it must be of the greatest concern to listen to the discussions and the opinions that are voiced when government representatives of 85 member States gather together. In conjunction with the Tenth Assembly in 1957, two days were set aside for discussing "The Role of the Hospital in the Public Health Programme." The great majority of those who took part in that discussion stated the belief that the hospital ought to play the leading role in public health. To many of them the hospital, as the large health centre of both curative and preventive work, was the high ideal. The concept of "the general practitioner" was touched upon, of course, indeed with some respect, but nevertheless as a person who ought to be guided by the "superior" hospital doctors by means of an out-patient department whose domain may even comprise home treatment: in short, the tendency was to greet centralization as the coming thing. I know that there are countries where, because of a shortage of both money and doctors, health centres are still the only means of providing the people with adequate medical attention; and that there are countries which, solely on account of their lack of doctors, are compelled to centralize much medical treatment in hospitals. But if the utmost concentration is not necessitated by such extraneous causes, all of which can be remedied with time, we should carefully weigh the importance and value of the two aspects of medical treatment—

domiciliary by the family doctor, and treatment in hospital—and try to arrive at the proper balance.

Experience in Denmark

My views on this subject of course are based mainly upon my experience in my own country. In Denmark we have one doctor to every 800 inhabitants. About half the doctors work in hospitals and scientific institutions; the other half practise outside the hospitals, the great majority as general practitioners. About 75% of the population are beneficiary members of the government health insurance. Health insurance, which is voluntary, has been since 1892 under statutory public control and subsidized by the public. We have a local-government hospital system, established in 1906, covering the whole country, and embodying the various special departments. Our health insurance covers all medical treatment in and out of hospital, so that pecuniary circumstances are never an obstacle to admission to hospital, which can be arranged only by a doctor.

Large investments in new buildings, rebuilding of hospitals in recent years, and the constantly growing and efficient work at the hospitals have attracted widespread attention to them and consolidated the interest and understanding of the great social value of hospital treatment. When we also consider that the great modern progress in medical science, with its conspicuous results, is always attributable to the work of the hospitals and their staffs, then we realize that extramural medical treatment has not given rise to so many problems and discussions—and perhaps has rather faded into the background. The time has come to draw attention to this in order to avoid a reevaluation of the merits of the two aspects of medical treatment and a consequent disturbance of the present balance. How shall we maintain both elements in the treatment of the sick, in collaboration on an equal footing?

Decentralization

We must realize that a doctor practising outside the hospital cannot, any more than the hospital doctor could, diagnose his case and carry out his treatment without access to the same technical aids as the hospital doctor. If we are to maintain independent treatment both in hospital and outside it, both hospital doctor and general practitioner must have access to laboratories, etc., and to the assistance of their specialists. On the other hand, for economic reasons alone, it would not be feasible to have, so to say, two sets of technical adjuvants and two teams of specialists, one for general practitioners and one for the hospital. The technical examination departments of the hospitals must be made common to both sides, and we are hard at work on such a new arrangement. This means that we are not making an out-patient department but building a bridge over the hospital walls to connect the two equally valuable bodies of doctors. Along these lines we are trying to limit centralization of medical work to what is absolutely necessary, and to maintain the possibility of efficient treatment outside the hospitals. We are doing it not merely because it is imperative to keep hospital expenditure itself down so far as is right and proper, but—and this not least—because it will consolidate the general practitioner's field of activity and his whole position.

The general practitioner, the family doctor, who has not the same training in the various branches of medicine as the specialists, but on the other hand has his own specialty in knowing the person behind the disease and all his circumstances, ought to be the fundamental element in the organization of medical treatment, he being the one who is best qualified to advise the patient as to treatment and the extent of the assistance obtainable from specialists, in or outside the hospitals.

But whatever may be decided in order to maintain the proper balance there remains the inevitable reality that part of the new-won territory in the domain of medical treatment has devolved upon the hospitals and the hospital doctors. The general practitioner's domain and the volume of his

work are being altered. Though this will not detract from his work in the treatment of the sick, these changes may nevertheless open the way for utilizing his knowledge and skills in other tasks, for there is work enough for doctors, even if, as I have said before, there is, as in the case of Denmark, one doctor to every 800 individuals.

Besides working in the service of treating the sick, there is a large field open to medical men in preventive medicine. What I have in mind is solely the section of prevention that is devoted to health control, vaccination, etc., all exclusively the work of physicians. Here again we are up against the choice between centralized and decentralized medical work.

Certain technical and economic advantages appear to be in favour of centralizing preventive work to health officers and specialists. But, having considered these matters, we have chosen decentralization and have placed the greater part of the preventive work of medicine on the shoulders of general practitioners, the part that is inherently associated with the ordinary work of a doctor, vaccination and health control of expectant mothers as well as of children up to the school age, after which the school doctor watches over the health of the children. The general practitioner, the family doctor, is thereby placed as the central figure in the sickness-prevention and health-preservation work in medicine and forms the natural link between curative and preventive medicine.

Conclusion

Medical work nowadays has many facets. It proceeds at the sick bed, in the operating theatre, in the laboratory, in the x-ray department, and so on. The presence of the patient is not always necessary, and not everything requires the presence of the doctor. Specialization and the use of technical adjuvants necessitate a certain amount of centralization and make the practice of medicine correspondingly difficult in its most original form: the meeting between doctor and patient, where one person is trying to help a fellow-being and in return receives his full confidence. It is that relationship of confidence which gives the doctor the feeling of security and the freedom to give of his best, and which is the indispensable foundation of all medical work. If we acknowledge that, then centralization must not be carried further than is absolutely necessary; whereas decentralization, the original form of the profession of medicine, must be strengthened. The family doctor with his many-sided work is so valuable a link in the organization of both treatment and prevention that he cannot be weakened, let alone removed, without great and lasting harm to the profession as well as to society.

The medical profession has a fundamental right to be consulted when the lines for the future development of the health system are to be plotted, not so that he may be drawn reluctantly into a new era with its ideals and forms of social life, but in order to meet developments as they come, receive what is new, and help to mould it with the aid of the old but ever-young ideals which now, as before, should be retained as a reality for doctors and medical work—the ideals of the right and duty to help the sick and safeguard the bonds of confidence between patient and doctor.

HOSPITAL RESIDENTS' ACCOMMODATION

The Ministry of Health has circularized hospital boards and management committees asking them to take note of recommendations on standards of living accommodation for hospital resident junior medical staff submitted by Committee B of the Medical Whitley Council. The recommendations are the outcome of the dissatisfaction expressed by residents in some hospitals at the type of accommodation and services provided. Committee B points out that the resident's room is his temporary home and he should be able to relax and study in it. Furniture and fittings should be reasonable in quantity and quality and it is recommended that if a bed-sitting room is small "consideration should be

given to providing a separate sitting room." Where practicable each room should have hot and cold running water. A telephone by the bed (with a bedside lamp) should be connected to the internal hospital telephone, and external telephones should be readily accessible. Attention is called to the need for adequate, varied, and attractively served and freshly prepared meals for those who, like resident medical staff, work long and irregular hours. There should be arrangements for making any complaints directly to the management committee or board.

NEWS IN BRIEF

PRIVATE PRACTICE BANNED.—The Czechoslovakian Government has decreed that, as from January 1, 1959, private practice by doctors and dentists must cease. A few professors, retired doctors, and invalid doctors already in practice will be allowed to continue private practice, but they will not be allowed to issue sickness certificates, nor will any treatment they advise or medicine they prescribe be paid for out of State health service funds.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Reorganization of General Practice

SIR,—On all sides nowadays one hears complaints from general practitioners about the unsatisfactoriness of their lives as doctors under the National Health Service. Although not a few admit that the social aspects of the Service, both for the patient and for themselves, have much to commend them, it is impossible not to be impressed by the obvious sense of frustration that permeates the whole of their practice. It is not easy to go to the root of this dissatisfaction in a few sentences, but the crux of the matter seems to be a feeling that they are no longer doctors practising an honourable profession but simply office boys, whose main duties are those of filling in forms and of directing the patient into the proper hospital channels when necessary. Although I cannot, as a specialist, honestly or logically object to what is nowadays so horribly described as "hospitalization," I do object most strongly to the general practitioner being cut off from all normal contacts with the high standards of diagnosis, prognosis, and treatment that are inherent to the hospital system.

What is the solution? For I honestly believe that, unless something is done to remove this unsatisfactory state of affairs, things will go from bad to worse. Inevitably, I'm afraid, we shall have not only even more disgruntled general practitioners but in the long run less efficient practitioners as well. For medicine is a practical science that simply cannot be practised in a vacuum, as it were, free from all proper clinical responsibility and continuity. Having thought about this problem for a very long time, I have decided to commit my ideas to paper. They are as follows.

I feel that the time has come when there should be a very drastic reduction in general practice as we now know it. But let me say straight away that this does not mean that I favour any reduction in the numbers of general practitioners. My suggestions, I might add, are intended solely for our large urban areas, and in the outlying country districts some form of practice as it exists to-day must inevitably continue. I suggest that entirely new departments—general practice departments—should be added to our existing hospitals and be an integral part of all new ones. In these departments, doctors who decide to engage solely in general practice would provide the staff. Exact details of such a scheme would require, of course, a very great amount of thought and planning. I can envisage, however, housemen, registrars, S.H.M.O.s, and specialists in the department of general practice. Remuneration would, of course, vary with responsibility but would not be less attractive than it is at present and should keep pace with both the cost of living and the salaries of consultant physicians and surgeons.

What would be the advantages of such a new concept? First and foremost, the general practitioner would have complete clinical charge of his patients in his own sphere, helped and guided at all times by the more senior members of the general practice department. Thus the old doctor-patient relationship would once again be fostered and there would be complete control of clinical continuity. But it would be clinical control with a difference, and, I venture to suggest, with a great improvement. Now the general practitioner would be, in fact, part of the hospital team. He would have every possible hospital facility to encourage him to diagnose, prognose, and treat his patient; and for the first time since he was a houseman would have the complete backing of the hospital as a member of the staff and not as an outsider. In addition he would have proper facilities for time off, reading, and research. He would, furthermore, take his turn on the district rota, to visit patients who were too ill to travel to hospital or who could best be treated at home. Finally, he would have the added incentives of progressing further and further along the general practice side of the hospital, so that energy and ability would take him to the very top of his own specialty—general practice.

Here, then, is the simple outline of a possible alternative to our present general-practitioner service, which would, I am sure, be welcomed by many of our discontented family doctors as offering a fuller and better form of practice than the one to which the present Service has doomed them. I should be interested to learn whether there are others that share my views.—I am, etc.,

Rickmansworth.

D. G. WILSON CLYNE.

Study for the D.P.H.

SIR,—Dr. G. D. Rees's letter (*Supplement*, August 23, p. 128) presents very well only one of the difficulties facing the aspirant to the D.P.H. qualification. The practitioner without private means and with family responsibilities cannot afford the full-time D.P.H. course, which is taken mainly by doctors subsidized by public bodies, and by bachelors. This leaves him with the alternative of the part-time course, which involves two days' study each week over five academic terms. Not all universities run a D.P.H. course. Birmingham, for example, has not run a course for several years, despite the fact that it has an excellent department of social medicine and serves the massive Midland conurbation. Some universities, such as Edinburgh and Glasgow, run only full-time courses. Those universities that do run part-time courses may suffer from lack of support because of a shortage of part-time public health work in the area. Even when part-time work is available, the rates of pay vary considerably. For instance, it may happen that there are two doctors identical in age, experience, and responsibilities working for different local authorities and taking the same D.P.H. course. The doctor working for local authority A receives seven-elevenths of the basic scale for assistant medical officers, regardless of his previous position on the incremental scale; the doctor working for local authority B receives seven-elevenths of his previous public health salary.

The surprising thing is not that there are so few candidates for the D.P.H. course but that, in view of the difficulties, there are so many. The remedy does not lie, however, in Dr. Rees's suggestion that the D.P.H. examination should be open to anyone qualified for three years. Public health is a branch of medicine which, like all others, cannot be learned from books alone. There must be participation in it and repeated association with all others taking part in it. The university course provides in some measure the last of these two conditions. To my mind, what is needed is a closer association between medical officers of health and university departments of public health to provide more posts which can be occupied by D.P.H. students for the duration of the course. Needless to say, there should be uniformity in pay also.—I am, etc.,

Leeds, 11.

ARNOLD SHAW.

Representative Meetings

SIR,—Arising out of the debate on A.I.D. on the last day of the Annual Representative Meeting at Birmingham, strong dissatisfaction has been expressed by several correspondents with the fact that from time to time an important subject

for debate at an Annual Representative Meeting is not reached until so late in the meeting that the subject has to be considered in an atmosphere of haste and in a meeting already depleted of membership by early departures, or that an important subject in some other way is debated at an unsuitable hour. Your correspondents either blame the Agenda Committee (Dr. H. G. Dowler, *Supplement*, July 26, p. 106), or suggest an earlier pruning of the time allowed for speeches (Mr. D. S. Pracy, p. 106), or advocate a form of grading in the importance of the various matters which are to be the subject of debate (Dr. J. E. Morrison, *Supplement*, August 9, p. 116).

The Constitution Committee, composed of an equal number of members of Council and of non-Council members of the Representative Body of considerable experience, examined this matter very thoroughly in the 1956-7 session, and no fewer than 14 paragraphs of its report to Council and the Representative Body deal with this matter. The recommendations of the Constitution Committee subsequently adopted by the Representative Body have considerably enhanced the powers of the Agenda Committee; attention was drawn by the Committee to the need for a strict adherence to standing orders in the conduct of business, and, further, the Agenda Committee has been given the power to give priority to matters of outstanding importance and to arrange for these matters to be debated at a specific time. Any extension of the powers of the Agenda Committee beyond this, the Constitution Committee, after full debate, decided, could result only in the curtailment of the right of a Division to bring any matter which it thought important before the Representative Body, whether it had been previously debated or not. I do not believe the Representative Body would accept any such curtailment of the rights of individual Divisions. I believe, therefore, the suggestions of Dr. Morrison would be unacceptable to the Representative Body and that the suggestion of an automatic curtailment of speeches after a specified hour each day, if a certain stage had not by that time been reached in the Agenda, would be unfair to the movers of motions, possibly of considerable importance, which might come up for debate later in any such day.

There is therefore no easy solution to the problem of securing proper time for the full and adequate debate of important subjects in as large a meeting as the Representative Body, meeting for four days only to consider 300-400 resolutions and amendments, although I am sure the Constitution Committee would be prepared to examine the matter afresh if it were so instructed by Council or the Representative Body. It may be that the new powers granted only last year to the Agenda Committee by the Representative Body were not as fully used by the Agenda Committee this year as they might have been, but, important as the subject of the profession's attitude to A.I.D. is, it is perhaps a matter of opinion as to how high a priority the majority of the Representative Body would have given this subject in relation to the many other important matters on the agenda.

It is my personal view that, without some pruning of the size of the Representative Body (as outlined in the Constitution Committee report and rejected by the Representative Body last year), the volume of debate will always in a four-day meeting result in some items of importance falling for consideration on the last and final day of the meeting, when time is getting short. It is also my personal view that there will never be a satisfactory attendance on the last day so long as it falls on a Monday and the whole A.R.M. is not contained within the same calendar week.—I am, etc.,

Shawford, Hants.

H. H. LANGSTON.

SIR,—Having followed the debates on the fourth day of the A.R.M. and having read the correspondence in your columns, permit me to make a few comments. I deplore the tendency to dub sound arguments based on the medico-social aspects of A.I.D. as emotional. Dr. Doris Odum, who spoke with such clarity, raised this bogey twice in the

course of a short speech (*Supplement*, July 26, p. 96). I am quite satisfied that in a discussion of this kind neither side has a monopoly of the emotions. Now, Sir, Dr. R. P. Liston suggests (*Supplement*, August 16, p. 121) that the Representative Body, being so easily aroused emotionally, is not a suitable body to discuss authoritatively a subject such as A.I.D. Such an argument could be advanced in favour of dispensing with the authority of the House of Commons, particularly when it discusses subjects such as education, capital punishment, corporal punishment, prostitution, and even old-age pensions. I submit, Sir, that the R.B. consisting of medical men—specialists, medical officers of health, and family doctors—is peculiarly well qualified to express an opinion on A.I.D.

It is true that the debates on the fourth day of the A.R.M. were conducted with unseemly haste and without notice of motion on the question of giving evidence on two important and controversial matters, nevertheless the results are fairly clear. (1) Whatever evidence may be submitted to the Royal Commission on the vexed question of merit awards to general practitioners will be governed by an amendment carried by a substantial majority that "there should be no 'merit awards' in general practice of the type at present existing in the consultant services." (2) Whatever medical evidence is submitted to Lord Faversham's committee on the medical aspects of A.I.D., the committee will be aware of the fact that the Representative Body of the British Medical Association, by a majority of 101 to 84, expressed "grave concern at the increasing practice of artificial insemination by donors."—I am, etc.,

West Clandon, Surrey.

C. P. WALLACE.

Part-time Consultants

SIR,—As member of Council for an area which possibly contains more part-time consultants than any other, I must, on their behalf, protest against the unjustified, fanciful, and unsupported allegations made about their work by two of our medical colleagues in the House of Commons in the debate on the N.H.S. on July 30. I refer to speeches made by Mr. John Cronin and Dr. Edith Summerskill (*Hansard*, July 30). I quote: "The opinion of well-informed circles is that the payment of a consultant by the session encourages him to keep his out-patients' department fully occupied and his beds full" (Dr. Summerskill, col. 1483). "Consultants are dependent for their remuneration on the number of patients they see, because the number of patients they see governs the number of sessions for which they are paid. The person who decides, to a large extent, how many patients attend a consultant's clinic is the consultant himself. He merely has to make his patients come more frequently and thus increase the numbers of his clinics. The consultant himself is the person who decides how many operations he does. No one would suggest that operations are done unnecessarily, but it must sometimes be difficult in borderline cases, of which there is a wide range, to decide whether one should do a large number of operations or not" (Mr. Cronin, col. 1476). I have the greatest admiration for our colleagues in the House, but to say these things is tantamount to saying that by writing unnecessary letters a Member of Parliament can keep his postbag full enough to justify his new "expenses allowance" to the Inland Revenue. Neither the one statement nor the other is susceptible of proof. Both are absurd. I am sure that, on mature consideration, damaging statements of this kind should be retracted. To general practitioners like myself, who send the patients to the consultants, they are laughable and merely bring the utterers into ridicule.

I keep wishing that a mechanism may be created whereby Members of Parliament could be informed of what actually happens. Their lamentable ignorance, particularly when they also happen to be colleagues, is a reflection on us.—I am, etc.,

London, W.C.1.

J. L. MCCALLUM.

Association Notices

B.M.A. FILM COMPETITION, 1958

FINAL REMINDER

Intending competitors are reminded that the closing date for receipt of entry forms and films is *September 30, 1958*. Further details may be obtained from the Secretary, B.M.A. House, Tavistock Square, London, W.C.1.

PRIZE ESSAY COMPETITION FOR MEDICAL STUDENTS, 1959

The Council of the British Medical Association is prepared to consider the award in 1959 of prizes to medical students for essays submitted in open competition. The subject of the essay is: "The Playing Field is a better place than the Library for a Medical Student's spare time in the preparation for his life's work."

Prizes of £25 will normally be offered, but the Council will take into consideration the number and standard of the essays received when determining the awards to be made. Any medical student who is a registered member of a medical school in the United Kingdom, Commonwealth and Empire, or the Republic of Ireland at the time of submission of the essay is eligible to compete for a prize. Previous prizewinners are eligible for a second award. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. Should the Council decide that no essay entered is of sufficient merit, no award will be made.

Essays must not exceed 5,000 words, and must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a note of the name and the medical school of the entrant. Notice of entry for this competition is necessary, and a form of application can be obtained from the undersigned.

Essays must be forwarded so as to reach the Secretary of the British Medical Association not later than January 31, 1959. Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

A. MACRAE,
Secretary.

Diary of Central Meetings

SEPTEMBER

- 12 Fri. Central Consultants and Specialists Executive, 2 p.m.
17 Wed. Alternative Service Subcommittee, G.M.S. Committee, 2 p.m.
18 Thurs. G.M.S. Committee, 10.30 a.m.
18 Thurs. Medical Members of the Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
18 Thurs. Charities Committee, 11.30 a.m.
24 Wed. Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
25 Thurs. Grants Subcommittee, Organization Committee, 11 a.m.
25 Thurs. Organization Committee, 2 p.m.
26 Fri. Overseas Committee, 2 p.m.
26 Fri. Staff Side, Committee C, Medical Whitley Council, 2 p.m.
26 Fri. Staff Side, Committee C, Medical Whitley Council and Public Health Committee, joint meeting, 2.30 p.m., followed by meeting of Public Health Committee.

OCTOBER

- 1 Wed. Private Practitioners Subcommittee, Private Practice Committee, 2.30 p.m.
1 Wed. Film Committee, 4.30 p.m.
2 Thurs. Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
8 Wed. Occupational Health Committee, 10.30 a.m.
16 Thurs. G.M.S. Committee, 10.30 a.m.

Branch and Division Meetings to be Held

BURNLEY DIVISION.—At Sparrow Hawk Hotel, Burnley, Friday, September 12, 8.30 p.m., meeting and hot-pot supper.
STRATFORD DIVISION.—At Board Room, Queen Mary's Hospital, Stratford, E., Tuesday, September 9, 9 p.m., general meeting.

The annual general meeting of the Welsh Region of the S.H.M.O.s Group will be held at B.M.A. House, 195, Newport Road, Cardiff, on Sunday, September 14, at 2.30 p.m.

Meetings of Branches and Divisions

BIRMINGHAM DIVISION

The following officers have been elected:
Chairman.—Dr. E. Bulmer.
Vice-chairman.—Dr. H. M. Cohen.
Joint Honorary Secretaries.—Drs. D. F. Heath and J. K. H. McCullough.
Honorary Treasurer.—Dr. D. F. Heath.

BISHOP AUCKLAND DIVISION

The following officers have been elected:
Chairman.—Dr. F. Robertson.
Vice-chairman.—Dr. J. Clark.
Honorary Secretary and Treasurer.—Dr. F. Lishman.

DONCASTER DIVISION

The following officers have been elected:
Chairman.—Dr. R. W. L. Ward.
Vice-chairman.—Mr. C. F. Eminson.
Honorary Secretary.—Dr. G. R. Outwin.
Honorary Treasurer.—Mr. L. D. Callander.

EAST SOMERSET DIVISION

The following officers have been elected:
Chairman.—Dr. M. C. O'Connor.
Vice-chairman.—Dr. W. H. Hylton.
Honorary Secretary and Treasurer.—Dr. A. B. Kettle.

METROPOLITAN COUNTIES BRANCH

At the annual general meeting on June 10 the following officers were elected:

President.—Dr. Annis Gillie.
President-elect.—Mr. A. Dickson Wright.
Vice-presidents.—Dr. A. French, Dr. F. Gray, Dr. A. Macrae, Dr. L. J. Stoll.
Honorary Secretaries.—Dr. J. Wiseman, Dr. J. W. Wigg.

MIDLAND BRANCH

The following officers have been elected:
President.—Dr. F. E. Gould.
President-elect.—Mr. H. Carson.
Honorary Secretaries.—Dr. A. F. Upton and Mr. A. Gourevitch.
Honorary Treasurer.—Dr. Mary B. Stone.

MONMOUTHSHIRE DIVISION

The following officers were elected at the annual general meeting:

Chairman.—Dr. F. W. Robertson.
Chairman-elect.—Dr. I. Mazin.
Honorary Secretaries.—Dr. J. C. H. Bird and Dr. S. Rosehill.
Honorary Treasurer.—Mr. D. B. Sutton.

NORTH-EAST ULSTER DIVISION

At the annual meeting on June 22 the following officers were elected:

Chairman.—Dr. J. Reid.
Vice-chairman.—Dr. R. J. Kernohan.
Joint Honorary Secretaries.—Drs. C. W. Burns and T. P. McB. Kelly.
Honorary Treasurer.—Dr. S. M. Bolton.

NOTTINGHAMSHIRE BRANCH

The following officers have been elected:
President.—Dr. G. M. Woddie.
President-elect.—Dr. G. M. T. Tate.
Joint Honorary Secretaries and Treasurer.—Mr. J. P. Jackson and Dr. R. E. Frears.

SOUTH AUSTRALIAN BRANCH

At the annual general meeting on June 25 the following officers were elected:

President.—Dr. C. C. Jungfer.
Vice-president.—Dr. G. T. Gibson.
Honorary Treasurer.—Dr. J. M. Dwyer.

STOCKTON DIVISION

The following officers have been elected:
Chairman.—Dr. T. E. Moody.
Vice-chairman.—Dr. Edith Armitage.
Honorary Secretary and Treasurer.—Dr. A. M. Brown.

TEES-SIDE BRANCH

The following officers have been elected:
President.—Dr. R. W. P. Jackson.
Vice-presidents.—Drs. A. Morrison and H. J. Peters.
President-elect.—Dr. J. S. Bow.
Honorary Secretary and Treasurer.—Dr. J. G. Warnock.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY SEPTEMBER 13 1958

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CONSULTANT AND OTHER SPECIALIST STAFF IN N.H.S. HOSPITALS

The accompanying tables have been made available by the Ministry of Health and Department of Health for Scotland. All the figures relate to Great Britain.

Table I shows the number of senior registrars in each specialty on September 30, 1957, at the various stages of their training. The column headed "Others" includes those who have completed four years' training and are awaiting higher posts (including transitional appointments) (102); holders of training posts for a 5th or 6th year (12); university staff with honorary posts (108); overseas registrars (6); part-time senior registrars (most of whom hold part-time posts as consultants or S.H.M.O.s) (34); those holding limited tenure or by custom held for a short period only and which were graded as senior registrars following the inception of the N.H.S. (12); and those holding posts of a kind not listed above (31).

Table II shows the numbers of consultants in each of the specialties year by year from 1949. The corresponding figures for senior hospital medical officers are not available.

Table III shows the age distribution at September 30, 1957, of consultants and senior hospital medical officers practising in the various specialties. It shows also the

numbers of paid sessions undertaken by the consultants and S.H.M.O.s in each specialty for each year of birth.

TABLE I.—Senior Registrars in Great Britain on September 30, 1957

Specialties	Training Plan Posts					Others*	Grand Total
	1st Year	2nd Year	3rd Year	4th Year	Total		
General Medicine	39	37	31	21	128	76	204
Diseases of the Chest	11	9	16	6	42	5	47
Mental Health	61	38	15	12	126	13	139
Neurology	5	1	1	3	10	3	13
Paediatrics	6	7	4	6	23	11	34
Radiology	23	15	9	5	52	3	55
Radiotherapy	5	8	1	1	15	—	19
Physical Medicine	5	1	2	1	9	—	9
Pathology	20	25	9	8	62	42	104
Infectious Diseases	1	3	—	—	4	1	5
Dermatology	5	5	2	1	13	11	24
Venereology	—	1	1	1	3	3	6
Ophthalmology	13	12	10	6	41	16	57
General Surgery	35	38	34	24	131	74	205
Anaesthetics	34	29	12	5	80	7	87
Neurosurgery	2	1	4	4	11	2	13
Plastic Surgery	5	1	3	1	10	6	16
Thoracic Surgery	2	3	5	4	14	14	28
Orthopaedic Surgery	15	19	13	7	54	14	68
Ear, Nose, and Throat Surgery	10	14	6	8	38	10	48
Obstetrics and Gynaecology	17	14	18	12	61	37	98
Totals	314	281	196	136	927	348	1,275

* Includes 108 honorary and 34 part-time senior registrars.

TABLE II.—Number of Consultants in Each Specialty at Various Dates since December 31, 1949 (Great Britain)

	General Medicine	Diseases of the Chest	Mental Health	Neurology	Paediatrics	Radiology	Radiotherapy	Physical Medicine	Pathology	Infectious Diseases	Dermatology	Venereology	Ophthalmology	General Surgery	Anaesthetics	Neurosurgery	Plastic Surgery	Thoracic Surgery	Orthopaedic Surgery	Ear, Nose, and Throat Surgery	Obstetrics and Gynaecology	Totals
31/12/49	755	216	449	53	166	327	85	49	495	50	127	89	331	927	496	37	30	49	252	312	424	5,719
31/12/50	831	250	504	53	202	378	93	57	526	52	136	101	341	943	602	39	32	57	269	328	439	6,233
31/12/51	857	266	532	59	208	400	101	61	541	48	135	99	342	948	655	42	33	66	293	341	449	6,476
31/12/52	904	310	566	61	214	414	108	70	581	51	142	97	351	986	714	44	36	81	320	339	473	6,862
31/12/53	905	340	595	67	222	436	112	75	631	60	145	94	342	982	748	46	43	89	328	346	473	7,079
31/12/54	924	344	616	68	226	447	116	74	646	59	146	93	340	987	782	48	48	91	335	350	485	7,225
31/12/55	924	344	616	68	226	447	116	74	646	59	146	93	340	992	805	51	50	96	346	351	493	7,378
31/12/56	939	347	635	69	229	463	123	76	675	56	148	94	340	992	820	53	51	96	357	345	493	7,486
31/12/57	953	346	659	72	233	485	129	82	691	56	152	91	338	984	820	57	54	98	366	348	500	7,664
31/12/58	965	344	687	77	237	493	134	85	723	56	163	88	338	999	852	—	—	—	—	—	—	—

NOTES: (1) Consultants practising in more than one specialty have been included under each. (2) Table includes honorary consultants.

TABLE III.—Age Distribution at September 30, 1957, of Consultants and S.H.M.O.s (Great Britain)

Year of Birth	General Medicine		Diseases of the Chest		Mental Health		Neurology		Paediatrics		Radiology		Radiotherapy		Physical Medicine		Pathology		Infectious Diseases		Dermatology	
	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions
1887					1	8											2	2				
1888	1	4	1	11													1	1				
1889	1																					
1890	2	13			2	13					3	7										
1891	6	30			1	11					1	4									3	10
1892	7	38	5	33	5	22				1	11	2	11				1	2			2	19
1893	23	142	6	66	6	41				3	17	3	21				1	11		15	3	28
1894	15	80	7	60	10	73	1	5	3	6	11	96		2	1	9	2	15	3	24	6	9
1895	17	112	11	115	10	90				6	5	39		7			5	55	6	50	3	42
1896	19	131	5	46	16	111	1	4	3	18	10	100		1	8		10	95	4	35	1	37
1897	29	178	10	89	24	192	1	4	3	20	11	99	2	22	1	6	16	147	4	36	8	38
1898	31	198	11	108	28	259				38	16	114	3	30	1	3	13	103	7	24	6	33
1899	27	173	16	158	31	286				22	14	134	2	18	1	11	12	106	4	67	6	40
1900	50	306	21	206	38	349	4	25	3	26	17	114	6	64	8	52	23	161	5	48	10	40
1901	40	263	17	154	31	303	2	8	9	35	14	120	3	33	2	11	18	149	8	47	8	
1902	29	178	32	339	33	316	5	36	10	50	12	113	4	40	3	23	15	141	14	96		
1903	39	268	26	269	26	231	5	44	5	30	13	110	3	29	4	25	11	87	4	21	7	34
1904	34	269	19	195	31	306	3	27	4	40	11	90	4	32	3	14	21	180	5	34	6	32
1905	34	290	26	245	41	392	2	19	6	50	13	116	4	22	3	10	17	133	5	26	3	22
1906	38	274	20	205	39	365	2	11	6	45	11	100	3	31			26	240	1	1	5	37
1907	61	467	26	260	40	384	5	30	11	74	10	104	2	31	6	45	23	197	4	28	7	30
1908	43	312	23	246	44	422	4	31	13	102	9	92	3	20	3	31	30	188	4	30	9	20
1909	54	374	22	206	32	308	6	48	12	53	13	99	3	58	3	20	20	186	5	44	4	68
1910	52	405	27	285	41	391	2	14	16	138	19	184	6	59	3	29	38	328	1	2	11	57
1911	48	359	24	238	53	511	1	—	—	66	16	152	9	90	4	28	35	267	4	25	8	62
1912	53	450	43	458	36	333	7	56	9	84	24	249	11	117	2	16	44	386	6	49	7	42
1913	60	494	43	452	52	477	3	14	11	91	31	319	15	146	5	34	37	322	5	33	9	73
1915	68	530	42	425	52	522	5	47	15	132	27	238	3	29	9	64	49	469	3	19	8	59
1916	54	418	54	583	49	463	3	25	16	140	33	329	8	72	5	53	50	481	5	55	6	44
1917	46	378	37	395	41	364	7	47	15	125	22	211	11	116	4	28	49	478	1	11	13	90
1918	33	231	33	340	35	337			16	130	21	203	11	106	8	78	41	383	3	17	6	45
1919	40	265	27	282	37	349	3	7	8	52	26	232	9	83	7	59	43	395	3	22	6	42
1920	32	211	30	324	44	437	2	16	11	99	15	147	8	88	4	33	44	370	2	22	6	43
1921	27	156	27	293	26	277	3	27	6	56	22	230	7	77	7	33	42	357	2	22	1	
1922	13	107	20	215	38	377	3			26	246	11	5	51	3	13	32	282	2			
1923	6	49	14	154	23	232				16	150	5		3	27	19	155			22		
1924	6	45	6	66	17	182				4	38	2		2		14	130			11		
1925	2	22		55	20	211				1	11	1		22		3	33					
1926				22	7	77								11								
1927				11	6	66								2								
1928					1	11								1								
1929					1	11																
Totals	1,226	8,594	780	8,025	1,109	10,493	83	567	253	1,856	552	5,088	175	1,708	106	829	909	7,822	131	1,009	198	1,200

TABLE III—contd.

Year of Birth	Venereology		Ophthalmology		General Surgery		Anaesthetics		Neuro-surgery		Plastic Surgery		Thoracic Surgery		Orthopaedic Surgery		Ear, Nose, and Throat Surgery		Obstetrics and Gynaecology		Totals	
	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions
1887																					4	12
1888	1	2			1	2															7	25
1889	1	7			2	4											1	3			11	33
1890							1	6													10	42
1891							2	10									2	8			23	115
1892							1	3													60	360
1893	1	7	3	9	3	10													2	9	23	908
1893	4	18	14	84	23	166	5	36											4	28	130	893
1894	5	26	15	97	24	143	10	58											6	39	135	1,036
1895	2	11	9	55	19	129	15	101											10	65	138	1,286
1896	6	29	13	86	25	183	23	135											11	87	181	1,583
1897	6	43	10	68	38	270	25	159											10	71	221	1,787
1898	6	41	24	139	26	193	24	189	2	15	1	2							12	74	238	2,173
1899	4	28	30	206	48	335	27	187											20	148	290	2,613
1900	7	44	28	186	46	340	41	276	1	9	1	6							17	139	356	2,491
1901	5	37	29	164	40	270	37	265	3	23	2	18	1						21	157	330	2,561
1902	10	76	21	129	55	385	43	276			2	17	3						27	207	334	2,338
1903	5	35	19	132	46	352	35	268	2	17	3	19	4						19	157	297	2,432
1904	5	32	13	86	58	482	30	225			2	11	3						10	65	22	173
1905	11	72	22	145	36	244	31	227	1	9	1	9							14	99	21	159
1906	5	39	11	79	47	388	37	303	3	36	1	9	3						11	95	18	140
1907	6	51	16	92	35	261	25	200	1	9	1	9	3						7	57	11	95
1908	7	52	19	141	48	390	40	291	1	9	4	21	3						12	116	13	101
1909	4	25	22	133	39	351	32	278	4	33	2	12	3						17	26	225	11
1910	9	80	25	170	68	568	32	263	3	32	1	4	2						20	174	12	104
1911	8	58	19	123	51	406	37	287	1	11	5	48	6						19	21	189	16
1912	4	34	14	109	52	466	40	310	2	18	2	20	6						32	20	181	13
1913	5	53	20	119	60	504	46	397	6	58	2	18	4						48	23	216	16
1914	7	59	22	164	49	404	45	406	3	27	2	18	4						53	21	187	10
1915	7	59	26	190	42	370	62	570	4	34	7	56	6						39	26	221	15
1916	3	17	26	184	55	454	54	495	5	39	5	40	6						48	23	213	12
1917	4	36	25	166	38	291	60	489	6	60	3	27	7						56	35	319	14
1918	3	19	17	89	24	195	27	250			2	20	6						25	231	15	134
1919	3	19	15	98	29	247	44	399			2	11	7						19	186	13	122
1920	5	46	12	59	25	180	47	433	3	22	1	11	4						60	14	129	12
1921	2	22	12	70	16	108	34	325	2	23			3						35	18	159	14
1922	2	14	10	49	8	60	42	396	3		2	20	5						49	8	64	15
1923	1	8	11	65	6	44	24	233			1	11	1						45	5	34	3
1924	1	3		57			29	276											3	27	8	1
1925				37	2	4	20	195														
1926				9			6	56														
1927	1	11	3	8	1	11	6	51														
1928							6	20														
1929			2	4			2	20														
Totals	166	1,223	603	3,831	1,194	9,262	1,152	9,427	57	523	55	436	98	818	434	3,812	383	3,077	590	4,587	10,227	84,187

Operating Theatre Technicians

SIR,—I would support the plea of Mr. William Gissane (*Supplement*, August 9, p. 117) for recognition of the need for operating theatre technicians and for better terms of remuneration for them. There are several hundred of such persons employed in the hospitals under the National Health Service and in the defence Services; but, although they are qualified for membership of their association and for registration as medical auxiliaries by training and examination of a standard approved by the Board of Registration of Medical Auxiliaries, those employed in the National Health Service are merely classified as theatre attendants, and, though their appointments are of a permanent kind, their remuneration is without increments for length of service. In consequence it seems likely that recruitment of persons of suitable ability and character for this nowadays essential post in theatre staffs will not be maintained.

The present method of staffing of operating theatres in the hospitals of this country is inconsistent with the real needs for the work which has to be done in them. This method of staffing, largely with frequently changing student nurses or nurses acting as staff nurses for six months or so after qualifying, may have been good enough in the past when operations were fewer in number and variety, and the apparatus in the theatre consisted of a few simple articles. But it is quite inappropriate and inadequate nowadays when theatres are working all and every day upon a great variety of operations, some highly specialized, and there are many pieces of complicated apparatus in use. This costly apparatus should be properly maintained, and those employed in the theatre should know how to do so and how to make the pieces work. Changeable nursing staffs cannot and do not do this efficiently, nor can they learn well enough how to prepare for and assist at the many operative procedures. The result is unnecessary strain upon the surgeon, the anaesthetist, and the theatre sister, and delays and errors in various ways which add to the risk to the patient and lessen the prospects of success of operations.

The practice of modern surgery requires permanent theatre teams composed only of persons especially trained for the work. This may be an ideal which is at present not fully realizable in most hospitals. But at least the value and economy of more theatre technicians should be appreciated, together with the need to give them a proper status and a scale of remuneration which will encourage competent men to remain permanently in such posts.—I am, etc.,

Bournemouth.

N. ROSS SMITH.

Home Confinement Grants

SIR,—Professor C. Scott Russell suggests (*Supplement*, August 9, p. 116) that the regulations governing payment of the National Insurance home confinement grant encourage women to seek an unduly long stay in hospital at their confinement. The writer of another letter on the subject, Dr. Vera E. Claxton (*Supplement*, August 30, p. 130), falls into the same error—that the National Insurance contribution towards post-natal attendance is provided by the home confinement grant.

This grant of £5 is, as its name implies, intended for confinements at home. It was introduced "to counterbalance the financial inducement to seek a [free] hospital confinement" (see paragraph 25 of the National Insurance Advisory Committee's Report on the Maternity Benefit Provisions, Cmd. 8446) and as a contribution towards the extra cost of having the baby at home in food, fuel, light, and laundry, etc. A contribution towards the cost of post-confinement expenses, including help in the home, is provided by the greatly increased maternity grant (£12 10s.), which is payable wherever the confinement takes place, and which combines the earlier maternity grant (£4) and attendance allowance (£4).

The changes in the National Insurance maternity benefit provisions effected by the National Insurance Act, 1953, in accordance with the recommendations of the National

Insurance Advisory Committee in their report referred to above, have been generally welcomed as a substantial improvement on the previous provisions.—I am, etc.,

London, W.C.2.

F. HAMER.

Senior Information Officer,
Ministry of Pensions and National Insurance.**H.M. Forces**

Surgeon Commander J. Alexander, R.N.V.R., has been awarded the Royal Naval and Royal Marine Volunteer Reserve Decoration.

HER MAJESTY'S OVERSEAS CIVIL SERVICE

The following appointments have been announced: A. D. J. Farquharson, M.R.C.S., L.R.C.P., D.T.M.&H., Specialist (Anaesthetist), Curative Services Division, Northern Nigeria; C. L. Hall, B.M., B.Ch., D.P.H., Assistant Director of Medical Services, Kenya; L. F. E. Lewis, M.R.C.S., M.R.C.P.Ed., D.P.M., Superintendent Medical Officer (Specialist), Mental Hospital, Trinidad; Elaine H. McNeil-Smith-Read, M.D., M.R.C.P., D.C.H., Medical Specialist (Paediatrics), Jamaica; N. G. Sanerkin, M.D., M.R.C.P., D.C.P., Senior Specialist (Pathologist), Cyprus; R. A. J. Webb, M.B., B.S., Assistant Medical Superintendent, Mental Hospital, Barbados; D. E. Brooke, M.B., B.S., Medical Officer, Tanganyika; A. K. Dewar, M.B., B.Ch., Medical Officer, Jamaica; J. J. Huberts, M.D., Temporary Medical Officer, Northern Region of Nigeria; G. S. Humphreys, M.B., B.S., Medical Officer, Trinidad; J. A. M. Martin, M.B., B.S., D.L.O., and J. Spencer, M.B., B.S., Medical Officers, Uganda; C. E. Stroud, M.B., B.Ch., M.R.C.P., D.C.H., Special Grade Medical Officer, Uganda; J. Wolf, M.D., Medical Officer, Brunei.

Association Notices**NIGERIA BRANCH**

Notice is hereby given by the Council to all concerned that three Divisions with the following titles and areas have been formed within the Nigeria Branch:

- Eastern Division, comprising the eastern region of Nigeria.
- Lagos Division, comprising the Federal Territory of Lagos.
- Western Division, comprising the western region of Nigeria.

The remainder of the Branch covers the northern region of Nigeria and the Cameroons Trust Territory.

A. MACRAE,
Secretary.**Diary of Central Meetings**

- | SEPTEMBER | |
|-----------|---|
| 17 Wed. | Alternative Service Subcommittee, G.M.S. Committee, 2 p.m. |
| 18 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 18 Thurs. | Medical Members of the Editorial Subcommittee, Joint Formulary Committee, 11 a.m. |
| 18 Thurs. | Charities Committee, 11.30 a.m. |
| 18 Thurs. | Medical War Relief Fund Committee, 2 p.m. |
| 18 Thurs. | Medical War Relief Fund Distribution Subcommittee, 2.30 p.m. |
| 24 Wed. | Tuberculosis and Diseases of the Chest Group Committee, 2 p.m. |
| 25 Thurs. | Grants Subcommittee, Organization Committee, 11 a.m. |
| 25 Thurs. | Organization Committee, 2 p.m. |
| 26 Fri. | Overseas Committee, 2 p.m. |
| 26 Fri. | Staff Side, Committee C, Medical Whitley Council, 2 p.m. |
| 26 Fri. | Staff Side, Committee C, Medical Whitley Council and Public Health Committee, joint meeting, 2.30 p.m., followed by meeting of Public Health Committee. |

OCTOBER

- | | |
|-----------|---|
| 1 Wed. | Private Practitioners Subcommittee, Private Practice Committee, 2.30 p.m. |
| 1 Wed. | Film Committee, 4.30 p.m. |
| 2 Thurs. | Editorial Subcommittee, Joint Formulary Committee, 11 a.m. |
| 8 Wed. | Occupational Health Committee, 10.30 a.m. |
| 16 Thurs. | G.M.S. Committee, 10.30 a.m. |

Branch and Division Meetings to be Held

SOUTHAMPTON DIVISION.—At Royal South Hants Hospital, Wednesday, September 17, 8.30 p.m., special general meeting.
WARRINGTON DIVISION.—At Lion Hotel, Bridge Street, Warrington, Tuesday, September 16, 8.30 p.m., meeting. Film: "Investigations of Female Sterility."

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A.R.M. AND JOINT ANNUAL MEETING, 1959**ACCOMMODATION IN EDINBURGH**

The Association has received from hotels in Edinburgh a total allocation of rooms for the duration of the Meetings (July 15–24), which in turn is being divided into a proportion for Canadians and a proportion for British. It is hoped that more definite information will be available shortly about the number of Canadians who will be coming, and as soon as this is known a list of hotel and other accommodation available will be published in the *Supplement*. In order to avoid confusion, therefore, B.M.A. members attending the Annual Representative Meeting and Joint Annual Meeting with the Canadian Medical Association are asked to wait until this list appears before applying to hotels in Edinburgh for accommodation.

NUCLEAR WARFARE

A lecture demonstration on the medical implications of the nuclear warfare has been arranged for October 26 by the Metropolitan Counties Branch of the B.M.A. The demonstration, which will be on the same lines as last year, will be given at 2.30 p.m. in the Great Hall of B.M.A. House. Queen Alexandra's Military Hospital, Millbank, and the Army Medical College will present a programme which will include items on (1) collection, treatment, and disposal of "mass" casualties; (2) new techniques of plaster immobilization of fractures—which can be carried out by orderlies, nurses, and first-aid workers; (3) irradiation casualties.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Physiotherapists' Ethical Rules

SIR,—I am grateful to Miss M. J. Neilson, secretary of the Chartered Society of Physiotherapy, for her letter (*Supplement*, August 2, p. 114) correcting any false impression my reference to physiotherapists' ethical rules may have created. I note, however, that her assurance that the proposed change in the society's ethical by-law has not yet been implemented does not extend to the future. Indeed, Miss Neilson's attempt to justify this change suggests that it may yet be implemented and therefore calls for a reply.

The present wording "not to undertake any case except under the direction of a registered medical practitioner" indicates that it is the physiotherapist's duty to follow the instructions given to him or her by the referring doctor. In contrast, the amended wording, "to accept for treatment only those patients who have been referred to him or her by registered medical practitioners with whom he or she will remain in consultation throughout the period of treatment," fails to indicate this duty of the physiotherapist, and its implementation may well, therefore, alter the existing ethical relationship between doctor and physiotherapist *vis-à-vis* the patient, quite apart from any change it may bring about in the medico-legal basis of that relationship.

The reason given by Miss Neilson for the Chartered Society's wish to change the ethical by-law—i.e., because the present wording "has sometimes been interpreted by doctors to mean that they *must* in every case give a detailed prescription for physiotherapy"—implies not only that a significant number of doctors know its exact wording, which is doubtful, but also that they continually interpret it in that way. Miss Neilson adduces no evidence in support of this contention. It is, of course, well known that, while some doctors requiring physiotherapy for their patients indicate their requirements in broad outline only, others supply a detailed prescription. The latter do so not because of the way they interpret the Chartered Society's ethical by-law but because they have a particular knowledge of physiotherapeutic procedures and find it in their patients' best interest to apply that knowledge by prescribing in detail. It may even be that there is an increase in detailed prescribing. If so, this is certainly related to the fact that physical methods are at last being scientifically appraised by doctors, and the results of this work must be applied urgently if we are to maintain adequate medical service in the present shortage of physiotherapists. Unfortunately this work is not always as fully appreciated by physiotherapists as it is by those doctors whose practice particularly involves the use of physiotherapy. A further contributing factor derives from the increasing use of other treatments—e.g., intra-articular hydrocortisone—in combination with physiotherapy. This obviously requires accurate prescribing of the physiotherapy based on the fullest knowledge of the additional medical and surgical treatments, knowledge which is outside the province of the physiotherapist.

Finally, may I amplify the report (*Supplement*, July 12, p. 34) of my comments at the last meeting of the Central Consultants and Specialists Committee, which apparently prompted Miss Neilson's letter? They were intended to support the criticism that the scheme for statutory registration of medical auxiliaries under discussion at that meeting allowed the auxiliaries concerned to change their ethics, training standards, and other conditions against the opposition of the medical profession, and yet impose such changes with the seal of the authority of the statutory registration boards. To illustrate the way in which this power could be used, I referred to the activities of chartered physio-

sion in which there is no incentive to be other than an ordinary general practitioner. Ten or thirty years in general practice with wide knowledge and experience counts for nothing in prestige or remuneration or merit award.

I am not surprised that the conscientious practitioner is disgruntled. He has entered that branch of the profession in which his ability, the quality of his work, and his best endeavours receive no recognition. He knows that he is in a blind alley which leads nowhere. But the general practitioner is still the essential and fundamental part of the Health Service, and something must be done to stop this deterioration in the quality of general practice. In my opinion, a diploma in general practice sponsored by the Royal Colleges and the College of General Practitioners should be instituted. Such a diploma would go a long way to establish and maintain a first-class general practitioner health service, which would ultimately link itself to the hospital service.—I am, etc.,

Aberdeen.

J. ROSS MACKENZIE.

Overseas Conference

SIR,—With reference to your report on my speech (*Supplement*, July 26, p. 105), I should be most grateful to you if you would kindly note that I expressed the Hong Kong delegates' thanks and appreciation of not only the B.M.A.'s fine hospitality to ourselves during the meeting, but for all its good efforts and help on behalf of the overseas branches. This was not reported at all. Regarding the proposed visit of high B.M.A. officials to overseas territories, in reply to a question if we would prefer routine visits or visits at times of difficulty, when their presence might be most needed, I said that we should very much like to see the B.M.A. representatives at any time they wish to come, but particularly when their advice and help on negotiations were specially needed. I did not say, as reported in the *Supplement*, that their visits should be restricted to these occasions. My fellow representative, Mr. George Choa, and I made this quite clear in our subsequent conversation with the Chairman of Council.—I am, etc.,

Z. LETT,

Representative for Hong Kong.

Reigate.

SPECIALLY EXPENSIVE DRUGS

The following are new drugs for the supply of which doctors receive payment over and above their capitation fees:

Chlorothiazide. Hexamethonium salts. Mecamylamine salts. Neomycin preparations. Pempidine salts. Pentolinium salts. Prochlorperazine salts. Promazine hydrochloride. Propantheline bromide preparations. Tolbutamide.

Association Notices**SIR CHARLES HASTINGS AND CHARLES OLIVER
HAWTHORNE CLINICAL PRIZES, 1959**

The Sir Charles Hastings Clinical Prize Competition is established by the Association for the promotion of systematic observation, research, and record in general practice. The Competition has been extended by the addition of a second prize known as the Charles Oliver Hawthorne Clinical Prize. The following are the regulations governing the awards:

1. The Sir Charles Hastings Clinical Prize, consisting of a certificate and £75, will be awarded for the best entry.
2. The Charles Oliver Hawthorne Clinical Prize, consisting of a certificate and £50, will be awarded for the second best entry.
3. Any member of the Association who is engaged in general practice is eligible to compete for these prizes.
4. The work submitted must include personal observations and experiences collected by the candidate in general practice, and a high order of excellence will be required. If no work entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations in practice rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations and their conclusions.

5. Entries must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1958.

6. A prizewinner in any year is eligible for an award of either of the prizes in any subsequent year. A study or essay that has been published in the medical press or elsewhere will not be considered eligible for a prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work.

7. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her entry the decision of the Council on any such point shall be final.

8. Preliminary notice of entry for this competition is required, on a form of application to be obtained from the Secretary.

9. Each entry, which should be unsigned, must be typewritten or printed on one side of the paper only and accompanied by a separate note of the candidate's name and address.

10. No definite limits are laid down as to the length of the work submitted, but the Council anticipates that for this competition 3,000 to 10,000 words would be suitable.

11. Inquiries relative to the prizes should be addressed to the Secretary.

A. MACRAE,
Secretary.**Diary of Central Meetings****SEPTEMBER**

- 24 Wed. Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
25 Thurs. Grants Subcommittee, Organization Committee, 11 a.m.
25 Thurs. Organization Committee, 2 p.m.
26 Fri. Overseas Committee, 2 p.m.
26 Fri. Staff Side, Committee C, Medical Whitley Council, 2 p.m.
26 Fri. Staff Side, Committee C, Medical Whitley Council and Public Health Committee, joint meeting, 2.30 p.m., followed by meeting of Public Health Committee.

OCTOBER

- 1 Wed. Consulting Pathologists Group Committee, 2 p.m.
1 Wed. Private Practitioners Subcommittee, Private Practice Committee, 2.30 p.m.
1 Wed. Film Committee, 4.30 p.m.

Branch and Division Meetings to be Held

BIRMINGHAM DIVISION.—At Debating Hall, Guild of Undergraduates Union, Edgbaston, Tuesday, September 23, 8 p.m., Wine-Tasting Evening.

BOURNEMOUTH DIVISION.—At Board Room, Royal Victoria Hospital, Boscombe, Friday, September 26, 8 for 8.15 p.m., meeting. Address by Dr. D. Stern.

EAST HERTS DIVISION.—At County Hospital, Hertford, Thursday, September 25, 8.30 p.m., special general meeting. Address by Dr. R. Ian Milne: "The Doctor and the Coroner." Members of the Hertford Branch of the Law Society and legal friends are invited.

HYDE DIVISION.—At Pack Horse Inn, Mottram, Wednesday, September 24, 8.45 p.m., annual general meeting.

MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Queen's Hotel, Alderley Edge, Friday, September 26, 8.15 for 8.45 p.m., Inaugural Banquet. All medical practitioners, their wives, and guests are invited.

MANCHESTER DIVISION.—The Manchester Medical Ball, under the joint auspices of the Manchester Division of the B.M.A. and the Manchester Medical Students Representative Council, will be held in the Students' Union, Oxford Road, Manchester, on Thursday, October 23, 8 p.m. to 2 a.m. Music by "The Saints" and "The Squadronaires." Tickets, £2 per double ticket for graduates, 25s. 6d. per double ticket for students and pre-registration graduates.

MID-ESSEX DIVISION.—Wednesday, September 24, all-day visit to Ford Works at Dagenham. Transport will leave Chelmsford about 8.45 a.m. to arrive at Dagenham at 10 a.m. Return to Chelmsford about 6.30 p.m. Wives and teenage children invited.

SOUTH-EAST ESSEX DIVISION.—At Overcliff Hotel, Friday, September 26, 8.30 p.m., meeting, chairman's cocktail party.

SOUTH MIDDLESEX DIVISION.—At Mitre Hotel, Monday, September 22, 9 p.m., divisional general meeting.

TOWER HAMLETS DIVISION.—At Mile End Hospital, Bancroft Road, London, E., Friday, September 26, 3 p.m., meeting. Pathological Laboratory Demonstration with Dr. E. Hardy and Dr. A. W. Foxell.

WEST MIDDLESEX DIVISION.—At Paul's Restaurant, Ealing Broadway, W., Friday, September 26, 8.30 p.m., annual general meeting.

VISIT TO CARDIFF.—Dr. S. J. Hadfield, Assistant Secretary, hopes to be available for consultation at the Welsh House in Cardiff, 195, Newport Road, in the early afternoon of Friday, September 26. Appointments may be made by telephoning Cardiff 25334.

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British Medical Association

President: Professor A. P. THOMSON, M.C., M.D., F.R.C.P.

ANNUAL CLINICAL MEETING—SOUTHAMPTON, DECEMBER 4-7, 1958**LOCAL OFFICERS:**

Chairman: R. S. RUSSELL-SMITH, M.R.C.S., L.R.C.P.

Honorary General Secretary: J. G. McDOWELL, T.D., M.D., 64, Langhorn Road, Swaythling, Southampton, Hants.

Honorary Science Secretary: R. P. W. SHACKLETON, M.R.C.S., L.R.C.P., F.F.A. R.C.S., D.A., Department of Anaesthetics, Southampton General Hospital, Shirley, Southampton.

Executive Officer: Miss B. E. MIDDLEMISS, B.M.A. House, Tavistock Square, London, W.C.1. (Euston 4499.)

PROGRAMME

The 1st Annual Clinical Meeting of the British Medical Association will be held in Southampton from the evening of Thursday, December 4, to midday Sunday, December 7, 1958. The following is a résumé of the proposed programme.

Thursday, December 4.—In the evening the Mayor and Corporation of Southampton will hold a reception in the Guildhall, to welcome members attending the Meeting.

Friday, December 5.—There will be a concentrated scientific programme all day in the Guildhall, starting with panel discussions at 10 a.m. and followed by a general session. During the luncheon interval there will be colour television (sponsored by Smith Kline and French Laboratories Ltd.) of surgical operations at the General Hospital, Shirley, Southampton. In the afternoon there will be another general session followed by a Transatlantic Clinical Conference in connexion with the American Medical Association Clinical Meeting in Minneapolis, and medical films. In the evening there will be an informal reception given by the Southampton Division of the B.M.A.

Saturday, December 6.—The morning scientific programme in the Guildhall will be similar to that on Friday, concluding with the colour television showings from 12.40 to 2 p.m. In the afternoon a series of live clinical demonstrations have been arranged at local hospitals. In the evening a dinner has been arranged by the Southampton Division of the B.M.A.

Sunday, December 7.—In the morning a number of visits to places of medical interest in the locality have been arranged.

Ladies

While no special programme is being arranged for them, ladies accompanying members will be welcome to attend the evening social functions and the Sunday morning visits to places of medical interest in the area.

Catering Arrangements

A buffet luncheon and a licensed bar will be available at the Guildhall on the Friday and Saturday.

Advance Registration

In order to assist the local organizers it is requested that members wishing to attend the Annual Clinical Meeting at

Southampton should write as early as possible for a registration form to the Executive Officer, B.M.A. House, Tavistock Square, London, W.C.1. There is no registration fee.

Private Hospitality

Some private hospitality will be offered by members of the Southampton Division. Any members wishing to take advantage of this offer are asked to state their requirements in writing to the Honorary General Secretary, Dr. J. G. McDowell, T.D., 64, Langhorn Road, Swaythling, Southampton, Hants.

Hotel Accommodation

There is adequate hotel accommodation in the district at varying prices. The following is a list of hotel accommodation in Southampton and district. Members wishing to reserve accommodation are asked to write direct to the hotel, stating that they are attending the B.M.A. Meeting. The

Name and Address of Hotel	Tel. No.	No. of Bed-rooms	Tariff B B from
* Alder Hey, Archers Road	22046	8	15/6
* Archers Court, Archers Road	24156	20	19/6
* Banister Guest House, 11, Brighton Road	21279	9	15/-
* Botleigh Grange, Botley Road	Botley 39	35	22/6
* Clausentum, Banister Road (Club)	24470	12	17/6
* Cotswold, Highfield Lane, Portswood	54300	30	21/-
* County, Hulse Road	24236	21	19/6
* Dolphin (Trust Houses, Ltd.), High Street	26178	70	25/-
* Earley Guest House, Peartree Avenue, Bitterne	48117	14	17/6
* Elizabeth Guest House, 44, The Avenue	24327	7	19/6
* Escot Guest House, 64, Portsmouth Road, Woolston	48732	12	16/6
* Langholm, 202, Regents Park Rd., Shirley	71739	10	17/6
* Linacres, Cobden Avenue, Bitterne Park	56897	12	18/6
* Northlands, Northlands Road	22871	14	21/-
* Ordnance, Ordnance Road	24789	16	18/-
* Polygon, The Polygon	26401	134	35/-
* Potters Heron, Ampfield, Nr. Romsey	Chandlers-ford 2448	3	25/-
* Rotheray, 54, Westwood Road	57424	17	12/6
* Royal, Cumberland Place	23467	100	24/-
* St. Regulus, 5, Archers Road	24243	27	18/6
* Stafford House, Winn Road	55292	34	21/-
* Star, High Street	26199	24	22/6
* Twyford House, Hulse Road	24213	18	18/6
* West Cliff Hall, Hythe	Hythe 2277	50	22/6

* Unlicensed.

Association cannot accept responsibility for any of the prices stated below; applicants should therefore verify the tariffs when making their reservations.

DETAILS OF MEETING

Thursday, December 4

8 to 10 p.m. Reception in Guildhall given by Mayor and Corporation of Southampton.

Friday, December 5

10 to 10.45 a.m. *Panel Discussions*. (1) Hand Injuries: Mr. J. N. BARRON (Salisbury), chairman, Mr. L. W. PLEWES (Luton) and Mr. R. J. PULVERTAFT (Derby). (2) Treatment and Prevention of Deafness: Mr. N. W. MACKEITH (Southampton), chairman, Mr. F. MCGUCKIN (Newcastle upon Tyne), and Miss EDITH WHETNALL (London).

10.50 a.m. Official opening of the Meeting by the President of the Association, Professor A. P. THOMSON, in the Guildhall.

11 a.m. *General Session*. Chairman: Dr. H. C. MAURICE WILLIAMS (Southampton). Professor JOHN BRUCE (Edinburgh): The Choice of Operation for Duodenal Ulceration. 11.30 a.m. Professor L. P. GARROD (London): Prevention of Antibiotic Reactions. 12 noon. Dr. D. M. T. GAIRDNER (Cambridge): Sudden Death in Infancy.

12.40 to 2 p.m. *Colour Television*: Demonstrations of surgical operations. (1) Mr. E. F. CHIN, Thoracic Surgical Unit, Southampton: A cardiac operation. (2) Mr. J. E. LAING, Plastic and Oral Surgery Centre, Odstock: A skin-grafting operation. *Moderator*: Mr. H. H. LANGSTON, Southampton. *Studio Panel*: Chairman: Mr. J. N. BARRON, Salisbury; Dr. D. J. PEARCE, Southampton; Mr. E. T. FRENCH, Southampton.

2.15 p.m. *General Session*. Chairman: Dr. S. WAND (Birmingham). Dr. RAE GILCHRIST (Edinburgh): The Diagnosis of Myocardial Infarction. 2.45 p.m. Professor A. M. CLAYE (Leeds): The Prevention of Severe Toxaemia of Pregnancy. 3.15 p.m. Dr. NEVILLE OSWALD (London): Management of the Pulmonary Complications of Influenza.

4 to 5 p.m. *Transatlantic Clinical Conference* in connexion with the A.M.A. Meeting in Minneapolis.

5.15 to 6 p.m. *Medical films*, with commentary by Dr. R. PROSPER LISTON (Chairman of the B.M.A. Film Committee).

8 to 10 p.m. Informal reception given by the Southampton Division in the Palm Court Restaurant and Ballroom.

Saturday, December 6

10 to 10.45 a.m. *Panel Discussions*. (1) Eye Emergencies: Mr. E. C. ZORAB (Southampton), chairman, Mr. B. W. RYCROFT (East Grinstead), and Mr. A. G. LEIGH (London). (2) The Risks of Therapy: Dr. R. M. S. MCCONAGHEY (Dartmouth), chairman, Dr. RICHARD ASHER (London), and Mr. D. F. ELLISON NASH (London).

11 a.m. *General Session*. Chairman: Dr. I. D. GRANT (Glasgow). Sir RUSSELL BRAIN (London): Acroparaesthesiae. 11.30 a.m. Dr. JOHN T. INGRAM (Leeds): The Restless Skin. 12 noon. Professor E. STENGEL (Sheffield): Common Misconceptions about Suicide and Attempted Suicide.

12.40 to 2 p.m. *Colour Television*. (1) Mr. E. C. ZORAB, Southampton Eye Hospital: Corneal transplant. (2) Mr. J. S. ELLIS, Department of Orthopaedic Surgery, Southampton: A hand operation. (3) Mr. L. A. RICHARDSON, Royal South Hants Hospital, Southampton: Stripping of varicose veins. *Moderator*: Mr. H. H. LANGSTON, Southampton. *Studio Panel*: Chairman: Mr. TOM ROWNTREE, Southampton; Mr. B. W. RYCROFT, East Grinstead; Mr. D. E. MACRAE, Southampton.

PROGRAMME OF LIVE CLINICAL DEMONSTRATIONS AND CLINICS

Saturday, December 6, 2.30-5 p.m.

SOUTHAMPTON GENERAL HOSPITAL

Medicine.—Dr. H. K. MELLER, Dr. P. G. TODD, Dr. T. K. MORGAN: Clinical demonstration of some cases of thyroid disease. Discussion of diagnostic methods and treatment.

Surgery.—Mr. S. N. LYTLE: Clinical demonstration of some cases of Crohn's disease.

Obstetrics and Gynaecology.—Mr. R. W. KNOWLTON, Mr. D. R. KILGOUR, Mr. A. G. W. HILL: Clinical cases.

Anaesthetics.—Dr. D. J. PEARCE, Dr. R. S. WALSH: Some problems arising during the treatment of patients suffering from respiratory insufficiency.

Geriatrics.—Dr. T. RUDD, Dr. R. N. GREENHALGH: Clinical demonstration of various patient hoists showing actual nursing techniques.

Neurology.—Dr. G. S. GRAVESON, Dr. P. K. ROBINSON: Clinical demonstration of patients with angiomas and aneurysms.

Otorhinolaryngology.—Mr. A. RUSSELL, Mr. N. W. MACKEITH, Mr. B. SUGDEN, Mr. E. M. SEWELL: Clinical cases.

Pathology.—Dr. S. C. DOBSON: Investigation of bleeding and clotting defects, and other haematological problems.

Radiology.—Dr. R. B. BOAL, Dr. R. D. CATON, Dr. D. V. RICE: Exhibition of interesting x-ray films.

ROYAL SOUTH HANTS HOSPITAL

Medicine.—Dr. K. M. ROBERTSON, Dr. R. J. MCGILL: Clinical demonstrations.

Surgery.—Mr. L. A. RICHARDSON: Peripheral vascular disease and its treatment.

Children's Surgery.—Mr. TOM ROWNTREE, Dr. G. ORMISTON, Dr. D. A. J. WILLIAMSON, Dr. J. GUY: Symposium on Diseases of the Urinary Tract in Infancy and Childhood.

Dermatology.—Dr. A. J. GRIMSTON: Clinical demonstrations.

Orthopaedic Surgery.—Mr. H. H. LANGSTON, Mr. J. S. ELLIS, Mr. D. E. MACRAE: Clinical demonstration of orthopaedic cases and treatment.

Pathology.—Dr. E. S. DUTHIE, Dr. R. A. GOODBODY: (1) Demonstrations of routine examinations of general interest in biochemistry, haematology, and bacteriology. (2) Morbid anatomy: miscellaneous conditions—e.g., renal and liver disease.

Physiotherapy.—Dr. J. R. PRESTON, Dr. G. SAVILLE: Demonstrations of electromyography. Demonstration of methods of traction used in treatment of prolapsed intravertebral disk.

Radiology.—Dr. R. B. BOAL, Dr. R. D. CATON, Dr. D. V. RICE: Exhibition of interesting x-ray films.

Radiotherapy.—Dr. A. G. C. TAYLOR: Demonstration of the Rotating Caesium Telecurie Treatment Unit.

SOUTHAMPTON EYE HOSPITAL

Mr. E. BACON, Mr. A. B. MOFFATT, Mrs. JANET SIMPSON, Mr. E. C. ZORAB: Demonstration, with clinical cases and colour slides, of (1) The type of cases which are worth while referring to ophthalmic surgeons, including cases showing acrylic lens after cataract extraction, plastic operations, dacryocystorhinostomy, glaucoma. (2) The type of case which can be safely and satisfactorily treated by the general practitioner.

SOUTHAMPTON CHEST HOSPITAL

Pathology.—Mr. E. F. CHIN, Dr. W. M. MACLEOD: Clinical demonstration of patients with diseases of the heart, lungs, and oesophagus. Dr. R. V. GIBSON: The spectrum of mitral valve disease. Dr. J. GUY: Identification of tubercle bacilli and testing for drug sensitivity. Dr. E. S. MACHELL: The anaesthetist in relation to thoracic surgery.

Transport will be provided from the Guildhall to the various hospitals between 2 and 2.30 p.m., and between hospitals during the afternoon, returning to the Guildhall at 5.30 p.m.

Tea will be provided in each hospital during the afternoon.

7.30 for 8 p.m. Dinner at the Pier Pavilion. Ticket 25s. (including aperitifs but excluding wine). (Dinner jackets.)

Visits to Places of Medical Interest in the Wessex Area Sunday, December 7, Morning

1. The Department of Daily Living, Winchester (Dr. RUSSELL GRANT).

2. The Plastic and Oral Surgery Centre, and the Nuffield Rehabilitation Unit, Odstock, Salisbury (Mr. J. N. BARRON, Dr. H. GLANVILLE).

3. The Medical Services of Fawley Oil Refinery (Dr. A. WARD GARDNER).

4. The Veterinary Artificial Insemination Centre, Lyndhurst, by invitation of Mr. G. N. GOULD.

5. County Borough of Southampton, Department of Health and Welfare. Visit to the Ocean Terminal for port health organization. Visits to Welfare Clinics and Old People's Homes. By invitation of the Medical Officer of Health, Dr. H. C. MAURICE WILLIAMS, O.B.E.

NOTE: The Winchester Division is arranging a reception for those visiting the Department of Daily Living. This visit is timed so that members and their wives may attend Matins at the Cathedral beforehand.

The Salisbury Division is arranging a reception for visitors to the Plastic and Oral Surgery Centre, Odstock.

REGISTRARS OPPOSE MINISTER'S PROPOSALS

NEW POSTS CRITICIZED

Reports received from various regions at a recent meeting of the Hospital Junior Staffs Group Executive Committee showed that hospital medical staffs (both senior and junior) are very largely opposed to the Minister's proposal to appoint a limited number of special posts for time-expired senior registrars. The Executive Committee's view was that, however attractive the rate of remuneration, registrars should not accept these new posts, and it decided to advise hospital junior medical staffs to resist their establishment.

Such a system, even if said to be on a temporary basis, would be a retrograde step, the Committee thought, for it would mean a new grade of senior registrar with duties of a highly responsible nature. Furthermore, it would be invidious to select posts to be occupied by only some of the time-expired senior registrars. It has always been the policy of the Group that, pending a permanent solution of the registrar problem, all time-expired senior registrars should be given security of tenure and an increase of salary above the present maximum. The Minister's proposal virtually introduced another grade into the hospital staffing structure and might well tempt boards to establish special posts when an additional consultant appointment would be more appropriate. There appeared, too, to be a danger that if a senior registrar, through financial exigency, were to apply for one of the special posts he would risk being stigmatized as "a failed consultant" and might well find himself in an appointment with no prospects of promotion.

Finally, the Group Executive Committee pointed out, the Minister's proposal in no way solved the immediate or the long-term problem of senior registrars. A fresh generation of senior registrars would very shortly be seeking consultant appointments, and the desperate situation in which many present senior registrars found themselves would be extended to many now in their early years in the grade. The Group Executive is circulating its views to other committees.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham.

Non-County Borough Councils.—Crewe.

JOINT ANNUAL MEETING, 1959

PRINCE PHILIP UNABLE TO ATTEND

In reply to an inquiry recently addressed to Buckingham Palace, the Association has been informed that the President-Elect, His Royal Highness the Prince Philip, Duke of Edinburgh, is very sorry that he will be unable to attend the Joint Annual Meeting of the British and Canadian Medical Associations in Edinburgh next July, as His Royal Highness will be with the Queen in Canada during the whole of that month.

COMMITTEE TO REVIEW MEDICAL SERVICES

CHAIRMAN APPOINTED

Sir Arthur Porritt has agreed to act as chairman of the committee to review the medical services which is being set up under the joint sponsorship of the Royal Colleges, the Scottish Royal Medical Corporations, the British Medical Association, the College of General Practitioners, and the Society of Medical Officers of Health. The sponsoring committee, on which each of these bodies is represented, will meet shortly to discuss with the chairman the constitution of the new committee.

CONTRACTUAL VALIDITY OF SPENS

MINISTER REJECTS SPECIAL CASE

The Secretary of State for Scotland has rejected the B.M.A.'s suggestion that he should join with it in the presentation of a special case to the Scottish Court of Session for its opinion on the contractual validity of the G.P. Spens Report. The Chairman of Council, Dr. S. Wand, announced to the Representative Body at Birmingham on July 12 that the Secretary of State for Scotland had been asked to consent to the presentation of such a special case (*Supplement*, July 19, p. 80). The procedure of a "special case" is peculiar to Scottish law, and differs from the usual type of contentious litigation in that the parties amicably agree to present their differing views to the Court for objective decision. The difference of opinion between the Association and the Secretary of State for Scotland, as the Minister responsible for the Health Service in Scotland, which the Association sought the Minister's consent to raise in this case was on the interpretation of the contractual obligations of the Government resulting from its acceptance of the Spens Report and the Danckwerts Award. It has always been the Association's contention that the Government was under a contractual and moral obligation, whether or not it could be enforced by legal proceedings in the ordinary way, to implement the promises which were made to the profession when they entered the National Health Service, and the Association's view has been that a proper interpretation of the Spens Reports was that remuneration should be adjusted from time to time in accordance, among other things, with changes in the value of money. The Government refused to admit any contractual obligation when the profession lodged its claim for an increase in remuneration in 1956, and in a letter to Dr. Macrae, Secretary of the Negotiating Committee, the Permanent Secretary to the Ministry of Health wrote: "If the Committee are not prepared to accept the Ministers' views as to this, no doubt the matter can be brought before the courts for adjudication" (*Supplement*, December 1, 1956, p. 201).

The text of the letter from the Permanent Secretary to the Department of Health conveying the Minister's refusal is as follows:

I am directed by the Secretary of State to refer to your letter of 10th July regarding the interpretation of certain documents relating to the remuneration of general practitioners in the National Health Service.

As you will know this question of interpretation was the subject of discussion and correspondence between the Ministers and the British Medical Association some time ago and the Association were informed in November, 1956, that Ministers were of the opinion that no contractual obligation such as was alleged by the Negotiating Committee of the British Medical Association existed and that no action based on such a claim could succeed.

Subsequently a Royal Commission was appointed under the Chairmanship of Sir Harry Pilkington which is at present considering among other things the remuneration of general practitioners.

With this in mind and after careful consideration of the whole circumstances the Secretary of State has decided that he cannot accept the B.M.A.'s suggestion that he should join with them in the presentation of a Special Case to the Court of Session.

Copies of this letter are being sent to the Secretary, Ministry of Health, and to Sir Harry Pilkington.

B.M.A.'S COMMENTS

The Scottish Council of the B.M.A. held a press conference in Edinburgh on September 23, at which were present Dr. W. M. Knox, Chairman of the Scottish Council, Dr. C. Harrower, Dr. J. G. M. Hamilton, Dr. A. Macrae, Secretary, and Dr. E. R. C. Walker, Scottish Secretary. The B.M.A. spokesmen commented that the Secretary of State had rejected the B.M.A.'s offer without asking to see the Association's draft of the stated case and that he had been "less than candid" in his reference to the Ministers' letter of November, 1956, in failing to mention the statement in it that if the B.M.A. was not prepared to accept the Ministers' view the matter could "be brought before the courts for adjudication." Despite the fact that the suggestion of obtaining a legal decision on the disputed question came originally from the Government, the Secretary of State had now rejected this approach, and it might be assumed, the B.M.A. spokesmen pointed out, that the Government was now less confident about the probable result of the suggested legal proceedings. It was further pointed out that the Secretary of State's reference to the Royal Commission was irrelevant in this context, since it had been made clear that the Commission would not adjudicate on the legal issue, which was therefore not *sub judice*.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

The Wrong Meaning

SIR.—After 10 years of the Health Service one is almost every day coming across instances where members of the public in general and quite a high proportion of patients persist in thinking that the whole of the weekly insurance contribution goes towards payment for the Health Services, and this notion often finds expression in the good-humoured jibe—"I may as well have my money's worth, doctor!" Of all remarks made by the contemporary patient, and they are many, this is one with the more serious implications, totally misconceived, and, as it happens, pregnant with the wrong meaning.

The latest instance I have noticed of this widespread impression is to be found in a leading daily paper dated September 9. In the article headed "Cost of Living in London for Young People" we read that "She (Susan) finished at her secretarial college six months ago and her weekly salary after deductions for income tax and National Health insurance amounts to £7 5s." Well, well, here we are again. All the poor girl's insurance contribution is apparently paid to the Ministry of Health towards the cost of doctors, medicine, and hospitals. This is exactly the interpretation which will be put on such statements by thousands of readers.

Is it not high time, Sir, that the Ministry of Health and the B.M.A. again organized adequate publicity through

radio, TV, press, and posters to tell the people the facts? This matter would be comparatively unimportant but for one big topical phenomenon of the greatest significance to every doctor in the country—viz., the Royal Commission. If official bodies and important persons, including lay people in responsible positions, all think that a more than adequate sum is being contributed each week by every wage earner to pay for drugs and to keep the Health Services and the doctors going, then indeed we are not going to invite much sympathy or congratulation when the great day arrives and the doctors get—or do not get—more pay. Most people think that they are already paying more than enough—to the Health Services. Please may we have an urgent resolution of this utter muddle and obtuseness of thought in public circles, which one fears may be causing and will cause indirectly a great deal of harm, by inference, to the medical profession now standing pilloried and inert, awaiting the verdict.—I am, etc.,

Hailsham, Sussex.

P. A. HUBBARD.

Study for the D.P.H.

SIR.—Dr. Arnold Shaw (*Supplement*, September 6, p. 136) has stated perfectly the economic facts of the D.P.H. I agree with him on most points, but I believe that Dr. G. D. Rees (*Supplement*, August 23, p. 128) shows greater realism when he states that the D.P.H. examination should be open to anyone qualified for a few years. There are many assistant medical officers, with ten years' or more experience of the public health service and the R.A.M.C., who have found it an economic impossibility to combine family responsibilities with a career in social medicine.

Surely a study of the questions set in a typical D.P.H. paper reveals that they can be answered without the necessity of attending a university course. Take an example, "Discuss the value of fluoridization of water," or another, "Describe the facilities provided by a local authority for the care of the elderly," and it is apparent that the subject could be accomplished from textbooks and local experience in public health work. The highest medical administrative post of the country, that of the Minister of Health, has been held by an ex-miner, an ex-lawyer, an ex-stockbroker. Did any of them have a D.P.H.? Yet they were the leading group healers when they held their appointments.

This is the age of the "economic mean." Those below the mean are pulled up to it, and those above are depressed down to it. It is damaging to the cause of group healing no less than individual healing when the medical profession itself joins hands with social forces to further depress the "economic mean" of its members.—I am, etc.,

Wolverhampton.

GARETH R. DAVIES.

Operating Theatre Technicians

SIR.—As secretary of the Association of Operating Theatre Technicians I would like to express, on behalf of the executive council and all our members, our grateful thanks and appreciation to Mr. William Gissane (*Supplement*, August 9, p. 117), and the subsequent support by the other correspondence that has appeared in the *British Medical Journal*, to his plea for recognition of the important service rendered by the operating theatre technicians.

The aims and objects of the association have for the past twelve years been to promote a better service in this field of hospital employment by a system of educational training in theatre duties, and later by examinations, whereby the surgical and nursing staffs in the theatre will have a qualified technician as part of the theatre team; added to this, a salary comparable to such as those who hold important offices in other fields of the hospital service.

The association has in the past met with considerable opposition, but this has so diminished to be practically nil with regard to the hospitals, for by the information and requests received concerning the acquisition of a qualified theatre technician it is evident that they are much sought

after. The armed Services of the Crown educate and train their operating theatre technicians. Why not, then, the hospitals controlled by the National Health Service?—I am, etc.,

London, N.9.

F. C. RADFORD,

Secretary.

Association of Operating Theatre Technicians.

Interim Payment

SIR.—Surely by now it must be obvious to everyone that the recent statement of the Ministry that the economical state of the country would not allow an interim payment to doctors is sheer nonsense. One sees and hears of nothing but prosperity in every direction, and it is high time that the profession who have done their best with the National Health Service for 10 years should share in the nation's apparent success.—I am, etc.,

London, S.W.16.

D. G. ALLEN.

Grants for Postgraduate Courses

SIR.—In my article on Postgraduate Education for the General Practitioner (*Journal*, September 6, p. 580) I said that "the Ministry will not pay for a locum when a doctor in partnership attends an intensive course." I am now informed that this statement is not completely true. In approved cases the Ministry will pay the fees for a locum, provided that he is specifically engaged to carry out the work of the partner who is attending an intensive refresher course of one or two weeks.—I am, etc.,

Winchester.

G. SWIFT.

Cost of Prescribing

SIR.—We thought you would be interested to hear that our reply (*Supplement*, August 9, p. 118) to a letter on cost of prescribing brought response from well over 300 doctors. You will also be interested to hear that we have personally written to each of these doctors, sending a copy of our *Prescribers List* where applicable.

This response, to our way of thinking, underlines two fundamental points—first, the interest that medical men show in your correspondence columns, and, secondly, the need for a "comprehensive list of medical products with prices." The need has become so obvious to us that early next year we shall be issuing a 1959 list, suitably enlarged, to over 30,000 doctors and consultants concerned with the National Health Service.—I am, etc.,

London, S.W.17.

F. LEWIS WATSON,

Managing Director, Unichem Limited.

Reorganization of General Practice

SIR.—May I be allowed to reassure Mr. D. G. Wilson Clyne (*Supplement*, September 6, p. 136) that, among urban general practitioners, what are interpreted by an unfortunate few as the overwhelming evils of the National Health Service fortunately assume their proper perspective in the minds of the majority as minor irritations? There is certainly no material factor inherent either in the N.H.S. or in any urban environment which need be allowed to impair the family doctor's ability to maintain high clinical standards. Let all would-be reorganizers of general practice remember, however, that a considerable part of the general practitioner's work concerns many matters of a para- and non-clinical nature, and to supplant him from among his patients and place him in the relatively impersonal atmosphere of the hospital would certainly deter patients from seeking his help in such matters.

Close co-operation between the hospital and the general practitioner is, of course, becoming increasingly essential. It is, however, not a question of reorganization but simply of mutual good will.—I am, etc.,

Widnes, Lancs.

DOUGLAS MILLINGTON.

Paying for Medical Care

SIR,—I think the time has come for the profession to give notice to the country that the Government's refusal to consider the doctors' claim for increased remuneration may lead to them taking only patients in a low income group on their lists. Unfortunately, this may lead to two types of treatment—utility and "proper." This is a state of affairs which the profession has been trying to avoid since 1920. Both Government and country must face the fact that they spend far less on medical care in proportion to population than, for example, the Scandinavian countries. Cheeseparing on the provision of hospitals and the remuneration of qualified professional men will do a grave disservice to the N.H.S. and treatment of the sick generally in the near future. The advances in medical and social science over the last 10 years have increased the work demanded of all branches of medicine so that, for example, the general practitioner cannot be expected to deal with more than 2,750 patients properly, as opposed to the 3,500 he may have now. Forty-eight million pounds are regarded as essential expenditure on a rocket, so let us all come down to earth and realize that the Treasury must free a greater sum from its coffers for the N.H.S. in all its branches.—I am, etc.,

Ipswich.

ROY WEBB.

H.M. Forces

ROYAL NAVY

Surgeon Rear-Admiral E. T. S. Rudd, C.B., C.B.E., has retired. Surgeon Captain T. B. Lynagh has retired. Surgeon Commanders T. F. Davies, S. H. R. Price, M. A. Rugg-Gunn, and I. C. Macdonald to be Surgeon Captains. Surgeon Commander T. A. Turnbull has retired. Surgeon Lieutenant-Commander (Acting Surgeon Commander) W. H. B. Ellis, A.F.C., to be Surgeon Commander. Surgeon Lieutenant-Commander W. Cullen to be Surgeon Commander. Surgeon Lieutenant-Commander P. R. Morgan has retired. Surgeon Lieutenant P. F. Toal to be Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Commanders J. A. Shepherd, V.R.D., and P. de B. Turtle, V.R.D. and Clasp, to be Surgeon Captains. Surgeon Commander A. R. Harper, V.R.D., has retired. Surgeon Lieutenant-Commanders J. F. McHarg, H. R. Gray, C. F. Cooper, D. C. Lillie, and W. P. Small to be Surgeon Commanders. Surgeon Lieutenant-Commander S. D. Moss has been removed from the Active List. Surgeon Lieutenant-Commander L. V. Gimson, V.R.D., has retired. Surgeon Lieutenants B. Concannon, P. R. French, J. S. Campbell, and J. B. MacMillan to be Surgeon Lieutenant-Commanders.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel T. McG. McNie, O.B.E., has retired on retired pay. Captains M. M. Whiteley, J. D. Hughes, N. W. J. England, W. P. Maclay, and D. F. Conway to be Majors. Captain (Temporary Major) T. S. Hart to be Major. Short Service Commissions.—Major H. T. Chiswell, O.B.E., has relinquished his commission on completion of service, and has been granted the honorary rank of Colonel. Captain (Honorary Major) C. R. Harris to be Captain, and has been granted the acting unpaid rank of Major.

REGULAR ARMY RESERVE OF OFFICERS

Major-Generals T. Young, C.B., O.B.E., and F. R. H. Mollan, C.B., O.B.E., M.C., late R.A.M.C., having attained the age limit of liability to recall, have ceased to belong to the Reserve of Officers. Colonel A. McMillan, late R.A.M.C., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Major (Acting Lieutenant-Colonel) F. S. Mooney has resigned his commission. Captain (Acting Lieutenant-Colonel) A. Murphy to be Major. Captains (Acting Majors) R. C. King, P. Stuart, and T. B. Boulton to be Majors. Captain B. W. Rhodes to be Major.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel E. H. P. Smith, T.D., has retired, and has been granted the honorary rank of Lieutenant-Colonel.
Captains W. Davison, F. P. Cassidy, G. A. Hanks, E. W. Walton, D. St. J. Murphy, and J. A. R. Parker to be Majors.
Captain T. M. Dauncey has been granted the acting rank of Major.

HER MAJESTY'S OVERSEAS CIVIL SERVICE

The following appointments have been announced: E. E. Bassey, L.S.M., Medical Superintendent, Federal Medical Department, Federation of Nigeria; N. R. E. Fendall, M.B., B.S., D.T.M.&H., Assistant Director of Medical Services, Kenya; A. J. McKendrick, M.B., Ch.B., D.P.H., D.M.R.D., Specialist Radiologist, Tanganyika; Ng Nen Ling Teckham, M.B., F.R.C.S., Assistant Orthopaedic Surgeon, Health Department, Mauritius; J. R. H. Humphreys, M.B., B.S., Medical Officer, North Borneo; A. D. Sinclair, M.B., Ch.B., D.A., Medical Superintendent, Barbados; J. F. Tattersfield, M.B., B.S., Medical Officer, Uganda; H. M. Williams, M.B., B.S., Medical Officer, S.P.H.S., Fiji.

Association Notices

PRIZE ESSAY COMPETITION FOR PROVISIONALLY REGISTERED PRACTITIONERS, 1959

The Council of the British Medical Association is prepared to consider the award, in 1959, of prizes to provisionally registered practitioners for essays submitted in open competition. The subject of the essay is: "To what extent are experiments on animals essential for medical progress?"

Any provisionally registered practitioner in the pre-registration year at the time of submission of the essay is eligible to compete for a prize. No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize.

If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. Should the Council decide that no essay entered is of sufficient merit, no award will be made. At least one prize of £50 is offered. In determining the number of prizes to be awarded, the Council will take into consideration the number and standard of essays received.

Essays must not exceed 5,000 words, and must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a note of the name and address of the entrant. Notice of entry for this competition is necessary and a form of application can be obtained from the undersigned.

Essays must be forwarded so as to reach the Secretary of the British Medical Association not later than January 31, 1959. Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

A. MACRAE,
Secretary.

Diary of Central Meetings

OCTOBER

- 1 Wed. Consulting Pathologists Group Committee, 2 p.m.
- 1 Wed. Film Committee (following showing of rehabilitation film at Hercules House at 2 p.m.).
- 1 Wed. Private Practitioners Subcommittee, Private Practice Committee, 2.30 p.m.
- 2 Thurs. Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
- 3 Fri. Executive Subcommittee, Science Committee, 11.30 a.m.
- 3 Fri. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
- 3 Fri. Science Committee, 2 p.m.
- 8 Wed. Occupational Health Committee, 10.30 a.m.
- 8 Wed. Private Practice Committee, 12 noon.
- 10 Fri. Ophthalmic Group Committee, 2 p.m.
- 16 Thurs. G.M.S. Committee, 10.30 a.m.

NOVEMBER

- 5 Wed. Welsh Committee (at George Hotel, Shrewsbury), 2.15 p.m.

Branch and Division Meetings to be Held

BROMLEY DIVISION.—At Beckenham Hospital, Wednesday, October 1, 8.15 for 8.30 p.m., meeting. Professor A. P. Thomson: "Education of Doctors in England." Guests are invited.

DARTFORD DIVISION.—At the Chest Clinic, Dartford, Thursday, October 2, 8.45 p.m., address by Dr. H. C. Calvey: "The Chest Clinic, Past, Present, and Future."

GLASGOW DIVISION.—At Glasgow Regional Office, 9, Lynedoch Crescent, Glasgow, Thursday, October 2, 8.30 p.m., meeting.

GREENWICH AND DEPTFORD DIVISION.—At St. Alfege's Hospital, Vanbrugh Hill, Greenwich, S.E., Wednesday, October 1, 8.30 p.m., meeting. B.M.A. Lecture by Professor P. Beaconsfield (Chicago University): "Recent Advances in the Surgery of Coronary Heart Disease." All medical practitioners in the area of the Division and in Lewisham and Woolwich are invited.

HOLLAND DIVISION.—At White Hart Hotel, Boston, Tuesday, September 30, 8 for 8.30 p.m., dinner. Mr. D. Wynn-Williams: "Plastic Surgery" (illustrated).

MANCHESTER DIVISION.—(1) At Fallowfield Hotel, Wilbraham Road, Manchester, Thursday, October 2, 8.30 p.m., annual meeting. (2) The Manchester Medical Ball, under the joint auspices of the Manchester Division of the B.M.A. and the Manchester Medical Students Representative Council, will be held in the Students' Union, Oxford Road, Manchester, on Thursday, October 23, 8 p.m. to 2 a.m. Music by "The Saints" and "The Squadronaires." Tickets, £2 per double ticket for graduates, 22s. 6d. per double ticket for students and pre-registration graduates.

MID-GLAMORGAN DIVISION.—At Twelve Knights Hotel, Margam Road, Port Talbot, Friday, October 3, 7.30 for 8 p.m., dinner, followed by address by Dr. Donald Isaac.

NORFOLK BRANCH.—At Samson and Hercules House, Norwich, Friday, October 3, 8 for 8.30 p.m., autumn ball. Dinner at 9 p.m.

NUNEATON AND TAMWORTH DIVISION.—At Red Lion Hotel, Atherstone, Tuesday, September 30, 7.30 for 7.45 p.m., supper: 8.30 p.m., valedictory lecture by retiring Chairman, Dr. E. S. M. Merry: "Milestones in Anaesthesia." Wives of members are invited.

SOUTH MIDDLESEX DIVISION.—At Mitre Hotel, Hampton Court, Thursday, October 2, 8.30 p.m., meeting. Lecture by Mr. C. Naughton Morgan: "Treatment of Minor Rectal Conditions in the Light of the Modern Conception of the Anatomy of the Anorectal Region" (illustrated).

WEMBLEY DIVISION.—At Board Room, Wembley Hospital, Tuesday, September 30, 8.30 p.m., meeting. (1) Address by Mr. John Shirley Callcutt: "A Visit to Brussels and the International College of Surgeons" (illustrated). (2) A short résumé of A.R.M., 1958 (Birmingham), by Dr. Philip H. Addison. Members of Harrow Division are invited.

WEST SUFFOLK DIVISION.—At Everard's Hotel, Tuesday, September 30, 8.30 p.m., B.M.A. Lecture by Dr. Francis Camps: "Medical Aspects of the Investigation of Homicide" (illustrated). Legal friends are invited.

Meetings of Branches and Divisions

BRISTOL DIVISION

The following officers have been elected:

Chairman.—Mr. A. Palin.

Chairman-elect.—Dr. W. J. S. Cameron.

Honorary Secretaries.—Dr. A. S. Anderson and Dr. Sarah Walker.

Honorary Treasurer.—Dr. C. Dix.

CHESTERFIELD DIVISION

The following officers have been elected:

Chairman.—Dr. J. F. Hanratty.

Vice-chairman.—Dr. R. T. Gaunt.

Honorary Secretary and Treasurer.—Dr. I. R. D. Proctor.

CLEVELAND DIVISION

The following officers have been elected:

Chairman.—Mr. J. C. Clark.

Vice-chairman.—Dr. W. P. Dunn.

Honorary Secretary and Treasurer.—Dr. J. N. Stirling.

DUMFRIES AND GALLOWAY DIVISION

The following officers have been elected:

Chairman.—Dr. F. T. Ingram.

Vice-chairman.—Dr. P. M. Kerr.

Honorary Secretary and Treasurer.—Dr. J. B. Wilson.

GOOLE AND SELBY DIVISION

The following officers have been elected:

Chairman.—Dr. E. Cretney.

Vice-chairman.—Mr. D. L. Shaw.

Honorary Secretary and Treasurer.—Dr. W. Wintersgill.

HARTLEPOOL DIVISION

The following officers have been elected:

Chairman.—Dr. R. Martin.

Honorary Secretary and Treasurer.—Dr. H. W. Bisset.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

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ENTRY INTO GENERAL MEDICAL PRACTICE

BY

L. S. POTTER, M.B., Ch.B.

Medical Director, B.M.A. Medical Practices Advisory Bureau

In 1955¹ and 1956² I published the results of inquiries into the incidence of unemployment and underemployment in the medical profession. The object of these surveys was twofold. First, to try to estimate the amount of real unemployment in the medical profession, and, secondly, to verify or refute the opinion I had expressed that too many would-be general practitioners were in posts which offered no prospects of advancement—that is, in what are colloquially described as "dead-end jobs."

In the spring of this year I undertook a third survey on similar lines. A questionnaire was addressed to all those registered with the Medical Practices Advisory Bureau, the great majority of whom were seeking to establish themselves as principals in general practice. On this occasion the scope of the inquiry was widened. It has been possible to analyse that section of the returns which included the so-called "permanent assistant," and, in the light of the Bureau's experience, to comment on the problem of entry into general practice about which so many different views are held.

It must again be emphasized that these inquiries have definite limitations. In the first place they comprise a selected group which cannot be regarded as a representative cross-section of the profession as a whole or even as a random sample of a particular section of the profession. Secondly, the Bureau has no monopoly, and there are many seeking to establish themselves who have not registered with the Bureau or who have withdrawn their names temporarily because they are, for the time being, in appointments. Thirdly, the Bureau cannot nominate candidates for vacancies which are advertised, and this excludes from the scope of the inquiry the majority of single-handed practices—that is, Executive Council vacancies. With these reservations, however, it can be claimed that those registered with the Bureau form a group representative of those seeking to establish

themselves in practice or trying, through exchange or other methods, to improve their circumstances.

Comparison of Figures

The total number circularized this year was 908. This is less than the number circularized in 1956 (947) and in 1955 (1,075). It is doubtful whether this difference has any significance, as the number registered with the Bureau at any one time varies considerably.

		Analysis of Returns		1958
1955	1956	Total circularized	Returned form "unemployed"	908
1,075	947	Returned form asking to be removed from list because satisfactorily settled	150	
82 (8%)	87 (9%)	Did not reply	201	
265	153	Returned form "employed"	494	
248	179			
480	526			
		Unemployment		
1955	1,075	Unemployed	82 (8%)	
1956	947	Unemployed	87 (9%)	
1958	908	Unemployed	63 (7%)	

These figures speak for themselves and support the view that of a selected group of doctors all seeking to establish themselves in their chosen field of practice rather fewer than 10% are unemployed at any one time, and that this figure is likely to vary only slightly. I do not regard the lower percentage in 1958 as indicating a trend any more than the slightly higher figures in 1956 indicated a deterioration in the position. Since of the 63 who were unemployed when they received the questionnaire only 10 placed no restriction on the type of appointment or area they would accept, it may be stated with some confidence that the amount of involuntary unemployment in the profession as a whole is very small indeed.

I should like at this stage to add two further comments arising from criticisms of the two previous reports. First, it has been suggested that these inquiries have been made at a time when unemployment would be at its lowest. In fact, April was chosen deliberately as the month in which the seasonal demand for locums would be unlikely to affect the result. Secondly, it has always been difficult to decide how to deal with the number who did not reply to the questionnaire. On a previous occasion I gave figures to show that the great majority of these could be regarded as satisfied. On this occasion it was plainly stated in the questionnaire that those who did not reply would be regarded as satisfied and, in accordance with our usual practice (a twice-yearly check of the register), would be struck off the list of the Bureau. Including those who replied saying that

they were satisfactorily settled and wished to be removed from our list, the total of those excluded from analysis is about 40%, as in previous years.

Establishment in General Practice

Of the 494 who answered the inquiry "Employed" in 1958, 55 were not seeking posts in general practice; 38 others were principals in established practices seeking alternative work or part-time appointments to supplement their incomes. These can therefore be excluded from the analysis, leaving 401 seeking principal status.

1955	1956		1958
48	526	Total	494
30	43	(1) Registered with the Bureau but not seeking general practice posts	55
20	30	(2) Principals in general practice seeking alternative work or part-time appointments to supplement their incomes	38
50	73		93
430	453	Net total	401
37	46	(I) Trainees	44
27	26	(II) In house posts or on national service and seeking first G.P. post	18
33	31	(III) Assistants with view to partnership who have asked to remain for the time being on the books of the Bureau	29
64	57	(IV) Principals seeking change of practice (exchange)	59
161	160	Total	150
136	152	(V) Assistants without view	144
58	62	(VI) Locums or temporary appointments	47
75	81	(VII) Appointments with no prospects—e.g., registrars	60
269	295	Total	251

Note. Groups I-IV not regarded as in dead-end jobs. Though all those in categories V-VII may be in dead-end jobs, only 35 (14%) place no restrictions on the area or type of appointment they are seeking.

Analysis of Assistantships Without View

Out of the total of 144, 69 had done traineeships, and of these 48 were in their first subsequent assistantship, 21 had done more than one year as assistant, 19 (27%) had been in general practice for more than three years.

Seventy-five had not done traineeships. Of these, 45 were in their first G.P. posts, 30 had had more than one assistantship, 12 (16%) had had more than three years' G.P. experience.

It is usually accepted that a doctor who has completed his pre-registration house appointments and his national service and who may have done a further period in hospital posts must have at least two years' experience in general practice, either as trainee or assistant, before he is likely to be considered for an Executive Council vacancy. Experience suggests that at least a year's experience is also needed before a doctor seeking an assistantship with view to partnership can compete on equal terms for the more attractive openings. There are, of course, exceptions. There are partnerships which are "kept warm" for sons or other near relations; there are also assistantships where no view is offered but which result, after a varying length of time, in partnership. On the other hand, there are those who are content with the security of an assistantship without prospects which enables them to wait for an opening in a particular area or one giving opportunity for special clinical interest. If it is justifiable to assume that a doctor seeking to enter general practice must expect to serve for two years either as trainee or assistant before he can obtain the status of a principal, either in single-handed practice or in partnership, then it is reasonable to regard those with three or more years' experience who have still no expectation of attaining principal status as having been too long in dead-end jobs. It would

also be true to say that during the first year no probationary post in general practice should be regarded as a dead-end job, and it is probable that this would be true also of the second year. The analysis of those in assistantships without view suggests that rather fewer than 25% have been too long in this interim stage of their careers. This figure should be increased by an indeterminate number who, though in appointments without prospects, have either withdrawn their names from the register of the Bureau for the time being or have restricted, within a narrow field, the type of appointment they will accept or the area in which they will work. It is interesting to compare this estimate with the conclusion I published in 1955 that, out of a group of 1,075 doctors seeking to establish themselves in practice, 269 (25%) were in posts which offer no immediate advancement or permanent security and which deny them the status of principal, to which, by reason of age, qualifications, and experience, they may well feel entitled.

Further evidence on the time normally taken to attain principal status is provided by the "turn-over" of the Bureau. It is significant that although the number registered with the Bureau remains constant within fairly narrow limits—that is, between 900 and 1,000—few remain on the books for more than two years. The number circularized in 1958 who replied, and were therefore retained on the register, was 557. Of these the number who were also included in the 1956 survey was 129 (approximately 23%) and the number included in the 1955 survey was 26 (approximately 4%). Of the 129 who could be assumed to be still searching for openings, 42 are not seeking posts in general practice. In the Bureau's experience the difficulty of obtaining an assistantship with view to partnership increases from about the age of 35 onwards, becoming a real handicap in the forties. Taking 35 as the borderline, it is interesting to note that, of the 129 included in the 1956 survey and still seeking posts in 1958, 80 (60%) were over 35. Of those included in the 1955 inquiry and still on the books in 1958, 21 out of 26 were over 35.

Discussion

To discuss entry into general practice in terms of tables and statistical analysis is to oversimplify the problem. This approach ignores many important factors and takes no account of individual circumstances, qualifications, ability, and personality. For instance, given the requisite experience, age may prove a handicap when seeking a junior partnership but may even be an advantage when applying for an Executive Council vacancy. Again, if a doctor can accept the obligation to buy a house or to purchase a share in the capital assets of a partnership without having to devote too much of his expected income to the repayment of loans, he is in a much stronger position and has a much wider field of opportunity. Lastly, no counting of heads or the equation of the number of openings to the number of possible applicants will answer such questions as these: why a practitioner in a successful partnership with what seems to be an adequate income will suddenly decide to emigrate; why a doctor with family commitments and little or no capital fails even to investigate introductions which would seem to answer his needs; why a doctor will face debt and years of frustration rather than the "bogy" of the city or industrial practice, which in some cases amounts to almost an obsession.

The Bureau is continually faced with anomalies which are very hard to explain unless one is prepared to accept the fact that the difficulties of entry into practice are very greatly exaggerated. Though many could be quoted, two examples will suffice to illustrate this:

(1) Owing to the retirement of a partner an assistant with view was required in a practice in an outer London suburb. N.H.S. list 5,000 plus. The new partner was required to purchase a share in surgery premises valued at £1,500 (alternatively the partnership would rent them). Salary as assistant £1,250 gross, commencing partnership share one-third, increasing to 49% over eight years. Particulars of this vacancy were sent to 220 possible applicants.

There were only seven applicants and the vacancy was subsequently filled after a private introduction.

(2) An assistant with view was required in a rural practice based on a small town in south-east England. N.H.S. list 3,000 (mainly dispensing) and some appointments. Salary as assistant £1,250 gross, commencing partnership share of one-third with rights to increase "as may be agreed." Particulars were sent to 250 possible applicants, of whom 50 applied in three days.

A few months ago a firm of two partners in a country town some 20 miles from London asked the Bureau to introduce an assistant with view. The salary offered during the probationary period was £1,050, with rent-free, unfurnished accommodation above the surgery premises. A commencing share of one-fifth was estimated to bring a net income of £1,500 per annum, with increases to approximately one-third after eight years. The new partner was required to purchase a share in the capital assets of the practice, which included freehold surgery premises, at an initial cost of just over £2,000. As there was scope for an increase in the amount of midwifery undertaken, preference would be given to applicants with experience in obstetrics.

The terms of this appointment as set out in the circular issued by the Bureau could be described as average. We should regard the area as "much sought after." Particulars were sent to 220 possible applicants, but only 25 applications were received. In spite of the deterrent—the need to find capital—we were puzzled by this small response, and, with the permission of the partners, I wrote to those who had not applied, asking for their reasons. About 80 replies were received.

The main inference to be drawn from the replies was that there was no sense of urgency, and though most of those who received the circular were in assistantships offering no prospects, and though many had expressed a preference for London and the home counties, they failed to investigate this offer of a partnership because *it was not quite what they wanted*. Many were deterred by the need to find some capital, others by the implication that for a time they would be required to reside on surgery premises though there was no indication that this was other than a temporary arrangement. A few jumped to conclusions which could not be justified either by reading the circular or by facts known to the Bureau. There may be good reasons for these suspicions, but if the need to attain principal status were pressing one wonders why so many did not even trouble to follow up the introduction or to make further inquiries. One doctor, in his reply, was frank enough to say that he had come to the conclusion that, because the midwifery was increasing and because an applicant experienced in obstetrics was required, this was evidence that the partners intended to pass all midwifery to the incoming man.

Many considerations influence a doctor seeking a practice or partnership. In the experience of the Bureau, by far the most important of these is locality. The need to find time in which equality will be reached seem to be of lesser importance, though, as suggested above, these may give rise to suspicions which, though not justified, will deter the would-be applicant from even investigating the offer. If one accepts all that has been said and written about the difficulty of getting established in general practice, it is hard to explain why so many refrain from investigating good opportunities and the great reluctance of doctors to go to the large towns and industrial areas.

There is no doubt that one of the main deterrents is the widespread conviction that once a doctor attains principal status in general practice he is tied to that practice for the rest of his life. There is, of course, good reason for this. It is well known that the scheme for exchange of practices, though admirable on paper and sponsored by the Medical Practices Committee and the majority of Executive Councils, breaks down in practice because most of those seeking to exchange practices are looking for the same thing—a similar income in a more attractive area. The picture, however, is not entirely dark. A client of the Bureau has been success-

ful in moving from the North of England to Somerset by means of three exchanges over the years. Nevertheless, the problem of restricted mobility remains.

Summary and Conclusions

Of 908 doctors who replied to a questionnaire circularized in the spring of 1958, 63 (7%) were unemployed at the time. Since this group comprised those who were looking for posts in their chosen field of practice, the amount of enforced unemployment in the profession as a whole is very small indeed.

Of those in appointments offering no prospects of advancement, 144 were assistants in general practice. Of these some 22% had been assistants (or trainees) for more than three years. If this figure is corrected to take into account those who had temporarily withdrawn their names from the Bureau, there are probably between 25 and 30% of those trying to establish themselves in general practice who have been too long in attaining principal status. The position is roughly the same as it was three years ago.

The experience of the Bureau suggests that the first steps are easy and there is no lack of appointments for trainees or assistants. Ordinarily, provided he is prepared to consider any good opening in any part of the country, a doctor should expect to attain principal status within three years of commencing his first general practice appointment.

Lastly, in the opinion of those dealing with the problem day by day, the position has been stable over the past three or four years, with recently a slight improvement in the number of the introductions made by the Bureau. As this coincides with the end of the first ten years of the N.H.S., it is impossible to say whether it represents a definite upwards trend.

REFERENCES

- ¹ *Brit. med. J., Supplement*, 1955, 2, 11.
- ² *Ibid.*, 1956, 2, 127.

GENERAL MEDICAL SERVICES COMMITTEE

A meeting of the General Medical Services Committee was held at B.M.A. House on September 18. Dr. A. B. DAVIES was in the chair. There was a lively discussion on the Sheffield Local Medical Committee's invitation to other local medical committees to submit independent evidence to the Royal Commission.

Having introduced and extended a cordial welcome to Dr. J. D. J. HAVARD, one of the newly appointed Assistant Secretaries of the Association, the CHAIRMAN referred to the continued illness of Mr. R. CURRER, Clerk to the Committee. The Committee sent a message to Mr. Currer conveying its best wishes for a speedy recovery.

Drs. F. GRAY and R. B. L. RIDGE were nominated by the Committee to serve on an *ad hoc* subcommittee set up by the Central Ethical Committee to inquire into the problem of the disclosure of information from chest clinics to industrial medical officers. The Committee appointed Drs. W. MORGAN EVANS and D. C. BOWIE as representatives to attend a one-day conference, to be held on November 14, dealing with the filling of medical appointments overseas.

Remuneration

The Committee's attention was drawn to a letter from the Birkenhead Local Medical Committee dealing with the payment of the final settlement. The letter recalled the announcement made at the Annual Conference of Local Medical Committees that £3m. of the final settlement for

the financial year ending March 31, 1958, would be paid at the end of December next, and continued: "My committee, whilst appreciating the considerable improvement in time of payment, would like to be assured that even nine months' delay in payment of such a proportion of the final settlement for 1958-9 is not envisaged, and that some similar amount will be paid at March 31, 1959, and in subsequent years even earlier, by an appropriate addition to the capitation fee." The Birkenhead Local Medical Committee felt that the profession should very strongly resist the continuation in any degree, however small, of delay of payments which would never be tolerated in the commercial world, and which had cost the general practitioner in the past very substantial amounts of money.

The CHAIRMAN pointed out that the Committee was always endeavouring to shorten the delay in paying the final settlement, and it would do everything possible in that connexion so far as future years were concerned.

Compensation

A letter from the Medical Practitioners' Union asking the Committee again to give consideration to the possibility of pressing the Ministry to increase the rate of interest payable on doctors' money held on account of compensation was referred to the Compensation and Superannuation Committee.

The Medical Practitioners' Union also asked that the terms under which advances might be obtained against sums held should be liberalized. It had particularly in mind the possibility of a practitioner wanting to spend money on his surgery and being unable to obtain the necessary advance.

Tribunals and Inquiries Act

The Committee received and accepted a letter from the Ministry of Health pointing out that the Government had not felt that it would be right to exclude executive councils and their service committees from the list of named tribunals in the Tribunals and Inquiries Act. However, the function of the Council on Tribunals (established under the Act with certain defined responsibilities for the constitution and working of named tribunals, etc.) would be advisory, and any advice it might wish to give would come to the Minister. Should the Minister, as a result of such advice, wish to propose any alteration in the existing arrangements, there would be no change in the present practice under which the professional associations were brought fully into consultation.

Royal Commission on Doctors' and Dentists' Remuneration

Evidence by Sheffield Local Medical Committee

The action of the Sheffield Local Medical Committee in inviting other local medical committees to submit independent evidence to the Royal Commission was the subject of a lively discussion. The matter was brought to the attention of the Committee by the London Local Medical Committee. Dr. F. GRAY pointed out that, although the right of the Sheffield Local Medical Committee to send independent evidence to the Royal Commission was not questioned, his committee deprecated the action of the Sheffield Committee in inviting all other local medical committees to do likewise. "I do not think I need stress what the result might be if a large number of local medical committees accepted the Sheffield invitation," added Dr. Gray.

In its letter the Sheffield Local Medical Committee suggested that if other local medical committees sent their views to the Royal Commission the concerted efforts should be more effective. The headings under which its own memorandum was constructed were those of the Executive Council's Association—namely, entry into general practice; position of assistants and partners; method of remuneration; size of list; load of work on general practitioners; and relationship between hospital staff and general practitioners.

The CHAIRMAN agreed with Dr. Gray that every local medical committee had the right to write to the Royal Commission expressing views, but in the past the General Medical Services Committee had advised local medical committees that it would be wise if their views were channelled through the former.

Dr. B. BURNS said there was strong feeling in Sheffield that the evidence given by the Association, both in writing and orally, did not represent the views of the profession locally on certain points which were regarded as fundamental to the future of the National Health Service. As there were no other means of communicating the views held by Sheffield to the Royal Commission, his local medical committee decided to submit a memorandum. In view of the fact that his committee felt that other local medical committees might hold similar views, it was decided to notify all other local medical committees that such action had been taken by Sheffield.

Dr. S. WAND (Chairman of Council) said he had a number of questions to ask Dr. Burns. For instance, when it produced its evidence did the Sheffield Committee realize that the evidence which had already been presented to the Royal Commission and published was only a portion of the total evidence that was to be given? Secondly, was the profession in Sheffield consulted before the evidence was given? Thirdly, had the Sheffield Committee evidence of the names or numbers of the "less scrupulous" members of the profession in that district, because there was a reference in the memorandum to "less scrupulous" colleagues? Fourthly, where did Sheffield obtain the information that "a medical assistant commands a salary of approximately £1,100 per annum out of which he must provide and run a car"? That was contrary to the evidence obtained from the Medical Practices Advisory Bureau and submitted to the Royal Commission.

Again, Dr. Wand asked whether the Sheffield Committee realized that a committee to review the Health Service was being set up which was to discuss these problems. He also asked what the question had to do with the terms of reference of the Royal Commission. "Finally," said the Chairman of Council, "did Sheffield send in this evidence in the full knowledge of the embarrassment which it is likely to cause those who are trying to speak on behalf of the profession through the organized channels, of which this Committee and the Association are one, and did Sheffield realize that before the evidence was given to the Royal Commission it might have been politic in the interests of the whole profession to have let an organized body such as this have an opportunity of seeing it?"

The CHAIRMAN ruled that any discussion on the rights and wrongs and validity of the contents of the Sheffield memorandum would be out of order.

Views of Majority

Dr. BURNS, in reply, said that the views of the profession in Sheffield had been obtained over the last two or three years in general meetings, in groups, and by every democratic means. The views expressed in the memorandum were those of the vast majority of general practitioners in Sheffield.

On the question of "unscrupulous doctors," the matter arose from oral evidence given by Dr. Wand to the Royal Commission in which he stated that the badge of merit of the general practitioner was the size of his list. "With that view the doctors in Sheffield profoundly disagree," said Dr. Burns. They agreed that in many cases the large-list doctor was worthy of his large list, but there were other methods of obtaining a large list which were not particularly meritorious. "I do not know how other areas are affected," continued Dr. Burns, "but we have a goodly proportion of them in Sheffield, and I have fair reason to suppose as a result of conversations I have had in this building that similar examples are recognizable in other areas of the country."

The figures quoted in the case of assistants were obtained from the chairman of the executive council. So far as the review committee was concerned, Sheffield saw no evidence that there was the slightest possibility of any decision on the matters outlined from the review committee in time for the report by the Royal Commission. As to the terms of reference of the Royal Commission, the Commission had asked almost every person and every collection of persons interviewed to explain why doctors were dissuading their sons from entering medicine. Sheffield was attempting to explain that.

On Dr. Wand's final point, Dr. Burns said he felt sure that his committee would wish him to apologize for any embarrassment which might have been caused to any other body, but, at the same time, Sheffield insisted on the right to convey views to the Royal Commission and to anybody else it pleased.

Dr. WAND asked Dr. Burns whether he was not guilty of a little divergence from fact so far as his statement about less scrupulous doctors was concerned. Dr. Wand recalled what he had said to the Committee—namely, "The Chairman of the Royal Commission said to me: 'How to-day is merit assessed?' and I said, 'The only way in which merit is assessed to-day is by the sizes of lists,' and that was a fact. He did not say that he agreed or disagreed with it. It was necessary to consider the atmosphere in the Royal Commission at the time, and the fact that the answers were given in the context of the original question."

Dr. BURNS replied that he appreciated the atmosphere in which the Chairman of Council had to answer the questions put to him. All that he could comment on was the impression that Dr. Wand's words, as reported in the *Journal* (Supplement, February 1, p. 39) and in the press generally, was conveyed to the Sheffield Committee. That impression was that merit was measured by the size of a list, and that therefore the size of a list was necessarily a measure of merit. With that view the Sheffield Committee profoundly disagreed.

Dr. R. J. T. GARDINER asked the Committee to look at the matter not as an argument between London and Sheffield, but rather to look at the broader issues—namely, why had anybody in the country thought fit to submit independent evidence to the Royal Commission? Frankly, the only answer would appear to be that there was a body of medical opinion in the country which did not feel that the evidence submitted by the G.M.S. Committee had truly represented its views. But for an accident of geography, Sheffield would not have been alone in submitting independent evidence to the Royal Commission, because in Northern Ireland there was a fairly substantial body of medical opinion which felt that the evidence submitted by the G.M.S. Committee did not truly represent its views. That body of medical opinion attempted to submit independent evidence, but, unfortunately, the Royal Commission ruled that its jurisdiction did not extend to that part of the country. "Therefore, instead of laying the blame at the door of those who have found it necessary to submit independent evidence, we should be more introspective and find the cause within this Committee," concluded Dr. Gardiner.

The CHAIRMAN reminded the Committee that at the outset of the oral evidence the representatives of the Association made their position clear as representatives of a democratic body. They did not claim to speak for every individual member of every local medical committee in the country, and were fully conscious that there might have been a minority view. In fact, they had admitted it to the Royal Commission and were asked whether they disagreed with the views of other people who had submitted alternative evidence. Dr. GRAY referred to Dr. Burns's statement that he had obtained the figures in connexion with the remuneration of assistants from the chairman of the executive council, and said that those figures must of necessity be inaccurate. They referred to cash payments. Anything paid in kind could not count for superannuation, which was the figure with which the executive council was concerned.

The Committee, having heard the debate, decided to take no further action other than to receive the item.

Registration of Stillbirths

The Committee considered a letter from the Registrar-General about obtaining information on the causes of stillbirths. The present position in England and Wales was that when a stillbirth was registered information on the cause or causes was not obtained, but in Scotland such information had been collected since January 1, 1939. The information would fill a gap in the national vital statistics and would also assist in important genetic studies. The Medical Research Council was anxious to foster the development of the study of human genetics, and the subject was of growing importance in relation to radiation hazards. The Registrar-General pointed out that the number of stillbirths in England and Wales totalled less than 17,000 annually, or about 22.5 per 1,000 total births, and the certification would not be for the medical practitioners to do in all cases.

The Committee saw no objection to furnishing the information.

Procedure on Appeal

With reference to recent criticism from local medical committees of the procedure which was adopted by appeals tribunals, a letter was received from the Ministry of Health in reply to the Deputy Secretary, Dr. D. P. STEVENSON. The point at issue had been the fact that local medical committees, although represented at the appeal, could take no part whatsoever in the proceedings. The letter from the Ministry indicated that the wording of the letter in which local medical committees were advised that a hearing was to take place would be revised. It would continue to say that the Committee might wish to send representatives to the hearing, but it would add that, as the procedure was a matter entirely within the discretion of the referees, it would, of course, be appreciated that it would be for them to determine what part, if any, any such representatives should take in the proceedings.

Remuneration of G.P. Cottage Hospital Staff

It was recalled that the Committee had referred to the Liaison Committee the question of the staffing of cottage hospitals with particular reference to the need for special arrangements for casualty work. In many hospitals, it was pointed out, there was no special payment for casualty work, and the only available fund was the bed fund, the use of which for out-patients was illogical. In the Liaison Committee it was suggested that there should be some scheme for payment on an "item of service" basis or for special attendance for emergencies, but before any recommendation was made it was felt necessary to have further information about the probable number and nature of emergencies in different areas. Some information had been furnished by Dr. H. S. Howie Wood and Dr. J. A. Pridham, to whom the Committee was indebted, and it was agreed that the matter should be explored with the Ministry, and that members of the G.M.S. Committee be asked to collect evidence in their own areas.

Maternity Medical Services

Fees

The Committee considered a resolution by Middlesex, which was carried at the Annual Conference of Local Medical Committees, instructing the General Medical Services Committee to negotiate immediately for an increase of fees in respect of maternity medical services.

The CHAIRMAN reminded members that the annual cost of the maternity fees was somewhere between £3m. and £3½m., and if, for example, the present scale were doubled, it would take another £3m. from the pool. Dr. F. E. GOULD

suggested that it would be premature to discuss any alteration in maternity fees until the Cranbrook Committee reported.

Dr. R. B. L. RIDGE opposed any suggestion of deferring a decision. Middlesex, he said, had been fighting the issue for some five or six years, and he reminded the Committee that the fees were exactly the same as they were in 1948. His committee took the view that maternity work was an essential part of general practice and that there should be an immediate increase in fees for such work. Dr. A. TALBOT ROGERS said he was against the Committee ignoring an instruction from the Conference. There was a clear instruction from the Conference, and it should be carried out quite irrespective of the Cranbrook Committee's report. Dr. BURNS suggested an increase in the total fee for full maternity service and a decrease in the fee for the minimal service which was provided by some doctors at present.

The Committee agreed finally to recommend to the Ministry that the present maternity fees of 5 and 7 guineas be increased to 7 and 10 guineas respectively.

Advice to the Public

The Ministry of Health informed the Committee that it accepted the Committee's suggested amendments to the advice to the public on the use of the general medical services which the Ministry proposed to issue. The Ministry submitted two additions. The first reminded patients that many drugs and tablets were dangerous to small children and should be kept out of their reach, and the second was that it would help to reduce the costs of the National Health Service if patients could always quote their National Health Service number when it was required.

Receipt Forms for Prescription Charges

The Committee considered a letter from the Ministry of Health on the proposed special receipt forms for dispensing doctors. The General Post Office was anxious to help dispensing doctors provided there were adequate safeguards in the method adopted, and the Ministry had been consulting the Post Office about a form with boxes printed for 1s., 2s., and 3s., and an additional box for entering a higher amount, the doctor to be required to initial the printed amount to be paid or to write some other amount in words and figures and to strike out unused boxes. After the most detailed and careful consideration it appeared that, however willing the Post Office might be in principle to handle a new form on the lines suggested, it had reluctantly come to the conclusion that it could not do so satisfactorily in practice.

The Committee agreed that the matter be pursued with the Ministry of Health and, if necessary, with the Postmaster-General's department.

List of Appliances

Nylon Hypodermic Syringes

The Committee had before it a letter from the Norfolk Local Medical Committee indicating that the latter had endorsed a suggestion from a member that nylon hypodermic syringes should be prescribable on form E.C.10 for diabetics and others. They were said to be slightly more expensive than glass but much more durable.

Dr. BURNS pointed out that objections to nylon syringes were that they became discoloured, they were not calibrated accurately for purposes of diabetics, and they could not be kept in spirit, which might present difficulties from the point of view of sterilization.

The Committee did not support the suggestion of the Norfolk Local Medical Committee.

Calculation of Central Pool

A resolution from the Liverpool Local Medical Committee urging the G.M.S. Committee to publish in a suitable form the items making up the total figure of the Central

Pool for each year was considered. The Liverpool Committee felt that there was widespread ignorance of exactly how the total figure was arrived at.

The CHAIRMAN informed members that he was preparing an aide-memoire on the subject for members of the Committee to consider.

Payment of Home Confinement Grant

The Sheffield Local Medical Committee's attention had been drawn to an anomaly in the National Health Service Regulations on the payment of the home confinement grant.

As things were at present, a mother could be admitted as an emergency to a maternity hospital for a period not exceeding three days, during the puerperium, without forfeiting the grant for home confinement. If, however, it was desirable for the safety of the mother—e.g., previous history of post-partum haemorrhage or retained placenta—that she be confined in hospital by prearrangement and sent home within two days, no grant was payable.

The Committee agreed to raise the matter with the Ministry of Health.

Defence Trusts

Meetings of the Trustees of the General Medical Services Defence Trust and of the National Insurance Defence Trust were held at B.M.A. House on September 18.

The officers of the Trusts were re-elected and the CHAIRMAN, Dr. Kate Harrower, gave details of the financial position of the Trusts.

Tax Appeals

Dr. HARROWER reported that the Trustees had decided to contribute the sum of £710 towards the expenditure of £3,250 involved in preparing the test case in connexion with the assessment of the income of part-time consultants under Schedule E. The Trustees agreed that within the next two meetings a document should be prepared setting out complete details in respect of money which had been spent and what were likely to be future commitments. Authority was given to Dr. Harrower to spend up to £2,000 on behalf of the Trust, it having been reported that further expenditure would be involved when the case referred to earlier was taken to appeal.

ORGANIZATION COMMITTEE

ASSOCIATION'S RECORD MEMBERSHIP

The Organization Committee of the B.M.A. was set up to advise upon all matters relating to the organization of the Association, upon rules of organization of Divisions and Branches, and upon grants to the local units. Its first instruction is "to organize systematic endeavours to maintain and increase the membership." Following the Annual Representative Meeting's resolution, requesting Council "as a matter of urgency" to consider specific arrangements to improve intraprofessional relationships and solidarity, the Organization Committee had been asked to set out detailed proposals for an efficient interchange of information between the periphery and Headquarters.

At its first meeting of the session, at B.M.A. House on September 25, the Committee re-elected Dr. R. G. GIBSON as its chairman, and welcomed two new members, Dr. J. S. ROSS and Dr. J. T. Warnock, to what the CHAIRMAN thought would be "a very hard year's work." The following subcommittees were appointed: Medical Students and Newly Qualified Practitioners; Forum; and Propaganda.

Membership of the Association is higher than ever, the Committee was told. It stood at 71,785, including 520 newly qualified practitioners. This compared with 70,808 a year ago, when only 450 newly qualified practitioners joined. Dr. L. S. POTTER, Assistant Secretary, drew attention

to the fact that the number was approaching 72,000, "which, of course, will be an all-time high."

Periphery and Centre

For nearly two and a quarter hours the Committee considered all aspects of intraprofessional relations and how they could be improved. Particularly the Committee considered means of increasing the to-and-fro flow of information between the periphery and Headquarters. Dr. E. C. DAWSON, a member of Council, who had been specially invited to attend the meeting, in an hour-long speech introduced a memorandum which he had prepared on what he preferred to call "intraprofessional co-operation," thinking that "relations" had a static implication. Among other things, Dr. DAWSON called for a propaganda campaign by all methods. Dr. S. WAND said that, although many would disagree with some of the details of Dr. Dawson's memorandum, there would be agreement with its general aims.

At the end of the discussion it was decided to reconsider the matter at the Committee's next meeting in a month's time. It was hoped then to frame recommendations for submission to the Council on the more urgent aspects of the question and to refer matters needing more detailed study to the Propaganda Subcommittee.

Junior Members' Forum

A letter was received from Dr. P. B. Bailey, Bristol, vice-chairman of the Forum for 1959, requesting help in financing the local young doctors' group. The Committee agreed in principle to furnish help. It was stated that there would be an early meeting of the Forum Subcommittee, responsible for arranging the next Forum. The Committee also decided to increase the grant for the 1959 Forum.

Budget for 1959

The Committee's estimated budget for 1959 for submission to Council was approved. It totalled £18,725. Out of this total would come the capitation grants to home and overseas branches, the cost of the secretaries' conferences in London and Scotland, the cost of the *Year Book*, and the cost of the Junior Members' Forum.

Criteria for Fellows

"The criteria for admission to the Roll of Fellows of the Association are woolly and can be stretched very far," declared Dr. J. S. ROSS. "If we want to maintain the standard we shall have to look at these criteria." The CHAIRMAN reminded him that the "back log" had not yet been finished. Commented Dr. J. S. NOBLE: "What we have to bear in mind is that this is supposed to be a signal honour and not just a pat on the back."

The Committee approved a further list of nominations for the Fellowship, sent by Branches and Divisions.

ANAESTHESIA BY HYPNOSIS

MINISTER SANCTIONS FEE

The Minister of Health has agreed to the payment of a fee for anaesthesia by hypnosis in maternity medical service cases provided the practitioner called in to carry it out is accustomed to use hypnosis as part of his professional practice. The fee paid will be as if an ordinary anaesthetic had been used. The Minister's decision was in answer to an inquiry from the London Executive Council. In January, 1957, a general practitioner submitted a claim for a fee for the attendance of a second practitioner for the purpose of procuring anaesthesia by hypnosis for suturing the perineum. The doctor was informed that there were no arrangements which allowed for the payment of a fee under these circumstances, and the executive council suggested that he should ask the opinion of the local medical committee. The latter, in turn, referred the matter to the General Medical Services Committee of the B.M.A. The

G.M.S. Committee quoted the view of the B.M.A.'s Anaesthetist Group Committee that "hypnotism induced by a medical practitioner should be regarded as an anaesthetic," and advised that the question of the payment of a fee should be pursued with the executive council. The executive council therefore sought the Minister's view, who replied as already stated. The appropriate fee (£1 15s.) will be paid.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Royal Commission Questionaries

SIR,—Dr. C. P. Lowther in his letter (*Supplement*, September 13, p. 141) raises a point in connexion with allowances and the advantages which would stem from these. He hopes the Royal Commission will take cognizance of them and our professional organization press for them. I trust they will do no such thing.

As to the Royal Commission, I hope it may restrict itself to broad principles and thus facilitate its invidious task. In the first instance, it might state whereabouts in its opinion the status of medical men features in the pattern of society. Of the greatest value would be its views on whether, say, a consultant should rank with civil servants—junior or senior—or men-of-law—struggling or well established—with their respective attributes. The point once settled, the Commission's labours would be vastly simplified. It could then decide whether a consultant should buy clothes off the peg, and take them to the local launderette, or have them tailor-made in Savile Row and valeted; whether he should travel tourist or first class; live in a bed-sitter or in a luxury apartment with all mod. con.; roll his own cigarettes or smoke Churchillian cigars.

I concede, Dr. Lowther, that some consultants, by reason of their position, their special interests, their renown, their academic standing, the nature of their work, and sundry other commitments, incur exceptional expenses—travelling, entertaining, and striving to keep up the prestige of the profession—while at the same time burdened with numerous unrewarded calls on their time. Again, there is a vast difference between the cost of living, entertaining, and keeping up with the Joneses in London and other big cities and that in provincial towns. It would therefore seem that some differential remuneration and weighting is desirable and fair, but perish the thought that this ever be achieved through a multiplicity of allowances with the unavoidable tedium of form-filling and inquisitions. When the Royal Commission has collated all the evidence, digested this, and knows all the answers, perhaps it could give proof of having grasped the situation and done its work diligently by submitting to the B.M.A. two typical, detailed budgets—one for a consultant of international repute in a London teaching hospital, and the other for a consultant in a provincial hospital. This might prove edifying.—I am, etc.,

London, W.1.

P. BAUWENS.

SIR,—Dr. C. P. Lowther in his letter (*Supplement*, September 13, p. 141) quite rightly pointed out that the Royal Commission should take account of the various expense allowances enjoyed by many professional men and women, but which are not available to doctors in the N.H.S. I was aware that in industry and commerce the allowance he quotes—e.g., for car, telephone, removal expenses, post-graduate course fees, and expenses, etc.—were much more easily obtainable, but I had always associated this with the fact that the officers concerned were not employed by the State. However, the examples he quotes are State employees of about equivalent rank to registrars in the N.H.S.

In my last post as registrar it was specified in my contract that I must provide a telephone in my house so that I could be on call, yet I could not even obtain any income-tax

allowance for the rental, let alone have the rental itself paid (as applies in the case of the scientific officer and the graduate engineer mentioned by Dr. Lowther). This is a relatively trivial matter, but the cost of running a car, taking postgraduate courses, and moving house can represent a considerable proportion of one's (taxed) income.

I find great difficulty in understanding why State-employed doctors should be so differently treated in this respect than other State-employed professional persons. Dr. Lowther states that we are the most recent addition to public service, but this cannot be the only explanation for the fact that we are also the most under-privileged—after all, the N.H.S. has been in existence now for over 10 years.—I am, etc.,

Warrington, Lancs.

W. J. STANLEY.

Chiropody Service

SIR.—In his efforts to establish a greater awareness of the existence of his association (in addition to that of the Society of Chiropodists) the Secretary of the Institute of Chiropodists (*Supplement*, September 20, p. 145) has failed to mention one very important point.

After prolonged negotiations the chiropodists succeeded, in 1938, in persuading the medical profession, as represented by the Representative Body of the B.M.A., that chiropody was a branch of medicine, and merited the active co-operation of the medical profession in the interest of the patient. Thus the B.M.A. deputed to the Board of Registration of Medical Auxiliaries the task of investigating and recognizing appropriate courses of training, coupled with adequate training schools and facilities and ethical standards. There were at that time at least 10 chiropody organizations seeking recognition, one of which was formed as early as 1912. Five of these bodies were eventually approved by the Board and now form the Society of Chiropodists. The Board insisted on a single portal of entry with a common examination standard, and, while it is true that not all those chiropodists who were eventually admitted to the chiropodists' section of the National Register of Medical Auxiliary Services had undergone a two years' course of training (now increased to three years), it was on production of evidence that such a course was in operation, and on the recommendation of eminent medical inspectors, that the qualifying bodies were approved by the Board.

The Institute of Chiropodists, founded in 1938, has never applied to the Board for the recognition of its qualification and ethical standards. It cannot therefore complain of the lack of awareness. As Mr. Shipper has pointed out, in regard to the Minister of Health and the National Health Service (Medical Auxiliary) Regulations, 1954, the mere existence of an organization does not necessarily confer on its members the right of recognition with all that implies.—I am, etc.,

London, W.C.1.

A. E. VINCE,
Secretary and Registrar,
Board of Registration of Medical Auxiliaries.

SIR.—I am glad to see that Dr. Gordon Scott (*Supplement*, August 30, p. 129) has raised the matter of a chiropody service in your columns, for the National Corporation for the Care of Old People has for almost three years now been assisting by grant-aid about 130 voluntarily run schemes of chiropody for aged people, and we have studied the subject closely through these schemes and in other ways.

There are two related points I would refer to in Dr. Scott's letter. First, that if by "graduates" of the Society of Chiropodists he means those who have taken a two- or three-years course, the number of chiropodists available would be far less than he mentions, for the large majority of members of the society have not had such a training, which has not been long available. Dr. Scott does not mention the Institute of Chiropodists, which is the other professional association acknowledged for Hospital Service purposes by the Minister of Health, but many members of the institute would equally be ruled out on the same

grounds. It is not my province to discuss whether the quality of what chiropodists do could be improved or whether cures could be effected where now there are palliatives. I am, however, convinced by considerable experience that much of what is done for old people in the schemes I have referred to above is distinctly worth while if only because of the relief and comfort achieved: to say that "nothing worth while" is being done because no permanent cure is effected strikes me as a somewhat cold and inhuman approach. I know too that many schemes are adequately served by chiropodists who are members neither of the society nor of the institute, let alone "graduates" of the sort Dr. Scott mentions, but I am convinced that many of these who have been in full-time practice for a number of years could be properly included in any national chiropody service.

If this is accepted, my second point is to dispute Dr. Scott's contention that "a national service would still be impossible under present conditions if every unqualified chiropodist . . . was also pressed into it." On Dr. Scott's own figures it seems that about 20% of old people might ask for treatment, and our information would confirm this: this implies, in round figures, about 1,400,000 patients, and, if patients average six treatments per annum, 8,400,000 treatments in a year. One full-time chiropodist averages perhaps 80 treatments a week or 4,000 per annum, and 2,100 chiropodists would, on these figures, therefore be needed. Things would not work out so neatly, because the distribution of chiropodists varies from one area to another, but there are available, I estimate, at least three times the total number required, and I would therefore suggest that it appears to be practicable to introduce a service, at least for old people—whose need is proportionately the greatest and whose means to pay for it are least.—I am, etc.,

M. R. F. SIMSON,
London, N.W.1.

Secretary, National Corporation
for the Care of Old People.

Interest-free Loans

SIR.—I have noticed little correspondence in your columns on the problem of stimulating G.P. spending on equipment and ancillary help. Would it be possible to press for more interest-free loans and/or partial grants towards the cost of equipment and surgeries and payment or part-payment of ancillary help? The details would be complicated, but at least we would have the sympathy of the public.—I am, etc.,

Broxbourne, Herts.

D. Y. SHARPLES.

Operating Theatre Technicians

SIR.—We have read with interest and we agree with Mr. W. Gissane's letter (*Supplement*, August 9, p. 117) concerning operating theatre technicians. We work in a very busy operating theatre unit, the staff of which consists of two trained sisters, twelve trained staff nurses, two student nurses, and five operating theatre technicians. The last group are permanent appointments. Since this theatre gives a six months' theatre course for trained nurses, it is inevitable that there is a constant change of theatre nurses. The technicians, then, are the mainstay of the theatre team, and they are chosen with care. We demand from them a high standard. They are all men of kindness and strict integrity, willing always to give their services. They know their duties are of a highly responsible nature, and it is our wish and aim to appoint men of a higher educational standard.

The technicians in our theatre unit replace the anaesthetic nurse; a replacement by the permanent of the temporary. They lay out in excellent order everything required for the anaesthetist. They clean, sterilize, and maintain all anaesthetic and most surgical equipment, and in no hospital is this better or more economically done. It is, of course, true that surgery and anaesthesia become ever more complicated mechanically. They require mechanical knowledge. They are absolutely trustworthy in the correct placing of the patient on the operating table and in such things as putting on of a diathermy pad, and they are fully trained to be

Association Notices

SCHOLARSHIPS IN AID OF SCIENTIFIC RESEARCH

The Council of the British Medical Association is prepared to receive applications for research scholarships as follows: an Ernest Hart Memorial Scholarship, of the value of £300; a Walter Dixon Scholarship, of the value of £300; four Ordinary Research Scholarships, each of the value of £200.

The scholarships are given to candidates recommended by the Science Committee of the Association as qualified to undertake research in any subject (including State medicine) relating to the causation, prevention, or treatment of disease. In addition, applications are invited for the award of the following research scholarship: the Insole Scholarship, of the value of £250, for research into the causes and cure of venereal disease.

Each scholarship is tenable for one year, commencing on October 1, 1959. A current scholar may apply to be reappointed for a further year, though no scholarship will be renewed more than twice. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may be a member of H.M. Forces or may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment will not, in the opinion of the Science Committee, interfere with his or her work as a scholar.

Applications for scholarships, including renewals, must be made not later than March 1, 1959, on the prescribed form, a copy of which will be supplied by me on application. Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated.

KATHERINE BISHOP HARMAN PRIZE

The Council of the British Medical Association is prepared to consider an award of the Katherine Bishop Harman prize in the year 1959. The value of the prize is £75. The purpose of the prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and child-bearing. It will be awarded for the best contribution (not previously published) submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the prize. Any registered medical practitioner in (a) the British Commonwealth and Empire or the Republic of Ireland and (b) any member of the British Medical Association, wherever resident, is eligible to compete.

Should the Council of the Association decide that no contribution submitted is of sufficient merit, the prize will not be awarded in 1959 but will be offered again in the year next following this decision, and in this event the money value of the prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each contribution must be typewritten or printed in the English language, and must be accompanied by a detachable slip bearing the candidate's name and address. The Council anticipates that contributions should be between 3,000 and 10,000 words, although no definite limits are laid down. Preliminary notice of entry is required and a form for this purpose can be obtained from the Secretary. Essays must be forwarded so as to reach the Secretary, B.M.A. House, Tavistock Square, London, W.C.1, not later than January 31, 1959. Inquiries relative to the prize should be addressed to the Secretary.

OCCUPATIONAL HEALTH PRIZE

The Occupational Health Prize was established by the Association for the purpose of encouraging interest and research in the field of occupational health. The Council of the British Medical Association is prepared to consider the award of this prize, which consists of a certificate and £50, in the year 1959. Any member of the Association who is engaged in the practice of occupational health, either whole-time or part-time, is eligible to compete for the prize. Candidates may select their own subject. Entries should be

aware of the dangers of the latter, which might cost the National Health Service thousands of pounds. They help to fetch and carry and lift patients, help with intravenous infusions, check blood bottles, and are in fact invaluable in their services.

It would appear that members of the Professional Council of the Whitley Council are unaware of the services rendered by these men. They have turned down their claim for reasonable status and thus for reasonable remuneration, and we feel that in doing so they have made a grave error and have rendered a severe disservice to the National Health Service, and ultimately to the patients whom we treat. Theatre technicians are usually good chaps and unselfish; but the labourer is worthy of his hire, and the skilled labourer is worthy of "higher" hire.—We are, etc.,

DONALD BARLOW,
J. ALFRED LEE,
A. E. BROHIER.

Southend-on-Sea.

Estimating Merit

SIR.—A lot has been written about merit awards, incentives, and the need to stimulate and reward the good doctor. Let us, then, imagine a series of medical boards investigating a random sample of all deaths, whether within or without hospital, to the extent that each G.P. could expect to face four such boards every year. Each board, half a consultant and half G.P. in membership, could conduct a detailed academic inquiry into the treatment of the patient starting from his first complaint to the G.P. and ending at the necropsy. Every doctor involved, consultant, registrar, houseman, or G.P., having stated his case, would be assessed as "above average," "average," or "below average." His merit, or demerit, award in any year would be based on the record of the medical boards he had attended during the previous five years and expressed as a percentage addition to, or subtraction from, his N.H.S. salary.

A terrifying prospect? Possibly, but it has these advantages. It is just and honest. A doctor is rewarded on a basis of clinical facts rather than personal fancy, social charm, medico-political importance, or showmanship. He is judged openly by his peers and can understand the reasons behind the judgment. The system could stimulate interest in, and care of, the patient. I do not like "merit" awards at all, but if they are to come let us steer clear of secret committees which can only breed competition, feed envy, and reward "empire builders" and doctor-politicians. If it is real merit that is to be rewarded let it be done openly, honourably, truthfully, and justly.—I am, etc.,

Holywell, Flintshire.

DAVID L. WILLIAMS.

H.M. Forces

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Brevet Major (Honorary Lieutenant-Colonel) J. A. Chapel, O.B.E., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, retaining the honorary rank of Lieutenant-Colonel.

Major (Honorary Lieutenant-Colonel) V. St. G. Vaughan, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, retaining the honorary rank of Lieutenant-Colonel.

Major (Honorary Lieutenant-Colonel) E. J. Bowmer, M.C., has relinquished his commission on appointment to the R.C.A.M.C. (M).

Captain (War Substantive Major) S. C. H. Lane, O.B.E., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, and has been granted the honorary rank of Lieutenant-Colonel.

Class III.—Captain (Acting Lieutenant-Colonel) C. W. S. F. Manning, from A.E.R.O., to be Captain, relinquishing the acting rank of Lieutenant-Colonel. Captain (Acting Major) A. R. H. Vorssam, from T.A., to be Captain, relinquishing the acting rank of Major. Captain (Honorary Major) O. Jordan, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, retaining the honorary rank of Major. Captain (Honorary Major) B. Wilson-Kay, from Reserve of Officers, to be Captain (Honorary Major).

submitted in a form suitable for publication and must include personal observations and experiences collected by the candidates in the course of their work. If no entry is of sufficient merit no award will be made. Candidates should confine their attention to their own observations rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.

Entries must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than January 31, 1959. No study or essay that has been published in the medical press or elsewhere will be considered eligible for the prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A previous prizewinner is not precluded from entering. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay, the decision of the Council on any such point shall be final.

Preliminary notice of entry for this competition is required on a form of application to be obtained from the Secretary. Each entry must be typewritten or printed on one side of the paper only, and accompanied by a note of the candidate's name and address. The Council anticipates that contributions should be between 3,000 and 10,000 words, although no definite limits are laid down. Inquiries relative to the prize should be addressed to the Secretary.

A. MACRAE,
Secretary.

Diary of Central Meetings

OCTOBER

- 7 Tues. Amending Acts Committee, 2 p.m.
- 8 Wed. Occupational Health Committee, 10.30 a.m.
- 8 Wed. Private Practice Committee, 12 noon.
- 9 Thurs. Joint Committee of B.M.A. and T.U.C., 3.15 p.m.
- 10 Fri. Ophthalmic Group Committee, 2 p.m.
- 15 Wed. Central Ethical Committee, 12 noon.
- 16 Thurs. G.M.S. Committee, 10.30 a.m.
- 17 Fri. Radiologists Group Committee, 2 p.m.
- 23 Thurs. Office Committee, 1 p.m.
- 23 Thurs. Arrangements Committee (Edinburgh, 1959), 2 p.m.
- 23 Thurs. Catering Committee, 3.30 p.m.
- 24 Fri. International Relations Committee, 2 p.m.

NOVEMBER

- 5 Wed. Welsh Committee (at George Hotel, Shrewsbury), 2.15 p.m.
- 19 Wed. Public Relations Committee, 2 p.m.

Branch and Division Meetings to be Held

ALDERSHOT AND FARNHAM DIVISION.—At Queen's Hotel, Farnborough, Hants, Tuesday, October 7, 8.30 p.m., annual general meeting. Film: "The Medical Witness."

BLACKPOOL AND FYLDE DIVISION.—At Savoy Hotel, North Shore, Blackpool, Wednesday, October 8, 7.15 p.m., dinner; 8.30 p.m., Dr. I. McD. G. Stewart: "A Touch of Blood Pressure."

CHESTERFIELD DIVISION.—At the Ashover County Hotel, Ashover, Friday, October 10, 7.30 for 8 p.m., chairman's address by Dr. J. F. Hanratty: "A Problem to Solve." 9 p.m., buffet supper.

DARLINGTON DIVISION.—At Darlington Memorial Hospital, Tuesday, October 7, 8.30 p.m., lecture by Mr. L. P. Lassman: "Role of Surgery in the Treatment of Epilepsy." Members of the Tees-side Branch are invited.

EAST YORKSHIRE BRANCH.—At Hull Medical Society, 68, Park Street, Hull, Wednesday, October 8, 8.30 p.m., lecture by Professor A. J. E. Cave: "The Birthplace of Medicine."

GOOLE AND SELBY DIVISION.—At "White Elephant," Snaith, Thursday, October 9, 7.30 p.m., address by Dr. W. Whitaker: "Pulmonary Heart Disease."

GRIMSBY DIVISION.—At Scarthoe Road Hospital, Tuesday, October 7, 8 p.m., film: "Key Questions in Coronary Disease." 9 p.m. (approx.), annual general meeting. All medical practitioners in the area of the Division are invited.

GUILDFORD DIVISION.—At Board Room, Royal Surrey County Hospital, Guildford, Thursday, October 9, 8.30 p.m., special meeting, followed by lecture by Dr. Philip Ellman: "Essentials in the Management of Diseases of the Chest in General Practice."

HARROW DIVISION.—At Tithe Farm House, Eastcote Lane, South Harrow, Tuesday, October 7, 8.45 p.m., A.G.M.

HASTINGS DIVISION.—At Lecture Room, Nurses' Home, Royal East Sussex Hospital, Tuesday, October 7, 8.15 p.m., Dr. A. F. W. Hall: A.R.M. Report; Dr. Samuel Oram: "Present Indications for Surgery in Heart Disease."

MID-ESSEX DIVISION.—At Out-patient Hall, Chelmsford and Essex Hospital, Sunday, October 5, 10.30 a.m., annual general meeting, followed by short address by Dr. Robert Smith: "Huntington's Chorea."

MID-HERTS DIVISION.—At St. Michael's Manor Hotel, Fishpool Street, St. Albans, Friday, October 10, 8.45 p.m., meeting.

MONMOUTHSHIRE DIVISION.—At Tredegar Arms Hotel, Newport, Thursday, October 9, 7.45 for 8 p.m., dinner meeting. Symposium on the Corticosteroids. Speakers, Dr. Grahame Jones, Dr. Bernard A. Thomas, and Dr. Michael Wade.

NORTH STAFFS DIVISION.—At North Stafford Hotel, Monday, October 6, 8 p.m., joint meeting with North Staffordshire Branch, Pharmaceutical Society. Lecture by Dr. Spinks, Ph.D.: "Drugs Affecting the Brain—A Laboratory View" (illustrated).

NOTTINGHAMSHIRE BRANCH.—At 64, St. James's Street, Nottingham, Thursday, October 9, 8.30 p.m., meeting.

REIGATE DIVISION.—At Reigate Hill Hotel, Tuesday, October 7, 8.30 p.m., meeting, followed by film: "Investigation of Female Sterility." A discussion will follow.

SHROPSHIRE AND MID-WALES BRANCH.—At Board Room, Royal Salop Infirmary, Tuesday, October 7, 8.30 p.m., annual general meeting. Films: "Cardiac Arrhythmias"; "Action of the Human Mitral and Aortic Valves."

SOUTH-WEST ESSEX DIVISION.—At Sir James Hawkey Hall, Woodford Green, Thursday, October 9, 7.30 for 8 p.m., annual dinner and dance. Principal guest, Dr. S. Wand (Chairman of Council, B.M.A.).

SUFFOLK BRANCH.—At Cathedral Church of St. James, Bury St. Edmunds, Sunday, October 12, 3 p.m., special St. Luke's-tide Service. All doctors, nurses, and their families are invited to attend.

SWANSEA DIVISION.—At Langland Bay Hotel, Swansea, Thursday, October 9, 7.30 for 8 p.m., dinner. Chairman's address.

WAKEFIELD, PONTEFRAC, AND CASTLEFORD DIVISION.—At County General Hospital, Friday, October 10, 8 p.m., lecture by Dr. S. J. Hartfall: "The Corticosteroids and the Chronic Rheumatic Diseases."

WEST DERBYSHIRE DIVISION.—At Peacock Hotel, Rowsley, Saturday, October 11, 7 p.m., dinner-business meeting.

Meetings of Branches and Divisions

KENT BRANCH

The following officers have been elected:
President.—Dr. B. A. Hoogewerf.
Vice-President.—Dr. J. Pickford Marsden.
President-elect.—Mr. W. E. Heath.
Honorary Secretary.—Dr. J. O. Murray.
Honorary Treasurer.—Mr. W. E. Heath.

MAIDSTONE DIVISION

The following officers were elected at the annual general meeting on July 22:

Chairman.—Dr. A. L. R. Mayer.
Vice-chairman.—Dr. E. Scott.
Honorary Secretary and Treasurer.—Dr. R. G. McLaren.

NORTH OF ENGLAND BRANCH

The following officers have been elected:
President.—Dr. T. S. Blaiklock.
President-elect.—Dr. W. Hunter.
Vice-presidents.—Dr. S. Weldon Watts, and Dr. J. N. Swainston.
Honorary Secretary and Treasurer.—Dr. J. S. Noble.

RUGBY DIVISION

The annual general meeting was held at the Grand Hotel on March 27. The following officers were elected:

Chairman.—Dr. E. F. S. Morrison.
Vice-Chairman.—Dr. R. C. Hill.
Honorary Secretary and Treasurer.—Dr. R. P. Hendry.

SOUTHERN BRANCH

The following officers have been elected:
President.—Dr. F. Caldecott.
Vice-presidents.—Dr. Joan H. Norris and Mr. N. Cridland.
President-elect.—Dr. J. G. McDowell.
Honorary Secretary.—Dr. R. Gibson.
Honorary Treasurer.—Dr. R. H. Balfour Barrow.

STIRLING BRANCH

The following officers have been appointed:
President.—Dr. A. P. Russell.
President-elect.—Dr. A. S. Biggart.
Vice-president.—Mr. R. G. Main.
Honorary Secretary.—Dr. J. E. Morrison.

WORCESTERSHIRE AND HEREFORDSHIRE BRANCH

The annual general meeting was held on July 17 at Worcester and was attended by over 80 members. The following officers were elected:

President.—Dr. C. W. Walker.
Honorary Secretary and Treasurer.—Dr. J. R. Bulman.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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PUBLIC HEALTH COMMITTEE

NEGOTIATIONS FOR INCREASED SALARIES

The next step in the negotiations for a radical revision of the remuneration structure of public health doctors was decided at a joint meeting of the Public Health Committee and the Staff Side of Medical Whitley Council Committee C at B.M.A. House on September 26. It had been agreed with the Management Side of Committee C that details of the negotiations should not be published, but the meeting reaffirmed the policy laid down at the last meeting of the Public Health Committee, and since approved by the Council of the Association, "that all possible steps be taken to establish the principle that the remuneration of public health doctors should be related to the remuneration in other fields of medical practice and not to the salaries of other chief officers of local authorities."

The Public Health Committee re-elected Dr. J. B. TILLEY as its chairman for the session, and he welcomed Dr. E. Grey-Turner, Assistant Secretary, who had been appointed to the Committee as its secretary.

Dr. Kelynack Elected to Committee C

Dr. Agnes Kelynack, Staff Side secretary of Whitley Council Committee C until her retirement from the staff of the Association in July, was elected a member of the Staff Side; in 1946 she was joint secretary to the Spens Committee on General Practice. The other members of the Staff Side appointed at the meeting were: Dr. H. D. Chalke, Dr. E. Hughes, Dr. J. Stevenson Logan, Dr. J. B. S. Morgan, Dr. Gladys Stableforth, Dr. D. P. Stevenson (Secretary-Elect of the B.M.A.), Dr. J. A. Stirling, Dr. J. B. Tilley, and Dr. Elspeth Warwick. Additionally three Scottish representatives will be nominated by the Scottish Council.

Milk

The Ministry of Agriculture, Fisheries, and Food had invited the Association to give evidence to a Government committee on the composition of milk, and the Science and Public Health Committees were asked by Council to consider jointly arrangements for the preparation of evidence. The Public Health Committee thought there should be liaison with the British Veterinary Association.

A similar request from the Department of Health for Scotland for evidence to a committee on new model dairy by-laws was referred to the Public Health Committee (Scotland). Of the Department's action in setting up the inquiry, Dr. J. KILMAN, a Scottish representative, remarked: "We have been agitating for this for 20 years."

Causes of Stillbirths

Dr. KILMAN also told the Committee that there had been no difficulty over the certification of causes of stillbirths in Scotland, where it has been compulsory since 1938. The Registrar-General for England and Wales had proposed that

there should be similar legislation for England and Wales, and the General Medical Services Committee has already expressed approval of the proposal. The Public Health Committee did likewise.

Professional Co-ordination

Hearing that there had been a request from the Society of Medical Officers of Health for a further meeting, the Committee deferred until its next meeting consideration of the Society's proposal that the Public Health Committee should be given a measure of autonomy similar to that of other autonomous committees and of the relationship between the Association and the Society under the revised agreement between the two. The matter came before the Committee in the form of the minutes of a meeting of the B.M.A.'s Committee on Professional Co-ordination.

Also postponed until the meeting on October 31 was the question of representation of county borough medical officers on the Public Health Committee. Dr. W. R. Martine had written a letter about this. Dr. W. G. HARDING pointed out that the hour was late for a discussion on a number of points of principle which he wished to raise.

It was agreed, at Dr. Harding's suggestion, that the whole matter of membership of the Public Health Committee be discussed at the next meeting.

OVERSEAS COMMITTEE

SHORT-TERM OVERSEAS CONTRACTS

The Secretary of the Overseas Committee is to point out to medical officers who ask the Association's advice on short-term overseas contracts that one of the greatest problems is that of re-establishment in Britain at the end of the contract.

This decision was reached at a meeting of the Overseas Committee at B.M.A. House on September 26, when the Committee considered some notes by the ASSISTANT SECRETARY (Dr. E. Grey-Turner) on points which should be included in short-term contracts. The CHAIRMAN suggested that it should be explained to those who sought advice that the contract did not bind anyone to find them employment afterwards. "The attitude of the Colonial Office is that it has no responsibility whatever," he said.

Points which it was felt should be covered in short-term contracts included term of engagement; description of duties; salary and allowances; gratuity, and taxation of it; passages; living accommodation; leave; medical attention; private practice; termination of contract by the employer; resignation by the employee; arbitration about the interpretation of the contract; local taxation; and the chain of command.

Appointments

Professor D. E. C. Mekie, who presided, was re-elected Chairman of the Committee. Dr. G. Macdonald and Dr. G. M. M. Menzies were again co-opted to the Committee

to represent areas not otherwise represented. The Chairman was appointed the Committee's representative on the Organization Committee, with Major-General J. C. A. Dowse as deputy, and Dr. C. J. C. Britton was again nominated for appointment to the Central Medical Recruitment Committee.

The Chairman welcomed Dr. E. E. Claxton as the new Secretary of the Committee in place of Dr. E. Grey-Turner, who had been assigned to new duties at the end of 10 years' association with the Committee. Dr. Grey-Turner had done outstanding work, and the Committee placed on record their sincere appreciation of it.

Overseas Subscription Rate

It was reported that there had been general agreement among the overseas members attending the annual meeting at Birmingham that they did not wish to be subsidized by home members and that some change in the overseas subscription was inevitable. Four suggestions had been made. The first was that the overseas rate should be raised, probably to 50% of the standard home subscription, the relationship which had prevailed between 1922 and 1950. This had encountered opposition in Australia and was unlikely to be popular in the Irish Republic. The second was that the receipt of the *Journal* overseas should be optional; that an overseas member opting to receive the *Journal* would pay a substantially higher subscription than at present—even £5 5s.—whereas a member not receiving the *Journal* would pay, say, £2 2s., or even less. This suggestion might involve amendments to the Articles and By-laws of the Association. The third suggestion was that the receipt of the *Journal* overseas should be optional in areas where there was a local B.M.A. journal which could be regarded as the official journal of the Association. The fourth suggestion was that a special overseas edition of the *Journal* should be produced, omitting advertisement pages. An overseas member receiving this special edition would pay a lower subscription than a member who received the full *Journal*.

Since the Finance, Journal, and Organization Committees were also interested in this problem, it was suggested that a conference of the four committees should be held. The Chairman, Mr. Myles Formby, and Dr. G. M. M. Menzies were appointed representatives of the Overseas Committee.

Overseas Conference

A report on the 1958 Overseas Conference held at Birmingham was received, and it was agreed that it should be recommended that the 1959 Conference in Edinburgh should last a full day. It was also agreed that the Association Secretary should write to Branches pointing out that the power of Headquarters in negotiations with newly autonomous territories was limited and urging Branches to act as fully responsible bodies and to negotiate themselves with local governments.

It was stated that the Memorandum on Conditions of Service in H.M. Overseas Civil Service, revised in the light of comments by overseas Branches, the Overseas Conference, and the Overseas Committee, had been recirculated to overseas Branches prior to submission to the Colonial Office.

Invitations had been sent out for the one-day conference on the filling of medical appointments overseas, to be held on November 14.

Private Consultations

It was reported that doubt had arisen in practice about the precise meaning of the words "called into consultation" in paragraph 9 of the Committee's circular on private practice. Were they intended to mean called into consultation to give advice only, or was it intended that the specialist concerned should also assist in treatment? The Chairman reminded the Committee that the original policy dealt essentially with the rights of doctors in overseas territories where there were no, or few, doctors in private practice to be called into consultation, but no special consideration had been given to the problems of consultants and specialists in

Government hospitals. There was a particular problem for anaesthetists: whereas a pathologist might receive a consultation fee for advice given, he would probably be working in a Government laboratory where the service would be carried out, for which a charge might be made. The anaesthetist, on the other hand, would carry out the service outside the Government hospital.

The CHAIRMAN suggested the following expression of policy:

Consultant and Specialist Practice.—Where facilities exist for the treatment of private paying patients outside the Government hospital, and where exceptionally, for the benefit of the patient, a private practitioner considers it desirable that the services of Government officers should be available, not only in consultation but also in the treatment and management, such practice should be recognized and permitted by the Government and the officers entitled to receive fees for the service.

The Chairman stressed the word "exceptional," because there would be objections to a member of the Government's staff habitually running a private practice. He emphasized that the right would be permissive and could be withdrawn in the case of abuse, and he pointed out that it would not prevent a D.M.S. from permitting it more than exceptionally when he felt it necessary.

It was agreed that observations of overseas members would be welcomed and that the matter should be further discussed at the next meeting.

The Committee also discussed the right of officers in Government service to receive fees, or an allowance in lieu of fees, when patients were called upon to pay for the service. The question arose following the receipt of a letter from an officer who claimed that the Singapore Government had altered his terms of employment by prohibiting him from taking consultation fees.

The Chairman said the type of case he had in mind was where the patient paid limited hospital fees which were collected by the hospital authorities and a proportion paid to the officers. There was a tendency for directors of medical services to get rid of all fees and to replace them by an allowance or nothing at all. The question was whether official Association policy should favour a whole-time service overseas.

Dr. C. BELFIELD CLARKE said that in Ghana the Government policy was to pay fixed allowances instead of fees, and he had no doubt that this would be the policy of other territories as they attained independence. The older doctors, who had been accustomed to certain privileges, would resent this movement of the modern age, but the younger doctors probably would not resent it as strongly. He believed that where exceptional skill was required payment should be made for it, and he believed that the abolition of fees might mean that the best possible treatment was not available in some places.

It was agreed to obtain the opinion of overseas Branches on whether there should be a wholly salaried service or one in which fees were paid for services, in order that the Association could consider what its policy should be in the various areas.

Other Business

A white paper, "Her Majesty's Overseas Civil Service: Statement of Policy regarding Overseas Officers serving in Nigeria," was considered, and the Assistant Secretary was instructed to obtain a legal interpretation of it.

A letter was received from the Honorary Secretary of the Council of the Caribbean Branches of the B.M.A. following the suggestion that this council needed permanent or semi-permanent secretarial assistance, and asking that, instead of the biennial grant of £400 for the travelling expenses of delegates, the Association should make an annual grant of £200 to provide some kind of permanent secretariat. Dr. BELFIELD CLARKE emphasized the need to continue assistance to the Caribbean Council, and it was agreed to recommend the Finance Committee to agree to the suggestion, with a review after five years.

The Committee thanked Dr. Belfield Clarke for his report on his recent visit to some of the West Indian Colonies.

DISCLOSURE OF MASS RADIOGRAPHY UNITS' FINDINGS

At a recent meeting of representatives of the B.M.A.'s Central Ethical, General Medical Services, Occupational Health, Tuberculosis and Diseases of the Chest Group, and Public Health Committees, it was decided that the findings of mass miniature radiography units should not be communicated direct to industrial medical officers. The following resolution was passed without dissent for submission to the Central Ethical Committee with a view to transmission to the Council of the Association:

It is desirable that the closest possible liaison should be maintained between chest physicians, directors of mass miniature radiography units, general practitioners, industrial medical officers, and medical officers of health. The results of mass miniature radiography, nevertheless, should not be communicated to the industrial medical officer. The chest physician, having reached a firm diagnosis should send a communication to the general practitioner in duplicate to enable him, with the patient's consent, to send a copy to the industrial medical officer.

The matter arose from a proposal made to the Ministry of Health by the Association of Industrial Medical Officers that, with the patient's consent, industrial medical officers should be notified directly of the findings of mass miniature radiography units.

LONG-TERM MEDICAL CERTIFICATES

FEWER ISSUED

According to the Ministry of Pensions and National Insurance, doctors are issuing fewer certificates covering a period of 13 weeks than they used to. These special intermediate certificates may be given to patients who have been unfit for work for at least six months. At the beginning of 1954, 460,000 of these certificates were in current use, but recently the number has fallen sometimes to as low as 413,000. Thirteen-week certificates were originally introduced to help doctors, but they also reduce the work of the local offices of the Ministry of Pensions and National Insurance. The latter has stated that an increase of 1% (just over 4,000) in the use of these certificates would be equivalent to a saving throughout the country of the work of 16 clerks.

Severely Disabled

The Ministry also states that when it appears from medical evidence already obtained that severely disabled war and industrial injury pensioners are permanently incapacitated they will be told that they need not send any more medical certificates of unfitness for work. Contributions and credits under the National Insurance scheme will be recorded automatically for these patients.

LESS MONEY FOR CHARITY

URGENT NEED FOR FUNDS

The amount of money received for distribution by the Association's Charities Committee was considerably less last year than in former years. Meeting on September 18, the Committee expressed disappointment at the poor response to the appeal for covenanted subscriptions to the Charities Trust Fund. It decided to make the urgent need for funds more widely known in Divisions. Dr. H. M. GOLDING was re-elected chairman of the Committee and Dr. R. COVE-SMITH deputy chairman.

Dangerous Drugs Act: Withdrawal of Authority

The Home Office announces that Dr. James Joseph O'Reilly (Risca, Mon.) is no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations, 1953, apply.

BOARD-AND-LODGING CHARGES TO CONSULTANTS AND S.H.M.O.s

The Minister has asked hospital boards to review the standard of board and lodging provided for consultants and S.H.M.O.s and to refer to him any cases where they think a reduction in charges is warranted because the accommodation, food, and services provided, taken as a whole, fall substantially below the general level of the region. If the Minister agrees to any reduction of charges it will be of a standard amount of £85 for a consultant and £75 for an S.H.M.O. The charges for board and lodging are standard charges and take into account variations, which are now all in one direction, from case to case. For this reason the Minister says he would not regard a difference in the standard of the services provided at one hospital when compared with another as warranting in itself a reduction in the standard charge. He will entertain a proposal for a reduction only when in an individual case the board and lodging falls substantially short of the overall standard.

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

Mr. H. H. LANGSTON has been elected chairman of the Central Consultants and Specialists Committee in the place of Mr. T. HOLMES SELLORS, who relinquished the chairmanship on his election to the chair of the Joint Consultants Committee. Dr. T. ROWLAND HILL and Mr. J. R. NICHOLSON-LAILEY have been elected deputy chairmen of the C.C.S. Committee. The Committee met on October 2, and a report will appear in next week's *Supplement*.

Scottish News

EXECUTIVE COUNCILS ASSOCIATION'S EVIDENCE TO ROYAL COMMISSION

Entry into practice, employment of assistants, the method of remuneration of general practitioners, and the optimum size of list are matters dealt with in a memorandum of evidence to the Royal Commission on Doctors' and Dentists' Remuneration from the Scottish Association of Executive Councils. The memorandum was prepared in answer to the Royal Commission's invitation to the association to give its views on certain points.

Entry into Practice

At the beginning of the Service, the memorandum states, it was believed that succession to an advertised vacancy would be the most usual means of entry into general practice. With the growth of partnerships (of which the witnesses approve, and suggest might be further stimulated by paying doctors who take partners a part of the compensation money owing to them) the number of advertised vacancies is now small and is likely to be smaller in the future. Facts and figures are given about applications for vacancies for the three years ending March 31, 1958. The number of applications received during this time for 84 vacancies was 2,403. The number of applicants, however, was 867. Of this number 433 applied for one vacancy only, 160 applied for two vacancies, and 74 for three. At the other end of the scale one applied for 25 vacancies and one for 28. Eighty-eight of the applicants had graduated 20 or more years previously, and one had completed 47 years since graduation. Those who had graduated from 1 to 6 years previously numbered 420.

Of the 84 successful applicants, 28 were making their first application, 12 their second, and 14 their third. Two were making their thirteenth, one his sixteenth, and one his seventeenth. Ten successful applicants had graduated 20 or more years previously (one 39 years) and 28 six or fewer years.

Further examination of the statistics shows that by no means all the 867 applicants were unestablished, since 331 were already principals in practice. Of the 84 successful applicants, 43 were principals and 24 were assistants (two trainees).

Assistants

Two hundred and twenty-one full-time assistants were employed in Scotland at March 31, 1958, and 188 of them were aged from 25 to 35; 101 had completed fewer than one year's employment as assistants and 92 between one and three years. The Scottish Association of Executive Councils believes that a period of assistantship is "a most desirable preliminary to entry into full general practice." To prevent abuse of the arrangements for training assistants, it thinks that "it might be desirable" that normally a principal should not continue to be recognized as a trainer under the trainee scheme for more than two years without a break. The association's memorandum also states that there should be stricter control over the employment of assistants other than trainees. The additional number of patients permitted to a doctor employing an assistant should be limited so as to lessen the possibility of an assistant being employed solely as a means of enabling the principal to make a large increase in his list. On the other hand, in approved cases the employment of assistants should be facilitated, and as one way of doing this it is suggested that the appointment of an assistant should not decrease the amount of the principal's income calculated for superannuation purposes. The association also thinks that a grading of assistants' salaries might be appropriate.

Remuneration

The Executive Councils Association finds it difficult to defend the capitation method of payment, since there is no direct relationship between the remuneration paid and the standard of professional work done. But, since it can find no yardstick with which to measure skill in diagnosis and treatment, it cannot suggest an alternative method. At present, the evidence continues, the doctor with the largest list and lowest expenses gains most, and the witnesses believe there should be a financial incentive to improved services by the provision of special premises and the employment of nurses or ancillary staff.

The maximum numbers now allowed on doctors' lists are considerably in excess of the average, and, in the Scottish Executive Councils Association's opinion, are excessive. The proper size of list for single-handed urban doctors should be 2,000-2,500 patients, it thinks, and for a rural doctor 1,500-2,000. The increase allowed when an assistant is employed should be in the region of 1,000 patients. A limitation in the size of a doctor's list on reaching the age of 70 is also advocated, together with the proviso that he should not be allowed to have an assistant.

All executive councils in Scotland are members of the Executive Councils Association, which is recognized by the Secretary of State and consulted by him on all matters affecting the work of executive councils in the Health Service.

The National Health Service Tribunal for England and Wales has directed that the name of Dr. Theodotus John Sumner, of 274, New Road, Porthcawl, be removed from the medical list of the Glamorgan Executive Council and that his name should not be included in any corresponding list kept by any other executive council under Part IV of the N.H.S. Act, 1946. The tribunal found that, in spite of repeated requests and warnings and the withholding of money on four occasions for similar failures to comply with the regulations, the respondent had returned no medical records to the executive council since 1953.

Correspondence

In this column we publish from time to time authoritative notes on a selection of drugs in current use.

Drugs for Private Patients

SIR,—I have just been rereading your account of the proceedings of the A.R.M. In the discussion on the provision of drugs for private patients at State expense (*Supplement*, July 19, p. 47), Dr. A. B. Davies is reported as having said that if this facility were approved it might involve circumstances which could "cost every general practitioner £50 a year." The very circumstances which he outlined are those which would enable private G.P.s to earn more. The greater part of the profession is, rightly in my view, very sensitive at the moment about the remuneration of G.P.s in the N.H.S.; but surely the earning opportunities of those in private practice have suffered a great deal more.

If the granting of drugs for private patients were to receive Government approval there might or might not be a considerable increase in private practice. If there was it would be possible for a large proportion of doctors to share in this increase. Those who did this would recoup themselves financially; those who did not want to be bothered with private patients would have only themselves to blame for any loss of income. Undoubtedly there would remain a group who practise in areas where private practice is, and would remain, non-existent; the income of these doctors might be reduced in the way Dr. Davies mentions, but, however many of these there might be, their number would not be anything like "every doctor."

So far from issuing a warning to every doctor, Dr. Davies was, wittingly or unwittingly, showing only a sectional interest. This, I am sure, is far removed from the thought of the Representative Body as a whole, which has passed eight resolutions in the last nine years, each by an enormous majority, in favour of this very important change. The R.B. represents the whole profession, and in this matter it has, I believe, not been concerned with the income of this or that group of doctors but has taken its action in the interest of certain patients whom it considers to have been misused.

I think there is shortly to be a meeting between Ministry of Health representatives and the B.M.A. on this subject. I am sure those who represent the Association will submerge partisan interests in their efforts to achieve the wish of the R.B. I am, etc.,

Eastbourne.

R. HALE-WHITE.

Psychological Medicine Group

SIR,—Two sets of figures which you have published recently bring out very forcibly the point made by Drs. A. Harris, J. G. Howells, J. T. Hutchinson, and C. Tellow in their letter which appeared in the *Supplement* of August 2 (p. 112). In the *Supplement* of August 23 (p. 125) you give the membership of the Psychological Medicine Group as 318 and in the *Supplement* of September 13 (p. 139) the numbers holding posts as consultants in mental health in the National Health Service as 687, with 139 senior registrars. With the S.H.M.O.s and the doctors in university posts the number of psychiatrists sufficiently senior to be eligible for membership of the Group is almost certainly well over a thousand, so that the actual membership of the Group is only about a quarter of the potential membership. When one considers what other bodies representing special points of view have achieved—for example, the Medical Superintendents' Society with a membership of 250 out of a possible 400, as reported in their evidence to the Royal Commission on Doctors' and Dentists' Remuneration in the *Supplement* of July 12 (p. 30)—it is obvious that the lack of interest in political matters among psychiatrists is quite remarkable.

I sincerely hope that psychiatrists will bestir themselves to join the Group, take an interest in its proceedings, and use it as a forum for discussion of their views and difficulties. Such a forum is badly needed at the present time.—I am, etc.,

Taunton.

M. F. BETHELL.

Reorganization of General Practice

SIR,—Mr. D. G. Wilson Clyne's letter (*Supplement*, September 6, p. 136) realizes that divisions should not occur in the medical profession, and indicates a bridging from the hospital side. It could also be bridged from the G.P. side. The present organization of the so-called health service in relation to the enemy disease, physical and mental, is parallel to that of the armed Forces before the war and before the realization of the value of combined operations. We have the absurdity of at least three individual services—public health, physical only; hospital; and general practice. The mental public health is largely ignored, apart from the psychiatric and other Maginot lines. The one and only bar to the elimination of artificial divisions is the ostrich-like attitude of the B.M.A. and the bulk of the profession. Regardless of the fact that it is in a salaried service, with no advantages and all its disadvantages, the profession chooses to pretend it is not. Tactfully, he does not mention it, but inevitably I believe Mr. Clyne's plan leads to salaries supplanting the sacred pool; in which case few will share his views—less than 10% probably.

In the same number of the *Supplement*, for those whose heads are above the sand, Dr. Johs. Frandsen (p. 134) also writes of the family doctor and the hospital.—I am, etc.,

Rochdale.

L. MCASKIE.

Altruism in the Young G.P.

SIR,—“An assistant with view to partnership in a Midland housing estate—full list for second doctor within five years.” Several years ago few doctors would have spurned such an opportunity. Yet recently such an advertisement produced only six inquiries from one medical journal and one inquiry from a paper. Five of these were considered. Two dropped out before the interview, and the remaining three in turn declined the appointment after interview, having prospects elsewhere (a country practice for one, and practices in the south for the other two). To me, it would appear that the ideal of practising among the needy has vanished.—I am, etc.,

Birmingham, 34.

D. S. CRANSTON.

Professional Unity

SIR,—The refusal of the Government to allow us access to the courts is surely the final proof that we can expect no justice until we can negotiate from strength. Having been refused negotiation, arbitration, and now law, can we possibly regard the Royal Commission as anything but a time-occupying manoeuvre?

No other body of employees has been treated in this manner for many, many years, and to submit meekly yet again is to yield more power to our overlords and accept the will of dictatorship. This is no idle phrase. Since the lodging of our claim 2½ years ago two steps only have been taken: the setting up of the Commission, and the 5% increase. Both of these decisions were entirely dictatorial; the profession was not consulted, the merits of the case not considered, and past promises disregarded. We acquiesced, and the power of the Government over us grew with each submission, so that when we claimed that last bastion of democracy, a court of law, that too was denied us.

Where do we go from here? One thing is certain—we divided we fall. Yet so divided have we been that our leaders feel unable to take any major step without special conferences, referendums, etc., wasteful in time and money, and giving ample warning of our intentions. But if our leaders could be assured of our support, could have our

unqualified pledge to take such action as they might recommend, then indeed they could negotiate as equals. In the end we must choose: either we trust those we elected to lead our erstwhile great profession or we abandon ourselves and all who come after us to the mercies of the politicians.

Will our leaders ask for such a pledge? Should they do so I believe the response would be overwhelming, and, given that, they assuredly have the ability to restore justice and fair dealing, and we have never looked for more.—I am, etc.,

Northampton.

J. LEAHY TAYLOR.

H.M. Forces

Lieutenant-Colonel R. I. Mitchell, M.B.E., R.A.M.C., has been appointed O.B.E. (Military Division) in recognition of distinguished service in Malaya for the period January 1 to June 30, 1958.

Captain J. S. Withey, R.A.M.C., has been mentioned in recognition of gallant and distinguished services in Malaya for the period January 1 to June 30, 1958.

Colonel C. M. Marsden, Staff, late R.A.M.C., has been appointed C.B.E. (Military Division) in recognition of distinguished service in Cyprus for the period January 1 to June 30, 1958.

The Army Emergency Reserve Decoration has been conferred upon Major J. A. Ward, R.A.M.C.

A *Supplement* to the *London Gazette* has announced the following awards:

First Clasp to the Territorial Efficiency Decoration.—Colonel H. K. Meller, M.B.E., T.D., and Major R. H. Moore, R.A.M.C.

Territorial Efficiency Decoration.—Major R. H. Moore and Captain (Honorary Major) D. M. Cathie (now T.A.R.O.), R.A.M.C.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel W. H. D. Patterson, T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., retaining the rank of Colonel.

Major (Honorary Lieutenant-Colonel) E. A. R. Berkley, T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., retaining the honorary rank of Lieutenant-Colonel.

Captain (Honorary Major) T. H. Hobbes, having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., retaining the honorary rank of Major.

Captain (Honorary Major) E. M. K. Jellicoe has ceased to belong to the T.A.R.O., retaining the honorary rank of Major.

ROYAL AIR FORCE

Air Commodore G. P. O'Connell has retired.

Group Captain D. J. Sheehan has retired.

Wing Commanders H. C. Thomas and S. Paul have retired.

Squadron Leader R. C. Rylance to be Wing Commander.

Flight Lieutenants P. Mestitz, F. M. Low, B. G. Dooley, R. M. A. McClelland, J. H. Dines, H. G. Pledger, P. D. Arnold, J. M. Titmas, C. M. Stevenson, and N. R. Sales have been transferred to the Reserve, retaining the rank of Squadron Leader.

Flight Lieutenant J. S. Cardwell to be Squadron Leader.

P. H. Drake to be Squadron Leader.

ROYAL AIR FORCE RESERVE OF OFFICERS

Squadron Leader J. M. Clark has relinquished his commission, retaining his rank.

Flight Lieutenant D. J. E. Cheshire to be Squadron Leader.

ROYAL AIR FORCE VOLUNTEER RESERVE

Squadron Leaders E. B. Davies, J. C. Davidson, J. Sutcliffe, and D. M. Wallace, O.B.E., have relinquished their commissions, retaining the rank of Wing Commander.

Squadron Leaders I. S. Buchanan, C. H. George, P. A. Gimson, B. S. Kent, D. S. Pattison, W. M. Ritchie, and A. G. Turner have relinquished their commissions, retaining their rank.

Flight Lieutenant R. J. Rutherford has relinquished his commission, retaining the rank of Wing Commander.

Flight Lieutenants G. Clayton, A. E. A. Cordin, J. A. Ward, H. Cantor, A. L. Collins, A. Everard, E. G. Fox, R. G. Griffiths, F. J. Hallinan, M.B.E., T. H. Lawton, A. F. Pearson, T. C. Corson, W. E. Coutts, A. C. Smerdon, N. B. Atkin, J. A. Bailey, P. S. Cheshire, P. J. Connolly, and B. J. O. Winfield, A.F.C., have relinquished their commissions, retaining the rank of Squadron Leader.

Association Notices

Diary of Central Meetings

OCTOBER

14	Tues.	Estates Committee, 2 p.m.
15	Wed.	Central Ethical Committee, 12 noon.
16	Thurs.	G.M.S. Committee, 10.30 a.m.
17	Fri.	Radiologists Group Committee, 2 p.m.
22	Wed.	Journal Committee, 2 p.m.
23	Thurs.	Financial Advisory Committee, 11 a.m.
23	Thurs.	Organization Committee, 11 a.m.
23	Thurs.	Office Committee, 1 p.m.
23	Thurs.	Arrangements Committee (Edinburgh, 1959), 2 p.m.
23	Thurs.	Psychological Medicine Group Committee, 2 p.m.
23	Thurs.	Catering Committee, 3.30 p.m.
24	Fri.	Compensation and Superannuation Committee, 2 p.m.
24	Fri.	International Relations Committee, 2 p.m.
28	Tues.	Staff Side, General Whitley Council (at 14, Russell Square, London, W.C.), 10.30 a.m.
28	Tues.	Full General Whitley Council (at 14, Russell Square, London, W.C.), 2 p.m.
30	Thurs.	Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
31	Fri.	Public Health Committee, 2 p.m.

NOVEMBER

5	Wed.	Committee on Professional Co-ordination, 2 p.m.
5	Wed.	Joint Committee of the B.M.A. and the Magistrates' Association, 2 p.m.
5	Wed.	Welsh Committee (at George Hotel, Shrewsbury), 2.15 p.m.
12	Wed.	Council, 2 p.m.
19	Wed.	Public Relations Committee, 2 p.m.
20	Thurs.	G.M.S. Committee, 10.30 a.m.

Branch and Division Meetings to be Held

ABERYSTWYTH DIVISION.—At Bronpadarn, Llanbadarn, Saturday, October 18, 8 p.m., films: (1) "Cancer of the Stomach"; (2) "Some Aspects of Accessible Cancer—Cervix and Uterus."

BLACKBURN DIVISION.—At Moorcock Inn, Waddington, Thursday, October 16, 8 p.m., annual dinner dance.

COVENTRY DIVISION.—At Keresley Parish Church, Sunday, October 19, 6.30 p.m., annual church service. It will be Evensong, conducted by the Reverend Edward J. Bastin.

CROYDON DIVISION.—At 45, Wellesley Road, Croydon, Tuesday, October 14, 8.30 p.m., general meeting. Films and lecture by Dr. Michael Wood: "Recent Advances in Radiology."

DEWSBURY DIVISION.—At Batley Hospital, Friday, October 17, 8.30 p.m., clinical meeting.

EAST NORFOLK DIVISION.—At 63, Thorpe Road, Norwich, Wednesday, October 15, 7.30 p.m., annual general meeting.

ENFIELD AND POTTERS BAR DIVISION.—At Nurses' Recreation Room, Chase Farm Hospital, The Ridgeway, Enfield, Thursday, October 16, 8.30 p.m., lecture by Dr. G. Melton: "Diabetes in General Practice."

ESSEX BRANCH.—At Officers' Club, Colchester, Saturday, October 18, 3.30 p.m., annual general meeting.

HALIFAX DIVISION.—At Old Cock Hotel, Wednesday, October 15, 8 for 8.30 p.m., annual dinner.

HENDON DIVISION.—At Hendon Hall Hotel, Ashley Lane, N.W., Tuesday, October 14, 8.45 p.m., Dr. Letitia Fairfield: "The Case of Madam Heinheil."

KINGSTON-ON-THAMES DIVISION.—At Kingston Hospital, Tuesday, October 14, 7.45 p.m., clinical meeting and general discussion.

LAMBETH AND SOUTHWARK DIVISION.—At Antenatal Clinic, Lambeth Hospital, Sunday, October 19, 11 a.m., clinical meeting.

LEIGH DIVISION.—At Waterfield's Restaurant, Leigh Road, Leigh, Friday, October 17, 7.30 for 8 p.m., annual dinner. Male guests are invited.

LEWISHAM DIVISION.—At Lewisham Hospital, Friday, October 17, 8.30 p.m., B.M.A. Lecture by Mr. Norman Cook (Curator of the Guildhall Museum): "Unearthing London." All medical practitioners in Greenwich and Deptford, Lewisham, and Woolwich Divisional areas are invited, together with wives and friends.

LIVERPOOL DIVISION.—At Exchange Hotel, Wednesday, October 15, 8.30 p.m., annual general meeting. Short address by Mr. C. C. Stevens, LL.B.: "Common Law Problems of the Medical Practitioner."

NORTH-EAST ESSEX DIVISION.—At Out-patient Department, Essex County Hospital, Tuesday, October 14, 8 for 8.30 p.m., clinical meeting.

NORTH OF ENGLAND BRANCH.—At Royal Victoria Infirmary, Newcastle upon Tyne, Thursday, October 16, (1) 7.15 p.m., clinical demonstration in Out-patient Department and demonstration by Department of Dermatology. (2) At Medical School, 8.30 p.m., address by Dr. J. D. Allan Gray: "Rational Use of Antibiotics."

RICHMOND DIVISION.—At Reception Room, Watney's Brewery, Mortlake Green, S.W., Friday, October 17, 9 p.m., talk by Dr. D. Stark Murray about his recent journey to Russia.

ROCHDALE DIVISION.—At Nurses' Lecture Theatre, Birch Hill Hospital, Monday, October 13, 8.30 p.m., clinical meeting. Dr. A. W. Frankland: "Allergic Diseases of the Chest."

SCARBOROUGH DIVISION.—At Board Room, Scarborough Hospital, Thursday, October 16, 8.30 p.m., meeting. Lecture by Mr. J. E. Wilson: "Blood in the Sputum of the Adult."

SOUTHAMPTON DIVISION.—At Conference Room, Civic Centre, Southampton, Wednesday, October 15, 8.30 p.m., ladies' night. Talk by Mr. and Mrs. Hiscock: "Their Trip Around the World in Wanderer 3." A social meeting will follow.

SOUTH-WEST ESSEX DIVISION.—At Board Room, Langthorne Hospital, Wednesday, October 15, 8.30 p.m., lecture by Mr. P. D. Trevor-Roper: "The Influence of Eye Disease in Pictorial Art." Wives of members and guests are invited.

STRATFORD DIVISION.—At Board Room, Queen Mary's Hospital, Stratford, Tuesday, October 14, 8.45 p.m., annual meeting.

SUNDERLAND DIVISION.—At Orthopaedic and Accident Hospital, Sunderland, Friday, October 17, 8 p.m., clinical evening.

SWANSEA DIVISION.—At St. Andrew's Church, St. Helen's Road, Swansea, Sunday, October 19, 11 a.m., St. Luke's Day Service.

Meetings of Branches and Divisions

CLEVELAND AND MIDDLESBROUGH DIVISION

The following officers have been elected:

Chairman.—Mr. J. C. Clark.

Vice-chairman.—Dr. W. P. Dunn.

Honorary Secretary and Treasurer.—Dr. J. N. Stirling.

DEWSBURY DIVISION

The following officers have been elected:

Chairman.—Mr. P. H. Merlin.

Vice-chairman.—Dr. J. L. Sharp.

Honorary Secretary.—Dr. G. F. Green.

EDINBURGH AND S.E. SCOTLAND BRANCH

The following officers have been elected:

President.—Dr. E. A. Cormack.

President-elect.—Dr. J. C. G. Mercer.

Vice-presidents.—Dr. R. T. Thin and Dr. B. C. Hamilton.

Honorary Secretary.—Dr. W. N. Darling.

Honorary Treasurer.—Dr. J. Riddell.

GLASGOW AND WEST OF SCOTLAND BRANCH

The annual general meeting was held on July 4 in the Glasgow Regional Office. The following officers were elected:

President.—Dr. G. M. Currie.

President-elect.—Dr. J. A. C. Guy.

Honorary Secretary.—Dr. W. W. Fulton.

Honorary Treasurer.—Dr. A. R. Miller.

GRIMSBY DIVISION

The following officers have been elected:

Chairman.—Dr. E. A. Robertson.

Vice-chairman.—Dr. J. Lanny.

Honorary Secretary and Treasurer.—Dr. F. M. MacDonagh.

LAMBETH AND SOUTHWARK DIVISION

The following officers have been elected:

Chairman.—Dr. W. K. Fargett.

Vice-chairman.—Dr. F. Summers.

Honorary Secretary and Treasurer.—Dr. S. Brest.

LEEWARD ISLANDS BRANCH

The annual general meeting was held in St. Johns, Antigua, from March 11 to 13. The following officers were elected:

President.—Dr. C. E. S. Bailey.

Vice-president.—Dr. B. Ross.

Honorary Secretary.—Dr. A. R. Walwyn.

Honorary Assistant Secretary.—Dr. Margaret O. Garra.

Honorary Assistant Secretary for St. Kitts.—Dr. G. D. McLean.

LEICESTERSHIRE AND RUTLAND BRANCH

The following officers have been elected:

President.—Mr. E. R. Frizelle.

President-elect.—Dr. L. Reuviv.

Vice-president.—Dr. G. Waring-Taylor.

Honorary Secretary.—Dr. G. L. Ward.

NORTH LANCASHIRE AND WESTMORLAND BRANCH

The annual meeting was held on May 29 at Samlesbury Hall, Blackburn, and the following officers were elected:

President.—Dr. H. Southworth.

Vice-presidents.—Mr. D. K. Lennox and Dr. Y. J. Burke.

Honorary Secretary and Treasurer.—Dr. J. Wilkie.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

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OPHTHALMIC GROUP COMMITTEE

MINISTRY STRONGLY CRITICIZED

"We have got nowhere after 10 years." This was the verdict at the Ophthalmic Group Committee when it heard the attitude taken by the Ministry of Health officials at a meeting to discuss the B.M.A.'s report on the future of the ophthalmic services—a report which had the support of the Faculty of Ophthalmologists. Also discussed at the meeting of the Committee, held at B.M.A. House on October 10, was the provision of eyes for corneal grafting and fees for school ophthalmic work. It was pointed out that the present Education Act provided for treatment, and therefore clinics for schoolchildren could not be regarded as merely refractive.

Mr. O. GAYER MORGAN was re-elected chairman of the Committee. He welcomed Mr. W. E. Heath as a new member. Mr. F. O. Walker, whom Mr. Heath replaced on the Committee, was thanked for his many years' service. The Committee decided to send a letter to Mr. R. Ramsay Garden wishing him a speedy recovery from his illness. Dr. W. Hedgcock, future deputy secretary of the Association, was welcomed as the new secretary of the Committee. Eighty-two new members were elected to the group.

Future of Ophthalmic Services

Following two years of discussions the Committee had produced, early in 1958, a report on the future of the ophthalmic services. At a recent meeting between a deputation from the Ophthalmic Group Committee and officials of the Ministry of Health, the recommendations in the report were discussed. A report on these discussions was given to the Committee.

On the matter of qualifications a point was gained. The deputation had given two examples of applicants who, though otherwise well qualified for work in the supplementary ophthalmic service, had not served six months in a resident ophthalmic appointment or equivalent whole-time non-resident appointment and would find it difficult now to do so—applicants in general practice and those who had been distinguished ophthalmic surgeons abroad. The Ministry had agreed to refer the recommendation for more detailed discussions between the Ministry and the Ophthalmic Qualifications Committee.

The Ministry had stated that it was concerned about the waiting-time for in-patient treatment. Difficulties in some areas, particularly in the north-west (Liverpool and Manchester), seemed to be caused by too much centralization. If members knew of areas where there was particular difficulty, the Ministry would be glad to hear of them.

The principle of employing opticians in the hospital eye service—endorsed in the report—had not been questioned

by the Ministry, but the difficulty, it had thought, was to get them to work in hospital. The CHAIRMAN thought there might be a different attitude among opticians to working in hospital after registration under the Opticians Act.

Staffing Difficulties

The B.M.A. report had referred to the "undoubted advantages" of employing more general practitioners in appropriate posts in hospital eye departments. It had further suggested that, as a condition of entry to the central professional list, practitioners other than retired consultants should be required to give an undertaking to do part-time (paid) hospital work. The deputation had pointed out that there were some ophthalmic medical practitioners who were content to restrict their work to the supplementary ophthalmic service even though hospital ophthalmic departments locally were urgently in need of assistance. A Ministry representative had said that, although it was right to try to secure assistance for ophthalmic departments, it could be done only by persuasion in some way through the profession. He had thought the Committee's proposal would not be acceptable to the profession, as it would be regarded as a form of direction. He had said he would approach regional hospital boards through senior administrative medical officers to encourage them to make use of suitable general practitioners as clinical assistants. He had referred to the difficulty of filling registrar vacancies, and said this would be looked at by the working party on hospital medical staffing structure.

The deputation had stated that too few doctors were taking up ophthalmology to-day. Before the National Health Service a considerable number of practitioners had had an interesting life working part-time in ophthalmology, but fewer and fewer were going in for this type of practice and something should be done to make this branch of ophthalmology more attractive.

Prescribing Drugs

Recommendations that ophthalmic medical practitioners should have the right to advise general practitioners on diagnosis and make suggestions for the disposal of cases, and to prescribe cycloplegic drugs for the purpose of examination, had brought a reply from the Ministry that there were no powers under the Act and that there was very little chance of getting the Act amended. The only functions laid down in the National Health Service Act for the supplementary ophthalmic service were the testing of sight and the prescription and supply of spectacles, it had been pointed out, and also the only section in the Act which dealt with dispensing was restricted to dispensing for general medical services. Thus an ophthalmic medical practitioner could prescribe only if he was a general practitioner, and

then only as a general practitioner. Would it be in order, the Ministry had been asked, for the practitioner to write a prescription and for the patient to pay, though not under the National Health Service? The Ministry representatives' reply had been that it might well constitute a breach of the terms of service. The Ministry spokesman had agreed that it was an advantage that patients, particularly children, should be able to go to an ophthalmic medical practitioner for refraction.

O.S.C. 1's for Every Sight Test

It had been recommended in the report that an O.S.C. 1 should be required for every sight test. It would enable general practitioners to encourage medical eye examinations in children up to 15 years of age and persons over 50, "though it is appreciated that considerable propaganda may have to be used to achieve this aim."

The Ministry spokesman had appreciated that the object was to reduce the incidence of blindness. He had pointed out, however, that an O.S.C. 1 form for every sight test would involve some 3½ million visits annually to doctors, and he could not see that there was much chance of this being accepted. Though he had felt the medical eye examination for children and persons over 50 was right in principle, how far it would achieve the desired results, and how far it would be acceptable to the public was another matter. Opticians would certainly not be in favour of it. He had also been very doubtful whether it would be practicable because of the limited number of ophthalmic medical practitioners available.

Of the Ministry's claim that "there was not much chance of this being accepted," Mr. E. G. MACKIE pointed out that the Representative Body, the Conference of Local Medical Committees, and the General Medical Services Committee had approved this. Mr. V. PURVIS, however, warned of the reaction of patients, who objected to wasting time waiting for an O.S.C. 1. Mr. BLACK thought they would all opt for it if they realized there was a risk of blindness.

Side-tracking the General Practitioner

Dr. D. P. STEVENSON, Secretary-Elect of the B.M.A., said the view taken by the General Medical Services Committee was that it would take exception if a member of the public could go straight to a consultant, side-tracking the general practitioner, and it saw no reason for an exception in this case. The Committee had had three attempts to secure this and it was going to continue in its attempts.

The B.M.A. report had recommended that although, ideally, the whole range of ophthalmic work for schoolchildren should be conducted solely by ophthalmologists under the hospital service, when this was not practicable arrangements should be made to ensure that refraction was at least in the personal charge of ophthalmologists, and this policy should be rigidly enforced.

The official reply had been that this had been the policy of the Ministry of Education for many years, and was also the policy of the Ministry of Health in so far as school ophthalmic work was being done through the hospital service. "It was understood that most regional hospital boards had now taken over this work." The deputation had asked that the Ministry should ascertain the extent.

The Ministry had been surprised by the result of an inquiry it had made, the CHAIRMAN commented. It showed that the big cities of the north had not taken over the school clinics, except for Leeds, where the school clinics had been transferred.

Shortage of Ophthalmic Nurses

Mr. NIGEL CRIDLAND, noting that the Ministry had been concerned about the waiting-time for in-patient treatment, said: "There is the greatest difficulty in getting ophthalmic-trained nurses, and I gather the number of entrants for the ophthalmic nursing diploma are dropping." Some years ago the Ophthalmic Nursing Board met with a refusal by the Ministry to pay extra to nurses holding the diploma. He was sure this was the reason for the shortage of nurses, and

why many who had the diploma reverted to general nursing. The shortage of ophthalmic nurses was becoming very serious, concluded Mr. CRIDLAND. He was supported by Mr. H. V. INGRAM.

Mr. MACKIE raised a further point that there was a present endeavour to put all children into paediatric departments. He recognized that there was a case for this where the child was sick, but where a child was well and had been admitted for a congenital cataract it ought to have ophthalmic nursing. He favoured a specialist ophthalmic unit of 20-25 beds, with male, female, and children's sections. The British Paediatric Association, he reminded the Committee, had laid claim to all children in July, 1957. At Dr. PURVIS's suggestion, it was decided to put this matter on the next agenda.

The Future

Of the meeting with Ministry officials to discuss the report on the future of the ophthalmic services, Dr. D. P. STEVENSON said: "They listened to what we had to say—and what are they prepared to do?" If the Committee just received the report of the meeting at the Ministry nothing further would happen. If it wished to press its views it would have to ask to see the Minister. "No one has ever seen a Minister of Health on the question of the eye services of this country," added Dr. STEVENSON. Dr. TENNENT, a member of the deputation to the Ministry, supported what Dr. STEVENSON had said.

Mr. L. H. SAVIN, president of the Faculty of Ophthalmologists and also a member of the deputation, said the Faculty was preparing another document which would be sent to the Committee for comment. It would be necessary to bombard the Minister again.

The Committee, on the proposition of Dr. TENNENT, passed a resolution expressing itself very dissatisfied with the Ministry's replies and indicating that it was the intention to bring the matter again to the Ministry's attention.

Fees for School Ophthalmic Work

The differential in fees paid for ophthalmic school work by local authorities and regional boards was again raised in a letter from Dr. TENNENT. In the whole of Scotland school ophthalmic work is the responsibility of regional boards, as it is in parts of England. In some cases a doctor able and willing to do the work might not have a hospital appointment, and in that case he is paid the rate for general-practitioner sessions—£3 17s. 3d., including the recent increase. In those areas where the local government authority was responsible the fee is 6 gns. per session (no recent increase). "It is generally admitted that school eye work should be under the hospital boards, but in this case it means a financial sacrifice on the part of the oculist," wrote Dr. Tennent.

Mr. SAVIN suggested a "no detriment" clause. It was agreed to take the matter up with the Ministry.

Also on the subject of fees for school clinic work, Mr. MACKIE drew attention to the fact that under the present Education Act there was a duty not merely to examine but to treat. Mr. CRIDLAND decried a statement that in a considerable number of cases where children returned for routine recheck all that needed to be done was for the doctor to satisfy himself that the present spectacles were satisfactory "without the necessity of doing a complete refraction."

The CHAIRMAN referred to the fact that the question of N.O.T.B. clinics in industrial premises was to be discussed with the Chairmen of the Occupational Health, Central Ethical, and Ophthalmic Group Committees and the executive of the Central Consultants and Specialists Committee. Dr. TENNENT said there was another point of view to the decision of Council in 1950 that existing facilities, ophthalmic and other, should be regarded as temporary and should not be extended, and that it was not in the public interest for hospital specialist services to be established in factories as part of the permanent provision of the National Health Service. "I think there is something to be said for

facilities in factories," he continued. "Under the old National Eye Service a good job of work was done under this service."

Dr. MACKIE pointed out that the objection was to clinics being inside a particular factory.

Corneal Grafting

A letter from the secretary of the medical committee, Manchester Royal Eye Hospital, referred to "considerable difficulty" in obtaining material for corneal grafting. "Various general hospitals have been approached, and one has requested that a suitable poster be designed for display in the hospital in the hope that this will produce more donors. My Committee has asked me to write to you to ask whether such a request has been made before and if you have such a poster. If not, do you think this would be a feasible suggestion?"

Mr. SAVIN said the matter had been discussed at the faculty. It felt that a poster would be macabre. Mr. A. MCKIE REID said that the Corneal Grafting Act was a simple one, but the Ministry of Health had sent out a circular which said it was desirable to obtain the consent of the relatives.

Mr. JOHN PRINGLE, Public Relations Officer to the Association, said his department received requests from the public at the rate of 500 a year for factual information on the procedure on leaving a body for medical research, and they had prepared a leaflet which had been agreed with the inspector of anatomy. This leaflet contained a section on corneal grafting, which he read:

Under the terms of the Corneal Grafting Act, 1952, anyone who wishes his eyes to be used for corneal grafting purposes after his death may give a written notice of his wish or a spoken expression in the presence of two witnesses, to his relatives or the people with whom he lives or (if he is in hospital) to the hospital authorities. He should also inform his doctor.

If this has been done, the person lawfully in possession of the body after death (which will include the hospital authorities if death has occurred in hospital) may authorize the removal of the eyes. As it is essential for the eyes to be removed as soon as possible after death, it should be appreciated that practical difficulties may occur in isolated or country areas which may make it impossible to carry out the wishes of the deceased. The hospital authorities in any area will be able to state whether facilities for corneal graft surgery exist in the district.

Sir TUDOR THOMAS said that he had a long list of future donors to the eye bank at Cardiff. This, however, did not solve the immediate problem. When a person died the relatives were usually on the spot or waiting, and it was often extremely tactless to press the question of removal of the eyes. But there were others who would respond to a request. He thought that the public were on the whole well informed on this matter in broad outline. "I think the Ministry was right in clamping down a little on this Act which gave us enormous powers," he said. "It was a human touch." In regard to the list of future donors, he had drafted some very simple instructions. The individuals returned a postcard, which he filed.

Mr. A. G. CROSS said that at St. Mary's Hospital, Paddington, they got the nursing sisters to make the approach to relatives. They also had to ask for permission for necropsies, and the sisters did the jobs at the same time. The sisters knew the relatives.

The feeling of the Committee was that arrangements for securing eyes for corneal grafting were best made locally and that a poster was not favoured.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham.
Non-County Borough Councils.—Crewe.

OCCUPATIONAL HEALTH COMMITTEE

Dr. H. ALEXANDER was re-elected Chairman of the Committee at its first meeting of the session on October 8. He welcomed the new members—Dr. H. Southworth (Blackburn), Dr. R. L. Luffingham (Hull), Dr. J. Stevenson Logan (Southend-on-Sea), and Dr. H. G. H. Richards (Winchester). It was agreed that letters of thanks should be sent to the retiring members, Dr. I. G. Davies, Dr. Peter Edwards, and Dr. D. L. Gullick. It was reported that Dr. Gullick, a member of the Committee since 1952, had been appointed an Assistant Secretary of the Association and, under a re-assignment of Assistant Secretaries to Committees, would now become Secretary of the Occupational Health Committee.

The CHAIRMAN paid tribute to Dr. S. J. Hadfield, assistant secretary, who had been secretary of the Committee, saying that his ceasing to be its secretary would be a source of regret to all members. Dr. J. A. L. VAUGHAN JONES associated himself with this.

The Committee recorded its appreciation of Dr. Hadfield's services.

Plight of the Young Handicapped

When the Committee considered the Representative Body's resolution stressing the urgent need for development of facilities available for the care and welfare of the aged chronic sick and young handicapped, Dr. H. G. H. RICHARDS said the latter seemed to be accepted completely by neither the local authorities nor the regional boards. They were not adequately treated by the welfare authorities. Dr. VAUGHAN JONES thought more could be done not only by the local authorities and hospitals but by the Ministries and by industry. The CHAIRMAN: "It is true that with these youngsters often a long time elapses between leaving school and their being placed in an occupation. That is very important psychologically."

Dr. J. STEVENSON LOGAN said that the North-east Metropolitan Regional Hospital Board had just completed and published a survey of young gravely handicapped and chronic sick. An appalling thing was there were too few specialized institutions who would study their proper treatment, and there were not the places to put them. The Shaftesbury Society had just opened a place for young adolescents in Dorset and there was some development of the El Alamein home. It took three years to put a boy with spina bifida into a place, and then he was found somewhere only through the Shaftesbury Society.

The CHAIRMAN referred to the problem of the aged. There were people who were supposedly "welfare" cases, in local authority homes, "who could not be more chronic sick if they tried." They were urgently in need of treatment.

The resolution was referred to the Committee's Planning Subcommittee and will be debated again.

First Aid in Factories

Another A.R.M. resolution considered that, "in the case of a factory where more than 50 persons were employed, the person in charge of the first-aid box or cupboard should hold a current certificate of first-aid issued by one of the recognized examining bodies for first-aid treatment (St. John Ambulance Association, British Red Cross Society, etc.)." Dr. M. E. M. HERFORD stressed that what it was desired to ensure was that the person in charge held a current certificate. "Even general practitioners and doctors in industrial medicine are urged to have refresher courses; it is only right that lay people should be asked for the same," he remarked.

I.L.O. and Occupational Health

The International Labour Office has drawn up proposals for the organization of occupational health services and sent a questionnaire on it to member governments. Dr. VAUGHAN JONES told the Committee that he had been

appointed chairman of the World Medical Association's Occupational Health Services Subcommittee. The secretary-general of the W.M.A. thought that, as a medical organization, it ought to submit comments before anything definite was determined by I.L.O. The American member of the W.M.A. Committee criticized the action of I.L.O., a lay body, saying this was a matter for the World Health Organization. Dr. Vaughan Jones, however, said he failed to see anything of the danger which the U.S. representative thought was inherent in I.L.O.'s action. I.L.O. was an old-established organization accepted by governments, employers, and employees. It was true that it had tended to become lay dominated, but, as chairman of the W.M.A. subcommittee, Dr. Vaughan Jones had had the utmost co-operation from I.L.O. The government replies to the questions on the organization of occupational health services were to be received by I.L.O. in January. Dr. Vaughan Jones said he was concerned with how the United Kingdom Government's reply would be prepared, having regard to the fact that there was no medical representation on the United Kingdom delegation when the matter was discussed at Geneva.

Dr. R. L. LUFFINGHAM pointed out that had it not been for the W.M.A. and Dr. Vaughan Jones's appointment, the Occupational Health Committee would not have known anything about a *fait accompli* by I.L.O. Dr. VAUGHAN JONES said that W.H.O. filled him with even more concern than I.L.O. Representation at I.L.O. was tripartite—representing governments, employers, and labour—but W.H.O. was concerned only with government representation. Dr. J. ROGAN thought the W.M.A. should urge that W.H.O. should change its constitution. The Committee agreed to reply to the questionnaire; to urge that W.H.O. be more representative of the non-governmental medical point of view; and to request medical representation on the United Kingdom delegation to I.L.O.

The Planning Subcommittee had considered the I.L.O.'s proposed conclusions on the organization of occupational health services and suggested a few amendments to them. "We talk quite a lot about health services for workers; we ignore management," was Dr. ROGAN's comment; he added that they were in need of medical services, too. The Committee agreed that the term "worker" should "include all those engaged in the organization."

New Salary Scales

Dr. ROGAN, reporting from the Committee's Remuneration Subcommittee, noted that the assimilation clause had been adopted by the A.R.M. (This states: "These salary ranges approved in 1957 supersede those previously in operation. It is expected that doctors of all grades already in employment will have their salaries raised to the point in the new range which corresponds with their length of service, as is the practice, for example, in the hospital service.") Said Dr. Rogan: "It leaves the employer with a clear obligation to assimilate."

Occupational Hygiene Laboratory Service

The principal item of business to be discussed by the Joint Committee of the B.M.A. and the T.U.C. the day after the Committee's meeting was the need for an occupational hygiene laboratory service, and the Committee had a short debate on this. (The B.M.A. had called for such a service in its memorandum on "The Future of Occupational Health Services" submitted to the Ministry of Labour and National Service in 1953.)

Dr. L. G. NORMAN said that there were a few arrangements by which one could get research done, but nowhere which would undertake routine investigations. What was needed was one laboratory on a proper scale to start with, and, if the scheme was as good as they thought, it would grow until there was one laboratory in each region. "Unless the people who run it are free from the dead hand of top-level civil service administration," warned Dr. LOGAN, "it will not give us what we need."

Morphine Administration

The Home Secretary had informed the Association that he would be greatly assisted in considering the representations of the Association that State-registered nurses in industry should be allowed to administer morphine if he could be furnished with any evidence of serious difficulties experienced in industry under the present arrangements, which officially precluded a nurse from giving morphine in the absence of a doctor. Dr. ROGAN said that in mines scheduled by the Ministry of Fuel and Power morphine could be administered by first-aiders.

The matter was referred to the Committee's Nursing Subcommittee, and it was decided to make further inquiries in which the Association of Industrial Medical Officers is to be asked to co-operate.

The Committee was informed of the conclusion, at a recent meeting of representatives of the Central Ethical, General Medical Services, Occupational Health, Tuberculosis and Diseases of the Chest Group, and Public Health Committees, that the findings of mass miniature radiography units should not be communicated direct to industrial medical officers (*Supplement*, October 11, p. 165).

Occupational Diseases

The Committee received a reply from the Industrial Injuries Advisory Council to its representations that tenosynovitis of the ankle should be included in the Prescribed Diseases Schedule. If the Association knew of any more conclusive evidence showing that certain ankle conditions were commonly caused by occupational factors, the letter stated, the Advisory Council would be glad to consider this at a subsequent review of diseases not prescribed. The letter added: "Before a disease can be prescribed under the Industrial Injuries Act it is necessary to show that individual cases of the diseases can normally be attributed to the nature of the employment with reasonable certainty."

The Ministry of Pensions and National Insurance regretted that an earlier promise given to the Association that an opportunity would be provided to comment on the draft of the new booklet, *Notes on the Diagnosis of Occupational Diseases*, had been overlooked. After consultation with the chairman of the Committee the Ministry was informed that, in the circumstances, the Association did not wish to make any immediate observations on the "Notes," but that the Association also greatly regretted that there had been no opportunity for it to comment on the draft.

Advisory Councils on Occupational Health

It was reported that "The Health of Married Women in Industry" had been chosen as the principal subject for the 1959 conference of Advisory Councils on Occupational Health. Advisory Councils had been invited to consider this subject during the coming session, and to submit, not later than the end of January, 1959, any motions for inclusion in the conference agenda.

"If it is a good idea to have Advisory Councils on Occupational Health," said Dr. ROGAN, "they really ought to be viable now. Yet only in a few areas do you get them set up." He noted the paucity of them in areas of heavy industry.

The CHAIRMAN agreed it was true that there were no councils in Glasgow, Liverpool, Birmingham, or Cardiff, but it was B.M.A. policy that they should be initiated by local B.M.A. Divisions. "Dr. Rogan is right," he said. "We have reached the stage when we ought to make a critical examination."

At Dr. LUFFINGHAM's suggestion it was decided that the assistant secretary should again circularize some Divisions, this time in selected industrial areas, about setting up Advisory Councils on Occupational Health.

There was support for a suggestion, originating from Dr. J. VALENTINE, who attended the 1958 Conference as an

observer from the Psychological Medicine Group Committee, that it would be advantageous if each Advisory Council could include in its membership, in addition to other medical representatives, a psychiatrist who would be able to advise on the mental health aspects of problems which came up for consideration.

INTERIM INCREASE DEPUTATION SEES MINISTER

At the request of the B.M.A. the Minister of Health received a small deputation to discuss the possibility of a further interim pay increase pending the report of the Royal Commission on Doctors' and Dentists' Remuneration. Following the discussion the Minister promised to consider what the deputation had said, and informed them that he would communicate with them within the next few weeks. The Association's deputation consisted of Dr. S. Wand (Chairman of Council), Mr. H. H. Langston (Chairman, Consultants and Specialists Committee), Dr. A. B. Davies (Chairman, General Medical Services Committee), and Dr. D. P. Stevenson, Deputy Secretary.

"Intransigent" Minister of Health

A resolution passed by the Lancashire County Local Medical Committee and supported, Dr. J. J. DEVLIN told the Committee, by other local medical committees in Group E (?), deplored "the intransigent attitude of the Minister of Health on the profession's claim—consideration of which was promised by his predecessor in 1957—for a further interim adjustment of remuneration pending completion of the Royal Commission's prolonged and extensive task." The resolution did not consider that the Minister had given proper and sufficient reason to account for his inability to agree to a further adjustment, and requested the General Medical Services Committee "to make strong representations to the Minister of Health for him to reconsider his attitude in this matter."

Dr. Devlin said that in the industrial north doctors saw engineers and everybody else getting additional money. They felt that the Minister's reasons for refusing a further interim adjustment were quite insufficient. As to his statement about the "state of the nation," Dr. Devlin referred to the Prime Minister's speech at Blackpool.

It was announced that a B.M.A. deputation was seeing the Minister of Health the next day, and the Committee unanimously supported the Lancashire Medical Committee's resolution.

The Scottish Case

Reporting on the reaction of the Scottish Council and the General Medical Services Subcommittee (Scotland) to the Secretary of State for Scotland's refusal to join with the Association in the presentation of a special case on the contractual validity of Spens to the Court of Session, Dr. W. M. KNOX said that the Government was obviously taking the attitude that the medical profession as a whole must accept the dictate of the Department of Health for Scotland and the Secretary of State, whatever these did, and Dr. KATE HARROWER described the decision as a high-level one. Dr. C. J. SWANSON pointed out that it was almost unprecedented to refuse even to examine a Special Case; it was customary to receive the Case first. "I think it is the grossest affront to the profession," he said. A section of the community had been refused access to the courts.

In the discussion which followed, English members of the G.M.S. Committee underlined the feelings of the profession on the fact that the Government, having issued a challenge to the profession to go to the courts, should back out when the challenge was taken up. It was decided to await the reply of the Secretary of State to the resolution of the Scottish Council (*Supplement*, October 18, p. 174) calling on him to reconsider his decision.

Dr. HARROWER reported the request of the Subcommittee that it should be called the General Medical Services Committee (Scotland), in the same way as there is a Central Consultants and Specialists Committee (Scotland) and a Public Health Committee (Scotland), emphasizing that it was a question of title and nothing else. Dr. HARROWER said the title had been selected to be in line with the practice of the other committees. Dr. A. TALBOT ROGERS recalled that he had proposed the change four years ago. The request was acceded to.

Statistics of Professional Earnings

The Board of Inland Revenue said they had often been asked for a breakdown of professional earnings. It was their practice not to disclose the earnings or profits of narrow groups of individuals without the consent of the group concerned, and this was what the Board now requested. They had in mind an analysis showing separately the professional earnings of five divisions, one of which would be "medicine (including dentistry)."

"What advantage would there be in this breakdown?" asked Dr. TALBOT ROGERS. "In all the divisions there is a very heterodox population. What value is there in saying, 'The average earnings are so and so,' when you have no idea what the average represents?"

GENERAL MEDICAL SERVICES COMMITTEE DISQUIET OVER SCOTTISH CASE

"Grossest affront to the profession" was how the refusal by the Secretary of State for Scotland, Mr. John MacLay, to allow the Association to test the contractual validity of Spens in the courts was described at a meeting of the General Medical Services Committee at B.M.A. House on October 16. At the same meeting general practitioners were urged to try to get more pregnant mothers to take polio-myelitis vaccinations; the response has been poor so far. There was disappointment at the sample of an expanding medical record card envelope which was sent by the Ministry of Health.

The CHAIRMAN, Dr. A. B. DAVIES, welcomed Dr. Walter Hedgcock, who, on becoming Deputy Secretary of the Association, will be the new secretary of the Committee.

It was reported that the Assistants and Young Practitioners Subcommittee had appointed Dr. F. G. Tomlins, an unestablished principal, as its chairman (*Supplement*, October 18, p. 172). Dr. DAVIES referred to the "long, patient and sterling service to the committee and to young members of the profession rendered by Dr. F. Gray in his capacity as chairman of the Subcommittee."

How the Central Pool is Calculated

As he had promised, the CHAIRMAN had prepared a memorandum explaining what the central pool is, how it originated, and how it is calculated and distributed. This seven-page document tracing the position from the National Health Insurance Act of 1912 was welcomed by members of the Committee. Some suggestions were made as to details of the treatment of the subject, and it was agreed that members should submit any comments to Dr. Davies. A revised document will be considered at the November meeting, when it will be decided what shall be done with it.

The Committee previously decided that, if evidence of hardship was forthcoming in any instance where a practitioner decided to change from quarterly to monthly payments, his case could be taken up on an *ad hoc* basis with the Board of Inland Revenue. The Board had agreed to consider such individual cases. A letter was received from a practitioner where the position arose that in one year he would have to pay tax on what was 14 months' income.

This case is to be taken up with the Board of Inland Revenue, with whom, if necessary, a further meeting is to be requested to discuss the situation. The CHAIRMAN asked if further examples were known.

The Committee were not in favour of the suggestion, but decided to await the decision of the British Dental Association, to whom their views will be conveyed.

Of the decision at a meeting of representatives of the Central Ethical, General Medical Services, Occupational Health, Tuberculosis and Diseases of the Chest Group, and Public Health Committees, that the findings of mass miniature radiography units should not be communicated direct to industrial medical officers (*Supplement*, October 11, p. 165), Dr. S. NOY SCOTT said the resolution stressed the importance throughout of doing everything via the general practitioner. The Committee endorsed the decision of that meeting.

Allocation Scheme "Conundrum"

Attention was drawn by the Ministry of Health to "a slightly awkward conundrum" arising out of the Allocation Scheme. It was that a patient could be left without treatment and without any knowledge of his reasonable rights if, when the executive council notified him that a doctor wished his name to be removed from his list, it did not at the same time inform him of the actual provisions contained in paragraph 7 (i) and (ii) on pp. 78-79 of the *Handbook for General Practitioners*.

It was stated that there was a case where a man had had a first certificate from his doctor and was told he need not attend any more and he was not receiving any treatment. A day or two later the man received notification that he was off the doctor's list but no indication that the doctor was responsible until another doctor had been allocated.

Dr. F. GRAY agreed there was no objection to the patient being informed of the allocation scheme, but he did not accept the statement by the Ministry: "We also believe that doctors would agree generally that a continuing incapacity for work, necessitating certification, normally implies that the patient is receiving treatment." It might, in some cases. If a doctor was only visiting a patient to give a certificate, that was not treatment.

The Committee approved a draft letter for clerks of executive councils which the Ministry proposed to send provided that words were added to make it clear that continuing incapacity for work did not always imply a need for treatment.

It also accepted a conference resolution, proposed by West Bromwich, that the Conference of Local Medical Committees would like to be consulted by the Local Government Boundary Commission, particularly in regard to the "special review areas" under the Local Government Act, 1958, so that it could give evidence of the effect of reorganization on the health services, and that there should be consultation with local medical committees in the "special review areas" before giving any evidence. The CHAIRMAN said that a meeting of representatives of the General Medical Services Committee, dentists, pharmacists, and other professions had conveyed their feelings of opposition to the Ministry.

Home Care of Seriously Ill Children

In August the Ministry of Health wrote that they were giving the question of the home care scheme for seriously ill children run by St. Mary's Hospital, London, "most careful consideration." This month, in reply to a further letter, the Ministry stated they could not go beyond what was said in the previous letter, although they were "fully seized of the need for coming to some firm arrangement in good time."

This "usual unsatisfactory reply" from the Ministry, said Dr. GRAY, was even worse than it appeared. The Ministry had done nothing for four years because St. Mary's had paid for the scheme out of their own funds. He had been informed that the county medical officer of health for London undertook that he would be prepared to help by arranging to take some of St. Mary's nurses on to the district nursing staff and seconding them to the hospital; in other words the L.C.C. would pay these nurses. The Ministry

had stated that they understood the proposition was that the nursing should be done by the district nurses. That was not what was suggested. It was what the Ministry had proposed and what had been rejected. They were nurses specially trained in the paediatric wards of St. Mary's.

The Committee agreed to support London over this matter. Dr. GRAY described the St. Mary's scheme for the home care of seriously ill children as a pilot one which was going to help everybody.

Hospital Management Committees

The way general practitioners are appointed to and receive advice of vacancies on hospital management committees came up in two items on the agenda.

Yorkshire (West Riding) Local Medical Committee were faced with the refusal of Sheffield Regional Hospital Board to add local medical committees to the list of organizations to be consulted every time a vacancy occurred in the medical membership of the hospital management committees, although they "might be prepared to consult with local medical committees" in cases where the vacancy was one that could, with advantage, be filled by a general practitioner. At the same time the Board had expressed the opinion that there was advantage in a general practitioner serving on each management committee.

Dr. G. D. W. ADAMSON, however, said that at one hospital for 10 years there had been no general practitioner. Dr. R. W. McCONNEL reported that in the Oxford region local medical committees and executive councils were consulted, and Dr. TALBOT ROGERS confirmed that this had been the position in his area for a very long time. The executive councils had taken it on themselves to suggest any lay member, whereas the local medical committees could look to the whole of their membership and indeed outside to get someone who was suitable. Dr. GRAY said that the arrangements for nomination described applied to all the Metropolitan regions. It was wrong that nominations of doctors should be made only by a body which was half lay. It was agreed to take the matter up with the Ministry.

The other hospital management committee matter concerned the action of Plymouth, South Devon, and East Cornwall General Hospital Management Committee in sending clinical advice to doctors over the signature of a member of the office staff. "It is the principle that we object to," Dr. NOY SCOTT told members. "It has been dealt with locally but not with very great success." A medical officer of health signed letters himself, and they would like all consultants to do the same thing.

The matter was referred to the Central Consultants and Specialists Committee.

Expanding Medical Record Envelopes

Samples of the limited supply of expanding envelopes for medical records which the Ministry has agreed, at the request of the representatives of the profession, should be made available to general practitioners were shown to the Committee. "Poor" was the verdict given on them. "I thought it was going to be something like a concertina," commented the CHAIRMAN. "I have a number of patients whose hospital reports, pathological reports, and other notes could not possibly go into this." The Ministry are to be informed accordingly.

Yorkshire (East Riding) Local Medical Committee were perturbed to learn that the American and Canadian poliomyelitis vaccines would continue to be supplied in 10-ml. or 9-ml. containers and that only about 40% of the English vaccine would be available in 1-ml. ampoules. The Committee were convinced that it would not be possible for practitioners in scattered rural practices, of which there were a number in the East Riding, to co-operate fully in the arrangements for vaccination unless they could be supplied with vaccine in 1-ml. ampoules. Dr. A. D. STOKER said that the fact that once the rubber cap had been pierced by the needle the ampoule had to be used up resulted in some instances in a wastage of 40%.

Another speaker explained that experts had said it would be unwise to use the vaccine after it had been opened, because poliomyelitis vaccines formed an exceptionally good medium for the growth of other bacilli. He pointed out that the American and Canadian supply had been an emergency one and the manufacturers had declined to put it up in other than 10-ml. ampoules. It was hoped to have enough British vaccine. The question of the 1-ml. ampoules is to be taken up with the Ministry of Health.

Expectant Mothers Not Taking Polio Vaccine

Dr. TALBOT ROGERS said that throughout the country, whereas the take-up of poliomyelitis vaccine had been very good in children, this had not been the case with expectant mothers, and in view of the severe complications if a pregnant mother contracted the disease there should be more propaganda. If every doctor impressed on his pregnant patients the desirability of having poliomyelitis vaccination, it would be in the interests of clinical medicine.

As usual proposals for inclusion of items on the list of appliances were considered. A consultant complained that paraplegics who had to empty their bowels by introducing suppositories or by digital removal of faeces had to travel some 60 or 70 miles to get a consultant's signature for finger-cots. The Ministry are to be approached on the matter.

The Committee also gave support for the inclusion of "carbonet" tulle, waterproof adhesive plaster, metatarsal pads, and polythene ring pessaries.

A question about payment of loadings on notional lists was raised in a letter. Dr. GRAY explained that before loading could be paid the partnership must be in existence and all the partners must be on the list. If a partnership started on July 8 they would not be entitled to loading that quarter.

Birmingham Local Medical Committee wanted the inclusion of copper sulphate (of a specific gravity of 1048) in the list of chemical reagents for testing for anaemia in pregnancy. Dr. F. E. GOULD described the test as well known and thoroughly accepted by haematologists. Dr. R. B. L. RIDGE, however, said that surely what they were agitating for was a laboratory investigation for all pregnant women. Dr. GOULD replied that it was hoped that initially the general practitioner would be able to obtain the haemoglobin estimation at the same time that he obtained blood for rhesus testing, to avoid repeated venepuncture and having to send the patient to hospital. Dr. B. BURNS suggested that this was as accurate as any haemoglobin test done in hospital.

It was decided to discuss with the Ministry the provision of copper sulphate as a reagent.

The Committee are to take no action on the Minister of Health's approving the temporary use of two wards at the Princess Louise Hospital for Children for maternity patients of St. Mary's Hospital.

General-practitioner Maternity Beds

A quarterly précis of General Medical Services Committee activities was advocated by Durham County Local Medical Committee, which also wanted the number of allocated general-practitioner and general-practitioner maternity beds per head of population in each local medical committee area or regional hospital board area published quarterly in the *Journal*, which would show whether there had been an increase or decrease on the preceding quarter.

Dr. TALBOT ROGERS declared that a quarterly report would be confusing and useless and would not tell them more than they can glean from the reports of our Committee meetings.

The CHAIRMAN said the Committee had been constantly pressing the Ministry for figures on general-practitioner beds and general-practitioner maternity beds, and had obtained something on a national basis.

At a previous meeting the Committee thought that the time was appropriate for a review of the reports of the Definition of Drugs Joint Subcommittee, in particular the

first report dealing with foods. Dr. TALBOT ROGERS reported that the Standing Advisory Committee in England agreed there was need for revision in respect of food and cosmetics, and suggested that the standing committee which dealt with drugs and which had four general-practitioner members should have this included in its remit.

The CHAIRMAN said that the Cohen Committee's proposals for a numerical tabulation of drugs were considered by drug houses and many general practitioners to imply a stigma. A report of the Standing Joint Committee, to be published in due course, would propose a new categorization using letters. "It underlines the complete freedom to prescribe provided we can justify it," said Dr. DAVIES.

Referendum on Trainee Scheme

Rochdale Local Medical Committee sees no reason to alter its opinion that the general-practitioner trainee scheme is "bad, is unfair in operation, and is wide open to abuse," the Committee was informed. The decision was reaffirmed at a long debate this month. But since the committee's decision in advising the executive council to discontinue operating the scheme in Rochdale appeared to have caused concern it was decided to seek the views of all local general practitioners. The G.M.S. Committee decided to await a further letter giving the result of this referendum.

The Committee, following a request from the Private Practice Committee, is recommending to Council that the reel film of the Birmingham Annual Meeting, sponsored by the Private Practice Committee to appoint one direct representative. The G.M.S. Committee is represented on the Private Practice Committee.

FILM COMMITTEE

Dr. R. PROSPER LISTON, re-elected chairman of the Film Committee at its first meeting of the session, reported that it had not yet proved possible to obtain the necessary financial backing to make the proposed film on rehabilitation. A film on rehabilitation, made for the Ministry of Labour and National Service, was viewed before the meeting, and later the Committee had a preview of a news-reel film of the Birmingham Annual Meeting, sponsored by William R. Warner and Company.

Dr. S. J. HADFIELD, Assistant Secretary, reported that a short programme of films had been sent for showing in Central and West African Branches and that an effort was being made to extend this service, in the first place to the East African Branches. Meanwhile a further programme is being prepared for Central and West African Branches.

New Films

The following films have been added to the Film Library: *The Action of the Human Mitral and Aortic Valves*; *The Foramen Ovale in Calf and Foal*; *Lymphangiography: Bits and Pieces* (Gynaecological); *First-aid for Aircrew*; *Treatment of Paraplegia due to Fracture Dislocation* (1st prize, B.M.A. Film Competition, 1957); *Rehabilitation of a Double Leg Amputee*; *Vertebral Angiography* (presented by Dr. Eric Batley); *Cardiac Arrest* (presented by Imperial Chemical Industries); and *One Man's Challenge* (presented by Lloyd Hamol Ltd.). It was agreed to purchase copies of the following films: *The Treatment of Sports Injuries*; *Nan—The Recovery of a Girl from Severe Head Injury*; and *Cine-Radiography of the Intestine*.

It was reported that 33 entries had been received for the 1958 Film Competition, and that arrangements for judging were in hand.

Dangerous Drugs Act: Withdrawal of Authority

The Home Office announces that Dr. Walter Allan Todd (London, S.W.) is no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations, 1953, apply.

NATIONAL INSURANCE DEFENCE TRUST TAX APPEALS

There was a meeting of the trustees of the National Insurance Defence Trust at B.M.A. House on October 16 to consider a letter from Hull Local Medical Committee criticizing the reported gift of £750 and the offer of a further £2,000 towards the expenditure involved in preparing the test case in connexion with the assessment of the income of part-time consultants under Schedule E (*Supplement*, October 4, p. 158).

The DEPUTY TREASURER, Dr. C. Harrower, said the £2,000 was to be made available "if required." It had been agreed that more detailed figures would be available in November, and she was certain that the amount required would not be so much. "You will find that the Central Consultants and Specialists Committee are taking their share of things," she added.

The Central Consultants and Specialists Committee, sitting as trustees of the Hospital Medical Staffs Defence Trust, decided (*Supplement*, October 18, p. 172) to make a further substantial contribution to this case so that the costs to date could be paid.

Scottish News

SCOTTISH ASSOCIATION OF EXECUTIVE COUNCILS

The Eleventh Annual Conference of the Scottish Association of Executive Councils was held in Rothesay on October 2 and 3 under the chairmanship of its president, Dr. JAMES M. GILL (Aberdeen and Kincardine).

Presidential Address

Dr. GILL, reviewing the progress in the first ten years of the Health Service, said it was a service of which the country could rightly be proud. Defects and imperfections were inevitable, and it was the duty and privilege of executive councils to help to minimize and overcome these whenever possible. It was unfortunate that the Service had never been free from disputes over remuneration. Executive councils were not directly concerned with the rates of remuneration, but they were concerned to see that the services provided to the public were adequate, and there was a clear connexion between remuneration and adequacy of services. Financial uncertainty and a sense of insecurity must affect the intake and quality of students to the professions in the Service.

Dr. Gill welcomed the statement in the interim report of the committee on prescribing that no evidence had been found of excessive or extravagant prescribing by doctors. That also was the general view of the Association of Executive Councils. At its last conference it had been suggested that in some areas there was a habit or tradition of expensive prescribing. It was, however, dangerous to attempt to draw conclusions from comparisons of the limited statistical information available. Epidemics, which could seriously affect the drug bill, did not strike the whole country simultaneously. Before any reasonable attempt at comparison could be made, full statistical information would be needed for a minimum period of one year, and variations in the incidence of disease in different areas would have to be taken into account.

Dr. Gill was concerned at the denigration of general practice. The consultant and hospital were extolled on television and in sound broadcasting and the work of the general practitioner disregarded. All this tended to undermine the confidence of the public in the family doctor, and it was not to be wondered at that patients demanded to be sent to hospital for treatment and investigations that were well within the competence of the general practitioner.

Under-Secretary of State's Address

The conference was addressed by Mr. J. NIXON BROWNE, M.P., Joint Parliamentary Under-Secretary of State for Scotland. He expressed the Government's appreciation of all that had been accomplished by executive councils during the first decade of the National Health Service. It had been a time of real achievement. There were three major problems which must be the concern of everyone at the beginning of the second decade. First, the mentally ill person: secondly, the old person in need of care; and, thirdly, the patient who had been seriously ill or seriously injured and, although largely recovered, was not yet back in circulation.

In the care of the elderly, the family doctor would have an ever-increasing part to play. He could lighten his work by being ready to call on other willing helpers and to direct their efforts. An interesting and important stage had been reached in the mental health services. New legislation was in preparation which it was hoped would take the best of the old and combine it with what is best of the new. The importance of the rehabilitation services had been emphasized in the report of a Government committee under the chairmanship of Lord Piercy. Hospitals would have to make long-term plans for being able to treat their patients further into the rehabilitation stage than at present. Whatever hospitals might do, there was again an essential place for the family doctor. He was often the first person to appreciate the need for rehabilitation and was in touch with the many services available to help him and his patient.

The Under-Secretary of State welcomed the general practitioners' wish for direct access to hospital diagnostic facilities. The report of the Scottish Health Services Council in 1951 on the general practitioner and the hospital service had emphasized the need for this. Much had been done since 1951 to carry out the spirit of the recommendations in this report, but much still remained to be done. Where direct access had been introduced it had proved a great success. Hospitals had long been known for their "ever-open door." The door should now be opened wide for general practitioners as well as for patients.

CONFERENCE OF HONORARY AND PUBLIC RELATIONS SECRETARIES

A very successful Conference of Honorary and Public Relations Secretaries of Branches and Divisions in Scotland was held in Scottish House on October 15 under the chairmanship of Dr. J. C. MACARTHUR, Honorary Secretary of the Lanarkshire Division. Twenty-five secretaries were present and the following also attended by invitation: the chairman of the Scottish Council; the chairman and secretary of the Central Organization Committee; the Secretary of the Association; the Scottish and Assistant Scottish Secretaries; and Dr. F. M. Martin, of the Department of Public Health and Social Medicine of the University of Edinburgh.

Intraprofessional Relations

The main items of discussion were intraprofessional relations and information. The discussion on intraprofessional relations was opened by Dr. J. E. MILLER, Glasgow, who dealt with the central aspects of the subject, and by Dr. A. F. CATTO, Dundee, and Dr. W. E. SMITH, Inverness, who addressed themselves to its local aspects. There was an exchange of views on how best to counteract the apparent deterioration of relations between the different groups in the profession. From the central organization aspect there was agreement that the informal "Between Ourselves" type of letter from Headquarters, distributed as widely as possible, did much to disseminate information important to the whole profession and so to counter apathy and separatist tendencies.

From the local viewpoint, it was felt that Branches and Divisions should include as often as possible in the programmes functions of a semi-social, semi-medical nature

where all sections of the profession could come together in an informal atmosphere and discuss matters of interest to them all.

The discussion on "Information" was opened by the SCOTTISH SECRETARY and Dr. F. M. MARTIN, and dealt mainly with the value of random sampling as a means not only of ascertaining what the general body of members of the profession were thinking, and thus aiding two-way communication of opinion, but also of helping to foster the development of informed opinion throughout the Association. The particular subject under discussion was the pending initiation of a pilot scheme in Scotland which will give the Association an indication of how useful this method of obtaining information can be.

Quality of Service

Those attending the Conference expressed to Dr. Macrae, on behalf of the Branches and Divisions in Scotland, their warm appreciation of his services to the profession and of his particular interest in Scottish affairs. They wished him every happiness in his retirement. Dr. MACRAE'S parting message was the advice that, while acknowledging its duties towards its members in the betterment of their terms of service, the Association should not lose sight of its fundamental principle of ensuring the highest quality of service rendered by the profession to the community.

It was resolved that it be recommended to the Scottish Council that a similar Conference should be held in the autumn of 1959.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Bartelheimer, H., and Kuchmeister, H. (Editors): *Kapillaren und Interstitium*. 1955.
Bernard, E.: *Heures Internationales dans la Lutte Contre la Tuberculose*. 1955.
Bolt, W., et al.: *Selektive Lungenangiographie*. 1957.
Borda, J. M., and Stringa, S. G.: *Dermatomiositis*. 1955.
Bret, J., and Legros, R.: *Tuberculose Utero-annexielle*. 1956.
Camponovo, L. E., and Dandoni, A. J.: *Farmacologia, Materia Medica y Terapeutica*. Volume I. 1955.
Cataldi, E.: *Le Malattie Professionali*. 1955.
Catalette, R.: *Une Révolution de la Médecine Physiologique grâce à l'Explication du Psoriasis*. 1955.
Cope, Z.: *Florence Nightingale and the Doctors*. 1958.
Cummins, N. M.: *Some Chapters of Cork Medical History*. 1957.
Davies, D. V.: *Anatomy for Nurses*. 1957.
Dreyfus, C.: *Some Milestones in the History of Hematology*. 1957.
Edmunds, V., and Scorer, C. G. (Editors): *Ideals in Medicine: A Christian Approach to Medical Practice*. 1958.
Ellis's Anatomy. Revised and edited by J. A. Keen. Second edition. 1957.
Erbaugh, J. K.: *Principles of Ophthalmoscopy*. 1958.
Eysenck, H. J., et al.: *Perceptual Processes and Mental Illness*. 1957.
General Dental Council: *Regulation of Dental Practice*. 1957.
Gershkoff, A., and Goldberg, N. I.: *Implant Dentures: Indications and Procedures*. 1957.
Godwin, E.: *Anaesthesia for Nurses*. 1957.
Groen, J., and Van de Heide, R. M.: *Atherosclerosis en Coronairthrombose*. 1956.
Gurr, G. T.: *Biological Staining Methods*. Sixth edition. 1957.
Hadfield, S. J.: *Law and Ethics for Doctors*. 1958.
Hart, H.: *Self-conditioning: The New Way to a Successful Life*. 1957.
Hewitt, D. W.: *Alcoholism: A Treatment Guide for General Practitioners*. 1957.
Hill, H., and Dodsworth, E.: *Sanitary Science Notes: A Handbook for Students*. 1957.
Hinden, E.: *Primer of Paediatrics*. 1957.
Hoyle, G.: *Comparative Physiology of the Nervous Control of Muscular Contraction*. 1957.
Hubback, J.: *Wives Who Went to College*. 1957.
Hudson, E. H.: *Non-venereal Syphilis: A Sociological and Medical Study of Bejel*. 1958.
John, M.: *Doctor on the Dole*. 1957.
King, E. L.: *Oczipitoposterior Positions*. 1957.
Landau, M. E.: *Women of Forty: The Menopausal Syndrome*. 1956.
Liddell, H. S.: *Emotional Hazards in Animals and Man*. 1956.
Liebenson, H. A.: *Doctor in Personal Injury Cases*. 1956.
Lumen, J. L.: *Methods of Psychology and Psychiatry*. 1957.
O'Connor, V. J.: *Suprapubic Closure of Vesicovaginal Fistula*. 1957.
Perry, E. T.: *Human Ear Canal*. 1957.
Querehi, M. S.: *Current Medicine*. 1957.
Saunders, L., and Fleming, R.: *Mathematics and Statistics for Use in Pharmacy, Biology, and Chemistry*. 1957.
Schubert, D. G.: *Doctor Eyes the Poor Reader*. 1957.
Selman, J.: *Fundamentals of X-ray and Radium Physics*. 1957.
Shock, N. W.: *Trends in Gerontology*. Second edition. 1957.
Wilson, J. W.: *Clinical and Immunologic Aspects of Fungous Diseases*. 1957.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Entry into General Medical Practice

SIR,—Again this year a most important fact and figure in Dr. L. S. Potter's article (*Supplement*, October 4, p. 153) is that at any one time 30% of those seeking entry into general practice have been in dead-end assistantships too long. Unfortunately, Dr. Potter utilized more than half of the discussion section of his article in dealing with anomalies, and did not address himself to the cause of this high figure. It is one thing to be puzzled over the anomalies described, but another to feel forced to infer from them that more than a hundred men who have been in dead-end jobs too long would not accept a reasonable prospect of attaining principal status if they were offered it. The very fact that there are a hundred such men is more reliable evidence that difficulties of entry into general practice are *not* greatly exaggerated than anomalies which are probably few in proportion to the whole, and may well have a good individual explanation.

As one who has recently attained principal status after more than three years in dead-end jobs and who has also represented assistants on the G.M.S. Committee, may I comment on both this figure and the anomalies? It is still, regrettably, the experience of assistants that all too many practices up and down the country, whose income would justify a partner, in fact employ recurrent assistants. While the supply of assistants remains at the high figure of the bureau, there will continue to be some principals who utilize assistants in this way. And, by like token, many views to partnership will continue not to materialize for ostensibly feeble excuses. Having experienced all this myself as an assistant, I feel the bureau could assist by the Council of the Association giving permission for advertisements for assistants to be refused where the declared size of the practice justified a partner or for an assistant with view where a previous offer of a view did not materialize, unless the desire not to go ahead with partnership was mutual on both sides. This would certainly reduce the number of recurrent assistantships, and make a real incentive on *both* sides to build a successful partnership during a probationary period. It would most likely reduce the 30% to a very small figure indeed.

So far as the anomalies are concerned, they do not represent the common experience of assistants anxious to settle. I have been to some thirty interviews for positions with view, and in nearly all cases have learnt that there were several score of suitable and keen applicants. If this fact is now becoming well known men will realize if geographical distance, medical school allegiance, race, or religion in relation to the principal's make them very unlikely to be regarded as suitable and will not bother to apply, however attractive as such the position is. Such a consideration may well explain the paucity of applicants in two of Dr. Potter's examples of anomalies.

Dr. Potter has described the position over entry into general practice as "stable." One hopes that he will use his esteemed offices as director of the bureau to improve the position in the future, and I hope, too, that the Council of the Association may consider the method which I have suggested to attain that end.—I am, etc.,

Leicester.

D. S. CRAIG.

Professional Unity

SIR,—There can be few in the profession who do not agree wholeheartedly with Dr. J. Leahy Taylor's sentiments (*Supplement*, October 11, p. 167). I am afraid that they are only sentiments which we have heard almost *ad nauseam* at the A.R.M. and elsewhere. We must acknowledge that

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

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ORGANIZATION COMMITTEE

"The shamble" of business at last July's A.R.M. led to criticism of the Agenda Committee at the meeting of the Organization Committee at B.M.A. House on October 23.

Miss M. Brookes, clerk to the Committee for many years and a familiar figure on the A.R.M. platform keeping the minutes, is retiring after 47 years with the B.M.A., and the meeting included a graceful tribute to her from the CHAIRMAN, Dr. R. G. GIBSON.

Membership of the Association, 900 up on the corresponding period last year, is now 71,940, the Committee was told.

Intraprofessional Relations

The Council had already approved in principle the Committee's proposals for the reorganization of Divisions into smaller groups as a necessary prerequisite to the establishment of an effective two-way information service between the periphery and the centre. The Committee now intends to seek the authority of Council to proceed immediately, and in consultation with the Divisions concerned, with the establishment of machinery for this reorganization.

Two informal "study groups" are to consider other suggestions on intraprofessional relations, and from their deliberations a plan will be put to the Propaganda Sub-committee. "We are trying to put the scaffolding up," said Dr. JOAN CHAPPELL.

Roll of Fellows

The Committee considered a suggestion that a limit should be put on the number of Fellows of the Association. So far 120 nominations for admission to the Roll have been received, "in an Association of nearly 72,000," the CHAIRMAN said. "I feel," said Dr. J. A. PRIDHAM, "that if the Fellowship is to be an honour it must be one that does not become so common that people no longer regard it as an honour." Some kind of an honour had been in the mind of the Association for 25 years; therefore there was a "back the log" and it would be difficult to impose a limit at the moment. But he felt there should be eventually, and that Divisions should be asked to restrict nominations voluntarily.

Dr. L. S. POTTER, Assistant Secretary, said that Divisions or Branches with two or three members of equal merit were likely to put them up for nomination together and then probably would not make any more recommendations for a number of years. Dr. J. S. NOBLE did not think the Committee should restrict nominations from Divisions but should itself be the arbitrator. He suggested there should be a set number of Fellows created each year.

Dr. J. S. ROSS thought all were agreed that they wanted to keep the number limited. But he believed that to lay down

hard-and-fast rules or limit the numbers would make a rod for the Committee's back. "We must try first of all to impress on Divisions the importance of keeping this limited to people only of exceptional merit," Dr. ROSS declared. One means of doing this would be to tighten up the criteria for nomination for admission to the Roll. Dr. CHAPPELL agreed with altering the criteria, and with the idea of not recommending more than a certain number of Fellows in each year.

Dr. H. G. DOWLER thought that for the next year or two there would be more people nominated for the Fellowship who had given many years of service, and therefore a limit now would be wrong. He hoped also to see people with 10 to 20 years' service, in active participation in Association work, being nominated.

The Committee agreed to stiffen further the wording of the objects of and criteria for admission to the Roll of Fellows, using the phrase adopted by the Conference of Honorary Secretaries, "only a very high standard," and to invite the next Conference to debate whether there should be a limit on the number of Fellows elected in any year. The matter will be reconsidered in the light of this debate. A suggestion that there should be an overall limit on the number of Fellows at one time did not find favour. Dr. J. H. E. MOORE warned that it would lead to Fellows being all men over 60 elected by seniority.

A further list of nominations for Fellowship, sent by Branches and Divisions, was approved.

Conference of Honorary Secretaries

April 24 was provisionally fixed for the 1959 Conference of Honorary Secretaries. Of the last Conference the CHAIRMAN remarked: "I think we did not give the floor enough time to talk." On this occasion, he added, there would have to be much discussion on the information service. Dr. NOBLE described the last Conference as "probably the largest and best most of us have ever attended" and congratulated those responsible for the arrangements.

A.R.M. Resolutions

In a letter from the Rugby Division, amplifying its A.R.M. resolution for the alteration of Article 40, which covers the procedure for dealing with resolutions passed by the A.R.M., it was stated that the present constitution had been tried and found wanting. The amendment proposed by Rugby would provide, among other things, that, when there was a delay in implementation by the Council of an A.R.M. resolution, a notice should be published in the *Journal* giving the reasons.

Association Notices

Diary of Central Meetings

OCTOBER

28	Tues.	Staff Side, General Whitley Council (at 14, Russell Square, London, W.C.), 10.30 a.m.
28	Tues.	Full General Whitley Council (at 14, Russell Square, London, W.C.), 2 p.m.
28	Tues.	Joint Subcommittee of Science Committee and Public Health Committee on Evidence to the Government Committee on the Composition of Milk, 2.30 p.m.
29	Wed.	Constitution Committee, 2.15 p.m.
30	Thurs.	Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
30	Thurs.	Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
30	Thurs.	Finance Committee, 2 p.m.
31	Fri.	Joint Meeting of Public Health Committee and Staff Side, Committee "C," Medical Whitley Council, 11.30 a.m.
31	Fri.	Public Health Committee, 2 p.m.
31	Fri.	Venereologists Group Committee, 2 p.m.

Branch and Division Meetings to be Held

ASHTON-UNDER-LYNE DIVISION.—At Broadoak Hotel, Tuesday, October 28, 8.45 p.m. Consideration of action to be taken regarding additional facilities for domiciliary medical consultations in the area, etc.

BOURNEMOUTH DIVISION.—At Board Room, Royal Victoria Hospital, Boscombe, Friday, October 31, 8.15 p.m., address by Mr. Kenneth Walker: "Fertility and Potency Problems in Marriage."

BRADFORD DIVISION.—At Medical Societies' Room, Bradford Royal Infirmary, Wednesday, October 29, 8.15 p.m., address by Dr. H. R. Sparrow: "Home or Hospital."

CITY DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, London, W.C., Tuesday, October 28, 8.30 p.m., B.M.A. Lecture by Professor R. Rothblat: "Electrons in Medicine." Members of St. Pancras Division are invited.

CLEVELAND AND MIDDLESBROUGH DIVISION.—At Hinton's Café, Corporation Road, Middlesbrough, Thursday, October 30, 7.30 p.m., supper; 8.30 p.m., lecture by Mr. F. McGuckin: "The Management of Deafness."

DORSET DIVISION.—At King's Arms Hotel, Dorchester, Wednesday, October 29, 8 for 8.30 p.m., annual dinner. Guests are invited.

DUNDEE BRANCH.—At Queen's College, Dundee, Friday, October 31, 8.30 p.m., B.M.A. lecture by Professor D. M. Dunlop.

EASTBOURNE DIVISION.—At Esplanade Hotel, Seaford, Tuesday, October 28, 7.15 for 7.30 p.m., dinner; 8.30 p.m., talk by Dr. A. C. Sommerville: "The Coroner."

EAST YORKSHIRE BRANCH.—At Royal Station Hotel, Hull, Thursday, October 30, 8 for 8.30 p.m., annual dinner.

GLASGOW DIVISION.—At Glasgow Regional Office, 9 Lynedoch Crescent, Glasgow, Friday, October 31, 8.30 p.m., meeting.

MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Royal Oak Hotel, Alderley Edge, Wednesday, October 29, B.M.A. Lecture by Dr. Francis Camps: "Things Are Not Always What They Seem." Preceded by buffet supper at 8.30 p.m.

NORTH WALES BRANCH.—At Ruthin Castle, Saturday, November 1, 3 p.m., autumn meeting. B.M.A. lecture by Dr. W. N. Mann: "On Getting Fat and Getting Thin."

ST. PANCRAS DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, London, W.C., Wednesday, October 29, 8.30 p.m., Dr. David Morris: "We and Our Patients," a discussion on new trends in paediatrics. Members of the City and Hampstead Divisions are invited.

SALISBURY DIVISION.—At Royal Military Hospital, Tidworth (C Block), Friday, October 31, 8 p.m., clinical meeting and discussion to which all medical practitioners in the area of the Division are invited.

SOUTH BEDFORDSHIRE DIVISION.—At Board Room, Luton and Dunstable Hospital, Wednesday, October 29, 9 p.m., Dr. Alistair Marshall: "Impressions of American Medicine—1958."

TOWER HAMLETS DIVISION.—At St. Andrew's Hospital, Devons Road, Bow, E., Friday, October 31, 3 p.m., meeting. Mr. L. M. Green: "Ophthalmology in General Practice."

WANDSWORTH DIVISION.—At South London Hospital for Women and Children, Clapham South, S.W., Wednesday, October 29, 8.15 for 8.45 p.m., South London Hospital Lecture by Sir Russell Brain, Bt.: "Recent Advances in Neurology."

WEMBLEY DIVISION.—At Board Room, Wembley Hospital, Tuesday, October 28, 8.30 p.m., joint meeting between clergy and doctors of Wembley, to which all medical practitioners in the area of the Division are invited. Discussion to be opened by the Reverend H. Cooper: "The Archbishop's Report on Healing."

WEST SUSSEX DIVISION.—At Burlington Hotel, Worthing, Thursday, October 30, 6.30 p.m., Dr. H. H. O. Wolff: "Psychosomatic Medicine in its Impact on General Practice." 8 p.m., dinner.

Headquarters and our leaders (who are at present unable to lead) should in all fairness be made aware of the amount of support which they can expect from the periphery. Could Dr. Taylor let us have something more concrete? Goodness knows, we need it.

We became aware at the time of the Guild not only that the profession had no mind of its own, but that the majority did not seem to care whether it had or not. Certain influential members of Council are known to be strongly averse to a questionnaire, and anyway it is unlikely that more than a third of the profession would trouble to answer one.

I am afraid that I am a defeatist. I see no way out of our struggle while we continue to pursue the "every man for himself" attitude. Supine we shall remain and so deservedly trampled upon. It would seem that the first essential is that we should learn to be loyal to each other and to a previously honoured profession, and that the bogey of 1913 and the attitude of former heads of colleges should be killed. How? I don't know.—I am, etc.,

Topsham, S. Devon.

F. E. GRAHAM-BONNALIE.

Regional Hospitals' Consultants and Specialists Association

SIR,—The Royal Commission on the Remuneration of Doctors and Dentists is still sitting and more evidence has to be considered. The findings will probably be published next year, and may be acceptable. This will probably be two years from the time of the inception of the Royal Commission, and the situation is changing. The joint working party on the medical staffing structure in the hospital service is now collecting evidence. This inquiry must mainly concern the non-undergraduate hospitals and their staffs. Recently we have heard of the new hospital costing system which has materially increased the charges for private wards, which many of us thought were already too heavy. Many are aware of the delays in making new appointments and appointing successors to retiring consultants in some areas, causing impairment of hospital service and delaying younger men in their promotion. These are a few of the items which concern the almost inarticulate but greater proportion of the consultants and specialists in Britain.

The Regional Hospitals' Consultants and Specialists Association exists to promote and safeguard the interests of consultants and specialists employed by the regional hospital boards, and as we increase our membership so will our authority and negotiating power be strengthened.—I am, etc.,

London, W.C.2.

HAROLD DODD,
President, Regional Hospitals' Consultants
and Specialists Association.

Psychological Medicine Group

SIR,—I should like to support the critical letter from Drs. A. Harris, J. G. Howells, J. T. Hutchinson, and C. Tetlow on this topic (*Supplement*, August 2, p. 112). I originally sought membership of the Psychological Medicine Group because I thought it would necessarily be the means by which the B.M.A. exerted its influence on the vital decisions at present affecting psychiatry in this country. In effect, however, the only result has been a request once per year to nominate and vote for elections to the Committee.

It would be helpful to have an explanation of the policy of the Group, or the establishment of some method by which individual members of the Group can influence more directly the activities of their Committee. It is perhaps specially important to know what recommendations, if any, are being put forward in the name of members and the reasons.—I am, etc.,

London, W.1.

R. W. CROCKET.

Sir Russell Brain, Bt., has intimated that, owing to pressure of work, he regrets he is unable to accept co-option to the B.M.A.'s Central Consultants and Specialists Committee (*Supplement*, October 18, p. 169).

The CHAIRMAN said the proposed amendment would do away with any possibility of dictatorship, but there were times when it might be impractical, or even dangerous, to publish reasons. "Otherwise it is a good idea," said Dr. J. E. MORRISON. Dr. CHAPPELL said: "I hope it will get over to the members that we are overhauling our machinery so as to speed action if we need it."

The Committee decided to take legal advice on the drafting of the amendment to Article 49.

Time-table for A.R.M.

Another A.R.M. resolution wanted the time-table of the A.R.M. altered as soon as possible so that it did not include a Sunday.

The ASSISTANT SECRETARY recalled that when this matter was discussed by the Constitution Committee a major argument in favour of the present arrangement was that unless there was an overlap with the scientific meeting the Representatives would be away for the President's address. Now the two groups were together for one or two days. "I think a lot of the dissatisfaction could be laid at the door of the Agenda Committee," declared Dr. PRIDHAM. "It was very unfortunate that the debate on A.I.D. came on the last day." The CHAIRMAN agreed with Dr. Pridham's sentiments. The Constitution Committee had agreed to have "priority motions" as well as common form motions, but this had not been implemented. If there had been such motions, what happened would not have occurred. The Agenda Committee, under Standing Orders, was also supposed to meet from day to day during the Meeting to advise the Chairman on the progress of business.

Dr. MOORE thought there could be a time-table, and from Dr. NOBLE came the proposal that motions which were reaffirmations of policy could be taken *en bloc* unless there was prior notice of opposition.

"There is," said Dr. DOWLER, "increasing feeling that we ought to avoid Sunday. It does not keep the representatives there for the President's address on Monday night. In the A.I.D. debate the hall was one-third empty." Monday, added Dr. NOBLE, had become by reputation "such a shambles."

The Committee agreed to suggest to the Constitution Committee:

(1) That the A.R.M. should be held on Wednesday, Thursday, Friday, and Saturday.

(2) That the attention of the Agenda Committee be drawn to the standing orders providing for "priority motions" (these should be placed, with a time-table, on a separate sheet, on the Agenda, the Committee thought, and Dr. MOORE spoke in favour of a general time-limit).

(3) That the Agenda Committee should be asked to review the general conduct of business in view of the conditions prevailing at the last A.R.M.

(4) That the Agenda Committee be reminded of the standing order that it should meet and advise the chairman on the conduct of business during the meeting.

(5) That motions which were formal reaffirmations of policy should be moved formally by the chairman of the Representative Body unless notice of opposition had been given or it was desirable to allow a statement.

Assistants and Young Practitioners

The General Medical Services Committee referred to the Committee for sympathetic consideration the recommendation of the Assistants and Young Practitioners Subcommittee that it should have a procedure for appeal to Council similar to that obtaining for groups. "I think it is very bad in principle," commented Dr. DOWLER. "A subcommittee should be a subcommittee." Dr. PRIDHAM, however, recalled that the assistants and young practitioners asked originally to form a group and were persuaded to have a subcommittee. He felt the Committee should help them over this; the subcommittee considered that they should have what the Hospital Junior Staffs had as a group. The recommendation was supported.

Hospital Residents' Hours of Work

The A.R.M. recommended "that sufficient hospital residents should be appointed so that each hospital resident doctor shall work less than 168 hours a week." The Executive Committee of the Hospital Junior Staffs Group felt that the arrangement of the duties of junior medical staff was a local matter, and where there was any difficulty this should be discussed locally before any approach was made to Headquarters. The Medical Staffing Subcommittee of the Central Consultants and Specialists Committee expressed the view that the shortage of junior medical staff was in many hospitals the primary reason for the lack of adequate off-duty time. Nevertheless it considered that the obligation rested with the consultant to see that the off-duty periods of his junior staff were as liberal as the circumstances would permit.

"We have not had any particular success in obtaining evidence of real difficulty here," said the CHAIRMAN.

The Committee concurred with the views of the Hospital Junior Staffs Group.

Supporting Group for W.M.A.

The Executive Committee of the British Supporting Group for the World Medical Association asked the Organization Committee to reconsider the possibility of members of the Association being invited to pay subscriptions to the supporting group with their B.M.A. subscriptions and the inclusion of a reference to the group in the B.M.A. subscription demand form. Members were sympathetic and endorsed the importance of the support group of the W.M.A., but were apprehensive of the effect of the inclusion with the subscription demand of yet another appeal which might affect the response to the charities of the Association. "Our medical charities are badly supported," said Dr. NOBLE.

It was agreed to consider the inclusion of a leaflet describing the supporting group in the envelope with the B.M.A. subscription form for next year.

N.O.T.B. ASSOCIATION

The 16th meeting of the council of the National Ophthalmic Treatment Board Association was held on October 9, with Dr. J. N. TENNENT in the chair.

After discussion on the use of mass visual screening instruments, the council resolved that it took no exception to the encouragement of mass visual screening in industry by any means deemed to be desirable. Reference was made to the statistical survey of new patients examined in the Supplementary Ophthalmic Services, which is being undertaken by members of the association and which started on October 1. The council was pleased at the excellent response to its request for voluntary help. The council noted that 38% of the association's total medical membership relied entirely on the N.O.T.B.A. to represent their interests. Dr. VICTOR PURVIS referred to a new leaflet which he was preparing for health exhibitions.

The minutes of the public relations and finance committees noted a widening of the activities undertaken by the public relations section and an increase in inquiries at the head office about many aspects of ophthalmology.

HOSPITALITY

A German doctor's daughter, aged 14, would like to contact a British doctor's daughter of a similar age to arrange an exchange visit for next year.

Would anyone interested please get in touch with Dr. R. A. Pallister, International Medical Advisory Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

SUNDAY AT SOUTHAMPTON

VISITS TO PLACES OF MEDICAL INTEREST

On the last day of the Annual Clinical Meeting at Southampton (Sunday, December 7), a selection of visits to various places of medical interest has been arranged (see *Supplement*, September 27, p. 149). For the convenience of those attending the meeting further details are given below.

Department of Daily Living, Winchester.—A demonstration at the physical medicine department of the Royal Hampshire County Hospital (Dr. W. RUSSELL GRANT) will show how people with hemiplegia, rheumatoid arthritis, the after-effects of poliomyelitis, and other disabilities can live useful lives in spite of them. In the department of daily living they learn how to overcome their difficulties with the help of inexpensive pieces of apparatus which are already being mass-produced. Gadgets for the living-room, kitchen, bedroom, bathroom, and lavatory will be demonstrated. The department also has a mobile service based

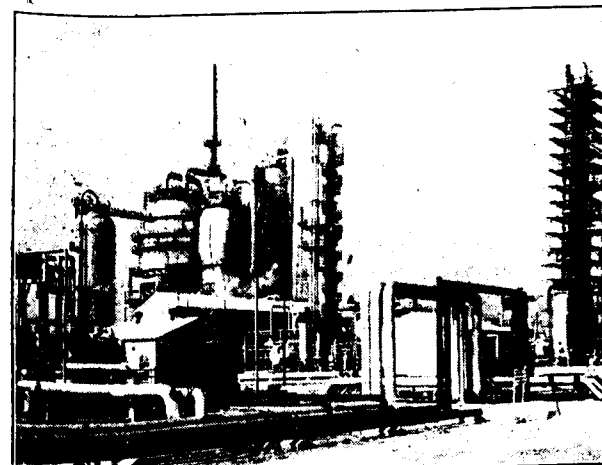


FIG. 1.—Part of Esso refinery, Fawley. (Photo: William Martin Ltd.)

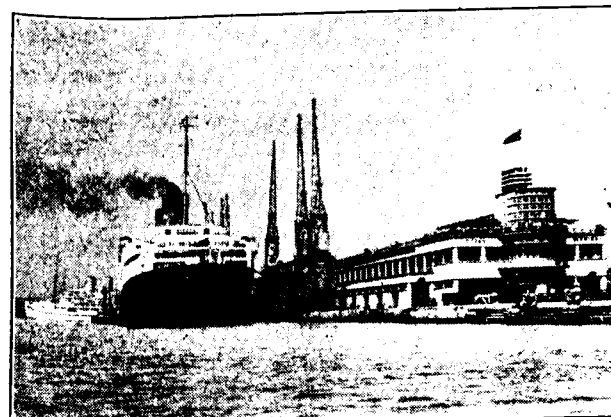


FIG. 2.—"Queen Elizabeth" alongside Ocean Terminal. (Photo: British Transport Commission.)

on peripheral clinics and a metal and woodwork shop for training and assessment. The timing of the visit will allow visitors to attend Matins at Winchester Cathedral beforehand, and the Winchester Division has arranged a reception.

Nuffield Rehabilitation and Plastic and Oral Surgery Centres, Odstock, Salisbury.—The rehabilitation centre at Odstock Hospital (Mr. J. N. BARRON, Dr. H. GLANVILLE) provides a planned recovery system in a general hospital where all aspects of rehabilitation from surgery to final resettlement are available. Demonstrations and a tour of

the specially designed Nuffield workshops will be a feature of this visit. The Salisbury Division has arranged a reception.

Esso Refinery, Fawley.—The Esso Petroleum Company's refinery at Fawley (Fig. 1) is the largest in the Commonwealth. There will be a conducted tour of the refinery which will include a visit to the medical department and casualty treatment rooms (Dr. A. WARD GARDNER).

Veterinary Artificial Insemination Centre, Lyndhurst.—This is the main insemination centre of the Hampshire Cattle Breeders' Society. It comprises administrative and laboratory buildings, a bull barn housing 29 bulls, and ancillary buildings. In a separate unit there are a laboratory for boar semen and another for the examination and deep-freeze storage of semen from farmers' bulls. Service is provided for all British breeds of cattle. There is also an experimental A.I. service for two breeds of pig. The techniques of handling, evaluating, and storing bull semen will be demonstrated.

Health Department, Southampton.—The Southampton County Borough Council is responsible for the Port Health Service (Dr. H. C. MAURICE WILLIAMS). This service covers an area which includes the docks and Southampton Water and extends as far as Cowes, Ryde, and Portsmouth. Over 2,000 ships from foreign ports are boarded each year. The tour of the Port of Southampton will include a visit to the Ocean Terminal (Fig. 2) and the King George V graving dock. The Millbrook Health Clinic, opened this year and providing maternity and child welfare and school health services for a new housing estate, will be open for inspection, as will also be a residential home providing accommodation for the elderly infirm.

NURSES' DUTIES

COLLEGE OF NURSING'S STATEMENT

A nurse's primary function is to nurse, the Royal College of Nursing said in a recent statement. The College has for some time past been concerned at the general and rapid increase of duties allocated to nurses, and it has had two main causes for anxiety on this score. First, additional duties are making inroads into the time which nurses should more properly give to their true function, and, secondly, the need to safeguard the nurse's professional position when, in the interests of the service, she is called upon to undertake duties outside the routine scope of nursing.

The College feels that certain duties are wholly outside the province of the nurse and should be undertaken only in a grave emergency. There are other techniques which appear to it to fall outside normal nursing duties and which it considers should be allocated to nurses only after all relevant circumstances have been considered and with adequate safeguards for the nurse's professional position. The College acknowledges that the scope of the trained nurse's duties is not necessarily circumscribed by the syllabus of the General Nursing Council, but it wants to ensure that special arrangements are agreed and safeguards established when it is necessary for a nurse to carry additional responsibility. It thinks that the position of the health visitor, the domiciliary nurse, and the nurse in industry should be safeguarded no less than that of the nurse in hospital.

In the College's view, discussions between the medical and nursing professions are of vital importance in establishing understanding in this matter. A document prepared by the Royal College of Nursing on the duties and position of the nurse is now being studied by the B.M.A., and some views on it by the Central Consultants and Specialists Committee were reported in the *Supplement*, of October 18 (p. 169).

The Medical Practices Committee has reclassified Ross-on-Wye, Herefordshire, from an intermediate to a designated area, with effect from May 31.

HOSPITALS AND THE STATE

ACTON SOCIETY'S PAMPHLET

The Acton Society Trust has published the fifth in its series of research papers on hospital organization and administration under the National Health Service. The series began in October, 1955, with a paper ("Background and Blueprint") describing the hospital services before and after nationalization. This was followed by "The Impact of the Change"—a series of case studies to discover the effects of the change to national ownership on those who run the hospitals. The third and fourth papers in the series examined hospital management committees and regional hospital boards. The Acton Society Trust is a non-profit-making trust set up to promote economic, political, and social research. It has no political ties and derives its income mainly from funds made available by the Joseph Rowntree Social Service Trust.

Top Management

The Society's fifth and latest paper on hospital organization and administration is an investigation into "The Central Control of the Service." The investigation was carried out by Professor T. E. Chester, professor of social administration at Manchester University, assisted by Miss S. N. Joy. It soon became clear, the paper states, that decision-taking in the hospital service is not located tidily in the Ministry of Health—in other words at the top, as in other big organizations whether privately or publicly owned. In the hospital service, the investigator points out, there are at least two levels of "top management," Ministry and Treasury, and the relationship of the Health Departments to the Treasury, as the central organ of Government financial control, is examined. The Treasury, it is further pointed out, is closely scrutinized by the Public Accounts Committee and the Select Committee on Estimates, which are organs of parliamentary financial control.

The paper assesses the degree of influence of these elements of top-level control on hospital administration, and the analysis is said to be undertaken as a preliminary to a discussion on the central strategical direction of the hospital service, which will be the subject of the sixth and last pamphlet of the series. Must ministerial responsibility be preserved? Is an ordinary Government department an appropriate directing authority for an operating service like the hospital service? If an ordinary Government department does not meet all requirements how could the deficiencies be corrected? By making the advisory committees to the Minister more active and less unwieldy? Or by the appointment of a board, like the National Coal Board, to which the Minister could delegate supervisory responsibility? Alternatively, if the departmental apparatus is to be maintained how can the present departments be better organized for discharging their duties as top-level management organizations? Do they even see their task in these terms? Does the Act permit them to do so?

Factual Information

These, it is stated, were the sort of questions in mind when the present investigation was made, and an answer will be attempted in the next paper. The present paper is largely concerned with factual information and inferences derived from it. It examines the historical background and organization and work of the Ministry of Health and Department of Health for Scotland. It then has a section on "where the Treasury comes in" and one on "Parliament and its committees." There are a series of appendices, 11 in all, giving in detail such things as the headquarters organization and staffing of the Health Department, hospital service organization in Northern Ireland, and analyses of hospital circulars, parliamentary questions, and parliamentary debates.

Under the heading "Where Does Policy Come From?" the paper discusses the part played by the Government and

¹ Hospitals and the State: Hospital Organization and Administration under the National Health Service, No. 5, The Central Control of the Service, 1958. Acton Society Trust. Price 4s.

its advisory bodies, the Central Health Services Councils; the policy decisions which are taken as a result of consultations with interested parties; and, finally, policy decisions based on surveys, reports, and inquiries. It then asks, "Is all this enough? Has the Minister got a sufficient thinking machine at his disposal to enable him to interpret the lessons of experience in the field and to give the inspiring guidance which a central directing authority should give to the whole service?"

In its analysis of where the Treasury comes in, the paper states that, in the search to find where final policy decisions are taken, the place to look is the Treasury; "for the expenditure and policy of the Ministry of Health are submitted to the same type of control from the Treasury (despite disclaimers, the word 'control' describes their activity most accurately) as all Departments of State." The Treasury, it concludes, acts on behalf of the executive, and to see where the ultimate power of decision on hospital policy really lies "it will be necessary to press the inquiry back to Parliament." This the paper does, and looks at the Public Accounts Committee, the Select Committee on Estimates, and the influence on policy of parliamentary questions and debate, and party politics. In general conclusion the question is posed, "What does it all mean in terms of practical results? Has the G.H.Q. of the service done enough in the way of constructive planning of strategy and given enough guidance in the tactical work of execution?" These questions will be considered in the next pamphlet as part of a general review of the first ten years of the Health Service.

Scottish News

GENERAL MEDICAL SERVICES
SUBCOMMITTEE (SCOTLAND)

The first meeting of the session of the General Medical Services Subcommittee (Scotland) was held in Edinburgh on September 25. Dr. C. HARROWER, Glasgow, and Dr. R. C. HAMILTON, Kilmarnock, were reappointed chairman and vice-chairman respectively.

Minister's Refusal

The Chairman recounted the events which had taken place since the last meeting in connexion with the special case on the contractual obligation inherent in the Government's acceptance of the Spens Report and the Secretary of State's refusal to agree to the presentation of a case in the Court of Session. An animated discussion made it clear that the Subcommittee was bitterly disappointed at the Secretary of State's decision, and it was finally agreed to recommend to the Scottish Council:

That the Secretary of State be informed that the profession is bitterly disappointed that he has declined even to examine the special case; that, in view of the fact that he had been associated with the original suggestion that the matter could be tested in the Courts, it is surprised at his present attitude; that it has been repeatedly assured that the Royal Commission is in no way a court of adjudication and that accordingly his remarks regarding it are irrelevant; that his present action shakes what confidence the profession has in the Government as an employer and that it is hoped he will reconsider his decision.

Dental Haemorrhage

The Subcommittee considered correspondence seeking its observations on fees for arresting dental haemorrhage. It appeared that the Department of Health's policy was to pay only one fee in respect of two visits to arrest a bleeding in one socket. It was explained by the member of the Subcommittee representing the Scottish General Dental Services that the question of payment rested really between the general practitioner and the dentist. It was accordingly agreed to advise the doctors concerned to pursue the matter with the dentists, and also that the Department's attention

should be drawn to the doctors' complaints, which seemed to the Subcommittee to be quite justified.

It was also decided that the Scottish General Dental Services Committee should be asked to raise the matter with the Scottish Dental Estimates Board.

Change of Address and Form E.C.1(c)

This subject was again discussed, and it was agreed that even although there were many anomalies it would be desirable to adhere to the present procedure for notifying change of address. It was felt that executive councils should make a special effort to act on the information given by general practitioners on Form E.C.1(c). In the Subcommittee's opinion the completion of this form should be regarded as one step towards curbing inflation, and it was decided to point this out to the Department, and also that the attention of general practitioners should be drawn to the importance of completing Form E.C.1(c).

Cancer Research

The Subcommittee agreed to proposals submitted by the South-eastern Regional Hospital Board for setting up a regional advisory committee on cancer research, as recommended by a special committee of the Scottish Health Services Council. The Subcommittee also considered a request from the Regional Board that two general practitioners should be nominated to serve on the Regional Advisory Committee on Laboratory Services. It was felt, however, that the Edinburgh Local Medical Committee should be approached so that they might consult with the other local medical committees in the region. The Subcommittee could not agree that two general practitioners would be adequate, and it agreed to ask the Department of Health to consider increasing the general-practitioner representation on the advisory committee.

Diagnostic Facilities in Glasgow

The Subcommittee considered a letter from the Department of Health on the vexed question of direct access to diagnostic facilities by general practitioners in Glasgow. The Department, it appeared, held that arrangements had been made for access to laboratory services—although this was not known to the Subcommittee—and that, in the Department's opinion, the main difficulty was with radio-diagnostic facilities. The Department had apparently been informed by the Western Regional Hospital Board that it had been impossible to provide even experimental arrangements. The Department wrote that it was still considering how best this question could be advanced. The Subcommittee expressed strong dissatisfaction with the lack of developments and agreed that the Department should be urged to press the Western Regional Hospital Board to ensure that official policy was implemented.

Questions Answered

Death Certificates

Q.—Is a doctor in contract with an executive council obliged, under his terms of service, to provide a death certificate?

A.—A death certificate is not included in the list of certificates which a doctor is required to give under the National Health Service arrangements. In England and Wales, under the Births and Deaths Registration Act (1953), however, the doctor who was in attendance during the deceased's last illness has a statutory duty to give a certificate of death stating to the best of his knowledge and belief the cause of death, and must deliver it forthwith to the registrar. Failure to comply, without reasonable excuse, is punishable on summary conviction with a fine of 40s.

Under the Registration of Births, Deaths, and Marriages (Scotland) Acts, 1854 and 1860, the medical person who was in attendance during the deceased's last illness shall, within seven days after the death, transmit to the registrar the

death certificate in the prescribed form. If a certificate is not received by the registrar within seven days after the death he must send to the doctor a death certificate form together with a request that the doctor completes the certificate and returns it to him within three days after receipt of the request. There is a penalty not exceeding 40s. provided for failure to transmit a certificate to the registrar.

NEWS IN BRIEF

YORKSHIRE BRANCH DISCUSSION GROUP.—The Yorkshire Branch of the B.M.A. has reconstituted its Occupational Health Subcommittee as a discussion group. Meetings will be held at Wakefield on the third Wednesday of each month until May, and the topic for discussion will be "The Duties and Functions of the Industrial Medical Officer." Dr. J. L. Vaughan Jones will sum up at the last meeting. All members of the profession will be welcome, and further information may be obtained from Dr. R. McL. Archibald, Treeton Colliery, Treeton, near Rotherham, Yorks; telephone Woodhouse 2321.

HOSPITAL STAFFING.—A meeting of the Hospital Junior Staffs Group of the Midland Region, at which all hospital junior staff in the region are entitled to be present, will be held on November 6. The main business will be to prepare a report for the annual meeting of the regional consultants and specialists in Birmingham on November 19, when hospital medical staffing will be discussed.

STIMULATING INTEREST.—Any member of the South Staffordshire Division of the B.M.A. who wishes to may attend the meetings of its executive committee in a non-voting capacity. This decision was taken at the annual general meeting of the Division.

ROYAL COMMISSION PUBLIC HEARING.—The Royal Commission on Doctors' and Dentists' Remuneration has invited representatives of the Executive Councils' Association (England) to give evidence at a public hearing on November 4. Representatives of the Joint Consultants Committee gave evidence to the Commission on October 31.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Registration of Medical Auxiliaries

SIR,—The report of the Central Consultants and Specialists Committee meeting (*Supplement*, October 18, p. 169) brings to light a position which closely affects a very large body of specialists. Though the question of the training, ethics, and registration of medical auxiliaries has never been very clearly defined, until the advent of the National Health Service the B.M.A. maintained a register of medical auxiliaries comprising such branches as were willing to accept certain ethical and educational standards. Many medical auxiliaries did not appear on this register. With the advent of the N.H.S., the State became far and away the largest employer of medical auxiliaries, and it was not unreasonable that the State should seek to put the registration of these medical auxiliaries on a more rational basis. With this in view, Sir Zachary Cope was asked to form a committee, examine the situation, and present a report to the Minister on this subject.

This report was presented in 1951, but was unacceptable to the medical practitioners concerned because of a basic weakness in that the bodies which it was proposed should control the education and examination of the various auxiliaries had only a very small medical representation. It committed, too, the error of trying to apply the same principles to all medical auxiliaries, which, by implication,

Association Notices

GENERAL MEDICAL SERVICES COMMITTEE

Assistants and Young Practitioners Subcommittee

The following have been returned as representatives of un-established principals and assistants on the Assistants and Young Practitioners Subcommittee for 1958-9:

Region	Unestablished Principal	Assistant
1	J. L. Williams (Lampeter, Cardigan)	T. H. English (Bartley, Southampton)
2	R. T. Jones (Basildon)	E. F. D. Gawne (Cambridge)
3	No nomination	C. A. Rushton (Stockport)
4	No nomination	W. Hughes (Sheffield)
5	F. G. Tomlins (Chingford, E.4)	R. E. Hancock (Drayton Gardens, N.21)

Diary of Central Meetings

NOVEMBER

3 Mon.	S.H.M.O.s Group Council, 2 p.m.
4 Tues.	Central Consultants and Specialists Executive Committee, 10 a.m.
4 Tues.	Orthopaedic Group Committee, 2 p.m.
5 Wed.	Committee on Professional Co-ordination, 2 p.m.
5 Wed.	Cremation Subcommittee, Private Practice Committee, 2 p.m.
5 Wed.	Joint Committee of the B.M.A. and the Magistrates' Association, 2 p.m.
5 Wed.	Welsh Committee (at George Hotel, Shrewsbury), 2.15 p.m.
6 Thurs.	A.C.M., Southampton, Committee of Management, 11.15 a.m.
6 Thurs.	Junior Members' Forum Subcommittee, 2 p.m.
7 Fri.	International Relations Committee, 2 p.m.
12 Wed.	Physical Medicine Group Committee, 11 a.m.
12 Wed.	Council, 2 p.m.
14 Fri.	Medical Members of Editorial Subcommittee of Joint Formulary Committee, 11 a.m.
14 Fri.	Special Conference on Medical Appointments Overseas, 11 a.m.
19 Wed.	Public Relations Committee, 2 p.m.
20 Thurs.	G.M.S. Committee, 10.30 a.m.
20 Thurs.	Dermatologists Group Committee, 11 a.m.
24 Mon.	Armed Forces Committee, 2 p.m.
25 Tues.	Planning Subcommittee of Occupational Health Committee, 2 p.m.
27 Thurs.	Alcohol and Road Accidents Committee, 12 noon.
28 Fri.	Hospital Junior Staffs Group Council, 2 p.m.

DECEMBER

5 Fri.	Editorial Subcommittee of Joint Formulary Committee, 11 a.m.
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Branch and Division Meetings to be Held

ASHTON-UNDER-LYNE DIVISION.—At Regis Suite, Alma Lodge Hotel, Stockport, Thursday, November 6, 8.30 p.m., annual dinner dance.

CHESTERFIELD DIVISION.—At Walton Sanatorium, Friday, November 7, 8.45 p.m., lantern lecture by Mr. A. Jefferson: "Neurosurgery in 1958."

CORNWALL DIVISION.—At Royal Cornwall Infirmary, Truro, Thursday, November 6, 8.30 p.m., B.M.A. Lecture by Mr. H. Osmond-Clarke: "Pain in the Neck and Arm."

DEWSBURY DIVISION.—At Three Nuns Inn, Mirfield, Thursday, November 6, 7.45 for 8.15 p.m., annual dinner.

DONCASTER DIVISION AND DONCASTER MEDICAL SOCIETY.—At Danum Hotel, Doncaster, Thursday, November 6, 7 for 7.30 p.m., Annual "Ladies Night" Banquet and Ball.

EAST YORKSHIRE BRANCH.—At Hull Medical Society, 68, Park Street, Hull, Wednesday, November 5, 9 p.m., general meeting. Address by Dr. A. B. Davies: "Remuneration."

GOOLE AND SELBY DIVISION.—At North Eastern Hotel, Goole, Thursday, November 6, 7.30 for 7.45 p.m., annual dinner-dance.

GREENWICH AND DEPTFORD DIVISION.—At the Yorkshire Grey, Eltham Road, Eltham, Saturday, November 8, 6.45 for 7.15 p.m., dinner and dance. All medical practitioners in the Greenwich and Deptford, Lewisham, and Woolwich Divisional areas are invited.

HARROW DIVISION.—At Tithe Farm House, Eastcote Lane, South Harrow, Tuesday, November 4, 8.30 p.m., clinical meeting. Film: "Key Questions in Coronary Disease." Dr. C. G. Barnes will open a discussion.

HARTLEPOOL DIVISION.—At Staincliffe Hotel, Seaton Carew, Thursday, November 6, 8.30 p.m., Professor W. F. Gaisford: "Abdominal Pain in Children."

HUDDERSFIELD DIVISION.—At Huddersfield Royal Infirmary, Monday, November 3, 8.15 p.m. Ordinary meeting.

LEEDS DIVISION.—At Littlewood Hall, General Infirmary at Leeds, Friday, November 7, 8 p.m., lecture by Dr. William Whitaker: "Pulmonary Heart Disease."

LEWISHAM DIVISION.—At Committee Rooms, Lewisham Hospital, Friday, November 7, 8.30 p.m., Mr. Kenneth Walker: "Fertility and Sexual Problems of Marriage."

MAIDSTONE DIVISION.—At Royal Star Hotel, Maidstone, Thursday, November 6, 8 for 8.30 p.m., B.M.A. Lecture by Mr. A. Lawrence Abel: "Recent Advances in the Diagnosis and Treatment of Cancer."

MID-ESSEX DIVISION.—At Hutton Masonic Hall, Shenfield, Wednesday, November 5, 8 p.m., dinner-dance.

MIDLAND BRANCH.—At Grosvenor Rooms, Grand Hotel, Colmore Row, Birmingham, Saturday, November 8, 7 for 7.30 p.m., annual dinner. Guest of Honour, Lord Cohen of Birkenhead, who will deliver the B.M.A. Lecture.

MONMOUTHSHIRE DIVISION.—At St. Mellons' County Club, Thursday, November 6, 8 for 8.30 p.m., annual dinner.

NORTHERN IRELAND BRANCH.—At Whitla Medical Institute, College Square North, Belfast, Thursday, November 6, 8.30 p.m., Presidential address by Mr. W. S. Braidwood: "In Home Waters."

NUNEATON AND TAMWORTH DIVISION.—At Red Lion Hotel, Atherstone, Tuesday, November 4, 8.30 p.m., Professor A. P. Thomson: "The Development of British Schools of Medicine."

Preceded by supper at 7.30 for 7.45 p.m.

REIGATE DIVISION.—At Redhill County Hospital, Tuesday, November 4, 8.30 p.m., Dr. R. A. Shooter: "The Changing Face of Bacteriology."

SCUNTHORPE DIVISION.—At Angel Hotel, Brigg, Thursday, November 6, 8.30 p.m., Dr. D. Stark Murray: "A Whole-time Salaried Service for the Nation."

SWANSEA DIVISION.—At Swansea Hospital, Thursday, November 6, 8.15 p.m., special general meeting.

TEES-SIDE BRANCH.—At Staincliffe Hotel, Seaton Carew, Co. Durham, Thursday, November 6, 8.30 p.m., Professor W. F. Gaisford (Manchester): "Abdominal Pain in Children."

TUNBRIDGE WELLS DIVISION.—At Elizabethan Barn, Tunbridge Wells, Thursday, November 6, 8 for 8.30 p.m., dinner-dance.

WAKEFIELD, PONTEFRAC, AND CASTLEFORD DIVISION.—At Castleford, Normanton, and District Hospital, Friday, November 7, 8 p.m., Dr. C. Stewart: "The Bulbous Eruptions."

WEST SUFFOLK DIVISION.—At Everard's Hotel, Bury St. Edmunds, Saturday, November 8, 7.30 for 8 p.m., 32nd "Doctor's Armistice" Dinner.

Meetings of Branches and Divisions

OXFORD DIVISION

The following officers have been elected:

Chairman.—Dr. Alice B. Carleton.
Vice-chairmen.—Dr. F. V. Squire and Dr. F. H. Kemp.
Honorary Secretary and Treasurer.—Dr. W. S. Holden.

ROTHERHAM DIVISION

The following officers were elected at the annual meeting held at the Crown Hotel on July 18:

Chairman.—Dr. J. O'Hara.
Vice-chairman.—Dr. C. Levey.
Honorary Secretary.—Dr. T. V. Griffith.
Honorary Treasurer.—Dr. F. C. L. Agnew.

SUSSEX BRANCH

The following officers have been elected:

President.—Dr. R. Green.
President-elect.—Mr. S. S. Freedman.
Vice-presidents.—Dr. C. Gibson and Dr. L. H. Booth.
Honorary Secretary.—Dr. P. Hall-Smith.
Honorary Treasurer.—Dr. S. J. Firth.

WEST COAST DIVISION (NEW ZEALAND)

The following officers have been appointed:

President.—Dr. B. M. Dallas.
Vice-presidents.—Dr. D. H. Symes and Dr. A. G. Couston.
Honorary Secretary.—Dr. J. R. Presland.

WEST WIGTOWNSHIRE DIVISION

The following officers have been elected:

Chairman.—Dr. R. C. Nimmo-Smith.
Vice-chairman.—Dr. I. Gilfillan.
Honorary Secretary.—Dr. D. M. Hastings.
Honorary Treasurer.—Dr. J. M. E. Turner.

YORKSHIRE BRANCH

The following officers were elected on June 11 for 1958-9:

President.—Dr. L. Varley Broadhead.
President-elect.—Dr. R. H. Sunderland.
Vice-president.—Dr. T. K. Cooke.
Honorary Secretary and Treasurer.—Dr. J. H. E. Moore.

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ROYAL COMMISSION ON DOCTORS' AND DENTISTS' REMUNERATION

JOINT CONSULTANTS COMMITTEE'S FURTHER EVIDENCE

Further oral evidence to the Royal Commission on Doctors' and Dentists' Remuneration, some of it *in camera*, was given by the Joint Consultants Committee on October 31. The Commissioners asked particularly about the relative advantages and disadvantages of whole-time and part-time consultant service, suggesting by their questions that the medical profession could not be placed in a "more favourable" position than other professions in respect of expenses, and about the negotiating machinery wanted by the profession. In a new memorandum of evidence the Joint Consultants Committee recommended that the salaries of hospital medical staff should now be further increased by 29% to offset the fall in the value of money between 1951 and 1957, and to maintain the economic position of doctors in relation to other professions, and that the three distinction awards should be increased by 60%. The effect of the recommendations would be that a pre-registration house officer would receive £550 and a second-year house officer £650 to £700, a registrar £1,096 17s. 6d. to £1,244 17s. 6d., a consultant on the basic scale £2,709 to £3,999, and a consultant with an "A" distinction award £6,709 to £7,999.

Those giving evidence on October 31 were: Mr. T. Holmes Sellors, chairman of the Joint Consultants Committee, Sir Harold Boldero, Dr. J. D. S. Cameron, Dr. T. Rowland Hill, Mr. J. P. Cocker, and Dr. D. P. Stevenson. In addition to the further written memorandum of evidence, the Royal Commission had received from the Committee a document setting out definitions of posts in the hospital service and a supplementary memorandum which dealt with a number of points that arose in the course of the Committee's oral evidence on December 18, 1957.

S.H.M.O.s Doing Consultant Work

Sir DAVID HUGHES PARRY said that in their definitions the Joint Committee stated that "a consultant grading is a personal one depending on the possession of appropriate qualifications or training and ability," but that in the memorandum it referred to "an S.H.M.O. post doing work of consultant quality and responsibility." They emphasized the personal aspect and then dealt with the post. Mr. HOLMES SELLORS pointed out that in the second case they used the words in connexion with S.H.M.O.s, and what they were saying was that an S.H.M.O., who was of consultant quality by virtue of qualifications and experience and so on, ought to be graded as a consultant, particularly when he was doing work of that character.

After he had explained how most consultants held a higher qualification of one of the Colleges, Mr. Holmes Sellors was asked by the CHAIRMAN, Sir HARRY PILKINGTON, about the Central Consultants and Specialists Committee.

He told how it was democratically elected and represented the whole of the hospital staffing structure. In answer to a question about psychiatrists, Mr. HOLMES SELLORS said they were represented on the Central Consultants and Specialists Committee and a high proportion were members of one of the Colleges.

The memorandum stated that the young doctor, after his pre-registration appointments and National Service, was about 27 before he could take any decisive step in his professional career. Sir DAVID HUGHES PARRY said National Service would soon be disappearing, "and we really ought to be planning on 25." But Mr. HOLMES SELLORS replied that it appeared that qualification was a little later now, and it might be 26, without National Service.

Expenses

"Every consultant should be encouraged to take some part in the meetings of his specialist body, and it is a justified grievance of whole-time consultants that they are refused income-tax relief for subscriptions to these organizations," stated the Joint Committee's memorandum. Sir DAVID HUGHES PARRY: "Part of that has gone?" Mr. HOLMES SELLORS: "Part of it, but not all, by any means." Sir DAVID: "No, I quite appreciate that."

The memorandum also stated that every hospital should maintain an adequate library or source of reference for its staff. This applied particularly to provincial or peripheral hospitals where the staff did not have ready access to medical libraries. At present the grants made to hospital management committees for this purpose were inadequate. "It applies particularly to the whole-time person and the young man working whole-time in the hospital where his income is not sufficiently large to let him subscribe to a number of journals which are important to him," amplified Mr. HOLMES SELLORS. The Joint Committee felt strongly that hospitals should provide the main structure of what he should read, "because, as you will appreciate, the medical literature at the present time is voluminous."

Registrars

A section of the memorandum was devoted to difficulties encountered by registrars. It stated that an increase in the salaries of both registrars and senior registrars was urgently needed. "And then," added Sir DAVID, "on the very next line you state: 'Senior registrars are too numerous, in relation to the number of consultants.'" To his suggestion that if the salaries of senior registrars and registrars were made so attractive there would be still more attraction to the posts, Mr. HOLMES SELLORS pointed out that the competition for senior registrar posts was extremely severe, bringing

up to 15 or 20 applicants who might all be considered very suitable for the post; also the number of these posts was governed by the establishment, which was agreed between the Ministry of Health and the profession. The registrar, below the level of the senior registrar, was in difficulties economically also, and in regard to future prospects. The CHAIRMAN: "Is there a very sharp distinction between registrar and senior registrar?" Mr. HOLMES SELLORS: "Very sharp."

Whole-time and Part-time

The next section was devoted to the relative advantages and disadvantages of different forms of service. "We regard that as a very important matter, naturally," commented Sir DAVID HUGHES PARRY. The advantages of part-time service seemed to be of two general kinds. There were the advantages resulting from the conditions of service and those resulting from being in a better position against the exactions of the Inland Revenue. The Joint Committee had also emphasized that the part-time person had advantages in independence of outlook; and there was some private practice.

"Can we take conditions of service?" Sir DAVID asked. "Would it be right that the part-timer is better off as regards travelling time?" "That is certainly so," replied Mr. HOLMES SELLORS. Mr. Holmes Sellors went on to explain about the sessional basis of payment. The sessional basis was never intended to be an exact computation of the number of hours spent at the hospital. The profession resisted the idea of being "clocked in" and "clocked out." It was essentially what a man gave in half a day which was to be the unit, "without having to go into hours and fractionizing into minutes, which is what finance officers do." The original contract was made on the assumption that the work the man would be doing would be roughly split into half-days; it was impossible to compute the amount of work which an individual did in the unit of time.

Dr. D. P. STEVENSON said he was not clear why Sir David Hughes Parry thought the sessional basis of payment was an advantage to the part-timer. Sir DAVID: "One advantage is that the hours are rounded up a little." Mr. HOLMES SELLORS explained that time had to be allowed for emergencies and extra visits. The CHAIRMAN said that in the terms and conditions of service there was a prescribed method of determining the number of hours which did involve rounding up. Mr. HOLMES SELLORS agreed, but pointed out that the terms did say that this was a general guide. The CHAIRMAN: "On the whole that works not too badly?" Mr. HOLMES SELLORS: "Yes, not too badly." Dr. T. ROWLAND HILL said that the "rounding-up" worked both ways. If a man had six sessions, in 99 cases out of 100 he never hesitated to work 10 or 11 if his patients needed it. "I think that is appreciated," replied the CHAIRMAN. Sir HUGH WATSON: "You do not work to rule?" Dr. HILL: "We do not want to be forced to."

When Dr. J. D. S. CAMERON mentioned that the part-time consultant had a continuing responsibility, it was pointed out that the whole-time consultant had his also. Sir DAVID: "You would agree that the weighting is rather in favour of the part-timer?" Mr. HOLMES SELLORS: "It was a great deal more before the last award, but that weighting includes a number of imponderable things."

Independence of Action

Many men chose to be part-time to give them that extra freedom, Mr. HOLMES SELLORS continued. It gave them freedom to engage in private practice. Some doctors were quite convinced that they would work better on part-time; others felt that they would do better if they worked full-time. The CHAIRMAN asked whether there were part-timers who would like to be whole-timers, but could not, or who would like more sessions than they could obtain? Mr. HOLMES SELLORS said a number would want to get more sessions for economic reasons, particularly young men.

In answer to Sir DAVID HUGHES PARRY, Dr. HILL agreed it was quite true that the full-time consultant had more security than the part-timer. He said that another point was that, in the case of a part-time consultant doing a good many hospital sessions, the stress and strain, if there was a considerable demand for him in private practice, could be very great. Lord Moran had said that many men chose to be whole-time for the more undisturbed nature of their professional work, particularly if they were interested in some kind of research. Another disadvantage of part-time work was that of the young consultant—and the Committee could give many examples—who began with perhaps two sessions and had no private practice yet. Still another disadvantage was that part-time consultant sessions were often spread over a number of hospitals, involving much travelling time. Professor J. JEWKES, a commissioner, pointed out that the superannuation scheme for part-time consultants was not quite so attractive as that of the full-time consultants.

Dr. STEVENSON said that a part-time consultant on maximum sessions might be doing far more than that for which he was paid. Secondly, if a hospital had to be reorganized through a change of use, a part-time man might have the number of his sessions reduced. These were examples of disadvantages in part-time service.

Trend to Part-time

In answer to the CHAIRMAN, Mr. HOLMES SELLORS said he thought that, when regional boards had given consultants the choice, the trend had been to choose part-time. A number of those who before the National Health Service Act were full-timers had become part-timers. Sir DAVID: "Private practice is with the doctor, as with the lawyer, a matter of great risk?" Mr. HOLMES SELLORS: "Very great at the present time." Sir DAVID said, however, that the man on nine sessions and with private practice had the security of the State behind him, as well as his private practice. Mr. HOLMES SELLORS replied that the young man was not likely to have the private practice.

Recalling that the Joint Committee had stated in written evidence that, when a whole-time consultant transferred to maximum part-time, he invariably gave his employing authority an undertaking to continue to fulfil all the duties of the appointment "as hitherto," Professor JEWKES said he was thus getting a smaller salary for the same work. "It is a worth-while disadvantage," replied Mr. HOLMES SELLORS. "It is like an act of liberation." He mentioned a radiologist and a pathologist who were applying to go maximum part-time "in order to get out of the whole-time atmosphere." The CHAIRMAN: "Do you know of any case where a man has gone to maximum part-time and another consultant has been appointed for the additional two sessions?" Dr. HILL: "I have never known it happen." Mr. HOLMES SELLORS said he was maximum part-time, and his rough estimate was that he put in 12 to 15 sessions. He emphasized what might be called the spiritual side of independence, to which many attached importance.

On this point the memorandum stated: "The great disadvantage of the whole-time consultant's position is that he lacks the sense of professional independence that is felt by a consultant not wholly dependent upon his salaried appointment." Sir DAVID asked: "Does that affect his work in any way in the National Health Service with the patient?" "No," replied Mr. HOLMES SELLORS. A full-time consultant and a part-time consultant were two people giving the same service professionally. The difference was in their outlook.

Advantage Over Other Professions

Sir DAVID said that on the question of allowances for travel, instruments and journals, and conferences, the Commission's difficulty was that it could not alter the income-tax law. Mr. HOLMES SELLORS replied that if it was agreed in the terms of a man's contract that he should have certain things available for the performance of his work, that would overcome the difficulty. "That would give advantages over

other professional people," declared Sir DAVID. "The telephone is a universal object, but it is essential for the medical man," said Mr. HOLMES SELLORS. Dr. STEVENSON drew attention to the paragraph in the Joint Committee's memorandum which stated: "The Consultant Spens Committee stated that it presumed that the Inland Revenue authorities would be prepared to consider favourably as legitimate allowances for income-tax purposes any items of expense which had been approved by a public hospital authority." "We thought that the full-timers never had the intentions of Spens implemented," he said. A whole-time consultant was required to be on the telephone. His board would pay out-going expenses for calls but not the rental.

The Spens Committee also recommended that all specialists engaged whole- or part-time in the Service should be paid, in addition to their remuneration, any sums representing expenses necessarily and reasonably incurred in the course of their work. Said Dr. ROWLAND HILL: "Time and again we have asked the Ministry and the Management Side of the Whitley Council to instruct hospital authorities to embody that clause in their contracts, but they do not do so." "Perhaps," suggested Sir HUGH WATSON, "Spens should not have said what he did. This affects many other professions than yours. I do not think you should blame the Inland Revenue for this."

Professor JEWKES asked whether he would be right in thinking that the most important of the differences between whole-time and part-time was that of domiciliary visits. Mr. HOLMES SELLORS told him that was probably the least important. He thought the question of car expenses and travelling time was the most important; travelling for the medical man was a matter of a car.

Importance of Freedom

The CHAIRMAN: "We have understood—from Dr. Rowland Hill particularly—that having freedom is the most important thing." Dr. HILL: "That is the paramount one—that is the thing that compensates for all the disadvantages of being a part-timer. The disadvantages are accepted disadvantages." The CHAIRMAN: "You are saying that it is worth while having a little bit less remuneration to have your complete freedom?" Dr. HILL: "I agree; I would like to emphasize that with great force." The CHAIRMAN: "On the whole the whole-timer should not earn less because he has the disadvantage, I think you said, of 'being a galley slave'?" Dr. HILL: "No. If no such thing as private practice existed and if there were no differences in income-tax law, it would still be the case that the great majority would want part-time. The great majority of the present generation—I cannot speak for future generations—do not want to be whole-time salaried officers of a public body." Sir DAVID HUGHES PARRY suggested that the maximum part-timer had the maximum security under the system. Dr. STEVENSON said that the weighting in favour of the part-timer was intended to compensate for some of the disadvantages inherent in part-time service.

Mr. S. WATSON, a commissioner, asked whether the person employed full-time in the Health Service should have a higher form of remuneration than those who got spiritual release—and private practice. Mr. HOLMES SELLORS replied that *pro rata* the remuneration for the hospital service doctor should be the same. Mrs. K. M. C. BAXTER, a commissioner, was not clear why the category of whole-time consultant had to be continued. Why could it not be abolished, thus releasing everybody from income-tax problems and from the galley? Mr. HOLMES SELLORS replied that there were some circumstances in which the full-time could not dictate to the man who wished to work full-time. Sir HUGH WATSON: "There are some Britons who prefer to be slaves?" Dr. HILL said that there was a limiting clause in the agreement that consultants should be offered the choice of part-time, which stated that if the hospital authority felt that for medical reasons the post should be whole-time the choice should not be given.

Emigration

The Joint Consultants Committee's memorandum described as "alarming" the high proportion of doctors attracted by the prospects overseas in comparison with those available in this country. "The fact that so many members of the profession are driven to emigrate reflects dissatisfaction with the present conditions of medical practice in the United Kingdom," the memorandum stated. Sir HUGH WATSON asked "whether this was a reference to finance or other things?" Mr. HOLMES SELLORS said finance was a very considerable cause. Another was that those who emigrated did not want to work in what people felt was becoming a State monopoly, and they thought the prospects of promotion were better overseas. "We have lost a great many very well trained registrars and senior registrars to the North Americas and other countries, and they have not come back."

Mr. WATSON: "Do you think a useful purpose could be served by retiring consultants earlier so that the line of promotion would be easier for the young men?" Mr. HOLMES SELLORS: "No, I do not think so." Mr. WATSON suggested that the question of emigration was nothing to do with the Health Service; it was just that there was no possibility of promotion within it. Mr. HOLMES SELLORS replied that there were people who felt strongly that they did not want to work under a State monopoly. "Would there be any advantage in raising the retiring age?" asked Professor JEWKES. "It is now 65, and that is lower than in some other professions where energy is supposed to count," he said. Mr. HOLMES SELLORS said that if the age was raised it would make more difficult the position of the younger members of the profession.

Private Practice After Retirement

The CHAIRMAN asked whether a consultant retired from private practice at the same time as retiring from the Service. Mr. HOLMES SELLORS said he continued private practice, but a man who severed his connexion with hospital became "run down" so far as private practice was concerned. Mr. GUNLAKE said it had been pointed out that it was difficult to carry on practice after retirement because of the difficulty of obtaining access to diagnostic and therapeutic apparatus. Mr. HOLMES SELLORS said that the retired consultant had theoretical access to private beds. "Which are very expensive?" queried Mr. GUNLAKE. He pointed out that, although the retiring age was normally 65, a consultant could be kept on up to 70. Mr. HOLMES SELLORS thought on the whole this was not done extensively. They felt that, in fairness to the younger men, they should not continue.

Negotiating Machinery

The Joint Consultants Committee witnesses were closely questioned on their proposals for negotiating machinery. "We have had a number of proposals on negotiating machinery," said Sir DAVID HUGHES PARRY, "and we are going into each one of them as deeply as we can."

The Joint Committee's memorandum stated that there were strong arguments in support of direct negotiation when major matters of finance or other questions of national importance were involved. In addition the Committee recommended that there should be a small advisory committee of eminent lay persons, appointed by the Prime Minister in consultation with the profession, to keep under continuous review the general level of remuneration of doctors engaged in the National Health Service in order to maintain their proper economic and social status; it should have the continuing duty of tendering advice to the Government on its own initiative, but also consider issues specifically referred to it by the profession or the Government.

Mr. HOLMES SELLORS explained that they had no wish to alter the machinery by which they had direct talks with the Ministry officials and even the Minister of Health himself on questions of policy. But they were entirely dissatisfied after 10 years' experience of the Whitley machinery for deal-

ing with major matters of finance. Mr. Holmes Sellors referred to the "inverted Micawberism" of the Management Side ("they are always waiting for something to turn down, rather than something to turn up"). Nearly everything a consultant did was governed by his terms of service. Dr. STEVENSON explained, and under the present system no amendment to the terms of service could be made without ratification by the appropriate committee of the Whitley Council. The present claim was a major matter of finance which was unsuitable for the Whitley Council.

The Committee had based its suggestion for a small advisory committee on the Coleraine Committee for the Civil Service, explained Dr. Stevenson. Mr. WATSON suggested that there was a very different employer/employee relationship there. Would this proposed body, set up only in consultation with the medical profession and which would be without any responsibility whatever, financial or otherwise, within the Health Service, bring forward recommendations? Dr. HILL said they were attracted by the suggestion in the report of the Royal Commission on the Civil Service in respect of the managerial staff. Mr. HOLMES SELLORS underlined that they did not think that the new body should have a say in settling staffing structure. The idea was to stop this interminable wrangling and definite ill-feeling which resulted from the present situation. The profession, he added, would prefer to work out any question of distribution of money themselves.

"Have you a fairly clear dividing line between those things which should be dealt with by Whitley and those things which should be dealt with by direct negotiation?" asked the CHAIRMAN. Mr. HOLMES SELLORS replied that in Whitley "bread-and-butter, day-to-day matters" could continue to be discussed. On matters of policy, such as pay beds, they believed that direct negotiation with the Minister was the best way of dealing with it.

The CHAIRMAN noted that the Joint Committee called for a "drastic overhaul" of Whitley. Mr. HOLMES SELLORS said this referred to the whole atmosphere; the Staff Side felt it was Treasury controlled. Mr. WATSON: "Of course that is really inevitable?" Mr. HOLMES SELLORS: "We agree, but it does not make for a well-lubricated machine." Mr. WATSON: "Do you recommend that the Management Side should be composed of Government officials with real authority?" Dr. STEVENSON said this was what happened in general practitioners' negotiations. Mr. WATSON: "If that is so, what is the need for the new advisory body?" Mr. HOLMES SELLORS: "Because 10 years of bringing many national issues to Whitley does not give us encouragement."

"Some of us," said Mr. WATSON, "are very anxious to find a medium of negotiation." He asked whether it was envisaged that the advisory committee would go through the whole of the Health Service from A to Z and make all sorts of recommendations, such as, for instance, on retirement, capitation, a State medical service, "and other reforms." Mr. HOLMES SELLORS said that remuneration was what they had chiefly in mind. The reference to its consideration of "other questions of national importance" involved such matters as inflation. Professor JEWKES: "You are suggesting for the reviewing advisory body one task only—to give advice on the total sums that should be made available for the payment of consultants and general practitioners in the National Health Service?" Mr. HOLMES SELLORS: "Yes." The CHAIRMAN: "The only drastic overhaul of Whitley you are asking is that Whitley should be composed of people who can give an answer?" Mr. HOLMES SELLORS agreed. Mr. GUNLAKE: "You have also said that you would like people to come with open minds." The CHAIRMAN: "Is it possible that your side goes with its mind made up?"

The rest of the evidence of the witnesses from the Joint Consultants Committee was taken in private.

The public hearing by the Royal Commission on Doctors' and Dentists' Remuneration of evidence from the Executive Councils Association (England), which was to have taken place on November 4, was postponed at the association's request.

EXECUTIVE COUNCILS ASSOCIATION (ENGLAND)

LOOKING TO THE FUTURE

The eleventh annual meeting of the Executive Councils Association (England) was held in Torquay on October 23 and 24, with the president, Mr. H. W. TOWNLEY, in the chair. Dr. T. M. MONTFORD, of Castle Donington, near Derby, was installed as president for the year 1958-9. Dr. Montford is chairman of the Leicestershire and Rutland Executive Council.

President's Address

Mr. Townley, in his presidential address, agreed with those who, judging by the health of the nation, regarded the National Health Service as having been an unqualified success. He looked to the future and found no room for complacency. The Service was costing about £2m. a day. As a result of the National Health Service Contribution Act of 1957 about £60m. a year was now compulsorily contributed by the people towards this cost. The possibility of further increases in contributions could not be ignored, and the president suggested that the effects of this "drastic departure" from the original scheme should be carefully scrutinized by all who were interested in the social services. The gross cost of the executive council part of the Service was about £172m. annually, and against this £21m., or 12% of the gross cost, was charged to patients. Dental service charges amounted to £7,828,000; ophthalmic service charges to £5,241,000; and pharmaceutical services charges to £7,869,000. There was a danger, Mr. Townley thought, that the direct costs to individuals might well get out of balance in relation to the costs borne by the general finances of the country through the Exchequer.

The president paid tribute to Mr. J. A. Speed's 45 years' service to insurance committees and executive councils and in other spheres of the Health Service. Mr. Speed has retired from the secretaryship of the Executive Councils Association.

Minister's Address

The MINISTER OF HEALTH, addressing the conference, said that the 10th anniversary of the National Health Service could be celebrated not with extravagant claims but with satisfaction at progress made. It was long enough to have established a sound record of performance but short enough for there to be no doubt that the future was more important than the past. His policy was to pursue the highest common factor of efficiency and economy in the Service.

The gross cost of the Service in 1957 was £740m., which represented about 3½% of the general national product. The cost to the Exchequer was £530m., or 10% of the budget. Lower costs did not necessarily follow improved efficiency and increased productivity in the N.H.S. as they did in most activities. The Health Service was the victim, economically speaking, of its own success. Science and medicine prolonged human life with the result that there was a larger proportion of old people, vulnerable to disease and chronic sickness.

The Minister went on to outline what he thought should be the approach in face of these facts. Without belittling the importance of better treatment and cure, he thought that more emphasis should be given to prevention of illness. He then went on to review the state of the preventive health service, other than environmental services and the part played by sound diet. He referred to the key position of family doctors in furthering preventive measures, and noted that representatives of the profession had agreed that it would be helpful if G.P.s were to receive some of the advice on social and preventive aspects of medicine prepared by standing advisory committees of the Central Health Services Council.

The Minister then reviewed the facilities for home care, especially for the aged and mentally handicapped, as being

another contribution to economy with efficiency. Happily there was no conflict between economic and social desirability in home care. It was economically good because it eased pressure on hospitals and it was socially desirable because most people preferred to stay at home. The successful operation of domiciliary services depended very largely on co-operation between local authorities and general practitioners. The proportion of the population living in under-doctored areas had decreased from about 60% to about 18%. In 1948 there was an average of 2,500 patients per doctor and in 1958 the average was 2,250. The number of G.P.s had increased from 17,500 to over 20,000. Partnerships and group practices had increased significantly, and already £4m. had been allocated in interest-free group practice loans.

Practice Vacancies

On the report of the management committee on last year's resolution urging the Minister to review the arrangements for filling practice vacancies a keen debate ensued. Some speakers urging a compromise arrangement between the Scottish and English methods of appointing candidates. The conference would have none of it, and again overwhelmingly voted in favour of the Scottish principle: that executive councils should be the appointing bodies and the Medical Practices Committee should be the appeal body. The management committee was instructed to urge this on the Minister with all vigour. A proposal to "freeze" a practice list until a successor is installed as a trial scheme for a period of two years was defeated.

The conference overwhelmingly supported a proposal that the numbers of hospital beds available to general practitioners should be increased and that the beds should be available for both medical and dental general practitioners. The proposer made it quite clear that specialist and laboratory cover should be implied in the scheme and that such beds would be acceptable either in "G.P. hospitals" or in "full facility hospitals." The management committee was instructed to investigate the matter and prepare a scheme for implementing the resolution.

On the scope of benefits under the N.H.S., a proposal that comparable facilities should be available to British nationals temporarily abroad met with unanimous support, but the practicability of implementing the actual wording of the motion was doubted by some. In the end it was referred to the management committee to interpret the obvious wishes of the conference and to bring forward a scheme to achieve the object.

The management committee undertook to explore the feasibility of arranging one session at future conferences to be devoted to a lecture-discussion on one or more matters of special importance in the N.H.S.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Quality in Medicine

SIR,—Quality of medical service must depend on academic training, personal experience, and an ability to apply both in a manner acceptable to the patient. Quality of service in general practice, given average ability, will depend therefore on the standard of academic achievements in hospital medical subjects plus the length of experience in hospital and in general practice. Under the present scheme the greatest financial reward is given to quantity, and the largest income goes to the most efficient sorter. Specialization in hospital is regarded as a bar to appointment to a practice vacancy, and there seems to be very little or no incentive to obtain higher qualifications, or gain extra experience in hospital, or to spend time doing things which a good G.P. could do. Prior to 1948 every incentive was provided to

give this kind of service because "better-class practice" brought higher fees for a smaller number of patients and payment was for work done. G.P. hospital appointments were available, and many specialists supplemented their income by general practice.

In hospital service emphasis nowadays is placed on academic and technical efficiency rather than on the personal quality of the service rendered. Under the voluntary system a satisfied hospital patient meant a satisfied G.P., and therefore more private patients for the consultant concerned. Now the consultant gets his salary independently of the G.P. Prior to 1948 there was greater interdependence of hospital and G.P. services, whereas to-day the gulf between them is very wide and getting wider. Not only was the consultant anxious to please both patient and G.P. but he was also concerned in placing his best students in the best practices from which the private patients came. It was to his financial advantage to consider quality in general practice, added to which these doctors did not waste his unpaid hospital time in unnecessary diagnosis and treatment, which they were able to do for themselves and for which they were paid. The gulf is widened also because, since it is exceptional for a G.P. to hold consultant sessions, the highest-paid hospital appointment open to him—i.e., S.H.M.O.—is remunerated at a lower rate than National Health general practice. A G.P. has now no financial advantage whatsoever from gaining higher academic qualifications or experience.

It is wise to stick to basic principles when suggesting methods for solving these problems. The first would be to provide a satisfactory reward for extra time and effort spent in acquiring greater knowledge and experience by staying on after the pre-registration year in hospital, and to ensure that payment while doing so is at least as good as, if not better than, the income that could be earned by the same doctor if he did not stay on. The second would be to eliminate all dead-end jobs, such as S.H.M.O.s, by absorbing them into the scheme as junior or senior consultants, and in future insisting on senior registrars passing through this grade. A safeguard against over-use of a junior consultant grade would be to arrange reasonable ratios of all grades to ensure adequate opportunity for all to advance to the top. This solution would seem to be far more practical for non-teaching hospitals. The delays or wastage of effort which are the lot of many senior registrars to-day could be overcome by regulating the numbers waiting for promotion in proportion to probable vacancies and by lessening the number of senior registrars by replacing them by junior consultants in non-teaching hospitals, thereby again improving the ratio.

The third would be to integrate G.P. and hospital work more closely by offering inducements in general practice to candidates with higher training and experience and also by making available to G.P.s hospital appointments where such extra qualifications could be suitably rewarded. Consultants with three to six sessions could be allowed to supplement their income with part-time general practice, and this, with its added local interest, would probably be far better than insisting on full part- or whole-time consultants having two or three sessions at widely spread hospitals. Some way should be found of making G.P. remuneration compare favourably with that of the specialist without depending on abnormally high numbers on the State list.

Fourthly, the greatest shortages of staff are being experienced in the non-teaching hospitals whose consultant staff outnumber that of the teaching hospitals by 4 or 5 to 1. Also the personnel suffering the greatest frustrations and injustices of the present system are to be found mainly among S.H.M.O.s, senior registrars, and other junior officers. While the profession welcomes the setting up of a working party on this urgent matter, to arrive at a permanently satisfactory solution it might be wise to give the fullest weight to the first-hand opinions of those who can speak with authority for these groups, who number 9,000 to 10,000. It is possible that the present difficulties are owing in some measure to the inadequate representation of non-teaching hospital consultants and G.P.s on the original planning committees.

Finally, the health centre idea flourished and died because practically all the emphasis was on elaborate and expensive buildings and equipment, rather than on forming the right kinds of teams and then housing them. No authority seems to have conceived the idea of teams of well-qualified medical experts working together in general practice. Such a team, based on a district hospital, could raise the standard of general practice and get the

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British Medical Association**ROYAL COMMISSION ON DOCTORS' AND DENTISTS' REMUNERATION****FOURTH SUPPLEMENTARY MEMORANDUM OF EVIDENCE****INTRODUCTION**

1. In its Preliminary Memorandum of Evidence (*Supplement*, November 23, 1957, p. 157) the Council dealt with the general principles involved in its dispute with the Government and with its claim for an overall increase of not less than 29% in the remuneration of both general practitioners and doctors in the hospital service. Subsequently, in its Second and Third Supplementary Memoranda of Evidence (*Supplement*, June 14, pp. 311 and 324), sent to the Commission on June 16, the Council put forward detailed proposals for the remuneration of all grades of hospital medical staffs. In this Fourth Supplementary Memorandum the Council deals with a number of questions on general practice which the Royal Commission itself posed in the course of oral evidence on January 23 and 24 and emphasizes some other aspects of general practice which it considers should be brought to the notice of the Commission.

MATTERS UPON WHICH THE COMMISSION HAS INVITED THE ASSOCIATION TO SUBMIT FURTHER EVIDENCE**(1) The Spens Recommendation for an Augmented Capitation Fee for an Abnormal Number of Aged Patients or Chronic Invalids (Recommendation 6)**

2. This recommendation has been carefully re-examined in the light of present circumstances and having regard to the practical considerations involved if such a scheme is to operate fairly. First, it would be necessary, as far as the aged are concerned, to prescribe an arbitrary age limit. Secondly, it would be necessary to define precisely the term "chronic invalid," and this would necessitate the very difficult task of setting out a list of diseases or infirmities which vary widely in severity and chronicity. Thirdly, some formula would be necessary to determine the basic percentage of those in these categories on each doctor's list above which the augmented capitation fee would apply. The administrative difficulties involved are obvious. The fluctuations in doctors' lists would necessitate a continuous review and recalculation in the case of the vast majority of general practitioners who might qualify under any scheme of this kind.

3. The Council feels that such a scheme would be useful only if it could be shown that in the above categories there is considerable unevenness of distribution as between one practitioner and another.

4. For these reasons, and primarily because of the administrative difficulties, the Council does not feel that it would be possible to achieve a scheme of this nature which would work equitably in practice. Nevertheless, whilst it doubts whether any special action on these lines would be justified, it is always prepared to discuss the matter with the Ministry in the light of any evidence which would appear to justify a modification of the existing distribution scheme.

(2) "Merit Awards" in General Practice

5. During the course of oral evidence the Commission asked the Council's representatives to comment upon the possibility of introducing a scheme of merit awards in general practice. The suggestion is by no means new, but bristles with difficulties. It has been considered by other bodies, including the Cohen Committee on General Practice, which made no recommendations on the subject.

6. It was also debated by the Representative Body of the Association at Birmingham in July of this year, when the following resolution was passed:

That this Meeting can see no objection to a "merit award" scheme for general practitioners, provided a practicable scheme can be devised and subsequently approved by the Representative Body.

7. The following paragraphs embody various criteria to each of which proper weighting should be given in the consideration of any scheme of this kind in general practice. The Council considers that the title of any award based on such criteria is important and it feels that "commendation" or some other term would be a more acceptable title than "merit."

1. To qualify at all a general practitioner would need a minimum period—for example, 10 years—in N.H.S. general practice with a minimum average list (the number varying according to the type and location of practice) over the period

2. Due regard could be paid to post-registration hospital appointments.

3. Postgraduate clinical qualifications or diplomas approved for the purpose could be taken into account.

straightforward jobs of treatment and investigation done near the patient's home. Application of these principles might be not only more acceptable to the public and profession alike but possibly provide a better service at a lower cost.

Thus, improving the quality of the National Health Service depends enormously on a satisfactory solution of the future hospital staffing problem. Such a solution could ensure (1) a continuous flow of candidates for all hospital junior appointments, instead of 770 or more vacancies; (2) a satisfied personnel, sure of reasonable opportunities and rewards, instead of disgruntled and disillusioned highly qualified doctors in dead-end jobs; and (3) it could help to raise the status of general practice—and general practice is still the foundation of medicine. In fact, it could supply just the right incentive needed to make British medicine the finest example of team-work of its kind in the world.—I am, etc.,

Tiverton, Devon.

GEORGE LOWE.

Association Notices**ELECTION OF A MEMBER OF COUNCIL**

The following candidates have been nominated for election to fill the vacancy in the Council announced in the *Supplement* of October 18 (p. 176):

G. F. Burnell, Truro, Cornwall.
O. C. Carter, Bournemouth, Hants.
R. P. Liston, Tunbridge Wells, Kent.
H. B. Muir, Auchtermuchty, Fife.
R. W. L. Pearson, Birkenhead, Cheshire.
W. B. J. Pemberton, London, S.E.1.
J. A. Pridham, Weymouth, Dorset.
C. M. Scott, New Barnet, Herts.

Voting papers will be issued on November 8, 1958, to the representatives of the constituencies and of Public Health Service members and members of Council representing the medical branches of the armed Forces, and must be returned not later than November 22.

A. MACRAE,
Secretary.**Diary of Central Meetings**

NOVEMBER

- | | |
|-----------|---|
| 11 Tues. | Medico-Legal Subcommittee, Central Consultants and Specialists Committee, 2.30 p.m. |
| 12 Wed. | Physical Medicine Group Committee, 11 a.m. |
| 12 Wed. | Council, 2 p.m. |
| 14 Fri. | Medical Members of Editorial Subcommittee of Joint Formulary Committee, 11 a.m. |
| 14 Fri. | Special Conference on Medical Appointments Overseas, 11 a.m. |
| 14 Fri. | Non-professional Group Committee, 2 p.m. |
| 19 Wed. | Public Relations Committee, 2 p.m. |
| 20 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 20 Thurs. | Dermatologists Group Committee, 11 a.m. |

Branch and Division Meetings to be Held

ABERYSTWYTH DIVISION.—At Feathers Royal Hotel, Aberystwyth, Saturday November 15, 8 p.m., dinner-meeting. Lecture by Mr. Roderic Bowen, Q.C., M.P.: "The Medical Man as a Witness." Wives of members, and guests, are invited.

ALDERSHOT AND FARNHAM DIVISION.—At Queen's Hotel, Farnborough, Wednesday, November 12, 7.30 for 7.45 p.m., dinner; 8.45 p.m. B.M.A. Lecture by Colonel R. A. Smart: "The Royal Society International Geophysical Year Antarctic Expedition." Guests are invited.

BLACKPOOL AND FYLDE DIVISION.—At Savoy Hotel, North Shore, Blackpool, Wednesday, November 12, 7.15 p.m., dinner; 8.45 p.m., lecture by Professor J. D. Hay: "Diagnosis and Treatment of Congenital Pulmonary Stenosis." (With film.)

BOURNEMOUTH DIVISION.—At the Prince Charles Suite, Royal Bath Hotel, Bournemouth, Friday, November 14, 7.30 for 8 p.m., annual dinner. Guests, including ladies, are invited.

BRIGHTON AND MID-SUSSEX DIVISION.—At Dudley Hotel, Hove, Thursday, November 13, 8.30 p.m., combined meeting with Brighton and District Section of B.D.A.

BROMLEY DIVISION.—At Nurses' Home, Beckenham Hospital, Wednesday, November 12, 8.15 for 8.30 p.m., clinical meeting. Discussion to be opened by Dr. R. F. L. Logan and Dr. Bruce Cardew: "General Practice—Past, Present, and Future." Guests are invited.

COVENTRY DIVISION.—At the Chace Hotel, Tuesday, November 11, 7.30 for 8 p.m., supper, followed by B.M.A. lecture by Professor Douglas Hubble: "Diagnosis and Treatment of Thyrotoxicosis."

CROYDON DIVISION.—At 45, Wellesley Road, Croydon, Tuesday, November 11, 8.30 p.m., general meeting. Address by Dr. Bruce Cardew: "The Next Ten Years."

DORSET DIVISION.—At King's Arms Hotel, Dorchester, Wednesday, November 12, 8.30 p.m., general meeting. Symposium by Mr. J. M. Jewers, Mr. P. I. Hywel-Davies, and Dr. T. V. Cooper: "Injuries and Infections of the Hand."

DUDLEY DIVISION.—At Guest Hospital, Dudley, Tuesday, November 11, 9 p.m., annual general meeting. Election of officers, etc.

DUMFRIES AND GALLOWAY DIVISION.—At Cresswell Maternity Hospital, Sunday, November 9, (1) 3 p.m., special meeting; (2) 3.5 p.m., address by Mr. W. Gissane: "Lessons in First Aid Based on Experience in an Accident Service."

EAST KENT DIVISION.—At Chez Laurie, Thanet Way, Herne Bay, Thursday, November 13, 7.30 p.m., dinner; 8.45 p.m. B.M.A. Lecture by Dr. G. F. Vaughan: "Child Psychiatry." Ladies are invited.

GLOSSOP DIVISION.—At Station Hotel, Glossop, Monday, November 10, 8.45 p.m., annual general meeting.

GLOUCESTERSHIRE BRANCH.—At Gloucestershire Royal Infirmary, Thursday, November 13, 5.30 p.m., clinical meeting, followed by ordinary meeting and supper at New County Hotel, Gloucester.

GOOLE AND SELBY DIVISION.—At White Elephant, Snaith, Thursday, November 13, 7.30 p.m., films: (a) "Diuretic Therapy with 'Saluric'"; (b) "Gout and Gouty Arthritis."

GUILDFORD DIVISION.—At Board Room, Royal Surrey County Hospital, Thursday, November 13, 8.30 p.m., Dr. E. C. Warner: "Hypertension."

HASTINGS DIVISION.—At Royal East Sussex Hospital, Tuesday, November 11, 8.15 p.m., clinical meeting.

HENDON DIVISION.—At Hendon Hall Hotel, Ashley Lane, N.W., Tuesday, November 11, 8.45 p.m., clinical meeting. Talk by Mr. Patrick Clarkson: "The Burnt Child in London."

KINGSTON-ON-THAMES DIVISION.—At Nurses' Home, Kingston Hospital, Tuesday, November 11, 8 for 8.30 p.m., address by Mr. A. Lawrence Abel: "The Acute Abdomen."

LANCASTER DIVISION.—At Grosvenor Hotel, Morecambe, Saturday, November 15, 7.30 p.m., annual dinner. Guest of honour, Dr. John Wilkie, of Lancaster.

LEIGH DIVISION.—At Courts Hotel, Church Street, Leigh, Tuesday, November 11, 8.30 p.m., annual general meeting. Address by Mr. W. S. Johnston: "Some Observations on the Abdomen" (Illustrated by slides.)

MONMOUTHSHIRE DIVISION.—At 1A, Waters Lane, Newport, Thursday, November 13, 8.15 p.m., extraordinary general meeting.

NORTH-EAST ESSEX DIVISION.—At the Albert Hotel, Cowdray Avenue, Colchester, Tuesday, November 11, 8 for 8.30 p.m., film meeting. "The General Practitioner and Rheumatic Disease." A discussion will follow. A special meeting of the Division will follow the film meeting.

PRESTON DIVISION.—At Preston Royal Infirmary, Tuesday, November 11, 8.30 p.m., clinical demonstration.

READING DIVISION.—At Phyllis Court, Henley-on-Thames, Wednesday, November 12, 7.30 for 8 p.m., annual dinner-dance.

ROCHDALE DIVISION.—(1) At Nurses' Lecture Theatre, Birch Hill Hospital, Rochdale, Monday, November 10, 8.30 p.m., clinical meeting. Address by Dr. Samuel Falk: "Psychiatry and General Practice." An extraordinary general meeting will follow.

(2) At Birch Hill Hospital, Rochdale, Sunday, November 16, 11 a.m. to 1 p.m., clinical demonstration and discussion.

SOUTH ESSEX DIVISION.—Sunday, November 9, 11 a.m., visit to Severalls Hospital, Colchester. Meet at hospital, 10.30 a.m.

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Wednesday, November 12, 8.30 p.m., proposals for adoption of new rules of organization, followed by a lecture by Dr. Raymond Daley: "Angina Pectoris."

SOUTH-WEST ESSEX DIVISION.—At Wanstead Hospital, Tuesday, November 11, 8.45 p.m., Dr. E. Frankel: clinical demonstration on medical cases, with special reference to recent advances.

SWANSEA DIVISION.—At Langland Bay Hotel, Thursday, November 13, 7.15 for 8 p.m., annual dinner.

WANDSWORTH DIVISION.—At South London Hospital for Women and Children, Friday, November 14, 8.15 for 8.30 p.m., Mr. R. W. Raven: "Advances in the Diagnosis and Treatment of Cancer."

WEST BROMWICH AND SMETHWICK DIVISION.—At Sandwell Hotel, West Bromwich, Thursday, November 13, 8 for 8.30 p.m., annual general meeting. Informal supper meeting, followed by a discussion and an address by Dr. H. Tabbush: "The Duties of an M.O.H."

WEST DERBYSHIRE DIVISION.—At Physiotherapy Department, Whitworth Hospital, Darley Dale, Wednesday, November 12, 8.30 p.m., meeting. Professor G. M. Wilson: "Antibiotics."

The annual general meeting of the Liverpool Region Hospital Junior Staffs Group will be held at the Liverpool Medical Institution on Monday, November 10, at 8.30 p.m. The meeting is open to all hospital junior staff in the Liverpool Region.

4. A further criterion could be evidence of "approved" post-graduate study.

5. Due weight could be given for special services and abilities not already taken into account under the previous headings.

8. The Council wishes to emphasize that these criteria are extremely tentative and there are many practical difficulties involved. Partnership agreements, for instance, frequently require earnings from all sources to be paid into the partnership's accounts and distributed in accordance with the partnership's shares. Again, general practitioners work under very different conditions from consultants and specialists, and, although the criteria set out above are important, the attachment of special weight to them will not necessarily identify the doctor who is worthy of special recognition.

9. The fundamental difficulty is to distinguish the doctor who is outstanding, and the nature of general practice is such that it is doubtful if any one person or body of persons can accurately assess the value of the services of the individual practitioner to the community. The Council is, in fact, in some doubt whether it is possible to devise any scheme of merit awards in general practice which the profession would accept as affording proper recognition, and it must emphasize that the profession's reaction cannot be anticipated until a detailed scheme is available for consideration.

(3) Assistants in General Practice

10. During the course of oral evidence the Council's representatives were invited to comment upon a number of points in connexion with the remuneration and terms of service of assistants in general practice.

11. First, the Council would like to place on record its view that an assistantship provides the best possible introduction to general practice. It enables the young practitioner whose experience of medical practice is confined to a hospital environment to gain an insight into the problems that arise in general practice and to acquire experience in the care of patients and the general administration of a form of practice which is quite different from his previous experience. The young doctor fresh from hospital has little knowledge of the sociological and legal aspects of general practice and may need to reorientate his views on prescribing for his patients. A period of assistantship provides such an essential training and also affords both principal and assistant the opportunity of working together and deciding whether from all points of view both are desirous of making the introduction permanent by way of a partnership.

12. It has frequently been said that the advantages of an assistantship lie wholly with the principal. This is not so, for the assistant is gaining his experience in the practice of the principal, who has the full responsibility for the practice. Whilst such a position is not peculiar to medicine, in general practice the principal's responsibility is specific, for under para. 8(8) of his Terms of Service he is responsible for the acts and omissions of the assistant.

13. Again the principal must accept a reduction in net income until such time as the size of his list approaches the maximum allowed by virtue of the employment of an assistant.

14. Some assistants wish merely to have a trial period in general practice to see if they like it. Others want an opportunity to look around so that they can determine the type of practice they desire, and where they want to settle down.

15. A good deal of criticism has been directed against the employment of assistants without a view to partnership. There are circumstances in which the help of an assistant in a practice is necessary. Yet to take the assistant into the practice as a principal would not be in the best interests of the assistant. Indeed, the offer to do so would be misleading and lead to frustration in the future. For example, the principal may have a prolonged illness (such as tuberculosis), or he may be engaged in a long period of post-graduate study. There is also the situation in which the list of the principal just exceeds the permitted maximum. It cannot be known at this stage if the practice will continue to

grow and support two principals. Again, a practice may have more than the permitted maximum number of patients, but the future is uncertain because of anticipated re-development in the area with a considerable reduction in population.

16. In all these examples some help is necessary to enable practice obligations to be carried out, and the Council believes that, provided the circumstances are made known in advance to the assistant and subject to the safeguards now in the hands of Executive Councils, such free association between principal and assistant is unobjectionable.

(4) Remuneration of Assistants

17. The Council has undertaken further inquiries into existing salary levels in this field and has endeavoured to ascertain the extent to which the salary of £500, recommended by the Spens Committee as being appropriate to the assistant's initial appointment, is being implemented.

18. After taking into account the Danckwerts betterment factor the figure would be £1,000, and allowing for a further 5% increase in respect of the interim adjustment made in net remuneration on May 1, 1957, the present-day figure would be approximately £1,050.

19. From the inquiries which it has made, the Council believes that present-day salaries, when combined with the emoluments which are attached to many posts, reach at least this figure and, in many cases, exceed it. In London, for instance, where a review of all assistants is taking place, of the first 51 whole-time assistants of principals interviewed during the period January 1, 1957, to April 1, 1958, the average gross remuneration at that time, including emoluments, was £1,245.

20. The car allowance in these cases averaged only £150, for in a number of instances no car was necessary. Thus the assistants concerned were on average receiving salaries well in excess of £1,050 even before May 1, 1957.

21. The Council would at this stage like to acknowledge the help of the London Executive Council in making this information available.

22. These facts are in line with the experience of the Association's Medical Practices Advisory Bureau, where, since April, 1958, doctors requiring assistants have offered salaries and emoluments ranging from £1,100 to £1,400 per annum—the average being £1,260 per annum.*

23. On a number of occasions in the past the Council has considered the possibility of laying down a standard minimum salary for assistants and enforcing such a policy by restricting advertisements for assistants in the *British Medical Journal* to those which conform to that minimum.

24. There are, however, considerable difficulties. In the first place the *British Medical Journal* has no monopoly, and the rejection of an advertisement by the *Journal* does not exclude its publication elsewhere. Secondly, many assistantship agreements are concluded privately and without advertisement of any kind. These factors undoubtedly reduce the effectiveness of action on these lines.

25. In addition there are practical considerations. Not infrequently the cash salary which is advertised for a particular post carries additional emoluments such as a rent-free flat or house, or free board and lodging. The difficulties of assessing the value of emoluments in different circumstances will be obvious. Then again the assistantship may not be full-time (the London inquiry, for example, showed that nearly 50% were engaged for less than full-time) or may carry other advantages to the assistant which may not be disclosed in the advertisement. Indeed, even full-time posts can give rise to anomalies, for the term covers a widely differing range of duties and responsibilities. It is such questions as these which have led the Council to refrain from attempting to impose a minimum salary by such means in the past.

*A memorandum on Entry Into General Practice, by Dr. L. S. Potter, medical director of the B.M.A.'s Medical Practices Advisory Bureau, and published in the *Supplement* of October 4 (p. 153) was attached as an appendix to the evidence.

26. Such evidence as is available, however, indicates that, in general, the salaries now paid to assistants exceed the Spens figure revised in the light of increases in the remuneration of established general practitioners.

27. Remuneration apart, the Council takes the view that the regular review of assistantship arrangements now being undertaken locally by Executive Councils in consultation with local medical committees as a result of suggestions already made by the Association in this field should prove the most effective check to such abuse of the assistant system as may exist. A full knowledge of all the circumstances of both principal and assistant is essential, and it is only at local level that the full facts of a particular case can be established.

28. The penalty of withdrawal of the right to employ an assistant or a reduction in the size of the additional list of patients allowed is likely to prove an effective deterrent to abuse.

(5) Practice Expenses

29. Several other bodies, in particular the Medical Practitioners' Union, in giving evidence to the Commission have criticized the present method of distributing practice expenses, and the suggestion has been made that these moneys should be separated from the Central Pool and paid out independently by a method which, it is contended, would result in a more equitable reimbursement of the individual doctor.

30. In the Council's view, the present system, in spite of its defects, affords at least rough justice and protects both the profession and the Treasury. By viewing the varying expense ratios of different sizes and types of practice at one particular moment in time, which is the effect of the Inland Revenue inquiries, the picture is distorted, for no practice remains static during its lifetime. As in other professions, the newcomer building up a practice will expect to face relatively heavy expenses during his initial years; the ratio will gradually diminish as he becomes established and then rise again in later years as his list and the volume of work which he can undertake falls. The pattern of expenses, viewed over the lifetime of most general practitioners, is not dissimilar, and in the long run some approach to equality is achieved.

31. Special provision is already made for the new entrant who commences practice in an area where more doctors are needed—i.e., areas designated by the Medical Practices Committee, whilst at a later stage in the doctor's life when his list is below certain levels he may be eligible for other payments from the Pool such as a Supplementary Annual Payment or a Hardship Payment.

32. These and similar arrangements make a valuable contribution towards the expenses of a small-list doctor who is practising in an area where his services are needed by the community.

33. Whilst the actual amounts of these allowances may require review from time to time, the Council is convinced that this is the best method of meeting a difficult problem. The division of practice expenses into groups as is done in the Inland Revenue inquiries does not of itself provide an accurate picture, for even in these groups there will be considerable variation. From the Government's point of view, the present system provides an incentive for the individual doctor to exercise reasonable economy. First, all expenses are subject to scrutiny by the Inland Revenue, and, although there is an element of choice, this fact in itself ensures that only such expenses are incurred as are likely to be accepted as valid. Secondly, whilst the profession as a whole is reimbursed its total expenses (although in part not until some 18 months later), the individual doctor's share is not directly related to his own personal expenditure. Any scheme involving the reimbursement of actual personal expenditure would not carry this incentive to economy. It is not conceivable that the Government would accept the principle of paying actual expenses unless it imposed at the same time a control of standards and direction over the expenses of such rigidity

as to be highly undesirable in a profession where a high degree of individuality is essential, and, from the Ministry's point of view, costly administrative procedures would be involved.

34. There are defects in the present system, if it is regarded as having as its object the repayment to the individual doctor of each item of expense which he incurs. Short of requiring each doctor to submit detailed and individual claims for practice expenses to the Ministry, for which it is presumed he would be reimbursed, no scheme of distribution could achieve this result. The Council regards this as impracticable.

OTHER MATTERS AFFECTING GENERAL PRACTICE IN THE NATIONAL HEALTH SERVICE

35. The Council would now like to refer to a number of other questions in the field of general practice which, in its view, have a direct bearing on the issues now before the Royal Commission.

(1) The Relationship Between General Practice and the Hospital Service

36. There is a clear distinction between the position of general practitioners and hospital medical staffs which is reflected in methods, as distinct from levels, of remuneration in the two fields. General practitioners are independent contractors, whilst hospital medical staffs, whether serving on a whole- or part-time basis, are salaried officers employed under contracts of service with the hospital authorities.

37. It is a comparatively simple matter to recommend detailed salary scales in the hospital service which will give effect to the Spens recommendations in present-day money values and restore proper differentials between consultants and other hospital medical staff. Very different considerations apply in the field of general practice, and the Council, in its Preliminary Memorandum of Evidence, has made it clear that it regards the Pool method of payment as the appropriate means of remunerating general practitioners, who, as a group, have undertaken collective responsibility for the population as a whole. The situation in this field is entirely different from the hospital service, where it is possible to devise a salary structure which reflects the varying degrees of responsibility involved in the different grades.

38. The Council would like to take this opportunity of emphasizing that general practitioners are opposed to a salaried service in N.H.S. general practice. Indeed, so strongly did the Association feel on this issue that at its instigation the Minister of Health embodied a proviso in the Amending Act of 1949 which states:

"Provided that the remuneration to be paid under such arrangements to a practitioner who provides general medical services shall not, except in special circumstance, consist wholly or mainly of a fixed salary which has no reference to the number of patients for whom he has undertaken to provide such services."

Now, as then, the Association holds firmly to the view that a salaried service in general practice would be detrimental to the interests of public and doctors alike.

39. The Council does not propose to submit detailed recommendations involving the distribution of the total sum made available for general medical services. Indeed, the Commission itself in its published statement of April 12, 1957, made it clear that its duty to recommend current levels of remuneration "calls for recommendations covering, for example, average incomes and the desirable spread between extremes, but it does not call for the construction of detailed schemes of distribution," and the Council assumes that the Commission intends to leave it to the profession and the Ministry of Health to discuss and agree upon a detailed scheme of distribution.

40. Apart from the difficulties of legislating in detail for remuneration in general practice, there are advantages to both the Government and the profession in maintaining

some degree of flexibility. It has, for instance, been found necessary in the past to facilitate the entry of newcomers to general practice, and to provide interest-free loans to encourage group practice. The Council submits that these and similar arrangements are best left flexible and determined from time to time by those concerned with the day-to-day running of the Service in the light of the circumstances obtaining and with the detailed knowledge of both the medical needs of the community and requirements in general practice.

41. Whilst, for the reasons given above, the Council is making no detailed proposals on distribution in the general-practitioner field, it nevertheless wishes to draw attention to the need for a proper relationship between the remuneration of general practitioners and that of hospital medical staffs. That relationship was in fact determined by the Reports of the two Spens Committees which sought to ensure that these two important branches of the profession would secure their appropriate share of recruits of the right calibre.

42. The Council hopes that the Royal Commission will see fit to recommend steps which will result in the establishment of the differentials which the Spens Committee envisaged. In the proposals made for the remuneration of hospital staffs in the Council's Second Supplementary Memorandum of Evidence, it suggested measures which, apart from restoring proper differentials within the hospital service itself, give effect to the profession's claim for an adjustment to take account of changes since 1951, and, at the same time, seek some measure of redress for consultants holding merit awards. The Council believes that the implementation of its general claim would, to a large extent, meet the need for proper relationships between the hospital service and general practice in terms of global sums of money. Whilst at the individual level no direct comparison is possible, the Council is nevertheless anxious that the financial expectations of at least a proportion of general practitioners should compare favourably with those of practitioners holding the more senior posts in the hospital service. It is also anxious that the gap in total life earnings of the average doctor in the two fields should be properly related, for this is a vital factor in determining the choice of a career.

43. The Council believes that in general practice, no less than in other spheres, there is a real need for proper incentives if the best doctors are to be attracted to this important section of the National Health Service. It has been said that it is a serious disadvantage of the Pool method of payment that it does not provide sufficient incentives to the more able general practitioners, and that the knowledge that additional earnings from outside sources and hospital appointments make no difference to their total earnings is not conducive to the additional efforts which the extra work entails. The Council feels that this situation can, nevertheless, be met by equitable distribution and without any radical departure from the general concept of the Pool method of payment. As in other walks of life and other sections of the profession, incentives are necessary. The Spens Committee in Paragraph 13 emphasized this, and it is essential that sufficient additional money should be made available to ensure a proper relationship between general practitioners and consultants to be effected.

(2) Recruitment

44. One of the major objectives of establishing a proper range of remuneration in general practice is the maintenance of an adequate level of recruitment. As the Commission is aware, this question has recently been reviewed by the Willink Committee, who have recommended that the scale of admissions to medical schools should be curtailed for a period in the near future. As yet, the Association has not discussed the Willink Report with the Ministry, but it would like to emphasize that the steps suggested by the Willink Committee cannot in its view be taken to imply either that there are too many doctors or that the level of recruitment to the N.H.S. in the future is properly safeguarded. The recommendations of the Willink Committee were necessarily

based on the situation as it was at the time of its investigation and on official estimates of the needs of the National Health Service in the future. In the hospital service, for instance, the Council has already shown, in its Second Supplementary Memorandum, that the position in the registrar and senior registrar grades has been brought about by an insufficient expansion of the consultant establishment in hospitals throughout the country where a comprehensive consultant service was promised before the Appointed Day.

45. The continuing acute shortage of junior hospital staff, another factor which is causing considerable anxiety at the present time, indicates clearly that the problem is by no means solved. Furthermore, there must always be some "reserve" of doctors to meet the expanding needs of the community and who are available to augment the medical services when extra help is necessary.

46. As far as the quality of present-day recruits is concerned, the Council has noted the views given to the Commission by such authoritative bodies as the Royal College of Physicians and the Royal College of Surgeons of Edinburgh. It feels that they are more competent to comment on this particular question.

47. The fact that the medical schools have expanded in recent years is of itself no real indication that the financial rewards of general practice are sufficiently attractive to achieve the Spens Committee's objective of maintaining recruitment to the profession. At the time that the Spens Committee investigated the financial incentives of medical practice, new entrants to medical schools, and particularly their parents, were prepared to undertake the expense of medical training and the long deferment of earning power which is entailed not merely because of its vocational aspect but also because of the prospects which a career in medicine offered. To-day, the majority of medical students receive substantial grants towards university fees and subsistence, and in this way the Government has been able to ensure the maintenance of an adequate supply of new entrants to the profession. The Council, therefore, wishes to emphasize that the present level of recruitment to the medical schools does not provide a true basis upon which to examine the adequacy of present levels of remuneration.

48. The Council would like to refer to the question of emigration amongst doctors in general practice. Clearly, there has always been a certain amount of emigration, and, provided that it is kept within reasonable limits, it is to the advantage of all concerned and of particular value to the Commonwealth. The Council is, however, anxious that the trend should not grow to the point where an undue proportion of the more able doctors are attracted by better prospects outside this country. It is difficult to obtain detailed information on the subject, for there are no official figures available, but evidence already submitted to the Commission from other organizations suggests that there is an increasing tendency among students to look overseas for a career in the future. In addition, the Council has been provided with a factual memorandum by the Medical Practices Committee on the subject as it affects general practice, which suggests that even among established doctors there has been a significant rise in the numbers going abroad. This memorandum appears in an Appendix.

(3) Comparison with Other Professions and Occupations

49. In the preliminary Memorandum of Evidence the Council referred in general terms to the scope, responsibility, and rigours of the life of a general practitioner.

50. The Council believes that the difficulties and responsibilities, the hours of duty, and the other factors in the general practitioner's life are so well known to all members of the community that it is unnecessary to go into detail. Nevertheless, comparisons have been drawn between the life of the doctor, notably the general practitioner, and that of others whose work entails long training and great responsibility. The Council does not dispute that there are other men and women who have long and difficult courses of preparation, long hours of continuous duty, and heavy responsi-

bility. It firmly believes, however, that no other group shares with the doctor, particularly the general practitioner, all the burdens which the practice of medicine entails continuously throughout the doctor's working life and in which his family is usually involved.

51. Throughout his life as an established practitioner, the doctor has to make vital decisions affecting his patients. Although the number of patients allowed to each general practitioner is limited, the demands that can be made are unlimited as to time and number. These demands, sometimes irresponsible and unreasonable, are subject only to the whim of the patient, who, in making them, is under legal protection. This does not apply in any other comparable profession. Considerations of this nature must be borne in the mind in any attempt to compare the remuneration of the general practitioner with that enjoyed by other professions and occupations.

(4) The Government's Memorandum

52. Finally, there are certain statements in the joint memorandum submitted by the Treasury and the Health Departments to the Commission which cannot be allowed to pass without comment.

53. In paragraph 29 of that Memorandum it is suggested that between 1948 and 1951 the number of "consultations" per patient increased from 5 to 5.5. The Council believes, although it cannot adduce statistical evidence, that with the increasing use of the National Health Service by the public the figure has further increased since that time.

54. In the same paragraph the average time per "consultation" is assessed at 10 minutes.

55. The Memorandum does not define the "ten minute average consultation." It is difficult to believe that it gives full weight to a night call, a call asked for late in the day (and these calls have increased), a maternity case (and midwifery forms only a small proportion of the late and night calls), a specialist consultation, or the considerable (and increasing) time spent in making telephone calls to hospitals and in writing reports.

56. *Pari passu* with the increased work in the hospitals, as described in paragraph 35 of the Memorandum (and in particular the last part of the paragraph), the time taken for each consultation has increased. It would appear, therefore, that the figures relating to 1951, if accurate for that time, are likely to be an underestimate in 1958.

57. The Council regards the dogmatic statement that the "more dangerously ill patients are admitted to hospital" (paragraph 89) as a misrepresentation of the work of the general practitioner, who, with the modern therapeutic measures at his disposal, is able to (and does) keep more of his "more dangerously ill patients" at home than hitherto.

58. In paragraph 76 the Memorandum refers to the comparable burden of work in summer and winter. The experience of general practitioners is that the difference between the amount of summer and winter work has diminished since the inception of the Health Service. The work is usually somewhat lighter in the summer months, but the influenza epidemic of 1957 readily comes to mind as an example that this is by no means always the case.

59. A simple arithmetical calculation will indicate, even if the Departments' figures are used as the basis, the long intensive hours of work of the general practitioner, including, for example, an evening surgery (for the benefit of the worker) often lasting to a late hour; hours of work that are not consecutive but spread through the whole of the 24 hours of the day.

60. The Council also wishes to emphasize that the figures given in the Memorandum exclude work done for other forms of practice which are remunerated outside the central pool, but which form part of the calculation of a general practitioner's income, as well as the time spent necessarily on the business and administrative sides of the practice and on keeping abreast of current advances in medicine.

61. In paragraphs 177-194 the Memorandum refers to the repercussions on the earnings of other groups which it is

claimed would follow any increase in medical remuneration. The Council believes that this argument has been greatly overstressed. The repercussions of the Danckwerts Award in 1952 were not widespread, and, although the consultants' award in 1954 may have had some influence on university salaries, its effect can be overstated. Indeed, the later increase in university salaries in 1957 was quite unrelated to medical remuneration.

62. At times when incomes are rising generally, as during recent years, the rise is effected simply by repercussions of increases awarded to one group on the incomes of other groups. The Council cannot accept the argument that medical remuneration—or, indeed, increases in any part of the "public service"—should be exempt from this natural (and economically necessary) process. The main professional groups (civil service, doctors, teachers) have a monopoly employer, and the argument that the Government expects those in the "public service" to accept income limitation even when it is obvious that wage-earners and salaried and self-employed persons in business and industry are not accepting it implies that all professional incomes are to be depressed by the exercise of the Government's monopoly powers.

63. The arguments adduced in the Government's Memorandum are, in the Council's view, quite indefensible, and this policy has already failed in the nationalized industries, where the higher management are no longer compared with civil servants but receive instead something approaching the proper market rate of remuneration.

64. The argument is equally indefensible in the case of the medical profession, which has a right to expect that the remuneration it receives in the public service in this country shall be on a par with what it receives under the freer conditions of other countries such as the Dominions or the United States.

65. The Council is certain that the Commission will wish to take all these factors into account when determining levels of remuneration for general practitioners in the future.

APPENDIX

MEMORANDUM BY THE MEDICAL PRACTICES COMMITTEE ON EMIGRATION OF ESTABLISHED GENERAL PRACTITIONERS

This memorandum deals with the emigration of doctors who, up to the time of emigration, were principals in established general practice within the National Health Service in England and Wales since July 5, 1948.

These doctors were, it is emphasized, men of middle age, with a substantial stake in the country, working in comparatively remunerative general practices, who for some reason preferred to abandon this and their homes in order to practise abroad, mostly in other parts of the Commonwealth.

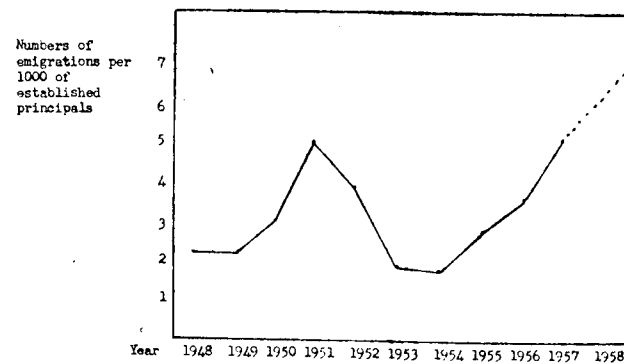
The figures we believe are reasonably accurate. They are derived from the returns of 124 of the 139 Executive Councils in England and Wales.

In the areas from which returns have been made just over 15,000 doctors practise. In those from which no return was obtainable just over 4,000 doctors practise.

The figures in the following Table reasonably represent the fluctuating rate of this emigration.

Year	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	Total
England	14	31	41	69	50	26	27	40	53	72	423
Wales	2	1	4	6	6	3	—	1	2	4	29
Total (for six months)	16	32	45	75	56	29	27	41	55	76	452
Rate per thousand doctors per year	2.13	2.13	3.00	5.00	3.73	1.93	1.87	2.73	3.67	5.07	3.13 Average

For those who prefer a graphic presentation of statistics the one below may be of assistance.



Members of the Royal Commission will be aware that the Danckwerts arbitration was in 1951 and the working party's report deciding the agreed new distribution of the moneys which came to the profession following the arbitration award was published in the summer of 1952.

It is submitted that the rise in the rate of emigration in the "pre-Danckwerts" period was significant of great unrest among established doctors. The subsequent fall to an average which we would submit can be regarded as a normal figure is equally significant, as again is the fact that mounting unrest has caused the figure to rise once more to a new high level in 1957.

When it is realized that many of those concerned in the 1957 exodus were within one year of their minimum pensionable period of 10 years in the Service, the figure becomes even more impressive. A rise to a figure of more than 2½ times greater than that of the immediate two "post-Danckwerts" years (1953-4) in these circumstances, must not be disregarded. It is true also that this occurred despite the fact that the opportunities for a man to establish himself abroad have become progressively less in number during the past decade.

In addition a far greater number of unestablished doctors engaged in hospital practice up to the range of senior registrar and also some of higher status and even of consultant rank have emigrated. The number of unestablished general practitioners who have also left this country is far greater, both relatively and absolutely, than their more fortunate established colleagues. There are, however, no reliable figures by which these can be classified.

PUBLIC HEALTH COMMITTEE

At its meeting on October 31 the Public Health Committee found it necessary, owing to insufficient time, to defer some important items in a very full agenda until the next meeting of the Committee to be held on December 12.

Constitution of Committee

One important matter which was not reached until late in the day was the constitution of the Public Health Committee, about which Dr. W. G. HARDING had said he wanted to speak. In view of the hour, Dr. Harding said he was prepared not to proceed to discuss the question. "At the same time," he added, "I am unhappy about a situation in which more and more business is being transacted in less and less time."

Dr. H. D. CHALKE suggested that the question could be solved quite simply by asking the Council to agree to the Public Health Committee doubling its membership in order that there could be representation of more types of public health work.

The CHAIRMAN (Dr. J. B. TILLEY) said that one of the criticisms made about the Committee was that as at present constituted it was not democratically composed. In his view there was some substance in that criticism. Another criticism was that there was not a sufficient preponderance of those engaged purely in public health work.

Dr. HARDING pressed for a much larger representation on the Committee of members of the Society of Medical Officers of Health nominated by the Society. He had hoped that the Council representation would act as a balancing factor, but it did not. "I think that as an Association we should be deeply ashamed that for two years the representative of the largest fraction of public health members has stood for election, both through the Representative Body and through the Council, and has not been elected," he concluded. That was not democracy.

The CHAIRMAN said that in his opinion the method of election by Council was outdated, and that some other method should be adopted. At the same time, he agreed that the number of representatives from the Society should be increased. It was only fair to remind the Committee, he added, that when the Public Health Committee was asked by Council some little time ago whether it was satisfied with its constitution the Committee said that it was.

The Committee finally agreed that Dr. Chalke should inform the Committee on Professional Co-ordination, which was meeting shortly, that the Public Health Committee felt that it should be enlarged, and should have larger representation from the Society of Medical Officers of Health, and that it was considering proposals on these lines.

It was reported that Dr. A. Barker and Dr. M. E. M. Herford had been reappointed as the representatives on the Committee of the Private Practice Committee and the Occupational Health Committee respectively. It was also reported that Dr. J. Alun Evans, Dr. Gladys Stableforth, and Dr. Nora Wattie had agreed to serve as co-opted members.

A.R.M. Resolutions

The Committee then proceeded to consider various Resolutions of the A.R.M., 1958.

One Resolution, which gave rise to some comment, requested the Government (1) to ban the import of infected egg products; (2) to control the production of home dried and frozen eggs to prevent infection. Dr. HARDING thought that (1) was an unrealistic suggestion and he did not agree with it. If pasteurization in this country was effective it could be applied just as well to foreign as to home-produced egg products.

"Why should not the pasteurization be done before the products come into this country?" asked Dr. J. W. PICKUP. Dr. HARDING pointed out that infection could develop to a recognizable level in transit. In his view the distribution of safe eggs from whatever source should be urged, but no policy should be favoured which might be unrealistic, without more investigation into the problem.

A suggestion by Dr. J. STEVENSON LOGAN that the Ministry should be asked what the present position was was agreed.

Smallpox Immunization

It was agreed to report to the Council that in the Committee's view the time was not opportune for a national campaign for smallpox immunization. All energies for the present should be given to encouraging poliomyelitis immunization. The Committee arrived at that decision after considering an A.R.M. Resolution calling the Minister's attention to the low level of smallpox immunization throughout the country, and urging that a campaign to rectify it should be renewed at once.

Amalgamation of Health and Welfare Services

The Committee considered whether it should recommend to the Council that it should be the Association's policy to seek the amalgamation of the health and welfare services. Members of the Committee had before them copies of a report on the subject which had been prepared by the Society of Medical Officers of Health, and a letter from the Medical Officer of Health for Eastbourne pointing out the advantages of a combined service.

Dr. STEVENSON LOGAN said that, while public health was good for welfare, it did not follow that welfare was good for public health, and, unless care was exercised, welfare

would swallow up public health and medical officers of health would see themselves as "glorified and more effective descendants of the old Poor Law administrators." He advocated caution.

The Committee finally resolved to advise Council that, while it felt that complete co-ordination of the health and welfare departments was desirable, and that the medical officer of health was in a key position for achieving this, it was not thought that the Association should undertake the authority which particular committee should undertake the responsibility. At the suggestion of Dr. Chalke it was further agreed that there should be added, by way of a rider, that there were certain specific matters in the welfare field which were the direct responsibility of the medical officer of health.

"Combined" and "Mixed" Appointments

Dr. F. J. G. LISHMAN, the author of a memorandum on "combined" and "mixed" appointments in the public health service, attended in person before the Committee. Dr. Lishman informed the Committee that there were two serious anomalies under the present salary agreements, one of which was due to defects in the Industrial Court awards, and the other to an informal arrangement, which had since been formalized but not published, made within Whitley Committee C. The first anomaly resulted in instances when a medical officer of health, if he were a medical officer of health without being an assistant county medical officer and health was later asked to take on additional work for the county council, must lose some salary in the process. The second anomaly arose from an arrangement which had not been published. When a medical officer of health for multiple authorities—who was also an assistant county medical officer—had a formal contract, and there was a joint sanitary committee for a combination of multiple districts, he received a salary supplement for the combined appointment. He did not receive it if he had not the advantages of a single contract and there was not a joint sanitary committee. The Committee agreed to send the matter to the Staff Side of Committee C, Medical Whitley Council, for consideration.

Presentation to Dr. Agnes V. Kelynack

Before the meeting of the Public Health Committee began the CHAIRMAN, on behalf of present and former members of the Committee and members of the Council of the Society of Medical Officers of Health, presented a cheque to Dr. Kelynack, who was secretary to the Committee until her recent retirement on the grounds of ill-health. It was said Dr. Tilley, a tangible witness of the Committee's regard for Dr. Kelynack, to whom a great debt of gratitude was owed for her help and advice through many years. Speaking as President of the Society of Medical Officers of Health, Dr. J. A. STIRLING supported what the Chairman had said. The Society very much appreciated the work which Dr. Kelynack had done in cementing the good relations between the Association and the Society.

Dr. KELYNACK thanked the Committee for their very generous gift. She had, she said, spent 14 very happy years serving the Committee.

Deferred Business

Among the matters deferred until the next meeting were items on the duties and position of the nurse, specialist services, and public health clinics under the Middlesex County Council, psychiatrists employed by local health authorities, bacterial rodenticides, delegation of health services to non-county boroughs, A.T.S. injections, and inspection of meat at slaughterhouses.

PUBLIC HEALTH SERVICES DEFENCE TRUST

The trustees of the Public Health Services Defence Trust met at B.M.A. House on October 31. The present officers were reappointed for the Session 1958-9.

Financial Statement

In presenting the financial statement, the Treasurer, Mr. L. DOUGAL CALLANDER, thanked the medical officers of health for their response to the appeal for funds made in February last.

The Trustees agreed that a new appeal for funds should be issued in 1959.

ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE

SIZE OF LISTS

The debate on a proposal that the maximum permitted size of N.H.S. lists be reduced (*Supplement*, October 18, p. 172) was continued by the Assistants and Young Practitioners Subcommittee of the General Medical Services Committee at its meeting on October 30. Dr. F. G. TOMLINS was in the chair.

In addition to a document prepared by the office, setting out certain statistics sought by the Subcommittee at the previous meeting, letters from Dr. R. T. Jones and Dr. J. L. Williams, supplementing their earlier arguments, were placed before the Subcommittee. Dr. Jones suggested that his proposal to reduce the maximum permitted size of N.H.S. lists would result in great benefit to the community as patients, and perhaps as taxpayers, and would help most members of the profession collectively and individually. It would reduce the overwork of the large-list practitioner and save him from having to subcontract out his highly personal work to a permanent assistant, and it would help the small-list practitioners and permanent assistants to become established.

In his letter Dr. Williams reiterated some of the points which he had made at the previous meeting. It seemed reasonable to infer, he pointed out, that a reduction of the maximum list was necessary to make room in a relatively static population for the increase in the number of general practitioners. A reduced maximum list would also offset the method of accountancy which, in his opinion, protected the established practitioner (especially the large-list practitioner) against a falling value of money to a greater extent than the unestablished practitioner.

While agreeing that the lists should be reduced to 3,000, Dr. T. H. ENGLISH said it was largely a question of remuneration. Dr. W. HUGHES said he sympathized with the end which Dr. Jones was seeking, but he wondered whether a flat reduction in the size of the permitted list was a sufficiently flexible method of reorganizing the state of practice.

Create Division

Dr. Williams wrote that fears had been expressed that the proposal, if adopted, might restrict those who wished to have lists above 3,000; but the maximum had already been brought down to 3,500 and there was not a greater loss of freedom in bringing it down to 3,000 if there were good reason for so doing.

Dr. H. N. ROSE suggested that nothing could do more harm and create more division among general practitioners than the proposal before the Subcommittee. Large-list practitioners who had already suffered a reduction of 500 were being asked to suffer another reduction of 500 with a loss of income and no compensation. The proposition was put forward ostensibly in the interests of the patient, whereas, to be quite honest, it was an effort to try to improve the position of assistants and unestablished practitioners and to facilitate their entry into practice. Robbing Peter to pay Paul was not the right way to do that, and what was required was an increase in the level of remuneration of the whole profession.

Dr. G. D. W. ADAMSON said he wondered whether it was true to say that a practitioner with 3,500 patients was overworked. It had been said that the Service instilled in the

general practitioner the attitude of doing as little as possible for as much as possible. It would be interesting to know how many practitioners with 3,500 patients on their lists were carrying on outside appointments, added Dr. Adamson. "You cannot measure the capacities of doctors by regulations," observed Dr. F. GRAY. Doubtless there were many doctors who looked after 3,500 patients better than many of their colleagues looked after 2,000 of the same type of patients. A danger to be avoided was that of throwing off the extra from the efficient man who could deal with a large list to an inefficient man who could not deal adequately with a medium-size list.

At the suggestion of Dr. D. R. SIM, the Subcommittee agreed again to defer the matter for further discussion.

Filling of Vacancies

The CHAIRMAN reported that Dr. T. H. English (Bartley, Southampton) had been elected to represent assistants in Region 1; Dr. E. F. D. Gawne (Cambridge) in Region 2; Dr. C. A. Rushton (Stockport) in Region 3; and Dr. W. Hughes (Sheffield) in Region 4.

The CHAIRMAN (deputy Dr. R. T. Jones) was nominated for co-option to the General Medical Services Committee to represent unestablished principals, and Dr. R. E. Hancock was nominated to represent assistants.

The remaining items on the agenda, including those on entry into practice, remuneration of assistants, trainee general-practitioner scheme, and the integration of hospital and general practice, were deferred until the next meeting.

S.H.M.O.s GROUP COUNCIL

Mr. G. WARING ROBINSON was appointed Chairman of the S.H.M.O.s Group Council at its meeting held in B.M.A. House on November 3. He cordially welcomed the appointment of Mr. J. M. Milloy and Mr. J. R. Nicholson-Lailey as representatives of the Central Consultants and Specialists Committee. Mr. A. Staveley Gough deputized for Mr. Nicholson-Lailey, who was unable to be present.

Mr. D. W. Lamb was appointed to fill the vacancy on the Group Executive Council's Committee caused by the death of Dr. J. F. Swan. The CHAIRMAN paid tribute to Dr. Swan's service to the Group Council and its various committees. Dr. W. Griffel (Manchester) was appointed a member of the Executive Committee to succeed Dr. McCarthy, who had resigned as the Manchester representative on leaving the region.

Dr. W. D. Gray, Dr. T. Reeves, Mr. G. Waring Robinson, and Mr. Vernon Jones were also appointed to serve on the Group Executive Committee. It was agreed that a representative of Northern Ireland should serve on the Executive Committee, and Mr. J. W. S. Wilson was appointed.

Executive's Annual Report

The Council proceeded to consider the annual report of its Executive Committee. The present membership of the Group, which, at 1,140, was slightly lower than that of the previous year, was described by the CHAIRMAN as "disquieting," because in his view it should have increased. He urged representatives to try to increase the membership in their regions. All S.H.M.O.s who did not belong to the Group should be invited to apply for membership.

S.H.M.O.s and Consultant Work

Dr. E. E. CLAXTON, Assistant Secretary, reported on the progress of the review of applications by S.H.M.O.s who claimed to be doing consultant work. He said that the name of every applicant who had been considered by the special panels had been sent to Committee B of the Whitley Council. Some 900 names had been sent, and Committee B was now making inquiries in the regions. The appointment by the Minister of a working party on hospital staffing would inevitably modify the procedure for the examination

of the problem. A subcommittee of Whitley Committee B, however, was to meet in December to look at illustrative cases of S.H.M.O.s carrying out consultant duties. Dr. Claxton added that 538 out of the 936 cases were considered by the panels to be doing consultant work. The CHAIRMAN said that he served on one of the panels and he was present at the meeting of the chairmen of all the panels. He was very impressed by the amount of consideration given to all the applications.

A motion moved by Mr. G. LOWE in the following terms was carried:

That this S.H.M.O.s Group Council is grateful for the support already given by the Staff Side of Whitley B to the claims of over 900 S.H.M.O.s, 500 of them upheld by their own specialist selection panels, and begs them to stand firm and compel the Management Side to acknowledge the justice of these claims, and so right some of the wrongs done to S.H.M.O.s during the last ten years. They feel sure that the Committee will realize that they owe this to themselves and their selection panels as well as the long-suffering S.H.M.O.s.

On the motion of Dr. W. J. WILSON, a vote of thanks was accorded to Dr. Claxton and the staff for the work which they had done in connexion with the claims.

Hospital Medical Staffing

Dr. T. F. MCCARTHY reported that hospital medical staffing was at present very much tied up with the formation of the working party. The Executive had already produced a document which was to be sent to the Working Party. The Central Consultants and Specialists Committee—and, it was hoped, the Joint Consultants Committee—had come round to the view that there should not be any grade between senior registrar and consultant, and this was helpful to the S.H.M.O.s' case. It was hoped that, if a new staffing structure was introduced, a senior registrar's position would be reviewed after two years, and, if he was regarded as worthy of consultant status, he would not have any further hurdles to pass and increments in the scale would automatically be up to the top range of consultant remuneration.

Remuneration of S.H.M.O.s

Dr. N. STRANG reported that at a recent meeting of S.H.M.O.s in the Newcastle Region dissatisfaction was expressed at the delay in implementing the proposed 80% salary ratio between consultants and S.H.M.O.s. It was pointed out that the Royal Commission and the working party on hospital staffing might not report for some time, and there was no guarantee that their findings would benefit S.H.M.O.s. Therefore the Newcastle meeting felt that steps should be taken to press the matter as an entirely independent item.

Dr. MCCARTHY pointed out that it was B.M.A. policy, and, in any event, it was doubtful whether the Government would discuss the matter while the Royal Commission was sitting. Dr. G. M. L. JAMES suggested that the Executive Committee did not wish to be tied down to figures. Dr. R. DERHAM said that the Liverpool Region wanted a minimum of 80%. Mr. A. STAVELEY GOUGH pointed out that there was a possibility that the ratio would be 100%. Dr. DERHAM added that it would satisfy the Liverpool region if those S.H.M.O.s who were retiring in the very near future had their pensions calculated on the adjusted 80% figure, and that the adjustment was made later if retirement had taken place before the increase had been granted. The CHAIRMAN assured Dr. Derham that he had that point in mind. He had every confidence that the negotiators would secure the best possible terms.

Working Party

Dr. W. J. WILSON asked for further information about the working party. He said he understood that a questionnaire was being presented to regional committees in the near future, and he wanted to hear something about it, and whether the working party intended to visit regions.

Correspondence

Time-expired Senior Registrars

SIR,—We, time-expired senior registrars, were surprised and disappointed at the comments of Mr. R. Brearley representing the Hospital Junior Staffs Group at the Central Consultants and Specialists Committee (*Supplement*, October 18, p. 170). He said that his group "vehemently" opposed the Minister's proposal to create a limited number of posts for time-expired senior registrars. One has the impression from his remarks that registrars are turning up their noses at the offer of these jobs. We do not think this is a fair picture. Certainly in our own region this is not the case.

The non-teaching hospital senior registrar has, in our view, not had a fair deal. Appointments committees for consultant posts are under the overwhelming influence of the teaching hospitals and the Royal Colleges, and so it comes about that he is seldom short-listed and practically never appointed to a consultant post. These men have been considered good enough for responsible work in their own hospitals for anything up to eight or nine years. They have deputized for consultants on leave and seen out-patients without supervision. Yet none are promoted. It is surely impossible for all these experienced men to be unsuitable for consultant posts, and so one can only assume that the method of promotion has gone astray. While this position is being put right it seems desirable to give the time-expired senior registrar security and a higher rate of pay. We therefore consider the Minister's proposals to be fully justified and urgently necessary.

The Minister's proposals are intended to correct the present injustice to time-expired senior registrars. They do not offer a long-term solution to the problems of hospital staffing, which is the responsibility of the working party. Therefore, there need not be any outcry against the creation of a limited number of posts not of consultant status. Of course, if it were financially possible, an immediate increase in the consultant establishment might be preferable; but already regional boards are unable to afford the additional consultant sessions which have been sanctioned. And, further, this step, as has already been pointed out, would in itself not be of any help to the non-teaching hospital senior registrars, who would be bypassed by the appointments committees.

We have experienced uncertainty and financial difficulty for nearly ten years and have seriously undermined our chances of entry into other branches of medicine. The Ministry is the only body which has put forward concrete proposals, and these should be accepted unless the profession can produce better ones.—We are, etc.,

A. POTELIAKHOFF.
P. L. WATTS.
T. C. P. WILLIAMS.

London, W.8.

Merit in General Practice

SIR.—The Chairman of Council, Dr. S. Wand, has created confusion by his remarks at the G.M.S. Committee meeting on September 18. In the *Supplement* of October 4 (p. 157) it is reported: "Dr. Wand recalled what he had said to the Committee—namely, 'The Chairman of the Royal Commission said to me: "How to-day is merit assessed?" and I said, "The only way in which merit is assessed to-day is by the sizes of lists," and that was a fact. He [Dr. Wand] did not say that he agreed or disagreed with it."

The disingenuous disclaimer in the last sentence is not borne out by the *Supplement* report (February 1, p. 42) of the proceedings of the Royal Commission on January 23, which reads as follows: "The CHAIRMAN: 'How is ability assessed at present—the ability to attract patients?' Dr. WAND: 'The ability to attract patients.' The CHAIRMAN: 'So the more patients you have on your books the more able

Dr. CLAXTON replied that the working party had already begun its work. Three meetings had been held, and a questionnaire was being issued which would be sent to regional consultants committees and specialists groups. When the questions were drawn up they would be submitted to the S.H.M.O.s Group Council and would be dealt with by its Executive Committee. The working party would visit regions and each region should begin to prepare its evidence to the working party on the arrangements in its area.

Northern Ireland News

HOSPITALS IN N. IRELAND

The tenth annual report, for the year 1957, of the Northern Ireland Hospitals Authority records that the hospital and specialist services made further progress and cost even more than in 1956. The number of hospital beds available increased from 15,150 to 15,578; admissions went up from 128,129 in 1956 to 132,762 in 1957; and the number of operations from 122,742 to 125,012. There was, however, a slight overall reduction in the demands on out-patient and radiological departments. At the end of the year the number of people awaiting admission to hospital (excluding those requiring operations for tonsils and adenoids) was 12,036, compared with 12,142 at the end of the previous year. The waiting-list for tonsils and adenoids operations increased from 5,367 to 6,889, owing to curtailment of operative work because of a poliomyelitis outbreak in 1957.

The Authority reports good progress with the extensive building programme, and at several hospitals new premises were brought into use. The foundation stone of the new Ulster Hospital was laid on October 25; and the building of four new hospitals commissioned by the Authority made good progress.

Capital payments in the financial year 1957-8 increased by £466,519 to £2,302,426, net revenue payments totalling £8,695,017 compared with £7,928,300 in 1956-7.

NEWS IN BRIEF

B.D.A. SUBSCRIPTION INCREASE.—The British Dental Association is to increase its annual subscription from 6 guineas to 9 guineas. The *British Dental Journal* reports that the decision was taken by an (November 4, p. 329) that the decision was taken by an overwhelming majority (87 votes to 11) at an extraordinary general meeting of the B.D.A. on October 24. The B.D.A.'s chairman of council, Mr. L. BALDING, said the increase was being asked for to readjust income to the general all-round rise in prices.

SIGHTHILL HEALTH CENTRE.—The fifth year's work of the Sighthill Health Centre, Edinburgh, has seen an increase in the use of the premises. The medical and dental services have continued as before, states the annual report, with 10 general practitioners and local authority medical and dental staff and ancillary services. New activities included a weekly clinic run by the Edinburgh Marriage Guidance Council; a cerebral palsy centre, staffed by speech and occupational therapists from the Scottish Council for the Care of Spastics; a diabetic group; and steps to form a Red Cross centre within the health centre. The old people's health club had a successful year and the chiropody clinic proved most beneficial to members. Another activity in the local authority part of the premises was an occupational therapy class under the auspices of the Edinburgh Cripple and Invalid Children's Aid Society. The number of patients attending for physiotherapy was greater than in any previous year. General practitioners, district midwives, and health visitors met regularly in the antenatal clinics.

you are? Dr. WAND: "I think it can be said, on the whole, that that is so." When a man reached his maximum it should be possible for him, by having an assistant, to spread his ability over a still larger number of patients."

It appears to us quite clear that the Royal Commissioners understood Dr. Wand to equate merit with size of list, irrespective of what Dr. Wand now thinks he intended to mean. Thus, when the General Practice Reform Association gave oral evidence, the Chairman of the Royal Commission said, "But when the British Medical Association were here they said quite definitely that the test of ability of a doctor was the number of patients he had on the books—I am paraphrasing what they said."

If the Chairman of the Royal Commission has so seriously misunderstood Dr. Wand, it is surely for the latter to clarify what he meant, unequivocally and publicly. This is no mere debating point, because it involves a very serious assessment of a most important facet of evidence to the Royal Commission by the Chairman of Council of the British Medical Association.—We are, etc.,

London, N.W.6.

A. C. J. SAUDEK,
Chairman of Executive Committee,
General Practice Reform Association.
L. RUSSELL.

REFERENCE

¹ Royal Commission on Doctors' and Dentists' Remuneration. *Minutes of Evidence*, 1958, No. 9, February 20, 1958, p. 445, para. 2274. H.M.S.O., London.

Entry into Practice

SIR,—As a young doctor who until recently had been on the Medical Practices Advisory Bureau's list for nearly two years, and has now achieved principal status through an executive council vacancy, I was very interested in Dr. L. S. Potter's article on entry into general practice (*Supplement*, October 4, p. 153). Although not successful in obtaining a suitable appointment through the Bureau, I have the highest regard for its efficiency, and very many established doctors must be grateful for its existence.

It would seem that Dr. Potter wishes to refute the allegation that entry into general practice is too difficult. While sympathizing with anyone who has the unenviable task of placating those militants on the Bureau's list, many unestablished doctors will feel that he is more critical of them than of the difficulties with which they are faced. This is most unfortunate in that it is bound to lend substance to accusations of complacency. Many must feel that their senior colleagues have no idea what it feels like to write out several applications every week for years, and to travel all over the country for interview (often at one's own expense) only to find that there are hidden snags, or to suffer the demoralization of repeated rejections. It is little wonder that the mind gradually becomes poisoned with suspicion.

The task of achieving principal status is for most of us exceedingly complex. It is only too easy to jump from the frying-pan (an assistantship without view) into the fire (a post with a poor view or one that does not materialize). Discretion has to be exercised in choosing vacancies for which application is made, and no doubt many would-be applicants become over-cautious after a while, when the telephone and petrol bills have mounted up and one's employer becomes exasperated at repeated absences. Anomalies such as Dr. Potter mentions are bound to occur from time to time, just as a busy surgery one day may be followed by a very quiet one the next. I can confirm Dr. D. S. Craig's experience (*Supplement*, October 25, p. 185) that at interview the principal often discloses that there have been scores of suitable applicants, and that he has far more choice than he requires or even desires.

There can be no doubt about the basic cause of this intolerable situation—it is the almost complete impossibility of changing one's area of practice after achieving principal status. Although Dr. Potter mentions this, I am greatly surprised that he does not stress it more. There are far too many young doctors trying to acquire their ideal practice at the outset, meanwhile inflicting upon themselves long assistantships and incidentally playing into the hands of the unscrupulous minority of principals who capitalize out of

their dilemma. Few of us wish to spend the whole of our lives and those of our dependants in industrial areas, and it is not surprising that the avoidance of those areas becomes an obsession.

It is to be hoped that as the restoration of freedom of movement affects all of us in practice, established and unestablished, strong support will be forthcoming to force a solution to this formidable problem.—I am, etc.,
C. A. SHARPLES.
Leicester.

Occupational Hygiene Service

SIR,—My attention has been drawn to the report of the Occupational Health Committee meeting under "Occupational Hygiene Laboratory Service" (*Supplement*, October 25, p. 180). It was stated that "there were a few arrangements by which one could get research done, but nowhere which would undertake routine investigations."

You are probably aware that in 1950 the London School of Hygiene and Tropical Medicine and the Slough Industrial Health Service initiated an occupational hygiene service with laboratories at the London School of Hygiene. This was an experiment designed to explore the need for investigation of environmental conditions in the 180 member firms of the Slough Industrial Health Service. However, during the first five-year period a certain number of investigations were carried out in factories outside Slough, and two of these have been very fully reported in the *British Journal of Industrial Medicine*.^{1,2}

Because this service undoubtedly proved its worth, a year ago it was decided to extend its facilities on a consulting basis to industry generally. The association with the London School of Hygiene and Tropical Medicine was amicably severed, and the laboratories have been moved to new and larger premises at Slough. Accommodation and equipment is available for investigating health hazards from exposure to toxic gases and fumes, dangerous dusts, and noise, and for studying working conditions in which the heating, ventilation, and lighting are inadequate. The laboratories are staffed by a physician, an engineer trained in industrial hygiene engineering in the U.S.A., and a graduate chemist. Technical assistants are available to carry out audiometric and haematological investigations. This out audiometric and haematological investigations. This consulting service is under the general administration of the Council of Management of the Slough Industrial Health Service, and is "free from the dead hand of red tape," and therefore fulfils the need mentioned in the report in your *Supplement*.—I am, etc.,

Slough.

P. J. R. CHALLEN.

REFERENCES

- ¹ Challen, P. J. R., Hickish, D. E., and Bedford, J., *Brit. J. Industr. Med.*, 1958, 15, 243.
- ² ———— *ibid.*, 1958, 15, 276.

Registration of Medical Auxiliaries

SIR,—The recent reports of the Ministry of Health's latest proposals for the constitution of the registration boards and of the co-ordinating council must indeed be very disturbing to many doctors and specialists the world over. It is probable that the medical profession is largely to blame for the present state of affairs, as it appears that it has not been able to put forward any widely accepted plan since it rejected the Ministry's earlier proposals.

A serious objection to both sets of proposals is the incredibly small medical representation. This can only have one intention: to remove from medical hands the control of the standards required for qualification and registration in the auxiliary "professions." This is probably a democratic intention with a political appeal, and it undoubtedly will delight the majority of the members of the so-called auxiliary professions. The medico-legal aspects of the Ministry's proposals will certainly need to be studied carefully, particularly if any registration standards which may be set should fall short of those required by the medical profession. Why should any doctor accept any responsibility for the work or conduct of a medical auxiliary whose basic qualification, though accepted as adequate by the Ministry, has been rejected as inadequate by the doctors?

It seems to me unlikely that the Ministry will concede at this late hour a medical majority on either the boards or the council, but this should not stop the medical profession from voicing its displeasure in no uncertain way. We should spare no effort to ensure that such medical representation is obtained in the right type in the right place—e.g., radiologists on the board for radiographers, physical medicine experts on the board for physiotherapists, etc. We should, at least, ensure a majority for doctors and auxiliary professions combined on the board and a very substantial representation on the co-ordinating council.

Let us remember that the medical profession has not been blameless in the past, nor has it been able to express itself with any degree of unanimity. The general state of apathy about anything in particular or any other thing in general is such that a Divisional meeting attended by some 90 members out of a possible 700 is regarded as an enormous success. Even a *nem. con.* vote in such circumstances need not be taken very seriously by a Ministry which scans the pages of this *Journal* more carefully than we do ourselves. A letter to this or any other journal from every doctor in the country would impress upon the Ministry the nature of our views more effectively than a large number of poorly attended meetings could ever hope to do.—I am, etc.,

Haywards Heath.

B. S. H. STORR.

Higher Medical Degrees

SIR,—As far as I am aware no figures are ever published of the proportion of successful candidates in any medical examination, either university or college, but neither does any regulation stipulate more than that a candidate shall satisfy his examiners of his proficiency in any subject. Nothing hints at any competitive standard. It is not therefore possible to quote statistics, but it appears to me that the examiners for the higher medical degrees are passing only an arbitrary percentage of candidates. If this be so, the colleges are being most unjust.

In the past these degrees have never been subject to a competitive examination, but have been awarded to any candidate who reached the necessary standard. Nor used the mere possession of a higher degree to ensure employment in a consulting capacity; many a G.P. possessed such degrees to the great benefit of his patients and to the prestige of the family doctor. Is all this to be lost, and are candidates to be disheartened and dissuaded from higher study because in the eyes of the examiners there may not be sufficient so-called suitable posts for all the proud possessors of a higher degree? This policy would put a premium on the acquisition of knowledge, and must react greatly to the detriment of our profession.—I am, etc.,

London, N.W.1.

CELIA CULVER EVANS.

Towed-away Cars

SIR,—Quite recently I had the experience of having my car towed away by the police, while attending a patient in a West End hotel, although my car was causing no obstruction (it was the only one in the road). It was clearly marked "Doctor" on the windscreen and also carried the B.M.A. badge, and the porter at the hotel told the police that I was visiting a patient. On a very busy morning I had to rush to Tottenham Court Road to retrieve it. On remonstrating with the superintendent of police I was courteously told that the police wished to co-operate with the doctors as much as possible but were unable to alter the regulations issued to them by their superiors.

This morning I received a warning notice because again I had to leave my car outside the same place. Sir, would it not be possible for the B.M.A. to take some stronger action than heretofore? Could not we be treated with the same indulgence as, say, the municipal refuse collectors—who, with their enormous vans, during the busiest time of the day block the street without any harassing or molesting by the police?—I am, etc.,

London, W.1.

E. M. HERBERT.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Act, Sexual Offences, 1956. Introduction and Annotations by C. B. Orr. 1957.
- Alston, J. M., and Broom, J. C.: *Leptospirosis in Man and Animals*. 1958.
- Ambrose, G., and Newbold, G.: *Hypnosis in Health and Sickness*. 1957.
- Dempster, W. J.: *Introduction to Experimental Surgical Studies*. 1957.
- Francis, J.: *Tuberculosis in Animals and Man*. 1958.
- Guirdham, A.: *Theory of Disease*. 1957.
- Harris, M. C., and Shure, N.: *Practical Allergy*. 1957.
- Heron, W. T.: *Clinical Applications of Suggestion and Hypnosis*. Third edition. 1957.
- Loraine, J. A.: *Clinical Applications of Hormone Assay*. 1958.
- McCarthy, R. G.: *Teen-agers and Alcohol: A Handbook for the Educator*. 1956.
- Mallison, V.: *None Can Be Called Deformed: Problems of the Crippled Adolescent*. 1956.
- Martin, J. P.: *Social Aspects of Prescribing*. 1957.
- Meares, A.: *Medical Interview: A Study of Clinically Significant Interpersonal Reactions*. 1957.
- Neustatter, W. L.: *Mind of the Murderer*. 1957.
- Northrup, E.: *Science Looks at Smoking*. 1957.
- Palumbo, L. T.: *Management of Disorders of the Autonomic Nervous System*. 1955.
- Pirie, A. (Editor): *Fall Out: Radiation Hazards from Nuclear Explosions*. 1957.
- Pollicard, A.: *Le Poumon: Structures et Mécanismes à l'Etat Normal et Pathologique*. 1955.
- Race, R. R., and Sanger, R.: *Blood Groups in Man*. Third edition. 1958.
- Raeburn, J. K., and Raeburn, H. A.: *Anatomy, Physiology, and Hygiene*. 1957.
- Ribet, R. M. de: *Le Système Nerveux de la Vie Végétative*. 1955.
- Rogers, I. H.: *Complete Cookery Book for Diabetics*. 1956.
- Rowett, H. C. Q.: *The Rat as a Small Mammal*. 1957.
- Saunders, J., and Napier, M. (Editors): *Spastics in Cheyne Walk*. 1957.
- Sherlock, S.: *Diseases of the Liver and Biliary System*. Second edition. 1958.
- Sherman, H. C., and Lanford, C. S.: *Essentials of Nutrition*. Fourth edition. 1957.
- Singh, C.: *Hair and Health*. 1956.
- Society for Experimental Biology Symposia No. XII: *Biological Replication of Macromolecules*. 1958.
- Sorsby, A. (Editor): *Systemic Ophthalmology*. Second edition. 1958.
- Steemann, A. T.: *Examination of the Nervous System: A Student's Guide*. 1956.
- Stern, D. M., and Burnett, C. W. F.: *Modern Practice of Obstetrics*. Second edition. 1958.
- Strauss, M. B., and Raisz, L. G.: *Clinical Management of Renal Failure*. 1956.
- Thorndike, A.: *Athletic Injuries: Prevention, Diagnosis, and Treatment*. 1956.
- Tracy, J. E.: *Doctor as a Witness*. 1957.
- Veeder, B. S. (Editor): *Pediatric Profiles*. 1957.
- Vorhaus, M. G.: *Changing Patient-Doctor Relationship*. 1957.
- Wallis, C. J.: *Practical Biology. Volume I. Practical Zoology*. 1957.
- Walsh, J. P.: *Manual of Stomatology*. 1957.
- de Wardener, H. E.: *The Kidney: An Outline of Normal and Abnormal Structure and Function*. 1958.
- Whitehorn, J. C.: *Psychiatric Education and Progress*. 1957.
- Wolf-Heidegger, G.: *Atlas of Systematic Human Anatomy. Volume III*. 1957.

H.M. Forces

Air Commodore G. H. Morley, O.B.E., has been appointed Honorary Surgeon to the Queen, in succession to Air Commodore D. A. Wilson, C.B.E., A.F.C., on the latter's retirement from the R.A.F.

ROYAL NAVY

Surgeon Captain W. P. E. McIntyre, Q.H.P., to be Surgeon Rear Admiral.

Surgeon Commanders J. Carlton and F. G. V. Scovell have retired.

Surgeon Lieutenant B. Waters to be Surgeon Lieutenant-Commander.

ARMY

Colonel M. R. Burke, O.B.E., late R.A.M.C., having attained the age for retirement, is retained on the Active List Supernumerary to Establishment.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Major G. J. Cunningham, M.B.E., has resigned his commission, and has been granted the honorary rank of Major.

Captains (Acting Majors) S. Mattingly, W. Lees, G. L. Brown, and W. J. D. Bradfield to be Majors.

Captain (Acting Major) D. E. Argent, from A.E.R.O., to be Captain, retaining the acting rank of Major.

Captains W. I. N. Kessel and T. D. H. Gray to be Majors.

Captains J. M. Pirrie and K. S. Bailey have been granted the acting rank of Major.

Association Notices

NORTH SHORE DIVISION OF THE NEW
ZEALAND BRANCH

Notice is hereby given by the Council to all concerned that a new North Shore Division within the area of the New Zealand Branch has been formed. The boundaries of the new Division are:

In the South, the Southern Coast of the North Shore Peninsula, from Devonport to Riverhead; in the North, the Southern Boundary of the Otamatea County; in the East, by the sea; and in the West, by a line drawn from Riverhead to the Eastern Boundary of the Kumeu Riding and thence along the Eastern Boundary of the Kaipapakapa Riding and above that by the sea. with consequential alteration to the boundaries of the Auckland Division.

CLAIRE WAND FUND

Travelling Scholarship

The Trustees of the Claire Wand Fund propose to award a Travelling Scholarship to enable a general practitioner to study methods of postgraduate education of general practitioners in Canada and the U.S.A.

The successful applicant must be prepared to spend six to eight weeks in the U.S.A. and Canada, and to attend the Second World Conference on Medical Education in Chicago from August 31 to September 4, 1959, held under the auspices of the World Medical Association, with the theme "Medicine, a Lifelong Study." The Scholarship, of a maximum value of £600, will be paid from the Fund as a contribution towards the expenses of the selected general practitioner, who will be expected to submit a report of his tour to the Trustees.

Applicants should submit full particulars of previous experience and of the research project they propose to the Secretary of the Fund at B.M.A. House, Tavistock Square, London, W.C.1, not later than January 31, 1959.

Diary of Central Meetings

NOVEMBER

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|-----------|---|
| 19 Wed. | Joint Subcommittee on the Composition of Milk, Public Health and Science Committees, 2 p.m. |
| 19 Wed. | Public Relations Committee, 2 p.m. |
| 20 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 20 Thurs. | Dermatologists Group Committee, 11 a.m. |
| 21 Fri. | Dental Formulary Subcommittee, Joint Formulary Committee, 2 p.m. |
| 24 Mon. | Armed Forces Committee, 2 p.m. |
| 25 Tues. | Library Subcommittee, Science Committee, 2 p.m. |
| 25 Tues. | Planning Subcommittee of Occupational Health Committee, 2 p.m. |
| 26 Wed. | Alternative Service Subcommittee, G.M.S. Committee, 11 a.m. |
| 26 Wed. | Private Practitioners Subcommittee, Private Practice Committee, 2 p.m. |
| 27 Thurs. | Propaganda Subcommittee, Organization Committee, 11 a.m. |
| 27 Thurs. | Alcohol and Road Accidents Committee, 12 noon. |
| 27 Thurs. | Consulting Pathologists Group Committee, 2.15 p.m. |
| 28 Fri. | Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m. |
| 28 Fri. | Hospital Junior Staffs Group Council, 2 p.m. |

Branch and Division Meetings to be Held

BARNET DIVISION.—At Barnet General Hospital, Thursday, November 20, 8.30 p.m., Dr. Oliver Garrod: "Uses and Abuses of the Newer Steroids, or, How to Withstand the Assaults of the Commercial Representatives."

BIRMINGHAM DIVISION.—At Birmingham Medical Institute, 36, Harborne Road, Edgbaston, Tuesday, November 18, 8.30 p.m., lecture by Professor A. W. Woodruff: "Tropical Disease Encountered in Britain." (Illustrated.) Discussion to be opened by Dr. Gerald Knight.

BRADFORD DIVISION.—At Out-patient Department, Bradford Royal Infirmary, Tuesday, November 18, 8.15 p.m., clinical meeting.

BRIGHTON AND MID-SUSSEX DIVISION.—At Dudley Hotel, Hove, Thursday, November 20, 8.30 p.m., combined meeting with Sussex Veterinary Society.

BRISTOL DIVISION.—At The Bristowe, Deanery Road, College Green, Bristol, Friday, November 21, 8 p.m. to 1 a.m., annual dance. Guests invited.

CHESTERFIELD DIVISION.—At Walton Sanatorium, Thursday, November 20, 5.30 p.m., lecture by Professor J. Gough: "The Pathology of Pulmonary Fibrosis."

CITY DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, W.C., Tuesday, November 18, 8 for 8.30 p.m., films: (a) "Doctor Defendant"; (b) "Medical Witness." Talk by Dr. J. A. Gorsky. Members of St. Pancras Division are invited.

CITY OF DUNDEE DIVISION.—At Queen's Hotel, Nethergate, Dundee, Friday, November 21, 8.30 p.m., scientific meeting. Film: "Diuretic Therapy with Chlorothiazide." A discussion will follow. Time permitting, an additional film will be shown: "Gout and Gouty Arthritis."

EAST HERTS DIVISION.—At Lister Hospital, Hitchin, Thursday, November 20, 8.15 p.m., papers by Dr. A. P. H. Randle, Mr. J. J. Shipman, Dr. P. J. W. Mills, and Dr. N. Macdonald. Film: "Haemorrhoids and the Early Detection of Cancer." Members of South Bedfordshire Division are invited.

EAST SOMERSET DIVISION.—At Red Lion Hotel, Shepton Mallet, Saturday, November 22, 7.30 for 8 p.m., annual dinner and dance. Wives of members and friends are invited.

ENFIELD AND POTTERS BAR DIVISION.—At Robin Hood Hotel, Potters Bar, Thursday, November 20, 8.30 p.m., lecture by Dr. R. Cedric Simpson: "The Criminal Population." Members of North Middlesex Division are invited.

HALIFAX DIVISION.—At Board Room, Royal Halifax Infirmary, Wednesday, November 19, 8.30 p.m., address by Professor J. C. Goligher: "Diagnosis and Treatment of Carcinoma of the Rectum and Colon."

HUDDERSFIELD DIVISION.—At Whiteley's, Huddersfield, Friday, November 21, 8 for 8.30 p.m., dinner dance.

KENSINGTON AND HAMMERSMITH DIVISION.—At Hammersmith Hospital, W., Tuesday, November 18, (1) 8.15 p.m., short special business meeting; (2) 8.30 p.m., Symposium by Professor Russell Fraser, Dr. A. St. J. Dixon, Dr. C. L. Cope, and Dr. P. Hugh-Jones: "Uses and Abuses of Cortisone and other Steroids."

LEWISHAM DIVISION.—At Committee Rooms, Lewisham Hospital, Friday, November 21, 8.30 p.m., wine party with public health and local authority staff.

MID-GLAMORGAN DIVISION.—At Seabank Hotel, Porthcawl, Thursday, November 20, 7.30 for 8 p.m. Supper, followed by an address by Mr. Emyln E. Lewis.

NORTH MIDDLESEX DIVISION.—At North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, November 18, 2.30 p.m., clinical meeting.

NORTH OF ENGLAND BRANCH.—At Royal Victoria Infirmary, Newcastle upon Tyne, Thursday, November 20, (1) 7.15 p.m., clinical demonstration in Out-patient Department. (2) At Theatre No. 1, Medical School, 8.30 p.m., address by Mr. H. Thornton: "A Veterinary Officer Looks at the World."

NOTTINGHAMSHIRE BRANCH.—At Portland Building, Nottingham University, Wednesday, November 19, 7.30 for 8 p.m., annual dinner. Principal guests, His Worship the Lord Mayor and the Lady Mayoress of Nottingham, Mr. Justice Elwes, and Dr. D. P. Stevenson (Secretary, B.M.A.).

OLDHAM DIVISION.—At Oldham Hotel, Rhodes Bank, Monday, November 17, 9 p.m., Mr. P. C. Steptoe: "Vaginal Hysterectomy and Repair," with film made specially for presentation to the Second World Congress of the International Federation of Obstetrics and Gynaecology in Canada.

REIGATE DIVISION.—At Burford Bridge Hotel, Boxhill, Friday, November 21, 7.30 for 8 p.m., annual dinner and dance.

SHROPSHIRE AND MID-WALES BRANCH.—At Raven Hotel, Shrewsbury, Thursday, November 20, 7.30 for 8 p.m., biennial dinner. Principal guest, Mr. Bill Yates, M.P.

SOUTHAMPTON DIVISION.—At Conference Room, Civic Centre, Southampton, Wednesday, November 19, 8.30 p.m., general meeting. Address by Mr. Ludwig Koch: "Songs of Wild Birds and How I Record Them." Members are invited to meet the speaker at dinner in the Royal Hotel at 7 p.m.

SOUTH ESSEX DIVISION.—At Golden Lion Hotel, Romford, Wednesday, November 19, 8 for 8.30 p.m., dinner meeting. Lecture by Dr. G. Marsh: "Experiences with the British Antarctic Expedition." (Illustrated.)

SOUTH STAFFS DIVISION.—At Victoria Hotel, Wolverhampton, Thursday, November 20, 8.30 p.m. to 1 a.m., annual dance.

SUNDERLAND DIVISION.—Thursday, November 20 (1) At Royal Infirmary, Sunderland, 3 p.m., Address by Dr. J. G. M. Hamilton: "Uses and Abuses of Some Modern Drugs in the Treatment of Cardiovascular Disorders." (2) At Seaburn Hotel, 7.30 p.m., annual dinner.

TROWBRIDGE DIVISION.—At the Lansdown Grove Hotel, Bath, Friday, November 21, 8 for 8.30 p.m., dinner dance.

WEST MIDDLESEX DIVISION.—At Paul's Restaurant, Ealing Broadway, W., Tuesday, November 18, 8 p.m., joint meeting with B.D.A. (Ealing Section). Dr. L. Forman: "Lesions of the Oral Mucosa and Lips."

WEMBLEY DIVISION.—At Century Hotel, Forty Avenue, Wembley, Tuesday, November 18, 8.30 p.m., Mr. P. Clarkson: "The Breast in Art, History, and Religion, with a Note on the Plastic Contribution to Surgery of the Breast." Members of the Wembley, Harrow, Hampstead, and Willesden Divisions, and guests, are invited.

WIGAN DIVISION AND WIGAN LAW SOCIETY.—At Haigh Hall, Thursday, November 20, 8 p.m., joint meeting. Buffet supper, followed by address by Miss Rose Heilbron, Q.C.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 29 1958

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PAYMENT OF PRACTICE COMPENSATION
MONEY

NEGOTIATIONS WITH MINISTER

Dr. A. N. Mathias, chairman of the Association's Compensation and Superannuation Committee, told the Council at its last meeting (Supplement, November 22, p. 219) that the Minister of Health had flatly refused an application for payment of practice compensation money, except for a minor exception which affects only about twelve doctors. A report of the Association's representations to the Minister on this subject and his replies are published below.

LETTER TO MINISTER OF HEALTH DATED
NOVEMBER 14, 1957

"The British Medical Association has watched with increasing concern the fall in the value of the sum set aside in 1948 to compensate practitioners giving General Medical Services for the loss of the right to sell the goodwill of their practices.

"The effect of inflation and the fall in the value of money has, in the opinion of the Association, produced an entirely new situation which could not have been foreseen but which justifies a review of the position as a matter of urgency, and without prejudice either to existing legislation or to previous representations which have been made to the Ministry of Health from time to time.

"The sale of the goodwill of his practice was one of the main ways by which a practitioner could provide for his retirement. He possessed an asset which he could increase by his own efforts, the value of which would have been protected in two ways. Either the general level of fees would have been raised, thereby increasing the annual value on which the price (expressed in so many years' purchase) would have been based, or the general level of premiums paid for goodwill would have increased to compensate for changed economic circumstances.

"General practitioners have been deprived of these compensatory adjustments. The Act of 1946 had the effect of freezing the capital value represented by goodwill, and the Association is advised that the depreciation of this value, in terms of purchasing power, since 1948 is between 25% and 30%.

"I am instructed to urge, therefore, that you, Sir, will receive representatives of the Association at an early date, in order that there may be a full and frank review of the unprecedented situation that has arisen.

"There can be no doubt of the growing feeling of frustration, amounting, indeed, to a sense of injustice, among general practitioners. Emphatic resolutions have been adopted both by the Conference of Local Medical Committees and by the Representative Body of the Association and also by a large number of local medical committees and units of the B.M.A., acting independently. The profession,

of which general practitioners form the largest group, speaks with one voice in demanding an assurance that the compensation promised in the Act of 1946, and on which many rely for their retirement, shall be safeguarded and its value maintained.

"The Association does not submit at this stage suggestions as to how this difficult problem should be solved, feeling that ways and means are better discussed round a table than by correspondence, but it may be helpful to summarize the exchanges which have taken place between the Government and the profession. The Association confidently hopes that you, Sir, will be able to reconcile opposing points of view and find means of resolving the impasse that has been reached.

"When the method of compensation was discussed between the Ministry and the Negotiating Committee of the profession it was appreciated by both sides that a special procedure would be needed, and it was agreed as a matter of principle:

... that compensation should be paid when a practitioner would ordinarily have sold the goodwill of his practice.

"The Act of 1946 (section 36) provided, therefore, that payment should be made on retirement 'as a practitioner giving part IV services' or on death.

"This principle might have been acceptable to the profession had there been consistency in its application. Section 35 of the Act of 1946 makes it illegal to sell the whole or any part of the goodwill of a practice, but section 36 provides for compensation only when the whole practice is surrendered. It follows that when a practitioner relinquishes part of his goodwill by taking a partner he receives no compensation.

"If a practitioner wishes to reduce his commitments or to change from one area to another (in both of which instances he would have sold part or the whole of his goodwill) he is denied compensation because he has not, in the strict sense of the word, retired from practice.

"These instances of departure from the principle on which the Negotiating Committee relied have been the subject of repeated representations by the Association, the last occasion being in 1953, when the Ministry of Health gave three main reasons for its refusal to concede any of the points made.

"(1) *The general financial position of the country . . . makes it necessary to rule out any expenditure not essential to the maintenance of a service or vitally important for its development.*

"In other words it is suggested that the liquidation of the global sum would cause inflation. The Association submits that a degree of inflation exists which has the effect of discriminating against general practitioners as a class, and that relief of the undeserved hardship caused by the reduction in the value of their capital assets should be treated as a matter of priority.

"(2) We are quite clear that the original settlement was intended as a once-for-all settlement which would stand irrespective of any changes in the level of values.

"This refers to the amount of the global sum and to the rate of interest payable. The Association emphatically dissents from the suggestion that the word 'settlement' should be applied to a rate of interest which was not negotiated but was imposed in relation to rates obtaining in 1948, which are no longer realistic. Nor does the Association accept that 'settlement' in this context precludes changes when circumstances have arisen which were not foreseen when it was made. In an evolving service there should be no such thing as a once for all settlement.

"(3) It would not be possible under the provisions of the 1946 Act, which embodies the principle that it is reasonable to pay compensation normally only on retirement or death.

"For the reasons stated above the Association cannot accept this limitation of the principle, nor that it is impossible to change provisions, intended to apply in normal circumstances, when circumstances are no longer normal.

"It is appreciated that an amendment of the 1946 Act might be necessary, but it is submitted that the principle of adjustment to special circumstances was conceded in the Amendment Act of 1949, and that the necessary changes to secure an equitable solution of the present problem are both possible and reasonable.

"To sum up, the Association requests the Minister of Health to receive a deputation, as soon as possible, to discuss an amendment of the provisions of the National Health Service Act, 1946, relating to compensation, in the light of the circumstances now obtaining."

AGREED NOTE OF DISCUSSION WITH MINISTER ON MARCH 19, 1958

On March 19 the Minister met a deputation from the British Medical Association about compensation for the loss of the right to sell the goodwill of a practice. The deputation put forward the following proposals.

(1) Since 1946 the purchasing power of the compensation money has declined by one-third. Doctors were in a particularly unfavourable position in that the compensation, unlike that due to people affected by industrial nationalization, was frozen so that it was not even theoretically open to doctors to take any kind of action to try to maintain the value of the compensation due to them. The position was particularly hard in relation to older doctors, who could look forward only to a fairly small pension. It was noteworthy that the Government had already accepted the principle of the pension betterment—for example, in the case of medical officers in the Armed Forces.

There seemed to be four possible ways, which could be used singly or in combination, of dealing with the general problem:

(a) To apply a betterment factor, which would be determined at the actual time of payment, to the sum of money which had not yet been paid out.

(b) To fund the outstanding money and issue negotiable scrip with a life of say 25-30 years at a reasonable rate of interest.

(c) To increase the rate of interest payable. Payment of interest had been an integral part of the original agreement and the rate had now become quite unrealistic.

(d) To pay out the compensation money now, on demand, thus settling the matter once and for all. Course (c) could be offered as an alternative choice.

Commenting on these suggestions, the Minister said that they appeared to have far-reaching implications in an inflationary period like the present, and would therefore need to be examined extremely carefully.

(2) The term "hardship" should be interpreted more widely. At present the Ministry took a very strict line and authorized advance payments almost entirely only in respect of loans raised before 1948 for the purchase of a practice. This was a change which could be made without legislation.

The Minister said that he would be glad to consider any general principles or any suggested definition of hardship which the British Medical Association cared to submit, and the deputation said that they would let him have proposals.

(3) The appropriate proportion of the compensation due should be paid in advance in suitable cases to a doctor who wished to move to another practice. Such moves were frequently necessary owing to genuine hardship—illness, increasing age, etc.—but were extremely difficult to arrange, largely for financial reasons. Before 1948 a doctor had been able to finance a move of this kind by selling the goodwill of his original practice, which would normally be more valuable than that of the practice to which he moved. This was now not possible.

(4) An appropriate part of the compensation due should also be payable in advance to the doctor taking a partner. It was true that the notional loading arrangements had led to an increase in the number of partnerships formed since 1954, but the numbers would have been greater, and doctors would have taken partners earlier, if the financial arrangements had been more satisfactory. At present the doctor who took a partner suffered a definite financial loss for the first few years, and this definitely served to discourage partnerships. It might perhaps be argued that the figures were at present showing a satisfactory trend, but this might well be partly due to the fact that pensions would shortly be becoming payable for the first time, and in so far as this was so, the effect would be temporary.

The Minister said that he would carefully consider all the proposals that had been put to him and would send a considered reply in writing to the Association.

SUPPLEMENTARY MEMORANDUM, MARCH 31, 1958

Memorandum on Compensation for Loss of Right to Sell Goodwill of Medical Practices

At the request of the Minister of Health, the British Medical Association submits the following memorandum which deals in detail with certain points discussed with the Minister on March 19, 1958.

The three points which we submit could be covered by an interpretation of the word "hardship" in the context of Regulation 13 in the Compensation Regulations are:

(1) The hardship suffered by a doctor who transfers a share of his practice to a partner.

(2) The hardship suffered by a doctor when he changes the area of his practice, in that he is deprived of a capital sum which he would have received on disposing of the first practice and which would have enabled him to establish himself in the other area.

(3) Financial difficulties arising through debts incurred in connexion with the purchase of practices which cannot, on the narrow interpretation hitherto applied by the Ministry, be regarded as the purchase of goodwill—e.g., the purchase of surgery premises or practice house.

It is submitted that a wider interpretation of the word "hardship" would enable the present situation to be greatly improved without the necessity of new legislation. At most an amending regulation might be required. We are advised that Section 36(3)(c) of the N.H.S. Act, 1946, gives the Minister sufficient latitude. The relevant paragraph is as follows:

Regulations shall . . . prescribe the manner in which and the times at which the compensation is to be paid and secure that except in such circumstances as may be prescribed, it shall not be paid until the retirement or death of the medical practitioner concerned, whichever first occurs.

(1) The principle of payment to a practitioner of a capital sum in respect of a share of his practice which he has transferred to a partner needs little further elaboration. This principle is recognized in the Amendment Act of 1949, but only in respect of partnership agreements in existence before the appointed day. This limitation has caused much hardship. It has, in our view, acted as a deterrent when all are agreed that an increase in the number of partnerships should be encouraged, and finally it is, in our submission, quite illogical. The Compensation Regulations, and indeed Section 36(3)(c) of the Act, are based on the assumption that compensation should be paid when goodwill would ordinarily have been sold. It is not always appreciated that, in addition to giving up part of his income, the senior partner may face capital expenditure in finding additional accommodation or enlarging practice premises. Why should he borrow money (even if he can) at the high interest rates

now obtaining for lack of the capital represented by the share transferred which he would ordinarily have received?

Following representations by the Association in 1953, the Ministry agreed to make advances of compensation in individual cases of hardship where an elderly doctor, or one whose health was failing, found it necessary to take a partner in order to prevent the complete disintegration of his practice. This concession, though it may sound generous, is unrealistic. A doctor faced with the complete disintegration of his practice cannot afford to take a partner. In those cases where a doctor whose health is failing has proposed taking a partner in order to ease his burden, appeals have been refused because the practice could not be said to be disintegrating in the strict sense of the word. Recently a doctor applied for an advance payment on the grounds that he had had to take a partner because, on medical grounds, he had been forced to reduce his commitments considerably. The following quotation from the Ministry's letter in reply to his appeal illustrates the emphasis which has been placed on disintegration:

"Your application . . . has received careful consideration but, on the information at present before the department, there is no evidence to suggest that your practice is, in fact, disintegrating."

We submit that there are many cases in which it is necessary to take in a partner to prevent disintegration.

(2) Before the appointed day a doctor who wished to reduce his commitments could sell his practice and purchase a smaller one. The balance of the capital he received could be devoted to the expenses necessarily incurred in the process of re-establishment. At present he cannot purchase another practice by private negotiation, but must compete with others for vacancies. He dare not take this risk, and the limitation of mobility is one of the consequences of the National Health Service which has caused very great hardship to individual practitioners. The Association has instituted and is operating the scheme for the exchange of practices, and it has the goodwill of the Medical Practices Committee and executive councils. Though in theory satisfactory, this scheme has proved most disappointing in practice, because of the difficulty experienced by the doctors concerned in financing the exchange. We submit that a doctor who arranges to transfer from one executive council area to another should be deemed to have retired within the meaning of Regulation 13(3) for the short period involved and should not be required to prove individual hardship. In the interests of the National Health Service as a whole and general medical services in particular, the increase of mobility rendered possible by this measure would be of great value.

(3) The Practices Compensation Committee (established under Regulation 8 of the Compensation Regulations) was consulted by the Department on the criteria which should guide the Minister in the exercise of his power under Regulation 13. It was agreed *inter alia* that, where the purchase of goodwill and a practice house formed one transaction, an advance of compensation should cover up to one-third of the debt incurred through the purchase of the house. This agreed procedure has only been implemented to a very small extent, and a very narrow definition of goodwill has been imposed. For instance, in lending money to purchase goodwill, it was the custom of the bank concerned to open a special loan account and require regular quarterly repayment. If, for any reason, an instalment was overdue, the outstanding amount was transferred to a current overdraft. On numerous occasions an appeal for an advance of compensation has been refused on the grounds that the loan had been paid off and that no advance could be made to liquidate an overdraft without regard as to how this had been incurred.

Furthermore, there was a period during which only limited advances could be made because the final assessment of compensation was not known. Many of the amount of compensation was not known. Many advances made during this period did not cover the debt incurred through the purchase of goodwill, but a further advance has not been granted either because of the conditions mentioned above or because it was held that the

amount outstanding no longer constituted hardship. We maintain that under these circumstances advance payments should have been paid in connexion with the original appeal.

We ask that a more liberal approach should be made to this problem and that in particular a debt or mortgage on a house used for the practice, the goodwill of which was purchased before the appointed day, should be treated in the same way as a debt on the purchase of goodwill. Both were expenses incurred in the purchase of a practice.

Lastly, the position of elderly practitioners was mentioned at our interview with the Minister on March 19. We ask that special provision should be made for the hardship suffered by these doctors without regard to the formula that payment should be made only when goodwill would have been sold—i.e., on retirement or death. Circumstances have changed and there are cases where strict adherence to this rule has caused hardship to some doctors merely because they were past middle age in 1948. For example, the effect of the Act was to reduce significantly the income of the practice of one doctor who was in his early sixties in 1948, though his work remained much the same. Some years later he had a coronary attack and was warned that he must do less work. He could not receive his compensation nor could he afford to retire. Being a widower with no dependants, he could gain no satisfaction and no relief from pressing financial anxiety from the thought that a capital sum would be available after he had died. We submit that any practitioner who was unable to look forward to a reasonable return from the superannuation scheme should be able to claim his compensation on reaching retiring age, whether or not he retires "as a practitioner giving Part IV services." It has always been accepted that compensation should be regarded as one of the means by which a doctor provided for his old age, and special provision on the lines suggested would merely implement this assumption.

Summary of Recommendations

It is suggested that the word hardship, in the context of Regulation 13(2)(a), should be given a wider interpretation than at present so that the Minister, in the exercise of his powers under Regulation 13(2)(e), shall make advance payments of compensation:

- (1) When a doctor transfers a share to a partner.
- (2) When a doctor changes the area of his practice.
- (3) When there is an outstanding debt or mortgage on a practice house purchased (together with the goodwill of the practice) before July 5, 1948.
- (4) When any practitioner who was over 55 years of age in 1948 reaches retiring age of 65 and requests payment, whether or not he continues to practise.

LETTER FROM MINISTRY OF HEALTH, SEPTEMBER 26, 1958

"Compensation for Loss of Right to Sell Goodwill of Medical Practices"

"1. The Minister has now been able to consult his colleagues about the Association's proposals, set out in their letter of November 14 last and subsequently amplified in a meeting with him and in a further memorandum submitted after that meeting, for modifying the current arrangements for paying compensation to general medical practitioners who suffered loss as a result of the prohibition on the sale of practice goodwill imposed by the Act of 1946.

"2. He has asked me to let you know that, after the most careful consideration, he regrets that he cannot accept these proposals.

"3. It is clear that the provision for compensation made in the Act of 1946 and in the subsequent regulations was intended as a once-for-all settlement. In their original letter the Association contended that there should be no such thing as a once-for-all settlement in an evolving service. The Minister cannot accept this contention and does not consider that the changes in the service since 1948 have any relevance to this particular settlement.

"4. The settlement, as you know, took account of the views of both sides. The Government's total liability was limited, as was also the rate of interest payable; and there was provision for the compensation not normally to be paid out until retirement or death. On the other hand the profession benefited from the fact that interest was now to be paid in respect of an asset which previously would have earned none (so far we have paid out, as interest, over £7½m. after deduction of income tax at the standard rate), and from the provision for 'hardship' payments, which again was a new feature and under which some £9m. has so far been paid out compared with the £5m. originally estimated by the Association. Altogether, apart from interest, a total of nearly £26m. has now been paid out, or nearly 40% of the total amount provided for in the Act; and some payment—either in full or in part—has been made in rather more than half the cases which qualified for compensation.

"5. Apart from the fundamental objection to reopening a once-for-all settlement of this kind, there are other comments that the Minister feels he must make on the Association's proposals.

"6. Certain of the proposals—those which would involve legislation—were directed, *inter alia*, towards adjusting the outstanding amount of compensation for the fall in the value of the money, and to carrying the fixed rate of interest payment. Such proposals would represent a major departure from the normal rules of public finance which could have widespread economic repercussions.

"7. Of the Association's other proposals, the most important was the proposal that the appropriate part of the compensation due should be paid whenever a share of a practice was transferred to a partner. The Association pointed out, in support, that, before 1948, a practitioner did in fact receive a capital payment from the partner in these circumstances. While this was so, the fact remains that there was no provision made in the 1946 Act for compensation to be advanced in these circumstances; had there been any intention to provide for this as part of the settlement, the Act would surely have done so. While technically (as the Minister is now advised) it might be possible to amend the regulations now to do what the Association propose, the Minister does not, as I have said, feel that the settlement can be reopened. The Association have suggested that the absence of provision for part-payment of compensation has discouraged the formation of partnerships. Although this is bound to be a matter on which opinions may differ, the Minister does not think that there is any real evidence of this. The number of doctors practising in partnership has in fact risen steadily—in England and Wales from 9,745, or 56.6% of the total number of principals in July, 1952, to 12,962, or 67% of the total number of principals in July, 1957. No doubt this trend has been helped by the provision for 'notional loadings' of partnership lists, which helps considerably to offset the loss of income on transfer of a share to a partner.

"8. The Minister is sorry that he cannot meet the Association's wishes in this matter. He has, however, asked me to conclude by saying this. The Association have expressed their dissatisfaction with the practical working so far of the arrangement for an advance payment of compensation on hardship grounds in those cases where an elderly doctor or one whose health is failing finds it necessary to take a partner in order to prevent the complete disintegration of his practice. The Minister has, therefore, asked us to review once more all those cases in which application for an advance payment has been made on these grounds and has so far been refused, and to consider whether there are cases where the circumstances do not on further examination justify such a payment. I cannot, of course, make any promises about the outcome of this review, but we will do our best to carry it out—and to consider any new applications on these grounds—in a constructive spirit."

Dr. D. Gullick has resigned from the secretaryship of the East Hertfordshire Division on his appointment as Assistant Secretary of the B.M.A. Dr. J. M. W. Sedgwick succeeded Dr. Gullick as Division secretary on September 30.

FELLOWSHIP FOR FREEDOM IN MEDICINE

ANNUAL GENERAL MEETING

The annual general meeting of the Fellowship for Freedom in Medicine was held at Caxton Hall, Westminster, on November 15, with Dr. R. HALE-WHITE in the chair. It was the tenth anniversary meeting and the ninth annual general meeting.

Dr. E. C. WARNER, honorary secretary of the Fellowship, stated in his report that the medical membership was 2,011, and that it was necessary to recruit at least 100 new members a year to maintain the membership.

Cost of Private Beds

Dr. C. P. WALLACE (Guildford), commenting on a reference in the report to a weekly fee of 35 guineas for private beds in certain hospitals, said it was one of the greatest scandals existing under the National Health Service. Recently he had visited a hospital which he had found to be an old-fashioned residence converted into a form of private nursing-home under the National Health Service, without lifts and without many of the most ordinary amenities, and he was told that the fee was £36 10s. If they raised the problem they were told that an amending Act was required, but he was satisfied that there was a good deal of jiggery-pokery in the matter. He complained of the method of calculating the cost, including overheads, and the costing.

Dr. D. M. BAKER said the matter would never be put right while the present fantastic form of accounting continued. It was something which would not occur in industry or any other competitive system.

Independence and Service

In an address entitled "Independence and Service," Brigadier N. SKENTELBERY said that in respect of policy and administration the present nationalized health system was wasteful and ineffective and was increasingly falling short of the known requirements for hospitals and hospital beds. Hospitals should be independent in policy and in the management of their own affairs, for they had to be individual. He was thinking particularly of the small general hospital serving a limited area, but there was no reason why the same argument should not apply to the specialist or teaching hospital. Governing bodies must be local. At present local management committees had no autonomy and were rubber stamps for the regional boards. Their creation was a cynical piece of lip-service to the democratic idea. They had no power or influence, and were never intended to have any, and for what they did they might just as well not exist. An organization responsible to Parliament must be established. A hospital which was completely independent would be more effectively run at less cost than one subject to the restrictions and extravagance of centralized administration.

The present system would only decrease the ability of the hospitals to give the service which they might do. The National Health Service sought to apply Civil Service methods of centralized control, but the Civil Service was unfitted by training, official aptitude, and organization to solve the problems of hospitals. The inevitable diversity of the hospitals of the country made them an intractable problem for a service such as the Civil Service, but the hospitals had been forced into such a mould and were the worse for it.

"Why a free service?" he asked. "If free health, why not free food, free drink, free travel, or free entertainment?" The proper solution was the relief of economic crises by insurance. Hospitals should be given independence in policy and administration. Their main support should come from those they served, and there should be grants-in-aid from State funds where that support fell short.

"We must repeat these ideas in season and out of season until those in high places eventually think they have thought

of them themselves. Then perhaps we shall once more have hospitals which are free to serve, free to look after their own affairs, and free to forge their own destiny."

Encouraging Private Practice

The meeting passed a resolution recording its strong disapproval of the principle of merit awards for general practitioners, in the form of a direct and secret increase in remuneration, and its belief that an item of service method of payment in the N.H.S. and an increase in the opportunities for private practice would secure a proper financial reward for merit.

A resolution was carried welcoming the announcement by the British United Provident Association of a general practitioner scheme which would provide benefits to help private patients to pay their doctors' fees.

Another resolution which was passed called upon the Government to remove the unfair discrimination against private patients whereby they had to pay for their drugs and appliances in spite of making their full contribution to the N.H.S.

The meeting also carried a resolution deeply regretting the refusal of the Secretary of State for Scotland to join with the B.M.A. in the preparation of a special case to go before the Scottish Court of Session and urging the B.M.A. to persist in its efforts to test the contractual validity of the Spens recommendations.

Chairman's Address

In an address entitled "The Tide is Turning," the CHAIRMAN said that the Fellowship had spoken repeatedly of the defects of present-day medicine and how the National Health Service was lowering standards with ever-increasing speed each year. He could say without hesitation that it was very largely due to their efforts that at last there was a gradually spreading a belief that all was not well, that medicine was indeed a patient, that if permanent paralysis was to be prevented something drastic must be done and done soon. A dreadful error in diagnosis had been made by a great many doctors. What they thought to be teething troubles of a passing nature had turned out to be widespread dental sepsis with decaying roots which required drastic extraction—some might say a clean sweep—if the patient was to regain any real health.

Stating that the stage had been reached when external evidence and the views of others was more important than their own, he referred to recently expressed views by Sir Hartley Shawcross on the need for private practice, and again on the Welfare State, when he said we are "tending to abdicate the responsibility for looking after ourselves." The *Times* had published a long leader critical of the central pool and the capitation fee, and had given space to correspondence.

In a questionnaire circulated in the Tunbridge Wells Division of the B.M.A. doctors were asked whether they thought that the B.M.A. should be concentrating on the formation of an alternative Health Service, and the answer was "Yes" 80, and "No" 26.

Even the Government in their new pensions scheme were allowing opting-out. In the early days when they talked about the possibility of opting-out of the National Health Service the answer always came with a patronizing smirk, "You cannot opt out of State education, so how can you be so silly as to think of opting out of the National Health Service?" That was always a ridiculous argument. Now it ceased to be that, and perhaps there was a chink of light.

For private practice the outlook was more encouraging than at any time since 1948. They must continue to press upon the Government and the B.M.A. that drugs for private patients was an issue which if solved favourably would prove an even greater stimulus, specially to private practice in the poorer areas. They would also be wise to ensure that private practice was brought more to the notice of medical students, who tended to be so immersed in National Health Service methods that many of them scarcely realized that private practice existed.

Better National Health Service medicine and increased opportunities for private practice were both in sight; and it was largely due to the work of the Fellowship that it was so. They could not relax their work; indeed, it was time for even more strenuous efforts, otherwise the slightly more encouraging conditions, for which they had worked so hard, could easily disappear overnight.

The meeting carried a resolution, moved by the CHAIRMAN, welcoming the fact that the Royal Commission was considering issues other than purely remuneration, especially methods of raising standards of doctoring within the National Health Service.

GENERAL MEDICAL SERVICES COMMITTEE

At a meeting of the General Medical Services Committee on November 20, Dr. A. B. DAVIES, Chairman, reported that Dr. W. MORGAN EVANS had regretfully tendered his resignation from the Committee in view of his many other obligations. The Committee accepted his resignation with reluctance and regret, and appointed Dr. C. M. SCOTT and Dr. S. NOY SCOTT respectively to fill the vacancies thereby created on the Assistants and Young Practitioners Subcommittee and the Private Practice Committee.

Interim Remuneration Increase

For a large part of the morning the Committee concerned itself with the recent further interim increase of 4% in basic remuneration. Having recounted the background and details of interviews with the Minister of Health, the CHAIRMAN invited the Secretary, Dr. D. P. STEVENSON, to read a letter from the Minister of Health informing the Association that an interim adjustment of 4% had been awarded by the Government. In view of statements which had appeared earlier in the national press forecasting the award, Dr. S. WAND, Chairman of Council, urged the Secretary to reassure the Minister of Health that no disclosure of the terms of the award had been made by members of the profession. The Committee expressed disappointment that the interim increase was not to be applied from an earlier date, but agreed to accept it as a belated action on the Government's part, without prejudice to the findings of the Royal Commission, whose report was now expected in the summer of 1959. The Committee appointed some of its members to discuss the distribution of the new money with officials of the Ministry.

Maternity Fees

The Committee, at the suggestion of Dr. A. TALBOT ROGERS, considered maternity medical service fees.

The CHAIRMAN reported that on October 21 the Committee's representatives discussed the question of raising the maternity medical service fees with officials of the Ministry of Health. The latter pointed out that the report of the Cranbrook Committee on the maternity services was expected in December, and that it would be inopportune to raise the fees before the Committee's recommendations were known. The Ministry's attitude could not be changed in spite of very firm representations, and it was agreed that the matter would be discussed again in January, immediately after the publication of the Committee's report, when an interim decision could be reached in the light of its recommendations, pending final agreement following the findings of the Royal Commission.

Dr. TALBOT ROGERS said that, whatever was in the Cranbrook Report, it could not be implemented for at least another year, and possibly another two years. Something should be done to implement the decision of the Conference of Local Medical Committees before the next Conference, and, that being so, whatever alterations were made in the terms of the fee should not be tied up with the final agreement on the recommendations of the Cranbrook Committee. Secondly, in his view, the money should come

from the total Central Pool. It should not form part of any new money that might come. Dr. Talbot Rogers suggested that the question of maternity medical service fees should be considered as a separate item.

Dr. H. N. ROSE suggested that obstetric work was unevenly divided over the country. Many general practitioners, he said, would like to do maternity work, but did not have the opportunity. In Essex a great amount of maternity work was done which was not taken into account by the Medical Practices Committee. That Committee should look into the matter and tie it up with medical manpower in those areas before any final distribution of the money was settled.

Remuneration

Calculation of Central Pool

The CHAIRMAN referred to the Committee's decision to give further consideration to the memorandum on the Central Pool which he had prepared in the light of comments which members were asked to send in. He said that he had received several comments which the Committee agreed should be incorporated in a revised memorandum which should be sent to all local medical committees.

Supplementary Payments for 1957-8

The Committee approved the Chairman's action in agreeing to the issue of a letter from the Ministry to executive councils on November 7, which gave the latter time to distribute the agreed advance payments to doctors at the end of December.

Correspondence in "The Times"

After a short discussion the Committee decided to take no further action on a number of letters and a leading article on the subject of the distribution of the Central Pool and the method of payment of general practitioners which had appeared in *The Times* recently.

Compensation

Dr. A. N. MATHIAS reported that representatives of the Compensation and Superannuation Committee met the Minister of Health on March 19, 1958, and urged him to increase the interest rate on practice compensation money. A reply was received at the end of September, and, except for one small concession (to review certain cases of hardship in a "constructive spirit"), the answer to the Committee's representations was an unqualified "No." Dr. Mathias said that representations would again be made to the Minister when the Committee considered the moment opportune.*

Drugs for Private Patients

Reporting on the meeting on October 28 between a Council deputation, consisting of Drs. S. Wand, I. M. Jones, L. W. Batten, and himself, and officials of the Ministry of Health, the CHAIRMAN said that, in his view, considerable progress was made on the question of drugs for private patients. The issue had been appreciably narrowed. "The ball is now at the feet of the Private Practice Committee," he said. The differences between the Ministry and the private practitioners were now purely on the question of the registration of the patients of doctors entitled to participate in the scheme. The Ministry officials considered it essential to have a list of private patients entitled to drugs, each from his nominated doctor. Dr. WAND added that the remainder of the Association's memorandum (*Supplement*, February 15, p. 67) on the subject was accepted by the Ministry.

The Committee agreed to receive the item and await the comments of the Private Practice Committee.

*A full report on the negotiations on practice compensation money is printed in the opening pages of this *Supplement*.

Hinchliffe Committee's Interim Recommendations

The CHAIRMAN reported that a meeting was held at the Ministry of Health on October 30 to discuss the interim recommendations of the Hinchliffe Committee on the cost of prescribing. The G.M.S. Committee was represented by himself, and representatives of the Ministry of Health, the British National Formulary Committee, and the pharmacists were also present. It was agreed, said Dr. Davies, that a copy of the *British National Formulary, Alternative Edition, 1957*, should be supplied to every general practitioner in the Service about next February, when copies would be available after reprinting. The standard edition of the *Formulary* would remain official until October 1, 1959. During the intervening period practitioners would have an opportunity of studying the *Alternative Edition*. Shortly before October, 1959, it was proposed to ask the G.M.S. Committee to indicate which edition it preferred, so that requirements could be assessed for the next edition, due for publication early in 1960.

The meeting agreed on a type of two-sided loose-leaf folder, specimens of which would be available at a later date, on one side of which would be a pocket for the *National Formulary*, and the other side a pocket to contain reprints of all the appropriate documents on prescribing, which in future would be of a standard size and shape. A list of the documents proposed for inclusion in the folder was set out and an invitation extended to the Committee to say whether it considered that any documents should be added to or subtracted from the list.

On behalf of the Committee, the Chairman thanked Dr. B. BURNS for his help and for the constructive suggestions which he had made.

Home Confinement Grant

The Committee decided to continue to observe the situation with regard to the payment of home confinement grants, and to get advice or indications from all parts of the country about what was happening. At the appropriate time and in the light of the information received, the Ministry of Pensions and National Insurance could again be approached.

The matter was originally raised by the Sheffield Local Medical Committee, which pointed out that, as things were at present, a mother could be admitted as an emergency to a maternity hospital for a period not exceeding three days during the puerperium without forfeiting the grant for home confinement. If, however, it was desirable for the mother's safety that she be confined in hospital by pre-arrangement and sent home within two days, no grant was payable. Admissions of this kind would make the best use of maternity beds, but the mother would incur the same expenses as if she were confined at home. As the regulations stood she had no grant to meet expenditure at home, and the financial sacrifice involved might well decide her against the one- or two-day stay in hospital which might be essential for her safety.

G.P.s on Boards of Governors

Following a report that local medical committees had been invited, in co-operation with Branches and Divisions of the Association, to consider the nomination of general practitioners for appointment to the boards of governors of teaching hospitals, the CHAIRMAN drew attention to a letter from the Essex Local Medical Committee. This stated that the Essex committee shared the Association's view that the Minister ought to consult the B.M.A. on the matter, and the comments of the General Medical Services Committee were requested on a suggestion that the Essex Local Medical Committee should write to other local medical committees and Branches and Divisions of the Association in the North-east Metropolitan Regional Hospital Board area not only asking them if they wished to put forward any names, but

also suggesting that they should make representations direct to the Minister that general-practitioner representation should be granted.

Dr. TALBOT ROGERS said that the matter was bound up with the question of getting general practitioners on to regional hospital boards. If an adequate number of general practitioners were on regional boards the position would right itself. Dr. F. GRAY asked whether it would not be appropriate to send a letter to the Ministry urging that when there was no general-practitioner representative one should be appointed.

Mr. T. H. DOCKRELL pointed out that the Minister had always taken the view that he did not put anybody on any committee as a direct representative. Mr. Dockrell did not consider it would be advisable to press for direct representation for any one section of the medical profession. Dr. H. N. ROSE said that all that was being asked was that one general practitioner should be on the board of governors of the teaching hospital. Dr. F. M. ROSE suggested that it was not just any general practitioner, because general practitioners had been selected by the Ministry who did not command the respect or support of their own colleagues.

The Committee agreed that a further approach should be made to the Ministry, and approved of local medical committees taking action individually.

General-practitioner Consultations

The Committee considered a letter from the College of General Practitioners enclosing a communication from a practitioner in which he pointed out that one of the major disadvantages in general practice at present was that there was very little contact between general practitioners living in adjacent areas, and that the technique and experience developed by outstanding general practitioners was not passed on to others who were younger and less experienced. The correspondent suggested that an excellent method of remedying this would be for general practitioners to be encouraged to bring each other into consultation by the institution of a scheme whereby every general practitioner could do 20 domiciliary visits per annum to the cases of another general practitioner within a reasonable radius who was not in his own partnership at a fee of, say, one guinea per visit. The increased cost to the Service would be small but the dissemination of information would be great, and the rivalries and dislikes between neighbouring general practitioners would tend to be broken down to the benefit of the profession as a whole. The Committee agreed to refer the matter to the liaison committee with the College of General Practitioners.

B.U.P.A. General Practitioner Scheme

It was reported that the British United Provident Association would shortly introduce a scheme whereby benefits would be available to contributors who obtained treatment from a private general practitioner. For the time being membership of the new scheme would be limited to subscribers to the existing B.U.P.A. scheme covering treatment in hospitals and nursing-homes. It was understood that other provident associations might also introduce similar schemes.

Injury Compensation

The Committee received, with thanks to the Compensation and Superannuation Committee, information on the general practitioner's position under the Superannuation Regulations if he suffered injury or death while participating in a scheme made by a regional hospital board for dealing with major accidents.

An injury allowance was payable if a general practitioner ceased to be employed in consequence of his being permanently incapacitated by an injury sustained by him in the actual discharge of his duty, and specifically attributable to the nature of his duty. The allowance would be of such amount as the Minister of Health considered reasonable, having regard to all the circumstances. It might not exceed

two-thirds of the doctor's average remuneration over the three years preceding the injury. In the event of death, the Minister might grant an annual allowance or gratuity to the widow of a person who died as the result of an injury sustained in the course of duty. The amount would be what the Minister might consider reasonable, and his discretion was not limited by the Regulations. A widow was also entitled to a death gratuity provided the practitioner had completed 5 years in the N.H.S. at the date of death. The death gratuity (which was tax-free) was equal to the greatest of (1) 4% of his remuneration as a practitioner, plus 3/80ths of his average remuneration as an officer (i.e., whole-time hospital appointments); (2) a return of contributions; and (3) his average annual remuneration over the three years before death (or before retirement if death occurred after retirement). If death occurred after the practitioner had become entitled to an injury allowance the amount of benefit paid to him before death was deducted from the death gratuity payable to his widow.

Assistants and Young Practitioners Subcommittee

Dr. F. G. TOMLINS, Chairman of the Assistants and Young Practitioners Subcommittee, presented the Subcommittee's report.

The CHAIRMAN informed Dr. TOMLINS that the Council had approved the Assistants and Young Practitioners Subcommittee's recommendation on the procedure for appeal.

Mileage

The Committee considered a letter from the Yorkshire (North Riding) Local Medical Committee, copies of which had been sent to the Ministry of Health, members of the working party of the Mileage Committee, Mr. A. M. F. Palmer, Sir T. L. Dugdale, Sir Alexander Spearman, and Mr. R. H. Turton. In the letter the Local Medical Committee made known in advance its strong objections to the proposals implicit in the interim report of the Mileage Committee and in the recommendations of that Committee that in future (1) mileage should be calculated from the main surgery of the doctor of choice; and (2) that no doctor should be entitled to any payment unless at least 10% of the patients on his list lived in areas designated as mileage areas.

Dr. C. F. R. KILLICK said that the Yorkshire (North Riding) Local Medical Committee had chosen an extraordinary way to try and press those concerned into something which the Conference of Local Medical Committees had not seen fit to accept. Neither the Conference nor the Mileage Committee had accepted the recommendations. It was a case of one particular area stressing a large number of particular difficulties when, in fact, the difficulties experienced over the country as a whole were being investigated. It was an unfair method of putting its points over.

Dr. D. L. S. JOHNSTON said that his recollection was that Dr. T. K. Cooke, who spoke on the subject at the Conference, stated that the substance of the North Riding resolution had been passed at a previous Conference, and there was some argument for his saying, "Why was it not implemented then?" The CHAIRMAN replied that the G.M.S. Committee, having sought the guidance of its Rural Practices Subcommittee, decided to advise the next Conference not to support the decision of the previous Conference.

Dr. JOHNSTON asked whether the Rural Practices Subcommittee was not bound to implement resolutions of the Conference. Dr. KILLICK replied that it was at the request of the Ministry that the G.M.S. Committee and the Rural Practices Subcommittee reconsidered this particular matter. Dr. TALBOT ROGERS said that if the Conference passed a resolution, the G.M.S. Committee did its best to implement it. But if it were found to be impracticable or unwise, or circumstances changed, it must always be possible for the Committee to go back to the next Conference and ask it to change its mind.

Personal Medical Card

The Committee agreed in principle to the introduction of a personal medical card to contain important medical data, such as blood group, liability to disease such as diabetes, epilepsy, and haemophilia, etc., the details of which would be discussed.

Supply of Insulin

The Committee decided to refer to the Central Consultants and Specialists Committee a letter from the Southampton Local Medical Committee complaining that hospitals of the Southampton group no longer issued insulin to their out-patients, except in token quantities. It was felt that it was an unnecessary hardship on diabetics to make a special journey to consult their doctor solely to obtain a prescription for insulin and, furthermore, to have to pay a separate shilling for it. It would appear to be an extravagant way of dispensing insulin.

DEFENCE TRUSTS

A meeting of the trustees of the General Medical Services Defence Trust and the National Insurance Defence Trust was held on November 20, at which Dr. CATHERINE HARROWER, Deputy Treasurer, presented the income and expenditure accounts for the nine months ended September 30, 1958, together with the balance sheet.

Income Tax Appeal

The trustees considered a letter from the Hull Local Medical Committee expressing alarm felt locally at the gift of £710 and the offer of a further £2,000 from the Defence Trust towards the expenditure of preparing the test case in connexion with the assessment of the income of part-time consultants under Schedule E. This information was contained in the report of the meeting of the Trustees published in the *Supplement* of October 4 (p. 158). The Hull Local Medical Committee felt strongly that the capital of the Defence Trusts should be kept intact to meet the purpose for which it was designed.

Dr. HARROWER pointed out that the commitments of the Trust would not exceed £835, and that the only call on the £2,000 would be the balance of £125, as the Hospital Medical Staff Defence Trust had accepted responsibility for the recent costs.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Time-expired Senior Registrars

SIR,—I am sorry that my remarks to the Central Consultants and Specialists Committee (*Supplement*, October 18, p. 170) surprised and disappointed Dr. A. Poteliakhoff and his colleagues (*Supplement*, November 15, p. 209). The opposition to the Ministry's proposed new grade which I reported was strongly and almost unanimously expressed by the members of the Hospital Junior Staffs' Group Council last May, and this attitude has been endorsed by further local meetings of H.J.S. groups and of the executive committee, by the Annual Representative Meeting of the B.M.A., by the Central Consultants and Specialists Committee, and by the Joint Consultants Committee. If the Ministry's proposals are all that Dr. Poteliakhoff says they are, why do they find so little favour?

The policy consistently advocated by the H.J.S. Group (and its antecedent, the Registrars Group) is that, pending the achievement of a long-term solution of the hospital staffing problem, all senior registrars kept on after four years in the grade should be given security of tenure and further salary increments, at least up to, and possibly over-

lapping, the starting figure for consultants. This proposal is simple, it treats all alike, it entails no permanent sub-S.H.M.O. grade, it does not further inflate the numbers competing for consultant posts or handicap some with an unfavourable label, and it has already gained widespread support. By contrast, the Ministry's proposals, set out in circular H.M. (58) 58, are for a limited number of "designated posts" to be filled ordinarily by advertisement and application, open to time-expired senior registrars and carrying a higher rate of pay (increments are not mentioned). The remainder of those continued beyond four years do so at the fourth-year rate as at present. No criteria are laid down to distinguish between the duties or the individuals which are to be considered appropriate to these differing states, but the definition of the scope of the designated posts ("responsible work commensurate with that which is normally expected of a fourth-year senior registrar") hardly leaves room for any difference at all.

Does the rejection of our simple and fair solution and the offer of this tortuous, inequitable, and dangerous alternative really seem to be intended, as Dr. Poteliakhoff asserts, "to correct the present injustices of time-expired senior registrars"? Even the Ministry's circular does not make this claim. It stipulates that the basis for creating such posts is to be "the demonstrable needs of the hospital service" not the demonstrable needs of the senior registrars. Pausing to compare what we have asked for with what we have been offered, can anyone utterly dismiss the suspicion that the Ministry is determined to obtain specialist services outside the consultant grade, and that to this end it wishes, before the working party reports, to divert a number of senior registrars into a blind alley out of which promotion will be impossible, and, by exploiting this situation, force the acceptance of a sub-consultant career grade as a permanent feature of the service? Surely we must continue to advocate the policy we know to be right and not yield to this wily gambit. I am, etc.,

ROGER BREARLEY,
Chairman,
Hospital Junior Staffs' Group.
Liverpool, 12.

SIR, I am grateful to Drs. A. Poteliakhoff, P. L. Watts, and T. C. P. Williams for their letter (*Supplement*, November 15, p. 209). Their comments, I am sure, embody the views of most senior registrars: that, far from spurning the Minister's proposal for granting security of tenure and a higher rate of pay for a selected number of senior registrar posts, we welcome it as a practical interim measure. And, as it has been pointed out in the Minister's circular, such upgraded senior registrars would still be free to apply for higher positions. One must face realities. It is inevitable that many senior registrars will not attain consultant status. And their training, habit, and temperament are such as to render many of them unsuitable for entering another avenue of medicine, be it general practice, industrial medicine, or the pharmaceutical industry.

The labourer may be worthy of his hire, but money, Sir, is not everything. Most of us are in medicine because we love it. And most of us are senior registrars because we find the occupation intellectually, emotionally, and spiritually satisfying. But without security of tenure we cannot be happy in our love for medicine. And, as an Indian philosopher has said, "We cannot all ride high horses and some of us must walk"; so must some of us remain in humbler positions. But do let us have, please, security of tenure. I am, etc.,

Cottingham, Yorks.

PAUL CROSBY.

Costing of Private Beds

SIR,—My committee is gravely disturbed by the recent increase in the already high cost of beds in private wards of hospitals, by the wide variations in the costs as between comparable hospitals, and by the apparent lack of correlation between the services offered and the charges made. An important consideration is that some hospital admissions, for example, maternity cases, are booked in advance, so that the recent sudden imposition of increased charges of as

much as £7 per week bears hardly upon patients who were unprepared at the time of booking.

The variation in costs—in Surrey the charges in some hospitals are £20, in others £36, per week—is due to a costings system based on local conditions, and might well be modified by a more regional costings system. The high charges to private patients, who pay additionally their medical and surgical fees, and who are already contributing to the cost of the Service in their rates and taxes, are calculated by adding a percentage to the average cost per bed in the hospital concerned. These patients are therefore charged extra for making their voluntary additional contribution to the reduction of the overall cost of the Health Service.

Is it too much to ask that the whole question of the costing of private beds in hospitals should be reviewed as a matter of urgency?—F am, etc.,

F. T. BURKITT.

Secretary,
Surrey Local Medical Committee.

London, S.W.19.

Telephone Charges

SIR,—With the proposed timing of local telephone calls at 2d. for three minutes, the majority of doctors are going to find their telephone bills considerably increased. In many cases it is inevitable, when phoning a hospital to speak to a doctor or to make an appointment for a patient, for there to be a delay while the doctor is found or the appointments office is free. Admittedly other sections of the public will be similarly affected, but surely some consideration could be shown by the Postmaster-General to subscribers who are paying a rental for the telephone service, and the timing of local calls could be restricted to call boxes.—I am, etc.,

London, N.15.

MARTIN KINGSLEY.

Partnership in General Practice

SIR,—I read and hear much about the desirability of general practitioners with large lists taking a partner in place of an assistant. It should be clearly understood that a medical partnership is never a purely professional one. It demands, above all, a satisfactory personal relationship and a state of harmony between the respective doctors' wives. A partnership will not fail because one doctor prescribes oxytetracycline to a patient when a Seidlitz powder would suffice, but because one doctor's wife thinks that her husband is doing more than his share of the work, or wants her annual holiday when it is inconvenient for the other.

I can imagine no greater purgatory than a miserable partnership, and I have good reason to believe that there are an appreciable number of these. The extent of this could easily be estimated by asking a competent body to circularize individually all doctors in partnership and ask them whether they are satisfied, or whether they would prefer, without loss of income, to become single practitioners. I feel myself qualified to write such a letter because I have in turn practised as an equal partner, a single-handed doctor, and a doctor with an assistant. I would unhesitatingly say to any doctor contemplating partnership—"Think carefully, and don't."—I am, etc.,

Chatham.

H. COOPER.

N.I. Contributions during Postgraduate Study

SIR,—A recent Ministerial change of heart may be of interest to those of your readers who undergo full-time postgraduate education. During such a time contribution for National Insurance may normally be allowed to lapse. However, leaflet N.I.30, section 10, states that a person under full-time training at an approved course will be credited with contributions for weeks of training after his 18th birthday only if three conditions are fulfilled. I quote the first and third, which are relevant to the subject of this letter: "First: The training is not intended to last for more than one year. . . . Third: The Minister is satisfied that if the trainee had not taken the course he would have remained or become unemployed."

An application was recently made that attendance, without outside employment, at the full-time course in basic medical sciences at the Royal College of Surgeons, with a view to taking primary F.R.C.S., should qualify on these grounds. The application was refused on the grounds that condition (3) was not satisfied. Representation to the Minister was made by Mr. Richard Nugent, Conservative M.P. for Guildford, that, as the F.R.C.S. or equivalent is a *sine qua non* for a senior surgical appointment, condition (3) was in fact satisfied. As a result the position was reviewed, and full contributions are now to be credited for this course (provided, of course, that the other conditions are satisfied—e.g., no liability to pay contributions as a self-employed or (part-time) employed person).

Although this has only been agreed in one specific instance, I feel sure that the principle will apply to other postgraduate courses which are (1) full-time, and (2) leading to a qualification without which a given specialty cannot be pursued. Failure to take advantage of such an arrangement seriously affects the amount of sickness or other benefit which a contributor may need then or later. Application is made on form C.F.55.C and the explanatory leaflet is N.I.30, dated November, 1957.—I am, etc.,

London, W.C.2.

C. N. HUDSON.

Hospital Staff Mileage Allowance

SIR,—It would seem that Committee B of the Whitley Council has recently been discussing the Staff Side's claim for an increase in the mileage allowance. The Management Side has suggested that a scheme similar to the new Civil Service claims for motor mileage allowance (E.C. No. 19/58 of June 26, 1958) would be basically suitable for adoption in the Health Service. This suggestion seems remarkable in that it would provide for a reduction and not an increase in the mileage allowance.

We think it is fair to say that most whole-time medical officers in the Health Service regard the present scheme as very unsatisfactory and the mileage allowance inadequate. They feel, too, that the distinction made between whole-time and part-time officers is invidious and would seem to be weighted in favour of those who are already relatively favoured from the income tax point of view. There can be little doubt that, by and large, the Health Service obtains very considerable advantages from the fact that most whole-time officers find it convenient to use their own cars for travelling to work—since a large proportion of these are obliged to move from one place to another during their work, or in the course of it. Obviously the Ministry would not be willing to pay for journeys to and from work on a regular basis, but in view of the foregoing it would seem reasonable that it should pay a fully adequate mileage for those few journeys which come within the scope of the mileage allowance. We therefore feel that the whole question of mileage allowances, including the distinction between part- and full-time employees, should be thoroughly reviewed and any question of reduction of the present miserable allowance vigorously opposed.—We are, etc.,

GRAHAM POOLE.

RONALD B. PRIDIE.

PETER STRADLING.

D. G. MASSEY.

London, W.12.

Medical Auxiliaries

SIR,—A considerable amount of correspondence has appeared in your columns on the subject of medical auxiliaries, and several consultants have taken up cases of unfair treatment of medical auxiliaries with whom they are associated. Attention has been called to the very low salaries paid by the National Health Service to medical auxiliaries compared with the wages paid in industry for such skilled workers. With regard to the registration boards, which the Minister proposes to set up, the medical representation is small, as it is on all boards connected with the management of the National Health Service.

I am interested myself in the welfare of my orthoptists, who seem to get very little help from their own boards, and

a very raw deal from the Whitley Council. I have two part-time orthoptists working in my department—one who does six sessions and the other four sessions. The orthoptist who was doing the four sessions, and who was a married woman, resigned recently and a new orthoptist was engaged in her place. Both her predecessors had done only four sessions a week, and they were paid 24s. per session. My new orthoptist was engaged on the same terms, and her engagement was confirmed in writing, but when she came to be paid at the end of the first week she was paid only at the rate of 13s. 6d. per session. The reason given for this was that she was already doing six sessions at another hospital, and that orthoptists were paid only 24s. per three-hour session provided that their work did not exceed 12 hours per week. I am aware that the short-time orthoptists on the higher rate per session do not get superannuation or holidays with pay, but a bird in the hand is worth two in the bush. I do not think that any comment from me is necessary on an arrangement such as this which puts a premium on idleness.

There is no unemployment among medical auxiliaries, in the way that there is among doctors, and I should have thought that the remedy was in their own hands, provided that they were united, and would support one another. I took the matter up with our group secretary, who genuinely regretted his inability to help, as he was bound rigidly by Whitley Council agreements in matters of pay.—I am, etc.,
Camberley, Surrey. **LESLIE HARTLEY.**

Entry into Practice

SIR.—Dr. C. A. Sharples (*Supplement*, November 15, p. 210) states that few of us wish to spend the whole of our lives, together with our families, in the industrial areas. This attitude is regrettable. It is not fair to that section of the population who keep this country's economy ticking over by its work in the pits and the mills. The doctor in the industrial area has a far more pleasant job than the man underground at the coal face. These men risk their lives, and deserve in return a solidly settled medical service, not a transitory one. Doctors have also brought up their families in far worse places. Some of us who settle permanently in these districts neither bemoan our lot nor wear a halo. We happen to like it, and get satisfaction from it.—I am, etc.,
Whitwell, Notts. **JOSEPH MAIZEL.**

Midwifery and Hypnosis

SIR.—At last the medical hypnotist is deemed worthy of his hire and is to be paid for his service at confinement (*Supplement*, October 4, p. 159). Glad we are indeed for any fee, but there here arises a problem. Merely to induce hypnosis for the first and only time during the actual parturition is not only poor technique but, except in the case of an unusually good subject, mainly useless. Before labour the woman must be an adept at attaining at least the lighter stage of trance. This means that she has to pay several visits to the hypnotist for training and at the final rehearsal be capable of inducing the state in herself at a given sign. The hypnotist need not be present at the confinement but he usually is, and should be if he is keen on a first-class job. It would seem then that the remuneration is somewhat small.—I am, etc.,
London, N.8. **H. OWEN-FLOOD.**

Association Notices

Diary of Central Meetings

DECEMBER	
2 Tues.	Estates Committee, 11 a.m.
3 Wed.	Central Ethical Committee, 2 p.m.
3 Wed.	Financial Advisory Committee, 3.30 p.m.
4 Thurs.	Central Consultants and Specialists Committee, 10.30 a.m.
4 Thurs.	Finance Committee, 10.30 a.m.
4 Thurs.	Otolaryngologists Group Committee, 2 p.m.
5 Fri.	Anaesthetists Group Committee, 11 a.m.
5 Fri.	Editorial Subcommittee of Joint Formulary Committee, 11 a.m.

6 Sat.	Radiologists Group Committee, 9.30 a.m.
8 Mon.	Science Committee, Special Meeting, 11.30 a.m.
9 Tues.	Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
10 Wed.	Private Practice Committee, 10.30 a.m.
10 Wed.	Industrial Nursing Subcommittee, Occupational Health Committee, 11.30 a.m.
10 Wed.	Cremation Subcommittee, Private Practice Committee, 2 p.m.
10 Wed.	Journal Committee, 2 p.m.
12 Fri.	Public Health Committee, 10 a.m.
12 Fri.	Ophthalmic Group Committee, 2 p.m.
17 Wed.	Council, 10 a.m.
18 Thurs.	G.M.S. Committee, 10.30 a.m.

Branch and Division Meetings to be Held

ABERYSWYTH DIVISION.—At White Lion Hotel, Machynlleth. Saturday, December 6, 8 p.m., dinner-meeting. Lecture by Mr. John Howkins: "Criminal Abortion." Wives of members, and guests, are invited to the dinner only.

ALDESHOT AND FARNHAM DIVISION.—At Physiotherapy Department, Farnham Hospital, Thursday, December 4, 8.15 p.m., clinical meeting.

BROMLEY DIVISION.—At Farnborough Hospital, Wednesday, December 3, 8.15 for 8.30 p.m., meeting. Sir Francis Walshe: "Medicine Now and 30 Years Ago." Guests are invited.

COVENTRY DIVISION.—At Hotel Leofric, Thursday, December 4, 7.15 for 7.45 p.m., Ladies' Night.

CROYDON DIVISION.—At Selsdon Park Hotel, Sanderstead. Thursday, December 4, 7.30 for 8 p.m., annual dinner and dance.

EAST HERTS DIVISION.—At County Hospital, Hertford, Thursday, December 4, 8.30 p.m., clinical meeting. Members of the Hertfordshire Branch and members of Hertford Medical Society are invited. A special general meeting will follow.

FURNESS DIVISION.—Saturday, December 6, visit to Calder Hall Power Station. Doctors should meet at 3 p.m., at Calder Operations main police gate.

GUILDFORD DIVISION.—At Board Room, Royal Surrey County Hospital, Thursday, December 4, 8.30 p.m., Mr. Charles Keogh: "Disorders of the Pharynx."

HARROW DIVISION.—At Rest Hotel (West Room), Kenton Road, Kenton, Tuesday, December 2, 8.30 p.m., meeting: 8.45 p.m., Dr. G. S. C. Sowry: "Diabetes Mellitus—Its History and Present Position in Hospital, Clinic, and Practice."

LEWISHAM DIVISION.—At Committee Rooms, Lewisham Hospital, Friday, December 5, 8.30 p.m., Mr. C. F. Critchley: "Treatment of Cancer."

MIDLAND BRANCH.—At Jubilee Room, Grand Hotel, Colmore Row, Birmingham, Saturday, December 6, 12.30 for 1 p.m., luncheon to newly qualified graduates.

MONMOUTHSHIRE DIVISION.—At St. Mellons' County Club. Thursday, December 4, 8 p.m., annual dinner and dance.

NORTHERN IRELAND BRANCH.—At Orpheus Ballroom, Belfast. Thursday, December 4, dinner, 8 for 8.30 p.m.; dancing, 8 p.m. to 1 a.m.

NORTH STAFFS DIVISION.—At Grand Hotel, Hanley, Tuesday, December 2, 8 p.m., supper meeting. Talk by Dr. M. J. Cochran: "Mountaineering" (illustrated by lantern slides). Ladies are invited.

REIGATE DIVISION.—At Out-patient Department, Redhill County Hospital, Tuesday, December 2, (1) 8.30 p.m., special meeting: (2) 8.40 p.m., lecture by Mr. D. V. Balls: "Veterinary Science Relationships in Human Welfare."

SUNDERLAND DIVISION.—At Royal Infirmary, Sunderland, Friday, December 5, 8 p.m., joint meeting with Sunderland Law Society. Address by Dr. G. A. Fitzpatrick: "Legislation and Mental Health."

SUTTON COLDFIELD DIVISION.—At Town Hall, Sutton Coldfield. Thursday, December 4, 9 p.m. to 1 a.m., annual dance.

SWANSEA DIVISION.—At Brangwyn Hall, Swansea. Friday, December 5, 8 p.m. to 1 a.m., annual ball (9 p.m., dinner).

WANDSWORTH DIVISION.—At the Grove Hospital (St. George's Teaching Group), Tooting Grove, Tooting, S.W. Tuesday, December 2, 8.30 p.m., Grove Hospital Clinical Evening in conjunction with South London Faculty of College of General Practitioners. Supper will follow clinical demonstrations and discussion.

WEST DENBIGH AND FLINT DIVISION.—At Old Deanery Hotel, St. Asaph, Saturday, December 6, 7.15 for 7.30 p.m., dinner: 8.45 p.m., B.M.A. Lecture by Dr. George Marsh: "Trans-Antarctica, 1958." (Illustrated with slides.) Members' wives and friends are invited.

WEST MIDDLESEX DIVISION.—At Oldfield Hotel, Greenford Road, Greenford. Thursday, December 4, 8 p.m., annual ball.

WEST NORFOLK DIVISION.—At Wenn's Hotel, Thursday, December 4, 8.30 p.m., address by Squadron Leader D. Sturrock. R.A.F.: "Problems of Radiation for Doctor and Patient."

BRITISH MEDICAL GUILD

Meeting to be Held

BIRMINGHAM.—At B.M.A. Regional Office, 36, Harborne Road, Edgbaston, Tuesday, December 2, 8.30 p.m.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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GENERAL MEDICAL COUNCIL

CENTENARY SESSION, 1958

A special Centenary Session of the General Medical Council was held on Thursday, November 27, with the President, Sir DAVID CAMPBELL, in the chair.

Appointments

Professor T. POMFRET KILNER was appointed a member of the Council, representing the University of Oxford, for the period of five years from August 1, 1958.

Notice was also given of the reappointment of the following members of Council: Dr. MACDONALD CRITCHLEY, representing the Society of Apothecaries of London, for the period of five years from August 20, 1958; Dr. A. TREVOR JONES, representing the University of Wales, for the period of three years from September 1, 1958; Mr. R. A. STONEY, representing the Royal College of Surgeons in Ireland, for the period of one year from October 14, 1958; and Dr. E. T. FREEMAN, representing the Royal College of Physicians of Ireland, for the period of one year from October 18, 1958.

B.M.A.'s Centenary Gift

Before delivering his Presidential Address, Sir DAVID CAMPBELL was asked by the President of the British Medical Association, Professor A. P. THOMSON, to accept, on behalf of the Association, a piece of inscribed silver.

Professor Thomson said it was a source of considerable satisfaction and real pride to members of the Association to be able to reflect that soon, after Charles Hastings at Worcester in the year 1832 founded the Provincial Association of Physicians and Surgeons, which later became the British Medical Association, a reform committee was established within the Association, and that committee took a considerable part in what might be called the "Battle of the Bills" and in the negotiations which were a prelude to the Act of 1858 establishing the General Medical Council.

"For that reason," concluded Professor Thomson, "the Council of the Association have asked me to invite your acceptance of this piece of silver which we have had inscribed, not only with the hope that there may be many happy returns of this occasion, your hundredth birthday, but also as a token of the appreciation of all members of the Association of the way in which this Council has discharged the difficult duties that were imposed upon it by Act of Parliament."

In response, Sir David Campbell said he felt sure that he was expressing the minds of every member of the Council

when he stated how highly the action of the British Medical Association was appreciated in helping the General Medical Council to celebrate their centenary by presenting such a beautiful gift.

"The British Medical Association has often been confused with the General Medical Council," continued the President, "and whether you regard that as complimentary or not I leave to you as President of the Association to decide! But I do know this, that since we have had direct representatives on the Council we have had the great good fortune to number among them many distinguished members of the Association who have given splendid service to the Council. I ask you as President of the Association to convey to your members our warmest thanks for this splendid gift."

Sir David Campbell then read a letter from the Wellcome Foundation Ltd. in which it was stated that the Librarian of the Wellcome Historical Medical Library, Dr. F. N. L. POYNTER, had prepared an album of portraits with brief outlines of the careers of all the Past Presidents of the General Medical Council. The Wellcome Library was part of the Wellcome Foundation Ltd., and the Chairman of the Board of the Foundation, Mr. M. W. Perrin, by whom the letter was signed, said it gave him great pleasure to present the album to the General Medical Council as a centenary tribute from the company and library.

The President expressed most cordial thanks to the Wellcome Foundation and to Dr. Poynter for the superb and historical album.

President's Address

At the 197th Session of the Council the President, Sir DAVID CAMPBELL, began by recording with deep regret the death of Professor G. M. Wishart, Lieutenant-General Sir Bennett Hance, and Professor J. A. Gunn, who had each helped the Council in various ways. He expressed the grateful acknowledgments of the Council to Sir Arthur Ellis, who had retired "after 15 years of devoted service" as the representative of the University of Oxford, and welcomed his successor, Professor T. P. Kilner, "the distinguished professor of plastic surgery in that University."

Their meeting in June, he continued, saw the completion of two important tasks on which the Council and the Disciplinary Committee had been engaged. The first was the adoption of a completely revised Notice for the Guidance of Medical Practitioners* in place of the Warning Notice which had formerly been issued. The second was the making of new Rules of Procedure to replace the original Rules made in 1951 before the

**Supplement*, June 14, p. 333.

Committee had acquired experience of the actual hearing of cases. The new Rules were in general shorter and simpler than the old. Their substance differed only in minor respects. The most important change was in the Rule relating to reception of evidence. This had been clarified and revised in accordance with the views expressed by the Judicial Committee of the Privy Council in the case of *Ong Bak Hin*. As required by the Medical Act, the new Rules were submitted to the Privy Council and were approved by them on October 30. They were then laid before Parliament, and came into operation on November 6. The proceedings of the Committee at their meeting earlier this week were accordingly conducted under the new Rules.

The Medical Act, 1956, by which all the earlier Medical Acts were consolidated, had itself been amended by the passage on August 1 of a further Act. This short but useful measure, said the President, made three welcome changes in the law. The most important of these simplified the procedure for obtaining provisional registration by providing that an applicant need no longer produce to the Council evidence that he had been selected for employment in a hospital. The effect of the change had been to expedite the process of provisional registration and to reduce administrative work on the part of hospitals, medical schools, and licensing bodies.

Another section of the Act related to the experience required for full registration in certain exceptional cases. These were of two kinds. The first comprised those few practitioners who qualified in the United Kingdom or in the Republic of Ireland before January 1, 1953, but did not then seek registration. The second, and more numerous, group comprised those practitioners who, before obtaining a British or Irish qualification conferring a right to provisional registration, had at an earlier stage in their career obtained in some other country a reputable medical qualification which (owing usually to the absence of reciprocity between that country and the United Kingdom) in itself conferred no right to registration in this country.

The section now enabled the Council for the first time to assess as a whole the professional experience of the applicant in both categories, and, if they thought fit, to register the applicants. These provisions, with which the Council fully concurred, had removed some anomalies which caused hardship. They had already registered twenty applicants under the new provisions.

The third change effected by the Act provided that the approval of the Treasury should no longer be required to the fees, expenses, and allowances payable to members of the Council. Since no expenditure of public funds was involved, the Treasury concluded that it was now unnecessary for their approval to be required.

The President then welcomed visitors from Commonwealth countries, and from one foreign country (Burma), with which we have reciprocity.

Greetings from Overseas Visitors

Dr. JOSEPH GALEA brought greetings from the Medical Board of Malta. The chief aim of the Medical Board of Malta was, he said, to follow the rules, regulations, and examples given by the General Medical Council.

On behalf of the Uganda Medical Board, Dr. D. G. SNELL said that the rising standards in the medical service of Uganda had been due in very large measure to the advice and encouragement given by members of the Council. It gave great pleasure to his African colleagues when formal recognition was given to the qualifications of the East African College of Makerere.

Professor G. A. ELLIOTT, in bringing greetings from the South African Medical and Dental Council, said that registration in South Africa followed very much the line of the General Medical Council.

One matter which had caused some difficulties in the past, but which it was hoped would be remedied in the near future was the "domiciliary clause." Under that clause a person holding a degree which was registrable with the South African Medical and Dental Council had to indicate, before he could be registered, that he intended to be domiciled for a period in South Africa. At the present

time the South African Council was trying to arrange for that term "domiciled" to be excluded, in order that there could be true reciprocity between the degrees registrable with the General Medical Council and those registrable with the South African Medical and Dental Council.

The Medical Council of Canada and the College of Physicians and Surgeons of British Columbia were represented by Dr. L. H. A. R. HUGGARD, who said that the Medical Council of Canada enjoyed its authority by virtue of an Act which was now over 50 years of age. "In a real sense we are young as a profession," he added, "for it was your Act which gave us professional status as compared with more senior professions, notably the Law and the Church."

Greetings were brought from the Medical Council of New Brunswick by Dr. H. STANLEY WRIGHT. The strength of an organization was, he said, the strength of its individual members, and it was gratifying to note the youthful vigour of the members comprising the General Medical Council.

Professor J. G. ALDOUS brought greetings from Dr. D. B. Stewart, the dean of the medical school of the University of Dalhousie, and warmest greetings were conveyed to the Council by Dr. W. G. D. RITCHIE on behalf of the College of Physicians and Surgeons of Manitoba.

THIRI PYANCHI Dr. U MIN SEIN, of the Medical Council of Burma, informed members of the General Medical Council that a small booklet was being published in his country on the history of medical education in Burma, and in one section for which he was responsible he had indicated that modern medical education in Burma was entirely due to the activities of a few British medical officers.

Dr. U Min Sein also stated that a new medical school had been opened at Mandalay, and he expressed the hope that eventually the General Medical Council might be gracious enough to accept their degrees.

Sir GORDON GORDON-TAYLOR offered the General Medical Council congratulations on behalf of the "great, keen, and enterprising" Royal Australasian College of Surgeons. Dr. K. C. YEO, who brought greetings on behalf of the Hong Kong Medical Council, said that the Hong Kong Medical Council registered only doctors with degrees or diplomas recognized by the General Medical Council.

The ethical standard of general practitioners in Hong Kong was on the whole good, but it was difficult to maintain a high ethical code when they were practising side by side with the native Chinese herbalists who were not subjected to disciplinary action or disallowed by law to practise. There were also refugee Chinese doctors who were unregistrable. The presence of over 300 refugee doctors from China presented a difficult problem for the Colony. Two lines of action had so far been taken. First, the employment of as many of those doctors as possible by the medical department of the Hong Kong Government, and, secondly, a special arrangement with the Society of Apothecaries for holding examinations in Hong Kong to enable the refugee doctors to obtain a registrable diploma recognized by the General Medical Council and Hong Kong Medical Council.

Finally, Sir WILFRED FISH, President of the General Dental Council, recalled that the Act which gave birth to the General Medical Council 100 years ago also contained within it the germ of the emergence of the General Dental Council as a legal entity. "We recognize that for 80 out of these last 100 years you have acted *in loco parentis* to us with such wisdom and understanding as could not have been bettered," he concluded.

The special centenary session then terminated.

Ordinary Business of the Council

Professor J. H. F. BROTHERSTON was elected to fill the vacancy created on the Disciplinary Committee, and Dr. H. S. MORLEY and Dr. G. W. IRELAND were elected to fill two vacancies on the Pharmacopoeia Committee.

Pharmacopoeia Committee

Dr. H. GUY DAIN, chairman of the Pharmacopoeia Committee, reported that the new edition of the *British*

Pharmacopoeia was selling well, but not so well as previous editions so far.

The new chairman of the British Pharmacopoeia Commission, Professor E. J. WAYNE, had reported that all the necessary arrangements for the work of preparing for the next *Pharmacopoeia* had been made, and an interim *Pharmacopoeia* would be published in 2½ years' time.

MEDICAL DISCIPLINARY COMMITTEE

The Medical Disciplinary Committee of the General Medical Council met on November 25 and 26 under the chairmanship of Sir DAVID CAMPBELL, President of the Council.

For Postponed Judgment

The Committee gave further consideration to a charge, on which judgment was postponed in November, 1957, against WILLIAM DAVID SMITH, registered as of 118, Marlborough Park Central, Belfast. Dr. Smith had been convicted on January 31, 1956, at Belfast Petty Sessions of being in charge of a motor-car when under the influence of drink or drugs. He had also been charged with having been convicted of a similar offence on May 15, 1957. The Committee was not satisfied that the evidence so far received would warrant it in discharging the case at the present time and postponed judgment for a further six months.

Further consideration was given to a charge, on which judgment was postponed in November, 1957, against ROBERT CREMONA, registered as of Westminster Bank Ltd., 1, Bath Road, Hounslow, Middlesex. Dr. Cremona was convicted in May, 1957, of obtaining with intent to defraud 30 tablets of "dicodide" and 100 tablets of "suavitil" by means of a forged National Health Service prescription and of contravening the Dangerous Drugs Act.

In view of the very satisfactory reports on Dr. Cremona's conduct, the PRESIDENT announced that the Registrar had not been directed to erase Dr. Cremona's name from the Register.

JOHN MILLER HUNTER MITCHELL, registered as of 96, Spottiswoode Street, Edinburgh, 9, made an interim appearance after having judgment postponed, in November, 1957, for two years on a charge that in July, 1957, he was convicted at the Portsmouth Magistrates' Court, after pleading guilty, of unlawfully and persistently importuning for immoral purposes, and that in August, 1957, he was convicted at the Sheriff Court of Lothians and Peebles at Edinburgh of committing acts of gross indecency with another male person.

Mr. P. BAYLIS, of Messrs. Hempsons, told the Committee that Dr. Mitchell had been receiving medical treatment. He had improved in health and there had been no repetition at all of the sort of conduct for which he was charged. But he had been unable to obtain professional work of any sort.

The PRESIDENT said he wished to make it perfectly clear that no ban whatever had been placed on Dr. Mitchell doing professional work. Mr. BAYLIS said that he appreciated that, but submitted that the only way in which Dr. Mitchell could be given an opportunity of resuming his professional work, although he was perfectly free as a matter of law to do so, would be for the Committee to conclude the case at the present stage, which he earnestly asked them to do.

The Committee directed that Dr. Mitchell's name should not be erased from the Register.

Further consideration was given to charges—on which judgment had been postponed in 1954 and on five occasions since—against WILLIAM FRANK CRUICKSHANK, registered as of Broxy Cottage, Westmuir, Brechin, Angus, first of having been convicted on March 13, 1954, of being drunk and disorderly; and, secondly, of neglecting his duties as a medical practitioner under the National Health Service and disregarding his personal responsibilities to the patients he had accepted on his list. In May, 1956, the Committee had been informed of a conviction in 1956 of driving a motor-car when under the influence of drink. In June, 1958, the

Committee had decided that it was once again not satisfied that the evidence concerning Dr. Cruickshank's habits and conduct warranted it in discharging the case and had given him a further opportunity to satisfy it.

Mr. G. J. K. WIDGERY, solicitor, read two testimonials to Dr. Cruickshank.

The Committee decided that Dr. Cruickshank was not guilty of infamous conduct in a professional respect in relation to the matters alleged against him in the second charge, and determined not to direct the Registrar to erase Dr. Cruickshank's name by reason of the conviction proved against him.

Erasures

Procuring Abortion

The Committee inquired into a charge against JOSEPH ADEWUNMI ADEMILUYI, registered as of 195, Harrow Road, London, W.2, that on December 9, 1957, at the Central Criminal Court, he was convicted on indictment of using an instrument with intent to procure an abortion, and was sentenced to four years' imprisonment, which was reduced, on appeal, to eighteen months' imprisonment. In June, 1958, the Committee considered a medical certificate stating that the practitioner was unfit to attend, and decided to adjourn the inquiry until the present session.

In presenting the facts, Mr. G. J. K. WIDGERY, solicitor, told the Committee that Dr. Ademiluyi was 44 years of age and at the time of the offence was in practice at 137, Seven Sisters Road, London, N.7. When he appeared at the Old Bailey he stated in his defence that the girl in question was in a state of melancholia, and that her health would have suffered if he had not terminated her pregnancy.

Mr. T. O. ELIAS, counsel, appearing for Dr. Ademiluyi, said that his client qualified in Nigeria in 1940, and between that time and 1948, when he came here to pursue his medical studies, he practised in Nigeria and held a number of responsible posts in gynaecology and obstetrics. Finally he was placed in charge of the general hospital in Ibadan. He acquired his British qualifications after that. The wide experience which he gained in Nigeria had enabled him to be of great service to Nigerians in this country. The Western Nigerian Commissioner and a number of important persons from Nigeria gave evidence testifying to the quality of Dr. Ademiluyi's practice and the high standards which he had always set himself. In the Court of Criminal Appeal, the Lord Chief Justice, in reducing the sentence from 4 years to 18 months' imprisonment, said he was quite sure that Dr. Ademiluyi was not a practising abortionist.

The PRESIDENT announced that, by reason of the conviction which had been proved against him, the Committee had directed the Registrar to erase from the Register the name of Joseph Adewunmi Ademiluyi. Dr. Ademiluyi has 28 days in which to appeal to the Privy Council.

Credit by Fraud

The Committee then inquired into a charge against WILLIAM RONALD PITT, registered as of 69, Hollyfield Road, Sutton Coldfield, Warwickshire, that on July 1, 1958, at the Assizes at Warwick, he was convicted (after pleading guilty) of obtaining £135 by false pretences between August 1 and September 10, 1957, and obtaining credit by fraud. He was sentenced to twelve months' imprisonment.

Mr. WIDGERY, solicitor, said that Dr. Pitt practised at Sutton Coldfield, and in July of last year he was adjudicated bankrupt with a deficiency of some £4,700. At his public examination it was said that drinking and gambling had been the two main causes of his failure. After his bankruptcy Dr. Pitt continued his practice, and in August last year he was consulted by a young man who had been suffering from a form of stomach disorder. After examining the patient, the doctor then told him that he had to take a film to the local hospital for developing. The patient thought that he had had an x-ray examination, since a number of electric wires had been placed round his body and the doctor had appeared to press various switches on and off during the examination. When the patient returned to the surgery later, Dr. Pitt told him that the examination

showed a serious liver disorder which, if not treated immediately, would cause the patient's death before he reached the age of 40.

Dr. Pitt recommended a course of injections of a certain drug which, he told the patient, was expensive and could not be obtained on the National Health Service: 135 injections would be needed at £1 per injection. The following week the patient paid Dr. Pitt £135 in cash. No receipt was given. After about seven injections the doctor said he was going on holiday for three weeks, and he gave the patient a number of tablets to take in lieu of the injections while he was away. During this time the patient consulted another doctor, who assured him that there was nothing wrong with his liver and that he was a fit and healthy man. Dr. Pitt eventually told the patient that he did not intend to charge him at first, but, as he put it, he was "stuck for money" and did not like to ask for a loan. Dr. Pitt handed the patient a cheque for £135, post-dated to November 14, 1957. The cheque was returned endorsed "Account closed, drawer adjudged bankrupt." Subsequently the doctor admitted to the police that the examination by wires and switches was a bogus one, that the injections he gave consisted merely of calcium, and that the tablets could be purchased by anyone at a chemist's shop. Dr. Pitt admitted that he got the money from his patient because he was absolutely desperate.

Another charge of obtaining credit by fraud arose out of an unpaid taxi fare of £5, said Mr. Widgery.

Dr. Pitt told the Committee that when he was adjudicated bankrupt the Warwickshire Executive Council took away all his patients. When the patient referred to came to see him, Dr. Pitt told him that at that time he was not a registered practitioner and the only patients he could have were private patients. He denied saying that the man might die. With the bankruptcy, drinking, and losing his house, Dr. Pitt said he got to the stage where he did not care what happened. In reply to the PRESIDENT, Dr. Pitt said he pleaded guilty to the offences at the Warwick Assizes on advice from his solicitor.

The Committee directed the Registrar to erase from the Register the name of William Ronald Pitt. Dr. Pitt has 28 days in which to appeal to the Privy Council.

Unlawful Killing

The Committee then proceeded to inquire into the case of LOUIS AIMÉE NEWTON, registered as of 40, Shoot-up Hill, London, N.W.2, who had been convicted on May 19, 1958, at the Central Criminal Court of unlawfully using an instrument with intent to procure a miscarriage, and unlawfully killing Jean Josephine Florence Cook, and was sentenced to imprisonment.

At the old Bailey trial the defence was that Miss Cook, an Australian nurse, had been sent to Dr. Newton by a psychiatrist, who said she was depressed because of her pregnancy, and accordingly Dr. Newton decided to terminate it. Mr. WIDGERY, solicitor, pointed out to the Committee that the prosecution had suggested that there was really no suicidal risk at all, and that it was just a case of a woman who was embarrassed by an unwanted pregnancy. Mr. Widgery reminded the Committee that Dr. Newton's name was erased from the Register in November, 1942, and remained off for five years. In 1940 Dr. Newton had engaged in what could be described as some sort of conspiracy to enable young men to evade military service, and his part in it was to issue false certificates.

Mr. N. J. L. BRODRICK, counsel appearing for Dr. Newton, stressed to the Committee that at the trial the jury had specifically acquitted Dr. Newton of any criminal negligence. Secondly, the view held by the Lord Chief Justice on appeal was that there was no justification whatever for considering Dr. Newton a professional abortionist.

The Committee directed the Registrar to erase Dr. Newton's name from the Register.

Dr. Newton has 28 days in which to appeal to the Privy Council.

Case from Hong Kong

YEOK KIN NG, registered as of 436, Nathan Road, Kowloon, Hong Kong, was struck off the Register after the Committee had heard a charge that he had committed adultery in his consulting-room on August 28, 1954, with a patient on an occasion when she had consulted him professionally; and that in respect of this conduct he had been subsequently convicted of rape in the Supreme Court of Hong Kong and sentenced to five years' imprisonment. Dr. Ng did not appear before the Committee and was not represented.

Mr. G. J. K. WIDGERY, solicitor, said that Dr. Ng had been consulted by a Chinese girl, Miss Tam Shun, aged 24, who had complained of stomach pains, and in the course of the examination the offence had occurred which had resulted in the charge of rape. The defence had been that the girl had consented to sexual intercourse. The Medical Board of Hong Kong, he said, had in November, 1955, held an inquiry into a charge similar to that before the Committee. In Dr. Ng's absence the charge had been found proved and his name had been removed from the Medical Register of Hong Kong.

The Committee found Dr. Ng to have been guilty of infamous conduct in a professional respect in relation to the facts alleged against him and directed that his name be erased from the Register. Dr. Ng had 28 days in which to appeal to the Privy Council.

Judgment Postponed

Influence of Drink

A charge against THOMAS PATRICK JOSEPH SINNOTT, registered as of the Surgery, Aberbargoed, Monmouthshire, that he had been convicted on three occasions of driving a motor-car when under the influence of drink was the subject of the next inquiry.

Mr. N. LEIGH TAYLOR, of Messrs. Hempsons, solicitors to the Medical Defence Union, acting on behalf of Dr. Sinnott, produced a number of testimonials showing that his client was in good standing with his colleagues locally. He told the Committee that the doctor was not a person who drank regularly, and pointed out that there was an interval of three years between the first two offences and the third.

The Committee decided that Dr. Sinnott's three convictions indicated habits which were not only discreditable to himself and to his profession but might well be a danger to his patients. To give him an opportunity of overcoming his tendency to drink to excess, the Committee decided to postpone judgment in the case for one year.

Mr. N. LEIGH TAYLOR, of Messrs. Hempsons, appearing for JOSE JAN LABNO, registered as of 84, Cloughton Road, Birkenhead, produced a petition containing the signatures of some 600 "grateful patients" of Dr. Labno, and read a number of testimonials from his colleagues.

Dr. Labno appeared before the Committee on a charge that on August 8, 1955, he was convicted at Birkenhead Magistrates' Court, after pleading guilty, of driving a motor-car when under the influence of drink, and was fined and disqualified from driving for twelve months, and that he was also convicted on July 24, 1958, at the Birkenhead Borough Quarter Sessions of a similar offence and was sentenced to three months' imprisonment and disqualified from driving for five years.

Mr. TAYLOR informed the Committee that his client was 44 years of age, married, and had four children. He was born in Poland and at the outbreak of war was a medical student at Cracow University. He was mobilized as an assistant surgeon, and was subsequently captured by the Russians, by whom he was "interrogated." He escaped and joined the Polish forces in France. When France fell, he went with the rest of the Polish force to Scotland. In 1941 Dr. Labno went to the Polish School of Medicine, Edinburgh University, and graduated in 1943. It took him two years, which, bearing in mind that he had to learn

English, showed aptitude and resolution, said Mr. Taylor. Dr. Labno went back into the Polish army, and served as the medical officer to a tank battalion in Normandy. He lost the sight of one eye and was seriously wounded. He had 65% disability pension and held decorations for bravery.

Dr. Labno found it difficult to find an opening in practice after the war, and finally, in 1950, in desperation he set up his plate in Birkenhead, and his present practice, consisting of 800 patients, had been built up entirely by himself with all due regard for the ethics of his profession. Although by no means addicted to alcohol, Dr. Labno had resolved that his drinking should not continue.

The Committee determined to postpone judgment for one year in order to give Dr. Labno an opportunity to overcome his admitted tendency to drink to excess.

The Committee also postponed judgment for one year in the case of GEORGE THOMAS ALEXANDER HASTINGS, registered as of 142, Robin Hood Lane, Hall Green, Birmingham, 28, to give him an opportunity of overcoming his admitted tendency to drink to excess, as evidenced by three convictions of being in charge of a motor-car when under the influence of drink.

Mr. P. BAYLIS, of Messrs. Hempsons, appearing for Dr. Hastings, said that Dr. Hastings had had medical treatment, and since September he had had no alcohol. Mr. Baylis read three reports from medical practitioners who had treated Dr. Hastings, and placed thirteen testimonials before the Committee, nine of which came from general practitioners in the Birmingham area.

The Committee gave further consideration to a charge—on which judgment had been postponed in 1956 and 1958—against JAMES WATSON RICHMOND, registered as of Culsamond Old Manse, Inch, Aberdeenshire, of having been convicted on January 23, 1956, of assault and of conducting himself in a disorderly manner and committing a breach of the peace.

Mr. G. J. K. WIDGERY, solicitor, reported that Dr. Richmond had written to say that he was receiving National Assistance and had no means to travel to London.

The Committee decided that they were still not satisfied that the evidence received warranted their discharging the case. They postponed judgment for a further six months.

Inquiry Postponed

Inquiry into a charge against THEODOTUS JOHN SUMNER, registered as of 172, New Road, Porthcawl, Glamorgan, that he was convicted on July 11, 1958, at the Assizes at Swansea, of manslaughter and was sentenced to four years' imprisonment, was postponed until a later session. Mr. WIDGERY, solicitor, said that he had received a medical certificate from the prison medical officer certifying that Dr. Sumner was an in-patient in the prison hospital and was unfit to attend the inquiry.

Names Restored

The Committee consented to two applications for restoration to the Register after disciplinary erasure.

The first was Mr. KENNETH LEOPOLD GEORGE NOBBS, G.M. He had been erased from the Register on July 1, 1957, on the grounds of his adultery with a patient.

Mr. N. L. TAYLOR, of Messrs. Hempsons, solicitors, on behalf of the applicant, read a number of testimonials. He produced a petition organized by Dr. Nobbs's former patients containing over 700 names, and stressed his fine war record, included in which was the award of the George Medal. He stated that Mr. Nobbs had since married the patient in the case and they had a 5-months-old baby.

The second application was that of EBENEZER FRANCIS THOMAS. Mr. G. J. K. WIDGERY, solicitor, said that Mr. Thomas's name had been erased from the Register in June, 1955, by reason of the applicant's adultery with a woman patient.

Mr. R. E. G. HOWE, counsel, stated that Mr. Thomas's liaison with the patient had come decisively to an end. He read a number of testimonials.

The Committee decided to restore both names to the Register.

DISTRIBUTION OF 4% INCREASE DISCUSSIONS WITH MINISTRY

A deputation from the General Medical Services Committee consisting of Dr. A. B. DAVIES, the chairman, and Drs. R. J. T. GARDINER, F. GRAY, C. F. R. KILLICK, and A. TALBOT ROGERS had a preliminary discussion with Ministry of Health representatives on December 3 on the way in which the further interim increase of 4% in the remuneration of general practitioners in the Health Service is to be distributed. The G.M.S. Committee, when it was informed at its meeting on November 20 (*Supplement*, November 29, p. 229) of the interim increase, and that the method of its distribution was to be discussed with the profession, decided that the new money should be applied, so far as possible, as a percentage addition to all those payments to general practitioners by executive councils which rank for superannuation. The Committee appointed the above-named members to form a working party to negotiate this proposal with the Ministry officials. Broadly speaking, the proposed distribution, if the Ministry accepts it, means that every general practitioner will receive approximately a 4% increase in his net remuneration—that is, excluding that part of his remuneration which represents payment for practice expenses—as from the end of the first quarter of 1959.

NOW WE ARE SEVEN

One of the smallest Branches of the B.M.A., the Seychelles Branch, held its first annual general meeting on September 26. Mr. T. M. J. OFFAY was re-elected president, and Dr. B. H. G. COLLIE was re-elected honorary secretary and treasurer. The Branch, which covers the Seychelles islands, currently has 11 members. Last year, since only three members were present at any one time on the main island of Mahe, it was not possible to hold any clinical meetings or conferences, but there are now seven members permanently on Mahe, and the Branch council is preparing a programme for the coming year.

St. Vincent, in the British West Indies, has a current membership of 10, and the St. Lucia Branch, also in the West Indies, has 11 members.

ANNUAL MEETING NEWSREEL

The B.M.A.'s 1958 Annual Meeting at Birmingham was recorded in a film made for the Association by Messrs. William R. Warner and Co. Ltd. The film looks in on the ceremonial occasions, scientific sessions, and exhibitions, the Representative Meeting, and social functions, formal and informal. The film, which is 16 mm., partly in colour and with sound commentary, runs for 15 minutes and is available for showing to Branches and Divisions, both home and overseas. Application should be made to the Film Library at B.M.A. House.

HOSPITALITY

A German doctor has a 15-year-old son who would like to make an exchange visit with a British doctor's son during next summer holidays. Two 13-year-old German boys would also like to make an exchange.

Would anyone interested please get in touch with Dr. R. A. Pallister, International Medical Advisory Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

HOSPITAL JUNIOR STAFFS GROUP COUNCIL

Mr. R. BREARLEY was elected Chairman of the Hospital Junior Staffs Group Council at its meeting in B.M.A. House on November 28. Dr. A. PATON was elected Deputy Chairman. The CHAIRMAN extended a welcome to the new members of the Council, and particularly to Dr. E. R. CULLINAN, who was attending for the first time representing the Central Consultants and Specialists Committee.

A proposal by the CHAIRMAN that the Chairman of the Junior Members' Forum, Dr. R. M. S. MATTHEWS, be invited to join the Group Council as a member was adopted.

Time-expired Senior Registrars

The CHAIRMAN reported that the Council of the Association approved on November 12 (*Supplement*, November 22, p. 217) a recommendation of the Central Consultants and Specialists Committee that in the event of the establishment of special designated posts for senior registrars in accordance with the Minister of Health's proposals, advertisements for such posts be not accepted for the *British Medical Journal*, and that, if necessary, the posts be made the subject of an "Important Notice."

In reply to Mr. W. J. ATKINSON, who asked what was the official reason for making this decision, the CHAIRMAN said it was feared that the proposed designated posts would prove to be dead-end appointments without prospects. For a long time it had been the policy of the Group Council that senior registrars' positions should be reviewed at the end of their fourth year, or during their four years' service. Those considered suitable for consultant posts ultimately should be confirmed in office, and thereafter they should have security of tenure and some sort of rising incremental salary scale. That seemed to be a simple way of solving the immediate difficulty facing many who were already in that position, but when the matter was discussed between the Joint Consultants Committee and the Ministry the latter would not agree to it. Dr. HAMISH WATSON expressed the view that it was necessary to put an "Important Notice" in the *Journal*. Those who were likely to be offered the new posts were the registrars who were faced with unemployment, and their fear would be that if they did not take a designated post someone else would be appointed and they would find themselves out of work. If they had the courage to refuse, very few regional hospital boards would go ahead and appoint someone else.

In conjunction with the question of time-expired senior registrars, the Group Council spent some time discussing two motions proposed by the North-west Metropolitan Region hospital junior staffs group, which were finally adopted in the following form:

(1) That the Hospital Junior Staffs Group Council approves the principle of salary increments for time-expired senior registrars, confirmed in office after the fourth year, with security of tenure, but without prejudice to their chance of future promotion, pending the working party's report.

(2) The Hospital Junior Staffs Group Council notes with anxiety that patients are frequently dealt with only by inexperienced medical staff as opposed to consultants, as a result of the present unsatisfactory staffing structure, and the deplorable effect of this on the Health Service.

Mr. D. E. BOLT, in presenting the first motion, said it was an expression of a feeling bordering on panic among the time-expired senior registrars. Their financial problems were becoming very acute, and they were inclined to feel that there had been a certain unreality about the discussions on a problem which affected them personally. Secondly, if a man was a time-expired senior registrar, and in a post which by any manoeuvre was made designated, he would be an archangel if he did anything other than accept it. The CHAIRMAN added that the choice was between accepting a little more money or unemployment. If such a situation arose, the man had little choice but to accept the post. On

the second motion, in reply to some doubt raised by Dr. WATSON, Mr. ATKINSON maintained that there was a loss of experienced senior registrars under the present system.

The CHAIRMAN pointed out that, when the evidence of the Royal Commission was being prepared, several bodies, including the Joint Consultants Committee, tried to obtain statistical information about emigration, but nobody was able to collect very convincing figures. Dr. D. J. O'SULLIVAN said that, from figures gathered in Birmingham, the loss was found to be less than had been thought. Mr. ATKINSON said that the really important point was that in some peripheral hospitals there was a shocking lack of experienced medical staff, and this was a deplorable state of affairs.

The Group Council agreed that both motions should be submitted to the Public Relations Committee and to the Working Party on Hospital Medical Staffing.

Evidence to Royal Commission

Dr. J. E. FORSTER submitted a resolution from the Liverpool Region hospital junior staffs group noting with concern that oral evidence had so far not been given to the Royal Commission on behalf of hospital junior staff. The CHAIRMAN assured Dr. Forster that the executive committee had not been sleeping on the matter. The Group Council could not demand to give oral evidence. It could only remind the Royal Commission that only one memorandum had been submitted on behalf of the Group Council and that it wished to give oral evidence.

The Council agreed that this should be done and that the Royal Commission should be informed that the Group Council would like to give oral evidence.

Constitution of Group Council

The Council considered a resolution from the South-western Region hospital junior staffs group seeking an increase in the number of regional group representatives on the Central Group Council from two to three, at least one of whom should be a house officer or senior house officer. At the same time consideration was given to a suggestion made at the Junior Members' Forum that the representation of senior house officers and house officers on the Hospital Junior Staffs Group Council was inadequate.

The CHAIRMAN said that, while he would welcome more house officer representatives, they should not be appointed members of the Group Council by some artificial means, but as the result of local demand.

The Council agreed to pass to next business. It was reported that a suggestion made at the Junior Members' Forum, that the pre-registration housemen's representation on the Medical Students and Newly Qualified Practitioners Subcommittee should be expanded, was being referred to that subcommittee. Another suggestion made at the Junior Members' Forum was that the relevant committee be asked to consider the possibility of the committees and subcommittees concerned with the welfare of young practitioners meeting on a Saturday.

The Group Council did not support the suggestion.

Standards of Accommodation

The following resolution from the South-western Region hospital junior staffs group was considered:

That the recommendations of Committee B of the Medical Whitley Council regarding standards of accommodation of hospital junior medical staff, as set out in the circular H.M. (58) 68, be made official terms of service.

Dr. E. E. CLAXTON, Assistant Secretary, pointed out that it would not be practicable to make the recommendations official terms of service. A request could be made that in the letter of appointment the hospital should undertake to carry out the provisions of circular H.M.(58) 68.

Removal Allowance

A resolution from the Western (Scotland) Region hospital junior staffs group was considered in which a request was

MEDICAL PRACTICES COMMITTEE

PROCEDURE IN SELECTING APPLICANTS

The Medical Practices Committee has made a statement on the procedure it follows when representatives of an executive council are present during the interviews of applicants for medical practice vacancies.

When the Committee interviews applicants for advertised medical practice vacancies it invites the executive council to send representatives to advise the Committee and to be present during the interviews. A meeting with the executive council's representatives is fixed for ten minutes before the time set for the interviews of candidates, and the representatives are invited to give the Committee the views of their council, and any information which will help to provide the members of the Committee with as complete a background as possible. The executive council's representatives are invited to question the applicants during interviews, and when these are ended a full discussion takes place in which every opportunity is afforded the representatives to state their views. The executive council's representatives then withdraw while the Committee selects the applicant for the vacancy. The council's representatives are invited to return to hear the decision.

The statement adds that executive councils who have sent representatives have frequently expressed satisfaction that their views had been fully taken into consideration by the Committee.

Scottish News

OPENING OF GLASGOW OFFICE

The new Glasgow office of the B.M.A., into which Dr. J. M. McCutcheon, Assistant Scottish Secretary, and his staff moved on May 22, was officially opened by the President of the Association, Professor A. P. THOMSON, on November 28. "An Association such as ours," said Professor Thomson, "is nothing without a home—a place where people may meet and talk." In his view the new headquarters in Glasgow would provide such a place and was admirable for its purpose. Dr. G. IRELAND, Chairman of the Scottish Council, presided at the opening ceremony and was supported by Mr. L. DOUGAL CALLANDER, Treasurer of the B.M.A., Dr. D. P. STEVENSON, Secretary, Dr. E. R. C. WALKER, Scottish Secretary, Dr. I. D. GRANT, Vice-President, Dr. W. M. KNOX, Immediate Past-chairman of the Scottish Council, and Dr. J. M. McCutcheon, Assistant Scottish Secretary. Many guests and members of Divisions served by the Glasgow office were present, and refreshments prepared by the staff were provided. Since the staff had taken a large share in furnishing and decorating the house, it was natural that they should show a pride in their new home, and the occasion had the air of a hospitable family gathering.

The office was described in a previous issue of the *Supplement* (May 17, p. 257). The address is 9, Lynedoch Crescent, Glasgow, C.3, and it is a nineteenth-century terrace house of ample proportions. Meals are not served, but there is a coffee-room where members and their wives may meet for light refreshment. It is hoped shortly to provide a small reference library.

Some Aspects of Medical Education

In the evening of November 28 the Glasgow Division met at the Glasgow office, with Dr. J. S. McLAREN QRD in the chair. Professor A. P. THOMSON gave a lecture on some aspects of medical education in which he reviewed the social and religious influences which governed the growth of British hospitals and medicine and the part they played in the education of doctors.

made that some form of disturbance allowance should be paid to hospital junior staff who were required to circulate within the region under their terms of contract, or who were required to move on promotion or change of appointment. Apparently removal allowances were given to some people in the Service. Dr. FORSTER suggested that it might prove an additional incentive to medical staff if they were able to obtain removal expenses.

The CHAIRMAN said that, according to the relevant circular, two points arose. One was that the scheme was not really for medical staff, but might, at the discretion of the Minister, be applied to them. Secondly, the discretion would be in their favour if the transfer were compulsory. Dr. WATSON suggested that the matter ought to be pursued.

Members of the Group Council agreed to collect specific instances, together with figures, so that a case could be prepared for submission to the Staff Side of Committee B.

Representation on Hospital Committees and Boards

A resolution from the South-western Region hospital junior staffs group asking the Group Council to press for direct representation of hospital junior medical staff on hospital management committees and boards of governors of teaching hospitals was not carried. Dr. CLAXTON pointed out that it would need an Amending Act in Parliament, and the chance of it succeeding would be small. On the other hand, when matters of concern to hospital junior staffs were discussed, hospital management committees could be asked to invite members of the junior staff to express their point of view.

Interviews for House Appointments

Mr. MYLES GIBSON described as "dangerous" a resolution submitted by the North-east Metropolitan Region hospital junior staffs group. The resolution called on the Group Council to disapprove of the practice, when making house appointments, of asking numerous candidates to attend for interview, even from great distances, in those instances where the future holder of the appointment had unofficially been already chosen.

The CHAIRMAN pointed out that regulations were also involved.

The motion was lost.

Publishing Speakers' Names

A resolution moved by Dr. B. McConkey, on behalf of the Welsh Region hospital junior staffs group, that the names of speakers in Group Council meetings should not be published in the reports in the *Supplement* to the *British Medical Journal* was lost. Dr. McConkey said that the resolution was not prompted by any particular incident, but at the last meeting of his regional group it was suggested that the publication of names could lead to unfortunate results.

Mr. D. E. BOLT said that in his view members should have the courage to support in public and in print what they said at meetings.

THE PRESIDENT-ELECT

As was reported in the *Supplement* of September 27 (p. 149). His Royal Highness the Prince Philip, Duke of Edinburgh, President-elect of the Association, regretted that he would be unable to attend the Joint Annual Meeting of the British and Canadian Medical Associations in Edinburgh next July, as he will be in Canada with the Queen all that month. It is now understood that, if it is humanly possible, His Royal Highness will attend a function of the British Medical Association in London in November or December next year. He also hopes that it will be possible for a meeting of the Canadian Medical Association to be included in the programme of next summer's visit to Canada.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Voice of Medicine

SIR,—For members of hospital staffs, the reports of the meetings of the Central Consultants and Specialists Committee seldom make cheerful reading; yet an examination of the report in the *Supplement* of July 12 (p. 32) suggests that a new nadir has been reached. According to the report, after years of consideration the Minister has made a unilateral decision to create special posts for time-expired senior registrars "in the teeth of our opposition." Doubtless it might be claimed that this would ease one aspect of the staffing position, but, as Professor G. I. Strachan correctly pointed out, "the fact that the designated posts seemed to be additional to the registrar establishment aggravated the position." Whether one agrees with the idea or not, one can scarcely be blamed for the suspicion that this may be the embryo of a sub-consultant grade, and, even though the present Minister may not regard it as such, his successor may not take the same view. In fact we see about to be put into action a plan to which our official policy is entirely opposed, and we are powerless to prevent it.

Eighteen months have passed since the commencement of the professional review of S.H.M.O.s undertaking consultant duties. 456 cases were selected for immediate review by the Management Side of Whitley Committee B, but when presented with this number they replied with a characteristic delaying action—the setting up of yet another committee. On lesser matters, such as delay in advertising vacant hospital posts, the fact that hospital authorities have no responsibility for the belongings of an employee, and the new suggestion that the Minister himself has no moral obligation to find other employment for displaced consultants and S.H.M.O.s, much dissatisfaction has been expressed by the Staff Side to the Management Side. In two major and three minor items, the Management Side have apparently been almost wholly uncooperative, and, by means of (1) unilateral action, (2) procrastination, (3) delay, (4) legal argument, and (5) assertion, have in fact defeated the Staff Side's expressed or implied intentions.

An important point emerges from the decision on the S.H.M.O. problem, for, according to Mr. Holmes Sellors, "it appeared that the Management Side had had no idea that the problem was so extensive." This is by far the most serious criticism which has ever been made of the Management Side, because, if it is true, then there must be doubt as to whether that side of the Committee is sufficiently informed on other matters of serious import to discuss them competently and responsibly. Decisions at present taken may affect the service for many decades. Is it possible that other problems which have been unsatisfactorily disposed of were in the same category and that the implications of their decisions escaped the Management Side? It is indeed a sobering thought. Do the Committee know, for example, that the late '70s and early '80s will see the retiral of a disproportionate number of consultants and that many of the men who may subsequently fill these posts have already begun their medical studies? In a few years many will hear of the senior registrar and S.H.M.O. problem and will take care that they do not personally aggravate the situation. Failure to arrive at a reasonable solution will almost inevitably affect the quality of subsequent hospital staffing in the latter part of the century. The eventual future staffing of the hospital services is in jeopardy, while there is no guarantee that sufficient heed will be paid to advice of hospital staffs, who are virtually powerless to have their carefully considered plans enacted, either through the central committees or medical advisory machinery, which has no statutory authority.

It appears possible that members of the Staff Side are becoming mesmerized by the consistently negative attitude of their opposite numbers. It may even be that through constant repetition the former regard the Management Side's attitude as correct. May I quote conclusion (2) from the Sixth Report of the Select Committee on Estimates, "Running Costs of Hospitals"? "The Committee have been impressed by the devotion and enthusiasm that prevails throughout the Service, but they have also been

depressed by the apparent lack of vigour with which some fundamental problems are being faced by the Ministry." Here we have a condemnation of this same negative attitude which the profession continually experiences.

Such problems as I have outlined will, of course, not be solved by the Royal Commission. That is not its purpose. They are essentially due to the fact that we are paid almost exclusively by the State. This appears to me to be the root of our lack of power to make our voices heard in the development of the Service and of our inability to influence decisions affecting our present and future conditions of service. Joint committees have become a burlesque and some advisory committees are not heeded by regional boards; not to mention the way in which the Ministry and Ministers ride roughshod over professional decisions and appeals. The present dispute in Scotland is typical, where the Secretary of State, after being associated with the invitation to the profession to seek a decision in the courts *re* the validity of Spens, refuses to take part in the special case proceedings. The only possible protest by the profession is the usual impotent document "without teeth," expressing disappointment and lack of confidence. How utterly pathetic.

The simple fact is that 10,000 consultants, specialists, and other hospital medical staff could very easily make their voices heard if they wished to do so, but there remains the suspicion, already voiced in a Council meeting (*Supplement*, April 12, p. 153), that there is "some faint-heartedness and dragging of feet somewhere." If this is not the case then there is work to be done. If, as in many other countries, doctors were paid in part by the patient, State, and private insurance or provident society, then we would be on the way to re-establishing our independence and our voice in Service counsels. It is time representatives of the hospital staffs, the large insurance companies, and the provident institutions, a rising power among us, met to thrash out the financial side of this. What annual fee is required per head of the population to cover the present sickness rate, and pay the hospital staffs, on an item-for-service or other agreed basis? The amount of our salaries is important, the method of payment even more so. Before we can have an adequate voice in the lay administration of the hospitals we must re-establish a degree of financial independence. That is the root of our problem.

Between 1952 and 1956 the British United Provident Association increased its registrations almost fourfold—to 252,000 by June 30 of that year. On the average each registration included one dependant in addition to the subscriber, so that the total is now presumably well over half a million. "The Australian Government has endorsed the principle of giving Commonwealth assistance to special insurance funds set up by registered health insurance organizations for people who cannot be insured at normal rates because of their age, or pre-existing or chronic illness" (*Supplement*, August 30, p. 130).

This surely removes one of the great objections to the introduction of a partly voluntary and privately organized health service—namely, its inability to pay its way. It is imperative that consultations be held as outlined so that we may have some idea of the workability of such alternative schemes in the near future. The Government are about to reorganize the pension side of the National Insurance scheme in order to save the taxpayer from extortionate demands in another decade. There is no guarantee that such a scheme might not be welcomed by a future government faced with ever-rising Health Service demands and costs. But the hour is late; it is time our constructive proposals for an alternative organization were formulated and circulated to the profession for discussion. Otherwise, as in the past, the decisions will be taken for us.—I am, etc.,

Worcester.

JOHN C. WOOD.

Fee for Service

SIR,—In the fullness of time there will be a Pilkington report on doctors' and dentists' remuneration, and in the negotiations that follow, whether amicable or more probably acrimonious, the question of distribution as well as total remuneration will undoubtedly be well to the fore. Recent leading articles and correspondence in *The Times*

Junior Specialist Staff

SIR,—A possible way of coping with the junior staff of hospitals would be to inaugurate the following system. After a period of training, with a specialist degree, and having regard to any particular work or papers published, a candidate from any post is allowed to apply to a committee set up by the Royal Colleges for grading as a specialist. Once the candidate is graded his pay automatically rises annually to that of a consultant, but not beyond, provided he stays in hospital employment. The starting salary could be fixed at registrar level and increased by annual increments of, say, £125 to £2,000 a year.

If a doctor who has received a general training wishes to specialize further, say, in chest surgery, and to do so becomes a houseman, he would continue, once having been graded, to receive the same salary and its increments. It would also provide the young trainee, who usually has a family to support, with a living wage while he awaits consultant status. It would also, of course, give him a security of tenure because of the innumerable jobs that exist in the State scheme, some of which are always vacant. It would also relieve the terrible anxiety of not knowing if employment could be found at the end of the senior registrar post. It would also allow the young men who wish to leave a teaching hospital to continue work as registrars. In this way the doctors awaiting consultant status could obtain employment anywhere at a living wage with a security which under the National Health Scheme is denied solely to this type of doctor.—I am, etc.,

Hitchin.

J. J. SHIPMAN.

Four Per Cent.

SIR,—I think the "holus bolus" acceptance of the 4% increase for the medical profession in the National Health Service is a bad decision. An 8% increase to those with salaries under £2,000 per year would have been of some benefit. The increase will mean very little to the consultants and it is one which I, personally, could easily have forgone for the less fortunate colleagues. All that will happen is that it will antagonize the public, and one gets very tired of refuting the charge "how grossly overpaid the consultants are." From the doctors' point of view, and particularly the consultants', the more I see of the administration side of the National Health Service, the less I like it.—I am, etc.,

Irvine.

RICHARD DE SOLDENHOFF.

Medical Appointments Overseas

SIR,—At the B.M.A. conference on medical appointments overseas (*Supplement*, November 22, p. 220), some of the solutions offered to the problem of filling vacancies seemed to me to bear a remarkable resemblance to some of those which have been tried for filling vacancies in regional hospitals at home. Professor J. H. F. Brotherston is reported (p. 223) as saying: "The moment it was known that a senior registrar who had one or two years' experience overseas stood a better chance of a consultant appointment, the authorities would be troubled with riches rather than poverty." For "overseas" substitute "in regional hospitals at home" and one of the most pressing problems of the N.H.S. is solved in a flash—except, of course, for the small matter of turning a pious hope into reality.—I am, etc.,

Shenfield, Essex.

I. M. LARKIN.

TRADE UNION MEMBERSHIP

The following local authorities are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham.

Non-County Borough Councils.—Crewe.

A. M. GOLDTHORPE.

Leigh on Sea, Essex.

Association Notices

ELECTION OF A MEMBER OF COUNCIL

The voting to fill the vacancy in the Council announced in the *Supplement* of October 18 (p. 176) has resulted in the election of Dr. R. P. Liston, Tunbridge Wells, Kent.

D. P. STEVENSON,
Secretary.

Diary of Central Meetings

DECEMBER

- 8 Mon. Science Committee, Special Meeting, 11.30 a.m.
9 Tues. Tuberculosis and Diseases of the Chest Group Committee, 2 p.m.
10 Wed. Private Practice Committee, 10.30 a.m.
10 Wed. Industrial Nursing Subcommittee, Occupational Health Committee, 11.30 a.m.
10 Wed. Cremation Subcommittee, Private Practice Committee, 2 p.m.
10 Wed. Journal Committee, 2 p.m.
12 Fri. Public Health Committee, 10 a.m.
12 Fri. Ophthalmic Group Committee, 2 p.m.
17 Wed. Council, 10 a.m.
18 Thurs. G.M.S. Committee, 10.30 a.m.

JANUARY

- 20 Tues. Committee on Drug Addiction, 3 p.m.

Branch and Division Meetings to be Held

BARNET DIVISION.—Friday, December 12, visit to Houses of Parliament. Assemble in Palace of Westminster at 6.30 p.m. Dinner in House of Commons.

BATH, BRISTOL, AND SOMERSET BRANCH.—At Wessex Room, Mermaid Hotel, Yeovil, Thursday, December 11, 8.30 p.m., annual general meeting. Presidential address by Mr. J. C. McMaster: "A Different Viewpoint."

BLACKPOOL AND FYLDE DIVISION.—At Savoy Hotel, North Shore, Blackpool, Wednesday, December 10, 7.15 p.m., dinner; 8.45 p.m., Mr. P. S. London: "Treatment of Wounds and Internal Fixation of Open Fractures." A special meeting will follow.

BORDER COUNTIES BRANCH.—At Station Hotel, Carlisle, Thursday, December 11, 4 p.m., annual general meeting.

BRIGHTON AND MID-SUSSEX DIVISION.—At Royal Alexandra Children's Hospital, Thursday, December 11, 8.30 p.m., clinicopathological conference.

BURTON-ON-TRENT DIVISION.—At Stanhope Arms, Bretby, Tuesday, December 9, 7.45 p.m., Dr. John Malins: "Diabetes Mellitus." Preceded by informal dinner.

CHELSEA AND FULHAM DIVISION.—At St. Stephen's Hospital, Fulham Road, S.W., Tuesday, December 9, 8.30 p.m., general meeting. Lecture by Dr. J. B. Harman: "New Drugs for Old." A discussion will follow. Members of the Kensington and Hammersmith Division are invited.

CHESTERFIELD DIVISION.—At Walton Sanatorium, Friday, December 12, 8.45 p.m., B.M.A. Lecture by Mr. A. Lawrence Abel: "Common Diseases of the Rectum and Anal Canal" (illustrated with lantern slides and films).

CITY DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, W.C., Tuesday, December 9, 8 for 8.30 p.m., debate: "The National Health Service has rendered the profession of medicine less attractive." Proposer, Mr. A. Lawrence Abel; seconder, Dr. J. L. McCallum. Opposer, Dr. H. Jules; seconder, Dr. D. Kerr. One of the most important meetings of the year. All B.M.A. members invited.

DEWSBURY DIVISION.—At Board Room, Dewsbury General Hospital, Friday, December 12, 8.30 p.m., lecture by Dr. Rex Tattersall: "Recent Advances in Therapeutics."

EAST KENT DIVISION.—At Ballroom, County Hotel, Canterbury, Thursday, December 11, 7.30 p.m., dinner; 8.45 p.m., address by Dr. D. P. Stevenson (Secretary, B.M.A.): "Looking Ahead." Members of Maidstone and Rochester, Chatham, and Gillingham Divisions are invited.

EAST YORKSHIRE BRANCH.—At Hull Medical Society, 68, Park Street, Hull, Wednesday, December 10, 8.30 p.m., B.M.A. lecture by Dr. Brian Russell: "Dermatology and the Inner Man."

ENFIELD AND POTTERS BAR DIVISION.—At St. Michael's Hospital, Chase Side Crescent, Enfield, Friday, December 12, 8.30 p.m., "Doctors' Hobbies." Speakers will include Dr. C. A. Birch: "Bees"; Drs. J. Dalziel, G. S. Moore, and R. B. L. Ridge: "Sailing" (illustrated).

FURNESS DIVISION.—At Old England Hotel, Windermere, Friday, December 12, 8 for 8.45 p.m., annual dinner and dance.

GLOUCESTERSHIRE BRANCH.—At Cheltenham General Hospital, Thursday, December 11, 5.30 p.m., clinical meeting, followed by supper at Moorend Park Hotel.

HASTINGS DIVISION.—(1) At Royal East Sussex Hospital, Tuesday, December 9, 8.15 p.m., Dr. D. F. Ross: "X-ray Investigation of Abdominal Pain." (2) At Queen's Hotel, Hastings, Friday, December 12, 7.30 for 8.15 p.m., annual dinner and dance.

HENDON DIVISION.—At Hendon Hall Hotel, Ashley Lane, N.W., Tuesday, December 9, 8.45 p.m., Dr. Macdonald Critchley: "The Language of Gesture."

KENSINGTON AND HAMMERSMITH DIVISION.—At West London Hospital, W., Tuesday, December 9, 8.30 p.m., film show: (1) "Case of Scurvy"; (2) "Gait"; (3) "Medical Hobbies"; (4) "Infections of the Hand."

KINGSTON-ON-THAMES DIVISION.—At Nurses' Home, Kingston Hospital, Tuesday, December 9, 8 for 8.30 p.m., address by Dr. Peter Bishop: "Modern Endocrine Therapy."

LAMBETH AND SOUTHWARK DIVISION.—At Antenatal Clinic, Lambeth Hospital, Wednesday, December 10, 8.15 for 8.30 p.m., Miss Lois E. Hurter: "Haemorrhage in Obstetrics." A discussion will follow.

LEIGH DIVISION.—At Courts Hotel, Church Street, Leigh, Tuesday, December 9, 8.30 p.m., Dr. V. T. Lees: "The Retina in Health and Disease" (illustrated by slides).

MID-HERTS DIVISION.—At Hill End Hospital, St. Albans, Friday, December 12, 8.30 p.m. to 1 a.m., annual dance.

MIDLAND BRANCH.—At Birmingham Medical Institute, 36, Harborne Road, Edgbaston, Birmingham, Thursday, December 11, 3 p.m., 97th annual meeting. Illustrated account by retiring President, Dr. F. E. Gould: "A Trip to Denmark."

NORTH-EAST ESSEX DIVISION.—At Red Lion Hotel, Colchester, Thursday, December 11, 7.45 p.m., dinner meeting in conjunction with Colchester Medical Society. Dr. Peter Bishop: "Endocrines and Cancer."

NUNEATON AND TAMWORTH DIVISION.—At Newdegate Arms Hotel, Tuesday, December 9, 7.30 p.m., supper; 8.30 p.m., B.M.A. lecture by Dr. Ian Grant: "Preview of South Africa." Wives of members are invited.

PRESTON DIVISION.—At Sharoe Green Hospital, Tuesday, December 9, 8.30 p.m., lecture by Mr. A. McDowall.

READING DIVISION.—At Library, Royal Berkshire Hospital, Reading, Thursday, December 11, 8.30 p.m., Dr. W. G. Tait: "The College of General Practitioners—Past, Present, and Future." Members' wives are invited.

ROCHDALE DIVISION.—At Nurses' Lecture Theatre, Birch Hill Hospital, Rochdale, Monday, December 8, 8.45 p.m., clinical meeting. Mr. H. A. Maslowski: "Selected Practical Neuro-surgical Problems."

ST. PANCRAS DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, London, W.C., Thursday, December 11, 8.30 p.m., Dr. Geoffrey Parker: "Some Experiences of a Surgeon in the French Resistance." Members of City and Hampstead Divisions are invited.

SCARBOROUGH DIVISION.—At Pavilion Hotel, Scarborough, Thursday, December 11, 7.45 for 8.15 p.m., annual dinner.

SOUTH BEDFORDSHIRE DIVISION.—At Warden Tavern, Wednesday, December 10, 8 p.m., annual general meeting.

SOUTH-EAST ESSEX DIVISION.—At Garon's Banqueting Hall, Southend-on-Sea, Friday, December 12, annual dinner and dance.

SOUTH ESSEX DIVISION.—At Harold Wood Hospital, Sunday, December 7, 10.30 a.m., clinical meeting.

SOUTH MIDDLESEX DIVISION.—At Mitre Hotel, Hampton Court, Monday, December 8, 8.30 p.m., annual general meeting.

STOCKPORT DIVISION.—At Alma Lodge Hotel, Buxton Road, Stockport, Tuesday, December 9, 8.30 p.m., Mr. Harold Bolton: "Common Orthopaedic Problems in Practice." Non-members, B.M.A., are invited.

STRATFORD DIVISION.—At Queen Mary's Hospital, Stratford, E., Tuesday, December 9, 8.45 p.m., talk by Miss Margaret McEwen: "The Treatment of Asthmatic Children at La Bourboule" (with film).

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tuesday, December 9, 8.30 p.m., clinical meeting, followed by special meeting.

WEST HERTS DIVISION.—At Board Room, Watford Peace Memorial Hospital, Rickmansworth Road, Thursday, December 11, 9 p.m., general meeting. B.M.A. Lecture by Dr. E. E. Pochin: "Clinical Value of Radioactive Isotopes."

WEST NORFOLK DIVISION.—At Grosvenor Hotel, Saturday, December 13, 7 to 8.30 p.m., wine and cheese party for members and guests.

WEST SUSSEX DIVISION.—At King's Head Hotel, Horsham, Thursday, December 11, 6.30 p.m., general meeting. Film demonstration by Mr. W. E. Tucker: "Athletic Injuries." 8 p.m., dinner; 9.30 p.m., special general meeting.

A meeting of S.H.M.O.s in the four Metropolitan Regions will be held at B.M.A. House, Tavistock Square, London, W.C., on Saturday, December 13, at 11 a.m. Dr. T. F. McCarthy will address the meeting.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 13 1958

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British Medical Association

ANNUAL REPRESENTATIVE MEETING—EDINBURGH,
JULY 16-20, 1959JOINT ANNUAL MEETING WITH CANADIAN MEDICAL ASSOCIATION
EDINBURGH, JULY 18-24, 1959JOINT ANNUAL SCIENTIFIC MEETING—EDINBURGH,
JULY 20-24, 1959

President-Elect: His Royal Highness the PRINCE PHILIP, DUKE OF EDINBURGH, K.G., K.T.

Local General Secretary: E. R. C. WALKER, B.A., M.D., F.R.C.P.Ed., B.M.A. Scottish House, 7, Drumsheugh Gardens, Edinburgh, 3

Assistant Local General Secretary: R. TRAQUAIR THIN, F.R.C.S.Ed., 31, Heriot Row, Edinburgh, 3.

Science Secretary: Professor G. I. SCOTT, F.R.C.S.Ed., 20, Heriot Row, Edinburgh, 3.

Assistant Science Secretaries: (Science Exhibition) Professor D. E. C. MEKIE, O.B.E., F.R.C.S.Ed., Royal College of Surgeons of Edinburgh, Nicolson Street, Edinburgh, 8; (Colour Television) J. INNES, M.D., F.R.C.P.Ed., Department of Medicine, University of Edinburgh.

Executive Officer: Miss B. E. MIDDLEMISS, B.M.A. House, Tavistock Square, London, W.C.1.

PROVISIONAL PROGRAMME

The 127th Annual Representative Meeting of the British Medical Association will be held in the McEwan Hall, Edinburgh University, on Thursday, July 16, 1959, and will continue on Friday, Saturday, and Monday, July 17, 18, and 20.

The Joint Annual Meeting with the Canadian Medical Association will be held from Saturday, July 18, to Friday, July 24, inclusive. The Joint Annual Scientific Meeting will be held from Monday, July 20, to Friday, July 24, inclusive.

On the evening of Wednesday, July 15, there will be a welcome party for Representatives and their Ladies, arranged by the City of Edinburgh Division, to be held in the Assembly Club, George Street.

A combined Dinner for Representatives and their Ladies will take place at the Assembly Club on Thursday, July 16, followed by a Dance.

The Association will welcome the members of the Canadian Medical Association and their Ladies at an evening Reception to be held in the Corn Market on Saturday, July 18.

The official Religious Service will be held in St. Giles' Cathedral on Sunday, July 19, at 3.30 p.m. There will also be a Roman Catholic Service.

On Sunday, July 19, there will be a choice of all-day tours to the country and also afternoon excursions and tours of the city. In the evening a concert will be given in the Usher Hall by the B.B.C. Scottish Orchestra.

An Adjourned Annual General Meeting will take place in the Usher Hall on the evening of Monday, July 20.

The Annual Dinner, at which the Canadian visitors will be the guests of the Association, will be held in the Waverley Market on Tuesday, July 21.

The Annual Breakfast of the Christian Medical Fellowship will be held in the North British Hotel on Tuesday, July 21, at 8.15 a.m.

There will be an Overseas Conference and Luncheon.

Special visits and excursions to places of interest are being arranged for ladies accompanying members of both Associations.

Arrangements for the usual Golf Competitions are being made.

The Reception Bureau for Registration of members of the B.M.A. will be open in the Entrance Hall of the Edinburgh College of Art, Lauriston Place, on Monday, July 20, at 9 a.m. Members of the Canadian Medical Association will register at the Assembly Club.

Two Plenary Scientific Sessions will be held in the McEwan Hall, Edinburgh University, one on Wednesday morning, July 22, and the other on Friday morning, July 24. A General Session will be held on the morning of Thursday, July 23.

In addition Round-table Conferences will be held at 9 a.m. on Wednesday, Thursday, and Friday, July 22, 23, and 24, in Adam House, Chambers Street.

Details of some of the Scientific Sections which will hold meetings are given below. Arrangements for some Sections are not yet complete, but these will be published later.

Both the Scientific Exhibition and the Annual Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications will be held in the Edinburgh College of Art, Lauriston Place, where there will also be an Exhibition of Art by Medical men. There will be a Historical Exhibition in the Museum of the Royal College of Surgeons of Edinburgh, Nicolson Street.

On each day of the Scientific Meeting there will be a programme of surgical operations and clinical demonstrations from the Edinburgh Royal Infirmary, shown by colour television on a closed circuit to two studios, one in the Infirmary itself and the other at the Edinburgh College of Art. Details of the programme will be published at a later date. The technical arrangements are sponsored by Smith Kline and French Laboratories Ltd.

HOTEL ACCOMMODATION

The following is a list of hotel accommodation (exclusive of that reserved for members of the C.M.A.) reserved for B.M.A. members attending the Meeting. Members wishing to book accommodation are asked to write direct to the hotel, stating that they are attending the B.M.A. Meeting. The prices given are the tariffs ruling at the moment and are subject to alteration without notice. The Association therefore cannot accept responsibility for any of the prices stated below, and applicants should verify the tariffs when making their reservations. Early application is recommended.

Hotel	Single	Twin	Double	Total Persons	1958 Tariff B/B
*Braid Hills Hotel, Edinburgh, 10 (Edinburgh 54748)	4	2	—	8	35-
*Caledonian Hotel, Edinburgh, 2 (Caledonian 2433)	5	30	—	65	45-
Clarendon House Hotel, 42, Craigmillar Park, Edinburgh, 9 (Edinburgh 45050)	—	2	2 1 (+S)	11	21-
Cockburn Hotel, Market Street, Edinburgh, 1 (Edinburgh 30092)	—	5	5	20	24 6
Ettrick Hotel, 13, Ettrick Road, Edinburgh, 10 (FOUntain-bridge 3955)	3	6	3	21	18 6
*George Hotel, George Street, Edinburgh, 2 (Caledonian 1251)	3	3	—	9	45-
Glentalla Private Hotel, 10, Suffolk Road, Edinburgh, 9 (Edinburgh 45315)	4	—	2 (3S) 2 (4S)	18	16 6
*Grosvenor Hotel, 9/25, Grosvenor Street, Edinburgh, 12 (Caledonian 5255)	—	2	3	10	25 6
*Palace Hotel, 1, Castle Street, Edinburgh, 2 (Caledonian 6365)	3	2	—	7	25-
Palmerston Private Hotel, 56, Palmerston Place, Edinburgh, 12 (Edinburgh 33755)	2	1	2 1 (D+S)	11	22 6
Pentland Hills Private Hotel, Camus Avenue, Edinburgh, 10 (FAIrmilehead 1001)	2	2	2	10	18 6
Pirie's Hotel, 6, Coates Crescent, Edinburgh, 12 (Edinburgh 62381)	3	2	2	11	18 6
*Queen Hotel, St. Colme Street, Edinburgh, 3 (Caledonian 1007)	2	5	—	12	32-
*Royal Hotel, 53, Princes Street, Edinburgh, 2 (Caledonian 7161)	2	2	2	10	27 6
*Royal British Hotel, 20, Princes Street, Edinburgh, 2 (WAVerley 4901)	—	—	2 2 (D+S)	10	35-
Royal Stuart Hotel, Abercromby Place, Edinburgh, 3 (WAVerley 1871)	13	5	3	29	21-
Belbourne Hotel, Hart Street, Edinburgh, 1 (WAVerley 2345)	11	3	4	25	23 6
Suttie's Hotel, 20, South Bridge, Edinburgh, 1 (WAVerley 1075)	6	3	7	26	20-
*Royal Abbey Hotel, 4, Carlton Terrace, Edinburgh, 7 (WAVerley 1189)	4	10	—	24	18 6

* Licensed.

Further reservations have also been made in smaller hotels, University hostels, and private houses where Edinburgh Festival visitors are accommodated. Should members prefer this type of accommodation they are asked to apply to the Local General Secretary, B.M.A. Scottish Office, 7, Drumsheugh Gardens, Edinburgh, 3, giving details of their requirements.

CARAVAN PARK

Arrangements are being made to reserve sites for members who wish to bring their caravans to Edinburgh during the Annual Representative Meeting and/or the Joint Annual Meeting. Applications for space should be made as soon as possible to the Local General Secretary, B.M.A. Scottish House, 7, Drumsheugh Gardens, Edinburgh, 3.

TICKETS

No tickets for functions and excursions can be issued in advance, with the exception of the Annual Dinner (details of which are given below).

All tickets for functions up to Sunday, July 19, will be available for Representatives at the A.R.M. Inquiry Office, McEwan Hall, Edinburgh University, on July 15, 16, 17, and 18, and for ladies at the Assembly Club, George Street.

Tickets for all other functions and excursions after Sunday, July 19, will be available from Monday, July 20, at the Assembly Club.

ANNUAL DINNER

The Annual Dinner will take place on Tuesday, July 22, in the Waverley Market, Princes Street. Arrangements for advance booking will be announced later.

GRADUATES' DINNERS

Details of arrangements for the various Graduates' Dinners will be announced later. It is anticipated, however, that the following Graduates will hold Dinners on Friday, July 17: Edinburgh, Glasgow, Welsh, and Irish.

ASSEMBLY CLUB

In view of the large numbers who will be attending the Joint Annual Meeting, it has been decided not to have a separate Ladies' Club but to have a general Club in the Music Hall and Assembly Rooms, George Street, during both the Annual Representative Meeting and the Joint Annual Meeting.

The Club will be open daily from 9.30 a.m. to 11.30 p.m. from Thursday, July 16. All ladies accompanying B.M.A. members and all the Canadian visitors will register at the Club.

Tickets for functions, tours, and excursions will be issued at the Club and there will be a general Information Bureau.

Fully licensed catering facilities will be available at the Club, which will provide morning coffee, lunch, afternoon tea, and dinner. It is hoped to make the Club the focal point of all the social activities connected with the Meetings, and it is proposed to have dancing there each evening during the Joint Meeting.

ENTERTAINMENT OF LADIES ACCOMPANYING MEMBERS

A very full programme is being arranged for the entertainment of the ladies accompanying both B.M.A. and C.M.A. members. Details of the actual programme will be published later. It is planned to have daily excursions to places of interest both in Edinburgh and in the surrounding countryside. It is also hoped to arrange visits to various industries and factories which should be of interest to the visitors. A mannequin show of Scottish tweeds and woollens is to be held in the Club on the morning of Tuesday, July 21.

ENTERTAINMENT OF YOUNG PEOPLE

As it is known that many young Canadians are accompanying their parents to the Joint Annual Meeting, special arrangements are being made for their entertainment.

FAREWELL TO MEMBERS OF THE C.M.A.

It is planned to hold a farewell party for the Canadian visitors in the Club on the evening of Friday, July 24.

MEDICAL ART EXHIBITION

From July 20 to 24 there will be an exhibition of paintings by Members of the British and Canadian Medical Associations. By courtesy of the governors and principal of the Edinburgh College of Art this exhibition will be held in the Andrew Grant Gallery of the College throughout the Meeting. Accepted work will be limited to approximately 150 exhibits, and should be either oil or water-colour paintings. A prize has been offered for the most outstanding exhibit. Members who wish to exhibit examples of their work on this occasion are invited, in the first instance, to communicate with Professor B. G. MAEGRAITH, School of Tropical Medicine, University of Liverpool, Pembroke Place, Liverpool, 3; Dr. A. M. RACKOW, Cleve Cottage, Hawk's Hill, Leatherhead, Surrey; or Professor D. E. C. MEKIE, Royal College of Surgeons, 18, Nicolson Street, Edinburgh, 8.

SCIENTIFIC EXHIBITION

The closing date for entries for the Scientific Exhibition, which will be held in Edinburgh from July 20 to 24, is December 31, 1958. Application forms for space at the exhibition are obtainable from the Secretary of the B.M.A.

TRAVEL RESERVATIONS

Accommodation on trains and on aircraft between London and Edinburgh during July is booked at a very early date. It is advisable to make reservations as soon as possible.

SCIENTIFIC MEETING, JULY 20-24

It should be noted that this programme is provisional and subject to alteration. All Scientific Meetings will be held in University premises.

PLENARY SESSIONS

Wednesday, July 22, 10.30 a.m. to 12.30 p.m. (McEwan Hall): "Trends in Modern Medicine"

Chairman: Dr. NORMAN H. GOSSE (Halifax, N.S.).

Speakers: Dr. ANDREW J. RHODES (Toronto), Dr. K. J. R. WIGHTMAN (Toronto), Dr. C. GORDON STEWART (Deep River, Ontario), Dr. R. O. JONES (Halifax, N.S.).

Friday, July 24, 10.30 a.m. to 12.30 p.m. (McEwan Hall): "Problems of an Ageing Population"

Chairman: Professor A. P. THOMSON (Birmingham).

Speakers: Professor P. L. KROHN (Birmingham), Dr. J. H. SHELDON (Wolverhampton), Professor M. ROTH (Newcastle upon Tyne), Dr. W. F. ANDERSON (Glasgow), Dr. T. N. RUDD (Southampton).

GENERAL SESSION

A General Session will be held in the McEwan Hall from 10.30 a.m. to 12.30 p.m. on Thursday, July 23.

Chairman: Dr. R. F. FARQUHARSON (Toronto).

Speakers: Dr. CHARLES BEST (Toronto), Diabetes Mellitus since Insulin; Dr. LLOYD G. STEVENSON (Montreal), The Contribution of Edinburgh University to Medical Education in Canada; Lord COHEN OF BIRKENHEAD, The Present Status of Collagen Disease; Professor JOHN BRUCE (Edinburgh), Some Reflections on the Treatment of Breast Cancer.

ROUND-TABLE CONFERENCES

Twelve Round-table Conferences will be held in Adam House from 9 to 10.15 a.m. on Wednesday, Thursday, and Friday, July 22, 23, and 24.

SCIENTIFIC SECTIONS

SECTION OF MEDICINE

Joint Presidents: Professor R. F. FARQUHARSON, M.B.E., M.D., F.R.C.P., F.A.C.P.(C.) (Toronto); Professor D. M. DUNLOP, M.D., F.R.C.P., F.R.C.P.Ed., F.R.S.Ed. (Edinburgh).

Joint Vice-Presidents: J. R. LEMIEUX, M.D. (Quebec); Professor Sir GEORGE PICKERING, M.D., F.R.C.P. (Oxford); Professor A. KEKWICK, M.A., F.R.C.P. (London).

Hon. Secretaries: W. I. CARD, M.D., F.R.C.P., F.R.C.P.Ed. (Edinburgh); J. BISHOP HARMAN, M.D., F.R.C.P., F.R.C.S. (London).

Monday, July 20.—2.30 p.m. Adam House, 1st Floor. Diet and Atherosclerosis.

Wednesday, July 22.—2.30 p.m. Adam House, 1st Floor. Health Education of the Patient.

Thursday, July 23.—2.30 p.m. Adam House, 1st Floor. Series of short papers.

Friday, July 24.—2.30 p.m. Adam House, 1st Floor. Abnormalities of Adrenal Cortical Secretion.

SECTION OF SURGERY

Joint Presidents: Professor JACQUES BRUNEAU, M.D. (Montreal); Professor C. F. W. ILLINGWORTH, C.B.E., M.D., Ch.M., F.R.C.S.Ed., F.R.F.P.S. (Glasgow).

Joint Vice-Presidents: Professor WALTER C. MACKENZIE, M.D., F.A.C.S., F.R.C.S.(C.) (Edmonton, Alberta); B. N. BROOKE, M.D., M.Ch., F.R.C.S. (Birmingham); A. GOUREVITCH, M.C., F.R.C.S. (Birmingham); T. McW. MILLAR, M.B., F.R.C.S.Ed. (Edinburgh); IAN ORR, O.B.E., M.D., Ch.M., F.R.C.S.Ed. (Preston).

Hon. Secretaries: C. W. A. FALCONER, M.B., F.R.C.S.Ed. (Edinburgh); SELWYN TAYLOR, B.M., M.Ch., F.R.C.S. (London).

Monday, July 20.—Morning, Adam House, 2nd Floor. Symposium: Diseases of the Small Intestine, Dr. W. I. CARD (Edinburgh), Professor DREW KAY (Sheffield). Short Papers: Treatment of Tumours of Salivary Glands, Dr. ERIC M. NANSON (Saskatoon); The Value of Electrogastrography, Dr. H. S. MORTON (Montreal).

Wednesday, July 22.—Morning, Adam House, 2nd Floor. Symposium: Prevention and Treatment of Hand Injuries, Professor J. H. F. BROTHERTON (Edinburgh), Mr. R. G. PULVERTAFT (Derby). Short Papers: The Facial Smash in Automobile Accidents, Dr. F. M. WOOLHOUSE (Montreal); A Method of Treatment of Compound Fractures of the Lower Limb, Dr. V. O. MADER (Halifax, N.S.).

Friday, July 24.—Morning, Adam House, 2nd Floor. Symposium: Reappraisal of Indications for Operation in Sigmoid Diverticulitis, Dr. WALTER C. MACKENZIE (Edmonton, Alberta), Mr. T. McW. MILLAR (Edinburgh). Short Papers: Problems Involved in Resection of the Liver, Mr. RODNEY SMITH (London), Dr. SHEILA SHERLOCK (London); Surgical Management of Diabetic Foot, Dr. ANGUS D. MCLACHLIN (London, Ontario).

SECTION OF OBSTETRICS AND GYNAECOLOGY

Joint Presidents: W. G. COSBIE, M.D., F.R.C.S.(C.), F.R.C.O.G. (Toronto); JOHN PEEL, F.R.C.S., F.R.C.O.G. (London).

Joint Vice-Presidents: Professor ELINOR F. E. BLACK, M.D., F.R.C.S.(C.), F.A.C.S., F.I.C.S., F.R.C.O.G. (Winnipeg); E. A. GERRARD, V.R.D., M.D., F.R.C.O.G. (Manchester); Professor R. J. KELLAR, M.B.E., F.R.C.P.Ed., F.R.C.S.Ed., F.R.C.O.G. (Edinburgh).

Hon. Secretaries: Professor A. S. DUNCAN, D.S., F.R.C.S.Ed., F.R.C.O.G. (Cardiff); J. STURROCK, F.R.C.S.Ed., F.R.C.O.G. (Edinburgh).

Monday, July 20.—2.30 p.m. Adam House, 3rd Floor. Anaesthesia for Obstetrical Manoeuvres and Operations. Professor IAN MORRIS (Manchester), Dr. W. D. WYLIE (London).

Tuesday, July 21.—2.30 p.m. Adam House, 2nd Floor. Management of the Third Stage of Labour and Its Complications, Mr. DONALD B. FRASER (London), Dr. J. K. FEENEY (Dublin), Dr. C. W. WALKER (Cambridge).

Thursday, July 23.—2.30 p.m. Adam House, 3rd Floor. Dysfunctional Uterine Bleeding, Dr. ARTHUR SUTHERLAND (Glasgow), Dr. T. N. MACGREGOR (Edinburgh). The Contribution Made by Maternal Mortality Study Committees, speaker to be announced later. The Problem of Prematurity, speakers to be announced later. The Early Diagnosis of Cancer in the Female Reproductive Organs, Dr. W. G. COSBIE (Toronto).

SECTION OF ANAESTHETICS

Joint Presidents: R. A. GORDON, M.D., F.R.C.P.(C.), F.F.A.R.C.S., D.A., F.A.C.A. (Toronto); JOHN GILLIES, C.V.O., M.C., F.R.C.P.Ed., F.R.C.S., F.F.A.R.C.S., D.A. (Edinburgh).

Joint Vice-Presidents: M. W. BOWERING, M.D. (Regina); H. R. YOUNGMAN, M.D., F.F.A.R.C.S., D.A. (Cambridge).

Hon. Secretaries: JAMES D. ROBERTSON, M.D., F.R.C.P.Ed., F.F.A.R.C.S., D.A. (Edinburgh); W. N. ROLLASON, M.B., F.F.A.R.C.S., D.A. (Hull).

Tuesday and Wednesday, July 21 and 22.—2.30 p.m. King's Buildings, Chemistry Lecture Room. Observations on the Combined Use of Hypotension and Hypothermia in the Dog, Dr. S. L. VANDERWATER (Toronto). The Physiology of the Cardiac Sphincter—Anaesthetic Implications, Dr. J. G. ROBSON (Montreal). Epidural Anaesthesia for Lumbar Spine Fusion and Laminectomy, Dr. DONALD MATHESON (Vancouver). Paper by Dr. ALAN B. NOBLE (Montreal). New Methods of the Analysis of Respired Gases, Dr. R. WOOLMER (London). Spreading it Thinner, Professor E. A. PASK (Newcastle upon Tyne). Role of the Anaesthetist in the Conservative Care of Head Injuries, Dr. A. R. HUNTER (Manchester). Avoidance of Hypoxia in Anaesthesia for Ambulatory Dental and Casualty Type of Operations, Dr. ARTHUR TOM (Cheltenham). Investigations into Rhythmicity of Electrical Output of the Human Cortex During Very Light Anaesthesia, Dr. J. CLUTTON-BROCK (Bristol). Paper by Dr. G. S. W. ORGANE (London).

SECTION OF ANATOMY AND PHYSIOLOGY

Joint Presidents: Professor J. C. B. GRANT, M.D., F.R.C.S.Ed. (Toronto); Professor R. WALMSLEY, M.D., F.R.C.S., F.R.C.S.Ed. (St. Andrews).

Joint Vice-Presidents: Professor D. H. COPP, Ph.D., M.D. (Vancouver); Professor D. SLOME, Ph.D., M.B., Ch.B. (London).

Hon. Secretaries: G. R. HERVEY, M.B., Ch.B. (Sheffield); J. B. KING, M.D., F.R.C.P.Ed., F.F.R. (Edinburgh).

Tuesday, July 21.—2.30 p.m. University West Lecture Theatre. The Regulation of Blood Calcium, Professor HAROLD COPP (University of British Columbia). Paper by Professor J. W. A. DUCKWORTH (Toronto). Anatomy of the Newborn, Professor ROBERT WALMSLEY (St. Andrews). Details of further subjects will be published later.

SECTION OF CARDIOLOGY

Joint Presidents: H. N. SEGALL, M.D., F.A.C.P. (Montreal); A. RAE GILCHRIST, M.D., F.R.C.P., P.R.C.P.Ed. (Edinburgh).

Joint Vice-Presidents: WM. GREENWOOD, M.D., F.R.C.P.(C.) (Toronto); Professor D. M. DOUGLAS, M.B.E., Ch.M., M.S., F.R.C.S., F.R.C.S.Ed. (Dundee).

Hon. Secretaries: FRANCES V. GARDNER, M.B., F.R.C.P. (London); R. M. MARQUIS, M.B.E., M.B., F.R.C.P.Ed. (Edinburgh).

Tuesday, July 21.—2.30 p.m. Adam House, 3rd Floor. Symposium on Coronary Artery Disease. Chairman, Dr. IVAN BEDFORD (London). Differential Diagnosis of Angina Pectoris, Dr. A. RAE GILCHRIST (Edinburgh); Errors of Electrocardiographic Interpretation, Dr. HUGH STANSFIELD (Vancouver); Diet in Prevention and Treatment, Professor W. F. CONNELL (Ontario); Panel discussion. *Short com-*

munications: The Need for Surgical Closure of V.S.D. in Infancy, speaker to be announced later; Lung Changes (X-ray) in Heart Disease, Dr. PETER KERLEY (London). Discussion.

Wednesday, July 22.—2.30 p.m. Adam House, 3rd Floor. The Treatment of Hypertension, Chairman Dr. JACQUES GENEST (Montreal); Panel: Professor MAX ROSENHEIM (London), Professor Sir GEORGE PICKERING (Oxford), Professor E. PATON (London), Dr. J. A. LEWIS (London, Ontario). Presentation of Problem Cases, Chairman, Dr. A. RAE GILCHRIST (Edinburgh); Panel: Dr. R. W. D. TURNER (Edinburgh), Professor I. G. W. HILL (Dundee), Dr. PAUL WOOD (London), Dr. A. J. KERWIN (Toronto), Dr. H. N. SEGALL (Montreal), Dr. JACK MERRIMAN (Saskatoon).

SECTION OF CHEST DISEASES

Joint Presidents: Professor J. D. ADAMSON, M.D., M.R.C.P.Ed., F.R.C.P.(C.) (Winnipeg); Sir RUSSELL BROCK, M.S., F.R.C.S. (London).

Joint Vice-Presidents: FERNAND S. GREGOIRE, M.D., F.C.C.P., F.R.C.P.(C.) (Montreal); Professor PHILIP R. ALLISON, Ch.M., F.R.C.S., D.P.M. (Oxford); Professor JOHN CROFTON, M.D., F.R.C.P., M.R.C.P.Ed. (Edinburgh).

Hon. Secretaries: I. W. B. GRANT, M.B., F.R.C.P.Ed. (Edinburgh); MAXWELL TELLING, D.M., F.R.C.P. (Leeds).

Thursday, July 23.—2.30 p.m. King's Buildings Zoology Lecture Room. The Management of Chest Infections, introduction by Professor JOHN CROFTON (Edinburgh); The Treatment of Pneumonia, speaker to be announced later; The Management of Bronchitis, Dr. BRIAN TAYLOR (Birmingham); The Problem of Anoxia in Chest Infections, Dr. THOMAS SIMPSON (London); The Management of Empyema, Professor F. G. KERGIN (Toronto).

Friday, July 24.—2.30 p.m. King's Buildings, Zoology Lecture Room. Sarcoidosis, Dr. ADRIAN ANGLIN (Toronto). The Epidemiological Aspects of Lung Cancer, Dr. C. R. LOWE (Birmingham). The Present Position of the Surgical Treatment of Bronchiectasis, Mr. R. J. M. MCCORMACK (Edinburgh). Chronic Cough and Carcinoma of the Lung, Professor J. D. ADAMSON (Winnipeg).

SECTION OF CHILD HEALTH

President: Professor STANLEY G. GRAHAM, LL.D.(Hon.), M.D., F.R.C.P.Ed., F.R.F.P.S. (Glasgow).

Vice-Presidents: Professor R. W. B. ELLIS, O.B.E., M.A., M.D., F.R.C.P. (Edinburgh); Professor J. HAY, M.A., M.D., F.R.C.P., M.R.C.S., D.C.H. (Liverpool); Professor J. L. HENDERSON, M.D., F.R.C.P.Ed. (Dundee).

Hon. Secretaries: N. R. BUTLER, M.D., F.R.C.P., D.C.H. (Salisbury); J. O. FORFAR, M.C., F.R.C.P.Ed., D.C.H. (Edinburgh).

Monday, July 20.—2.30 p.m. King's Buildings Zoology Lecture Room. Neonatal Hyperbilirubinaemia, Dr. A. E. CLAIREAUX (London), Dr. WILLIAM WALKER (Newcastle upon Tyne), Dr. J. P. BOUND (Blackpool). *Occasional Papers:* A Reappraisal of School Health Examinations, Professor HARRY MEDOVY (Winnipeg); The Prognosis of Asthma in Children, Dr. C. COLLINS WILLIAMS (Toronto).

Wednesday, July 22.—2.30 p.m. King's Buildings Zoology Lecture Room. Staphylococcal Infection in Newborn Infants, Dr. J. O. FORFAR (Edinburgh), Dr. F. J. W. MILLER (Newcastle upon Tyne), Dr. ISABELLA FORSHALL (Liverpool). The Diagnosis and Management of Speech Disorders in Childhood, Miss EDITH WHEINALL (London), Dr. T. T. S. INGRAM (Edinburgh), Dr. W. N. BOOG WATSON (Edinburgh).

Friday, July 24.—2.30 p.m. University West Lecture Theatre. Psychoses in Infancy and Childhood, Dr. W. A. HAWKE (Toronto), Dr. MILDRED POTT (London), Dr. F. H. STONE (Glasgow), Dr. KENNETH CAMERON (London). The Dawson Williams Lecture, Mr. DENIS BROWNE (London).

SECTION OF DERMATOLOGY

Joint Presidents: Professor H. A. DIXON, M.D., F.R.C.P.(C.) (Toronto); Professor G. H. PERCIVAL, Ph.D., M.D., F.R.C.P.Ed., D.P.H. (Edinburgh).

Joint Vice-Presidents: L. P. ÉREAUX, M.D., D.A.B.D. (Montreal); T. E. ANDERSON, M.D. (Aberdeen).

Hon. Secretaries: P. W. HANNAY, M.B., F.R.C.P.Ed. (Edinburgh); A. ROOK, M.D., M.R.C.P. (Cambridge).

Thursday, July 23.—2.30 p.m. University Biochemistry Lecture Room. Cutaneous Porphyria, Dr. A. LYALL (Aberdeen), Dr. GUNTER HOLTI (Birmingham), discussion to be opened by Dr. R. R. FORSEY (Montreal). The Local Use of Hydrocortisone Acetate in Dermatological Practice, Dr. G. CRAIG (Montreal). Cutaneous Manifestations of Reiter's Disease, Dr. R. C. SMITH (Toronto).

SECTION OF GENERAL PRACTICE

Joint Presidents: JACK MCKENTY, M.D. (Winnipeg); G. W. IRELAND, M.B., Ch.B. (Ford, Midlothian).

Joint Vice-Presidents: H. G. HALL, M.D. (Toronto); J. W. BROWN, T.D., M.B., B.Sc. (Sutton Coldfield); A. C. HOUGHTON, T.D., M.B. (Birmingham); J. H. HUNT, D.M., M.R.C.P. (London).

Hon. Secretaries: ANNIS GILLIE, M.B., B.S., M.R.C.P. (London); RICHARD SCOTT, M.D., D.P.H. (Edinburgh).

Thursday, July 23.—2.30 p.m. Adam House, 2nd Floor. The Ageing Population and the Community, opening remarks by Dr. JACK MCKENTY. The Early Diagnosis of Hypertension in General Practice, Dr. H. GIBSON HALL (Toronto). Geriatrics in the Setting of General Practice, speaker to be announced later. The Evaluation of the Physical, Psychological, Social, and Economic Factors in the Patient's Illness, Dr. C. J. HOUSTON (Yorkton, Saskatchewan); Dr. RICHARD SCOTT (Edinburgh), Dr. IAN GRANT (Glasgow).

SECTION OF HISTORY OF MEDICINE

Joint Presidents: Professor LLOYD G. STEVENSON, Ph.D., M.D. (Montreal); DOUGLAS GUTHRIE, M.D., F.R.C.S.Ed. (Edinburgh).

Joint Vice-Presidents: ARTHUR L. MURPHY, M.D., F.A.C.S., F.A.A.S.T. (Halifax); E. ASHWORTH UNDERWOOD, M.D., D.P.H. (London).

Hon. Secretary: H. P. TAIT, M.D., F.R.C.P.Ed., D.P.H. (Edinburgh).

Tuesday, July 21.—Hall of the Royal Medical Society. Programme to be announced later.

SECTION OF NEUROLOGY AND NEUROSURGERY

Joint Presidents: J. C. RICHARDSON, M.D., F.R.C.P., F.R.C.P.(C.) (Toronto); Professor N. M. DOTT, C.B.E., M.B., F.R.C.S.Ed., F.R.S.Ed. (Edinburgh).

Joint Vice-Presidents: CLAUDE BERTRAND, M.D., F.R.C.S.(C.) (Montreal); A. M. G. CAMPBELL, D.M., F.R.C.P. (Bristol).

Hon. Secretaries: F. J. GILLINGHAM, M.B.E., M.B., F.R.C.S. (Edinburgh); JOHN MARSHALL, M.D., M.R.C.P., D.P.M. (London).

Friday, July 24.—2.30 p.m. Adam House, 3rd Floor. The Results of Medical Treatment of Epilepsy, Dr. FRANCIS McNAUGHTON (Montreal), Dr. JOHN SIMPSON (Edinburgh), Dr. DENIS WILLIAMS (London). The Surgical Treatment of Parkinsonism, Mr. F. J. GILLINGHAM (Edinburgh), Dr. CLAUDE BERTRAND (Montreal), Dr. MACDONALD CRITCHLEY (London). Tissue Reaction (Allergy) in the Nervous System, Dr. HENRY MILLER (Newcastle upon Tyne), Dr. ALLAN BAILEY (Saskatoon), Dr. JOHN STANTON (Edinburgh). Modern Experience with Bacterial Meningitis, Dr. H. H. HYLAND (Toronto), Dr. THOMAS MORLEY (Toronto).

SECTION OF OCCUPATIONAL HEALTH

Joint Presidents: GRAHAM ROSS, M.D. (Montreal); Professor R. C. BROWNE, M.A., D.M., M.R.C.P. (Newcastle upon Tyne).

Joint Vice-Presidents: GORDON SINCLAIR, M.D. (Toronto); T. O. GARLAND, M.D., D.P.H. (London).

Hon. Secretaries: HUGH MILLER, M.D. (Edinburgh); JAMES A. SMILEY, O.B.E., M.D., D.I.H. (Belfast).

Thursday, July 23.—2.30 p.m. King's Buildings Chemistry Lecture Room. A Morbidity Study in an Active Working Population, Dr. G. A. SINCLAIR (Toronto). The Place of the General Practitioner or Family Doctor in Industrial Health, Lord TAYLOR (Harlow). Control of Occupational Dermatitis in an Aircraft Industry, Dr. GIBSON E. CRAIG (Montreal). The Role of the Industrial Medical Officer in the Education of Management and the Workers in Health and Safety, Dr. IAN RICHARDSON (Aberdeen). The Role of the Doctor in Vocational Guidance, Dr. M. E. M. HERFORD (Slough). A.T.S. Reactions and Their Effect upon Passive Immunity, Dr. L. J. MAHONEY (Toronto). The Allocation of Time in Planning the Duties of the Industrial Medical Officer between Clinical and Environmental Work, Dr. T. O. GARLAND (London). Readjustment in Industry of the Worker with Heart Disease, Dr. H. N. SEGALL (Montreal).

SECTION OF OPHTHALMOLOGY

Joint Presidents: M. R. MARSHALL, M.D., F.R.C.S.(C.), F.A.C.S., D.L.O. (Edmonton, Alberta); T. KEITH LYLE, C.B.E., M.D., M.Ch., M.R.C.P., F.R.C.S. (London).

Joint Vice-Presidents: J. V. V. NICHOLLS, M.D., D.A.B.O. (Montreal); Professor G. I. SCOTT, F.R.C.S.Ed., F.R.S.Ed. (Edinburgh).

Hon. Secretaries: C. R. S. JACKSON, F.R.C.S.Ed., D.O.M.S. (Edinburgh); K. C. WYBAR, M.D., Ch.M., F.R.C.S. (London).

Thursday, July 23.—2.30 p.m. Adam House Theatre. Modern Treatments of Detachments of the Retina, Mr. L. G. FISON (London). Differential Diagnosis of Vitreous Haemorrhage, with Special Reference to the Treatment of Eale's Disease, Dr. A. J. ELLIOT (Toronto). Displacements of the Orbital Floor and Traumatic Diplopia, Dr. ROSS TILLEY (Toronto), Mr. T. KEITH LYLE (London).

SECTION OF ORTHOPAEDICS

Joint Presidents: Professor F. P. DEWAR, M.D., F.R.C.S.Ed., F.R.C.S.(C.) (Toronto); Professor Sir WALTER MERCER, F.R.C.S., F.R.C.S.Ed., F.R.S.Ed. (Edinburgh).

Joint Vice-Presidents: J. G. PETRIE, M.D. (Montreal); N. CAPENER, F.R.C.S. (Exeter).

Hon. Secretaries: G. A. POLLOCK, M.S., F.R.C.S.Ed., F.A.C.S., D.P.H. (Edinburgh); R. GUY PULVERTAFT, F.R.C.S. (Derby).

Tuesday and Wednesday, July 21 and 22.—2.30 p.m. Adam House Theatre. Neurological and Vascular Factors in Upper Limb Dysfunction, Dr. W. S. WATSON (Edinburgh). Dr. C. C. BURT (Edinburgh). Tumours of the Hand, Mr. GRAHAM STACK (Brentwood). Treatment of Hip Conditions in Cerebral Palsy, Dr. DOUGLAS LAMB (Edinburgh). Carpal Tunnel Syndrome, Mr. KARL NISSEN (London). Papers on Abduction Treatment of Legg-Perthes Disease, The Gallie Ankle Fusion, Fractures of the Os Calcis, and Injuries to the Articular Disk at the Wrist, speakers to be announced later. *Panel Discussion:* Healing of Fractures.

SECTION OF OTO-RHINO-LARYNGOLOGY

Joint Presidents: Professor P. E. IRELAND, M.D., F.R.C.S.(C.) (Toronto); I. SIMSON HALL, M.B., F.R.C.P.Ed., F.R.C.S.Ed. (Edinburgh).

Joint Vice-Presidents: G. A. HENRY, M.D., F.A.C.S. (Toronto); E. G. COLLINS, M.B., F.R.C.S.Ed. (Aberdeen).

Hon. Secretaries: A. DAUNT BATEMAN, O.B.E., V.R.D., F.R.C.S., D.L.O. (Bath); G. D. McDOWALL, M.B., F.R.C.P.Ed. (Edinburgh).

Monday, July 20.—2.30 p.m. Adam House Theatre. Dysphagia, Dr. D. B. KELLY (Glasgow). Facial Pain, Mr. DAVID MIDDLETON (Edinburgh), Mr. KENNETH HARPISC (Manchester). Twenty-one Years' Experience of Surgery for Otosclerosis, Dr. JOSEPH A. SULLIVAN (Toronto). Methods of Shrinking the Inferior Turbinate, Dr. G. E. TREMBLE (Montreal). Carcinoma of the Larynx, Dr. FERNAND MONTEUIL (Montreal).

SECTION OF PATHOLOGY AND BACTERIOLOGY

Joint Presidents: WM. BOYD, M.D., F.R.C.P., F.R.C.S.(C.), D.Psy. (Willowdale); AGNES R. MACGREGOR, M.D., F.R.C.P.Ed. (Edinburgh).

Joint Vice-Presidents: Professor C. E. VAN ROOYEN, M.D., D.Sc., M.R.C.P., F.R.C.P.(C.) (Halifax, N.S.); Professor C. P. BEATTIE, M.B., Ch.B., D.P.H. (Sheffield).

Hon. Secretaries: J. H. BOWIE, M.B., F.R.C.P.Ed. (Edinburgh); W. H. H. MERIVALE, M.B., M.R.C.P. (London).

Tuesday, July 21.—University New Buildings, West Lecture Hall. Staphylococcal Infections in the Home and Hospital, Dr. HUGH STARKEY (Montreal), Dr. DONALD CRUIKSHANK (Edinburgh), Dr. J. SMITH GARDNER (Calgary, Alberta), Dr. K. S. MACLEAN (London), Professor JOHN W. MACGREGOR (Edmonton, Alberta), Professor ROBERT CRUIKSHANK (Edinburgh).

SECTION OF PLASTIC SURGERY

Joint Presidents: FULTON RISDON, M.D., D.D.S., F.R.C.S.(C.) (Toronto); A. B. WALLACE, M.Sc., F.R.C.S.Ed. (Edinburgh).

Joint Vice-Presidents: JOHN W. GERRIE, M.D., D.D.S., D.L.O., D.A.B.P.S. (Montreal); J. N. BARRON, F.R.C.S.Ed. (Salisbury).

Hon. Secretaries: A. D. R. BATCHELOR, F.R.C.S.Ed. (Edinburgh); L. M. ROUILLARD, F.R.C.S.Ed. (Norwich).

Friday, July 24.—2.30 p.m. Adam House Theatre. The Problems of Acute Skin Destruction, Mr. J. KIRK (Edinburgh), Dr. HOYLE CAMPBELL (Toronto), Dr. JOHN GERRIE (Montreal), Maxillofacial Injuries in Childhood, Dr. W. D. MACLENNAN (Edinburgh), Dr. HOYLE CAMPBELL (Toronto), Dr. JOHN GERRIE (Montreal), Oedema, Professor J. B. KINMONTH (London), Mr. J. S. TOUGH (Glasgow). A New Approach to the Operation for Dupuytren's Contracture, Dr. R. LANGSTON (Vancouver).

SECTION OF PREVENTIVE AND SOCIAL MEDICINE

Joint Presidents: Professor C. B. STEWART, M.D., F.A.P.H.A., D.P.H., Dr.P.H., M.P.H. (Halifax); Sir KENNETH COWAN, Q.H.P., M.D., F.R.C.P.Ed., D.P.H., F.R.S.Ed. (Edinburgh).

Joint Vice-Presidents: Professor JOHN WYLLIE, M.D., D.P.H. (Kingston, Ontario); Sir JAMES KILPATRICK, K.B.E., C.B., M.B., D.P.H. (London).

Hon. Secretaries: Professor J. H. F. BROTHERSTON, M.A., M.D., D.P.H., Dr.P.H., F.R.C.P.Ed., F.R.S.Ed. (Edinburgh); WILFRID G. HARDING, M.R.C.S., L.R.C.P., D.P.H. (London).

Monday, July 20.—2.30 p.m. University West Lecture Room. The Aftercare of the Hospital Patient, Professor T. FERGUSON (Glasgow), Professor A. MAIR (St. Andrews), Dr. I. RICHARDSON (Aberdeen), Professor J. H. F. BROTHERSTON (Edinburgh).

Wednesday, July 22.—2.30 p.m. University West Lecture Theatre. A Study of the Comparative Mortality Index as Applied to Cancer Mortality in Canada, Professor JOHN WYLLIE (Kingston, Ontario). Canadian Experience in the Prevention of Communicable Disease Through Immunization Programmes, Professor R. J. WILSON (Toronto). Some Observations on the Applied Epidemiology of Tuberculosis, Dr. JOHN NELSON (British Columbia). Observations on the Canadian Sickness Survey, speaker to be announced later.

SECTION OF PSYCHIATRY

Joint Presidents: Professor A. B. STOKES, C.B.E., M.D., F.R.C.P., F.R.C.P.(C.), D.C.H., D.P.M. (Toronto); T. P. REES, O.B.E., M.D., M.R.C.P., D.P.M. (London).

Joint Vice-Presidents: Professor R. O. JONES, M.D., F.A.P.A. (Halifax, N.S.); Professor G. R. HARGREAVES, O.B.E., M.R.C.S., L.R.C.P. (Leeds).

Hon. Secretaries: MARGARET M. METHVEN, M.B., D.P.M. (Edinburgh); D. STAFFORD-CLARK, M.D., M.R.C.P., D.P.M. (London).

Tuesday, July 21.—2.30 p.m. Adam House, 1st Floor. Psychological Crises in Family Life, Dr. H. V. DICKS (London), Dr. G. E. HOBBS (London, Ontario). Brief Methods of Psychotherapy, Dr. STAFFORD CLARK (London). Professor D. MCKERRACHER (Saskatoon). The Person and the Family in Medical Education, Professor G. R. HARGREAVES (Leeds), Professor A. B. STOKES (Toronto).

SECTION OF RADIOLOGY

Joint Presidents: Professor A. C. SINGLETON, M.D., F.F.R., F.A.C.R., F.R.C.P.(C.) (Toronto); Professor R. McWHIRTER, F.R.C.S.Ed., D.M.R.E., F.F.R., F.R.S.Ed. (Edinburgh).

Joint Vice-Presidents: HENRI LAPOINTE, M.D. (Quebec); W. H. BOND, F.R.C.S., D.M.R.T. (Birmingham); HUGH DAVIES, T.D., D.M., D.M.R.E., F.F.R. (London).

Hon. Secretaries: A. P. BOOTH, M.B., D.M.R.E. (Tottenham); K. A. MACKENZIE, M.B., D.M.R. (Edinburgh).

Monday, July 20.—2.30 p.m. Western General Hospital Theatre. Supervoltage Radiotherapy in the Treatment of Malignant Disease: (1) Cobalt-60 in the Treatment of Malignant Disease, speaker to be announced later. (2) The Linear Accelerator in the Treatment of Malignant Disease. Dr. RALSTON PATERSON (Manchester); (3) Cobalt-60 in the Treatment of Malignant Disease in a Selected Site, speaker to be announced later. (4) The Linear Accelerator in the Treatment of Malignant Disease in a Selected Site. Professor B. WINDEYER (London).

SECTION OF RHEUMATIC DISEASES

Joint Presidents: A. W. BAGNALL, M.D., F.R.C.P.(C.), M.R.C.P. (Vancouver); G. D. KERSLEY, T.D., M.D., F.R.C.P. (Bath).

Joint Vice-Presidents: WALLACE J. GRAHAM, M.D., F.R.C.P.(C.), F.R.C.P. (Toronto); J. J. R. DUTHIE, M.B., F.R.C.P.Ed. (Edinburgh).

Hon. Secretaries: J. H. H. GLYN, M.D., M.R.C.P., D.Phys.Med. (London); R. J. G. SINCLAIR, F.R.C.P.Ed. (Edinburgh).

Thursday, July 23.—2.30 p.m. University West Lecture Theatre. Symposium on the Polyarthritic Syndrome: chairman, Dr. W. S. C. COPEMAN (London). (1) Acute Polyarthritis, Professor E. G. L. BYWATERS (London); (2) Chronic Polyarthritis, Professor J. H. KELLGREN (Manchester); (3) Spondylitis, Dr. D. C. GRAHAM (Toronto); (4) Soft-tissue Rheumatism, Dr. SIMON DWORKIN (Montreal). *Occasional Papers:* chairman, Dr. JOHN WOODBURY (Halifax, N.S.). (1) Rehabilitation of the Arthritic Patient, Dr. JOHN S. CRAWFORD (Toronto); (2) The Problem of Painful Feet, Dr. F. P. DEWAR (Toronto); (3) Diagnostic Problems in a Rheumatism Clinic, Dr. R. J. G. SINCLAIR (Edinburgh); (4) Current Views on Gout and its Treatment, Dr. G. D. KERSLEY (Bath); (5) Laboratory Tests and Prognosis in Rheumatoid Arthritis, Dr. A. G. S. HILL (Stoke Mandeville).

SECTION OF TROPICAL MEDICINE

President: Sir ALEXANDER BIGGAM, K.B.E., C.B., M.D., F.R.C.P., F.R.C.P.Ed., D.T.M.&H. (Edinburgh).

Vice-Presidents: Professor P. C. C. GARNHAM, M.D., D.Sc., D.P.H. (Farnham Common, Bucks); Sir GEORGE McROBERT, C.I.E., M.D., F.R.C.P., D.T.M.&H. (London).

Hon. Secretaries: Professor W. E. KERSHAW, V.R.D., M.D., D.T.M.&H. (Liverpool); F. J. WRIGHT, M.D., F.R.C.P., D.T.M.&H. (Edinburgh).

Thursday, July 23.—2.30 p.m. Surgeons' Hall. Anaemia in the Tropics, with special reference to Abnormal Haemoglobins: Anaemia in the Tropics, Dr. R. H. GIRDWOOD (Edinburgh); The General Problem of Abnormal Haemoglobins, Professor A. W. WOODRUFF (London); The Nomenclature and Diagnosis of Abnormal Haemoglobins, Dr. H. LEHMANN (London); Clinical Aspects of Abnormal Haemoglobins, Dr. A. B. RAPER (Kampala, Uganda); Chronic Sick-cell Anaemia, Professor G. M. EDINGTON (Ibadan, Nigeria).

Friday, July 24.—2.30 p.m. Surgeons' Hall. The Importance of Tropical Diseases Occurring Outside the Tropics: Malaria, Professor B. G. MAEGRAITH (Liverpool); Amoebiasis, Sir GEORGE R. McROBERT (London); Filariasis, Professor W. E. KERSHAW (Liverpool); Intestinal Helminths, Dr. F. J. WRIGHT (Edinburgh).

SECTION OF UROLOGY

President: A. JACOBS, P.R.F.P.S. (Glasgow).

Vice-President: DAVID BAND, F.R.C.S.Ed. (Edinburgh).

Hon. Secretaries: J. D. FERGUSON, M.D., F.R.C.S. (London); W. SELBY TULLOCH, F.R.C.S.Ed. (Edinburgh).

Monday, July 20.—2.30 p.m. Western General Hospital. Calcium Metabolism in Renal Calculi, Dr. J. BALFOUR (Vancouver). The Classification of Testicular Tumours, Dr. R. C. B. PUGH (London). Percutaneous Needle Biopsy of the Kidney, Dr. G. N. RANKING (Toronto). Experiences with Supervoltage X-ray Therapy for the Treatment of Bladder Tumours, Mr. DAVID BAND (Edinburgh). Prognosis in Genito-urinary Tuberculosis, Dr. W. H. KERR (Toronto); Dr. G. GALE (Toronto).

ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE

EVIDENCE TO ROYAL COMMISSION CRITICIZED
A motion expressing complete dissatisfaction with the evidence relating to assistantships and entry into practice given by the British Medical Association to the Royal Commission was carried by the Assistants and Young Practitioners Subcommittee of the General Medical Services Committee at its meeting on November 28. Dr. F. G. TOMLINS was in the chair.

In the course of the debate, which arose out of a discussion on the Association's preliminary memorandum of evidence (*Supplement*, November 23, 1957, p. 157) and of the fourth supplementary memorandum of evidence (*Supplement*, November 15, p. 201), the CHAIRMAN explained that, although the subcommittee had not been consulted about the preparation of either document, he, as its chairman, had been invited by the Royal Commission Evidence Subcommittee of the G.M.S. Committee to attend its July meeting, but had, unfortunately, been unable to do so.

Dr. R. E. HANCOCK said he did not regard the preliminary memorandum as evidence but as a "statement" amounting to a complete defence of principals in general practice. Dr. J. L. WILLIAMS described the fourth memorandum as a defence of the evidence given at the oral hearing (*Supplement*, February 1, p. 39), particularly of that given on assistants' salaries; as such, it was very inadequate.

Dr. W. HUGHES thought that the oral evidence failed to establish that Spens was being implemented in respect of assistants. The figure of £1,245 gross, which the fourth memorandum quoted as the average yearly salary offered to assistants, would be consistent with the Spens recommendations; but he understood that, in the Sheffield area at any rate, the common figure lay between £1,050 and £1,100. Dr. E. F. D. GAWNE asked that a short questionnaire should be sent out to those on the subcommittee's electoral roll seeking more facts from assistants about their salaries and hours and conditions of work. Dr. D. M. CRUIKSHANK said that the figures quoted in the evidence seemed to be ludicrously high.

Dr. F. GRAY said that the figure of £1,245 stated in the memorandum related to the London area and did not pretend to do otherwise. He had explained to the Evidence Committee how he had arrived at the figure and it had accepted it as accurate.

After further discussion the resolution referred to was passed. It was decided to appoint a special subcommittee, consisting of Drs. Tomlins, R. T. Jones, and Hancock, to produce a memorandum of additional information before the next meeting.

Procedure for Appeal

The CHAIRMAN announced that the suggested procedure for appeal by the subcommittee direct to the Council, in certain circumstances, had been approved by the latter body, following the recommendation of the Organization Committee, to whom the subcommittee's request for the grant of this right had been referred. He said it was a right which ought to be used with considerable discretion. It would not do any good if invoked frivolously; on the other hand, it could be a most valuable thing when employed in the right circumstances.

Calculation of Central Pool

The subcommittee considered that there was no objection to general disclosure of the information contained in a memorandum prepared by Dr. Davies for the G.M.S. Committee on the method of calculation of the Central Pool. It was felt, however, that if it was to be communicated to every general practitioner on the list it ought to be in a more popular form and be sent to assistants as well as to principals. To save the expense of sending out the original document to everyone, it was urged that it should be available at Headquarters for any doctor who was genuinely interested in it.

Elections to Subcommittee

The subcommittee then discussed a letter received from Dr. D. B. HAWKINS (Romford) suggesting that more information about candidates for election to the subcommittee should be given on the voting papers.

The CHAIRMAN said it looked as though Dr. HAWKINS wanted a sort of electoral address sent out. The question of expense then arose. Dr. GRAY explained that in elections to the Council of the Association a description of qualifications limited to 20 words was sent out free. Dr. GAWNE thought that the voting papers should state when the candidate qualified, from what hospital, how many years he had been a trainee or assistant in general practice, and how many years' experience he had.

The CHAIRMAN suggested that, for the time being, the principle of 20 words should be accepted but that the subcommittee should recommend that a note should be incorporated in the preliminary notice to candidates, which was sent to the *Journal*, explaining the nature of the procedure required; that the office should then be asked for information on the amount it would cost the candidate to send out an electoral address of, say, one foolscap sheet.

Entry into Practice

Following a suggestion by Dr. WILLIAMS that unestablished principals should be asked to collect some information on entry into general practice, the CHAIRMAN suggested that members might send in their ideas for a suitable proforma which unestablished principals could be asked to complete.

Dr. GRAY, however, pointed out the danger of duplicating some of the information on the subject which the Royal Commission was collecting. He suggested that the Association be asked to request the Royal Commission to make the information it received known in advance so that the Association's representatives could consider it before giving further evidence.

The subcommittee agreed to inquire into the feasibility of Dr. GRAY's suggestion and to consider further action at the next meeting.

Membership of Subcommittee

A report was received that Dr. W. MORGAN EVANS had resigned from the G.M.S. Committee and that Dr. C. M. SCOTT had been appointed by that committee to serve on the subcommittee in Dr. Evans's place.

It was decided to recommend to the G.M.S. Committee that the holder of the office of chairman for the time being of the Junior Members' Forum should be invited to be an *ex officio* member of the subcommittee.

It was agreed that the gross figure of £1,650 should, as a temporary measure and without prejudice to its further consideration, be proposed as a reasonable income limit to apply to unestablished practitioners in determining the subcommittee's electorate.

The subcommittee appointed Dr. HUGHES as deputy to Dr. HANCOCK as representative of assistants on the G.M.S. Committee.

The CHAIRMAN announced that he had accepted an invitation to become a member of the Medical Services Review Committee (*Journal*, December 6, p. 1401). He felt that the invitation was a compliment to the subcommittee.

FEES AND MILEAGE

Emigrants to Australia

The B.M.A.'s Private Practice Committee has negotiated the following fees for examinations of assisted-passage emigrants to Australia with effect from January 1, 1959.

(1) For each person 16 years and over and any unaccompanied child: not exceeding £2 2s. sterling; (2) for each child examined at the same time as its parents: not exceeding 15s. sterling.

At present the maximum fees for such examinations are £1 1s. and 7s. 6d. respectively.

Mileage and National Service Medical Boards

Also as a result of representations by the Private Practice Committee the Ministry of Labour and National Service has agreed that chairmen and members of National Service medical boards may claim mileage allowance in respect of two return journeys made on the same day, provided that:

(1) the doctor attends two sessions of a medical board on the same day and there is an interval of more than two hours between the sessions; (2) during the interval the doctor returns home to attend to his practice; (3) the interval between the two sessions be defined as the period beginning when the last man is dealt with by the chairman at the first session until the scheduled commencement of the second session; and (4) the mileage allowance in respect of the second return journey be subject to the usual rate per mile and to a maximum of 16s.

This new arrangement came into operation on November 3.

COMPOSITION OF MILK

The Association has submitted evidence to a Committee on the Composition of Milk which has been set up by the Minister of Agriculture, Fisheries and Food with the following terms of reference:

To consider the composition of milk sold off farms in the United Kingdom from the standpoint both of human nutrition and animal husbandry, and to recommend any legislative or other changes that may be desirable.

The Food Subcommittee of the Association's Public Health Committee has decided to submit no observations upon draft regulations relating to skimmed milk with added fat which the Minister proposes to make jointly with the Minister of Health under the Food and Drugs Act, 1955. The Public Health Committee (Scotland) has considered a corresponding proposal from the Secretary of State for Scotland, and has decided to submit no observations.

Sealed Churns

The Food Subcommittee of the Public Health Committee has also considered a proposal from the Ministry of Agriculture, Fisheries and Food to withdraw the requirement that churns of raw milk, consigned under the designation "T", should be sealed, and has informed the Ministry that it cannot support the proposal.

The Lord Chancellor's Office has agreed that fees for part-time members of pensions appeals tribunals should be 10 guineas for full-days' sittings and 5 guineas for half a day.

Scottish News

GENERAL MEDICAL SERVICES COMMITTEE (SCOTLAND)

Previously known as the General Medical Services Subcommittee (Scotland) the General Medical Services Committee (Scotland), as it is now named, met at Edinburgh on November 27, with Dr. C. HARROWER in the chair. The CHAIRMAN gave a report of the views of the General Medical Services Committee on the Government's further interim increase of 4% in the basic remuneration of doctors and of the Committee's decision to appoint a working party to discuss with the Ministry of Health the distribution of the new money (*Supplement*, December 6, p. 239).

Change of Address

The Committee was told that, as a result of discussions with representatives of the Department of Health, executive councils were now acting on the information they received from completed forms E.C.1(c). It regarded this as satisfactory and as one step towards correcting inflation. It was agreed to send a circular to local medical committees asking them to encourage doctors to complete these forms as a method of keeping lists up to date.

Diagnostic Facilities in Glasgow

The Chairman reported that the representations which had been made to the Department on the inadequacy of the facilities directly available to general practitioners in Glasgow for laboratory and radiological examinations were the subject of discussion at a recent meeting with the Department. The Committee hoped that a satisfactory solution might be forthcoming in the not-too-distant future.

Air Ambulance Service

The Committee considered a draft circular from the Department about the Air Ambulance Service and with particular reference to the use of helicopters. It recorded its thanks to those who were concerned in the arrangements for the operation of the Air Ambulance Service and agreed that the proposals seemed to be very satisfactory.

Dental Services in Remote Areas

Representations from the Highlands and Islands Practitioners' Subcommittee about the difficulties in obtaining dental services in the remote parts of Scotland were considered. While appreciating the general shortage of dentists, the Committee felt that the special problem of patients in the Highlands and Islands areas in Scotland merited consideration, and it was agreed that Dr. C. J. Swanson and Dr. J. T. McCutcheon should meet representatives of the General Dental Services Committee (Scotland) to discuss the matter and report back.

Personal Medical Record Card

The Committee considered a letter from the Edinburgh Local Medical Committee pointing out the need for a patient's personal medical record card. It was reported that this matter was under consideration centrally, but the Committee felt it was advisable in the meantime to ask the Public Health Committee (Scotland) for its observations on the proposal.

Doctors' Houses in Highlands and Islands

It was reported that representatives of the Highlands and Islands Subcommittee had again discussed with the Department of Health the question of the maintenance of practitioners' houses in the Highlands and Islands and also the question of providing other accommodation in those cases where the house was particularly unsuitable. It was learned that the Department is considering the representations, and it is hoped that in the near future it will submit proposals for the Subcommittee's consideration.

PUBLIC HEALTH COMMITTEE (SCOTLAND)

Two meetings of the Public Health Committee (Scotland) have been held in recent weeks. At the first meeting Dr. J. RIDDELL, Midlothian, was reappointed Chairman for the session 1958-9, and Dr. J. KELMAN, Perth, was appointed Vice-chairman.

Dr. I. C. MONRO, Lanarkshire, and Dr. J. G. THOMSON, Edinburgh, were welcomed by the CHAIRMAN as new members of the Committee.

The Committee appointed Dr. Nora Wattie to represent them on the Maternity Services Committee of the Association's Scottish Council, Dr. B. R. NISBET to represent them on the G.M.S. Committee (Scotland), and Drs. Riddell, Nisbet, and Kelman to represent them on the National Health Service Review Committee (Scotland).

Medical Referees at Crematoria

The Committee had under consideration the obligations of Medical Officers of Health in Scotland who are asked to become medical referees at crematoria, and a special subcommittee was appointed to examine the position.

Model Dairy By-laws

It was reported that evidence on proposed new by-laws, which was prepared in conjunction with the Scottish Branch of the Society of Medical Officers of Health, had been submitted to the Model Dairy By-laws Committee.

The Committee also considered proposals from the Department of Health for regulations concerning skimmed milk with added fat, and had no observations to make on them.

Road Accidents

A small subcommittee was appointed to consider some aspects of the increasing number of road accidents and in particular the facilities available for dealing with them. The subcommittee consists of two medical officers of health (Dr. J. A. C. GUY and Dr. J. G. THOMSON), two medical superintendents (Dr. S. G. M. FRANCIS and Dr. G. H. SCULAR), and one general practitioner (Dr. C. J. SWANSON).

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Tax Relief on Defence Society's Subscriptions

SIR,—Prior to the coming into operation of the Finance Act, 1958, a doctor or dentist whose professional remuneration was assessable to income tax under Schedule E (remuneration by salary) was not normally allowed relief for his annual subscription to his defence society. The Commissioners of Inland Revenue have now approved the Medical Defence Union, the Medical Protection Society, and the Medical and Dental Defence Union of Scotland for the purposes of Section 16 of the Finance Act, 1958, and the whole of the annual subscription paid by a member who qualifies for relief under that Section will be allowable as a deduction from his emoluments assessable to income tax under Schedule E. Practitioners assessed under Schedule D already enjoy this concession, but a member of a medical defence society who holds a salaried appointment should apply to his tax office without delay for form P.358 on which to make a claim for adjustment of his "pay as you earn" coding.—We are, etc.,

ROBERT FORBES,
Secretary, Medical Defence Union.

ALISTAIR FRENCH,
Secretary, Medical Protection Society.

C. C. MILLAR,
Secretary, Medical and Dental Defence Union of Scotland.

London and Glasgow.

Merit Awards for General Practitioners

SIR,—We, the undersigned practitioners, have recently had the feeling from articles in the press that there is a strong move being made behind the scenes to introduce a merit award scheme to general practice. To introduce such a scheme would, in our opinion, be a retrograde step designed to disrupt what unity there is in the profession and would be no remedy for the inadequacy of the present method of payment. Could it be that the Minister, recognizing our dissatisfaction, has decided that the cheapest method of dealing with it would be to "buy off" those of us who are in a position to give a lead? What criterion would be accepted for the award? Length of service, size of list, or the possession of higher degrees is no indication of true merit in practice, and no award based on these would be a substitute for what is really required—payment for work done.

We are afraid that we may waken some morning to discover that a merit award system has been foisted upon us, and, since we believe that such a system would be contrary to the best interests of the profession and to the wishes of the majority, we appeal to all practitioners who agree with us to make their opinion known now by letter or at local B.M.A. meetings.—We are, etc.,

W. T. C. ADAMSON.

G. BAIN.

D. B. DONALDSON.

JANE B. LINDSAY.

Oban.

DAVID MACKIE.

W. M. REID.

CAROLINE ROBERTSON.

ERIC ROBERTSON.

Partnership in General Practice

SIR,—When Dr. H. COOPER (*Supplement*, November 29, p. 233) offers advice against an accepted method of entry into general practice, one cannot help feeling that he should suggest another practical method to replace it. As it stands, it is difficult to see how his advice of "don't" to a partnership can be taken seriously.

Of the three ways into general practice, two of them (executive council vacancies and putting up one's plate) can accommodate only a proportion of doctors seeking permanent posts. If, as Dr. Cooper says, the assistantship followed by a partnership is inadvisable, how else does one enter practice as a principal? Unless Dr. Cooper has a sensible alternative, I suspect that when the opportunity arises most doctors will disregard his advice, just as many people have disregarded Mr. Punch's concerning matrimony, without regret.—I am, etc.,

Clive, Shropshire.

DEREK D. GRIFFITHS.

Private General Practice

SIR,—Many general practitioners will deeply resent the implications of your annotation entitled "Private General Practice" (*Journal*, November 29, p. 1343). If "some old-fashioned socialists" dislike the idea of family doctoring being dependent on financial privilege they are in good company. The decision to provide a comprehensive general practice service for the whole community was taken by a coalition government of all parties. In 1954 the committee on general practice of the Central Health Services Council, under the chairmanship of Lord Cohen, endorsed this concept and "decided that it is right to regard prescribing as an integral part of general medical services, and therefore does not recommend that doctors be allowed to use National Health Service prescription forms for their private patients." The report was signed by such men as Guy Dain, E. A. Gregg, and W. N. Pickles, men with a lifetime of service in the interests of the family doctor, and therefore cannot be lightly disregarded.

During the first 10 years of the N.H.S. the vast majority of family doctors have sought to give the best available service. We are quite capable of meeting the reasonable demands of busy people among our patients. Most of us have evening surgeries for those who wish to consult us after working hours—a service which no other profession consistently provides. A growing number find no difficulty

in running efficient appointment systems for N.H.S. patients. We may not have Prime Ministers on our list, but who among us has not frequently gone out of his way to suit the convenience of those who serve or entertain the public in humbler capacities? Most of us have few or no private patients. No insurance schemes or the right to N.H.S. prescriptions will bring them to our surgeries. It is true that a significant increase in private practice "will lessen the heavy burden now borne by the State," but it will inevitably result in a reduction of the Central Pool and therefore reduce the remuneration of every general practitioner who has no private patients nor the possibility of getting them. This seems a heavy price to pay for the freedom of the minority to do more private practice.

Moreover, any general impression that we wish to divide family doctoring into first- and second-class compartments would be disastrous to the profession at the present time. Our case to the Royal Commission, the Government, and the public must be that we seek adequate pay and the time and tools to allow us to give a first-class service to all our patients irrespective of income. Many of us will feel that operating such a service, seeing our patients, and prescribing for them without financial considerations will give us a greater sense of freedom than selling our services to the individual patient or his insurance company.—I am, etc.,

London, N.W.5.

H. C. FAULKNER.

REFERENCE

¹ Central Health Services Council. Report of the Committee on General Practice Within the National Health Service, 1954. H.M.S.O., London.

Dispensing Capitation Fee

SIR.—The dispensing capitation fee has remained unaltered since 1952. Since that time the final settlement money has risen from a few thousand to nearly five million pounds. The dispensing doctor receives no added share of this staggering amount for his dispensing in spite of his grossly increased drug bills. Similarly the 5% interim award of last year brought no addition to the dispensing capitation fee.

The G.M.S. Committee is committed "to review the position in the light of the discussions which are taking place on the redistribution of the final settlement moneys" (para. 138, Report of the G.M.S. Committee to the Annual Conference of Representatives of Local Medical Committees, 1958). There is so far no sign that it has done this, though a further supplementary payment is due on December 31, 1958. I fear the worst. Is it too much to hope that, when the 4% award is distributed, the G.M.S. Committee will at last do the right thing, the honest thing, by dispensing doctors?—I am, etc.,

Airesford, Hants.

JOHN S. HAPPEL.

H.M. Forces

Surgeon Captains T. G. B. Crawford and J. G. Gent, R.N., have been appointed Honorary Physicians to the Queen, in succession to Surgeon Captain C. B. Nicholson, R.N., and Surgeon Rear-Admiral R. L. G. Proctor, C.B., respectively. Lieutenant-Colonel F. G. Wood-Smith, R.A.M.C., has been awarded the Army Emergency Reserve Decoration. Lieutenant K. G. Melish-Oxley, R.A.M.C., has been awarded the Territorial Efficiency Decoration.

ROYAL NAVY

Surgeon Rear Admiral R. L. G. Proctor, C.B., has retired. Surgeon Captain P. B. Jackson has retired. Surgeon Commander G. L. Hardman has retired. Surgeon Lieutenant W. B. Wright to be Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Commander A. F. M. Barron, V.R.D., has retired. Surgeon Lieutenants C. D. Peters, R. A. J. Baily, J. G. Gill, and P. M. Kinloch to be Surgeon Lieutenant-Commanders.

ARMY

Colonel J. H. Anderson, late R.A.M.C., having attained the age limit for retirement, has retired on retired pay (Reserve Liability). Colonel M. A. Rea, O.B.E., late R.A.M.C., has retired on retired pay (Reserve Liability).

Association Notices

CLAIRE WAND FUND

Travelling Scholarship

The Trustees of the Claire Wand Fund propose to award a Travelling Scholarship to enable a general practitioner to study methods of postgraduate education of general practitioners in Canada and the U.S.A.

The successful applicant must be prepared to spend six to eight weeks in the U.S.A. and Canada, and to attend the Second World Conference on Medical Education in Chicago from August 31 to September 4, 1959, held under the auspices of the World Medical Association, with the theme "Medicine, a Lifelong Study." The Scholarship, of a maximum value of £600, will be paid from the Fund as a contribution towards the expenses of the selected general practitioner, who will be expected to submit a report of his tour to the Trustees.

Applicants should submit full particulars of previous experience and of the research project they propose to the Secretary of the Fund at B.M.A. House, Tavistock Square, London, W.C.1, not later than January 31, 1959.

Diary of Central Meetings

DECEMBER

17 Wed. Council, 10 a.m.
18 Thurs. G.M.S. Committee, 10.30 a.m.

JANUARY

7 Wed. Occupational Health Committee, 10.30 a.m.
8 Thurs. Assistants and Young Practitioners Subcommittee (G.M.S. Committee), 2 p.m.
15 Thurs. G.M.S. Committee, 10.30 a.m.
20 Tues. Committee on Drug Addiction, 3 p.m.

Branch and Division Meetings to be Held

BIRMINGHAM DIVISION.—At Birmingham Medical Institute, 36, Harborne Road, Edgbaston, (1) Tuesday, December 16, 8.30 to 11 p.m., annual Christmas reception and sherry party for members, their ladies, and friends. (2) Thursday, December 18, 8.30 p.m., joint meeting with British Dental Association. Dr. J. L. Hardwick: "The Englishman's Diet Through the Ages."

BRIGHTON AND MID-SUSSEX DIVISION.—At Hotel Metropole, Brighton, Friday, December 19, 8.30 p.m. to 2 a.m., annual ball.

CAMBERWELL DIVISION.—Wednesday, December 17, visit to Albion Brewery, Whitechapel Road, London, E.1. Meet at main gate of Brewery, 12.30 p.m., luncheon at 1 p.m.

DARTFORD DIVISION.—At Railway Hotel, Dartford, Wednesday, December 17, 8.30 p.m., social meeting and clinical "quiz."

LANCASTER DIVISION.—At Grosvenor Hotel, Morecambe, Friday, December 19, 8 p.m. to 2 a.m., annual medical ball.

NORTH MIDDLESEX DIVISION.—At Committee Room, North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, December 16, 8.45 p.m., paper by Dr. Una C. Ledingham: "Thyrotoxicosis."

OLDHAM DIVISION.—At Oldham Hotel, Rhodes Bank, Oldham, Monday, December 15, 9 p.m., special meeting, followed by ordinary meeting.

RICHMOND DIVISION.—At Watney's Brewery (Reception Room), Mortlake Green, Friday, December 19, 9 p.m., films: "Atrial Septal Defect" (in colour) and "The Doctor Defendant."

STRATFORD DIVISION.—At Board Room, Queen Mary's Hospital, Stratford, Tuesday, December 16, 9 p.m., special meeting.

SWANSEA DIVISION.—At Langland Bay Hotel, Swansea, Thursday, December 18, dinner, and lecture by Professor A. P. Thomson (president, B.M.A.): "Some Aspects of Medical Education in England."

WAKEFIELD, PONTEFRAC, AND CASTLEFORD DIVISION.—At Arthur Guinness Son and Co., Ltd., York House, Drury Lane, Westgate, Wakefield, Friday, December 19, 8 p.m., Mr. E. M. Warren: "The Brewing of Stout."

WIGAN DIVISION.—At Lewis's Restaurant, Wallgate, Wigan, Thursday, December 18, 8.15 p.m., Mr. J. G. Gow: "Recent Advances in the Treatment of Renal Tuberculosis."

Dangerous Drugs Act: Withdrawal of Authority

The Home Office announces that Dr. Marcus Gershon Lucas (Shirley, Warwickshire) is no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations, 1953, apply.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY DECEMBER 20 1958

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CENTRAL CONSULTANTS AND
SPECIALISTS COMMITTEE

Medical Superintendents' Evidence to Royal Commission

It was a great mistake for the medical profession to "down-grade" medical administration, Dr. J. B. S. MORGAN told the Central Consultants and Specialists Committee at its meeting on December 4. Under discussion were the Executive Committee's comments on the evidence submitted to the Royal Commission by the Medical Superintendents' Society in which it had expressed the fear that, owing to the inadequacy of medical superintendents' salaries, doctors might accept such posts with a view to achieving consultant status. The Executive Committee's opinion had been that while such a possibility might exist in relation to mental hospitals, it did not apply to the hospital service generally. Speaking against this view, Dr. MORGAN said: "There is a dead set against medical administration. It is a pity. I have a lot of sympathy with the medical superintendents in this. A little levelling up would help the whole medical profession in the long run." The paragraph was deleted.

A proposal by the CHAIRMAN (Mr. H. H. Langston) that the document setting out the Executive Committee's views on the society's evidence should go forward to the Royal Commission *en bloc* was objected to by Dr. J. VALENTINE, whose motion that the items be considered separately was carried.

The Committee supported the Executive's rejection of the suggestion that the work of the part-time consultant was the poorer because he was exposed to an alleged conflict of loyalties between hospital and private practice, and that consultants working only in hospital might develop a "parochial" outlook. It was considered undesirable that the Committee should be drawn into any controversy on whether part- or whole-timers gave better value for their services.

The Executive's comment, agreeing that local advice on the selection of recipients for special distinction awards was desirable but opposing any suggestion that the awards should be made by local committees, was deleted as being inappropriate criticism of the Medical Superintendents' Society's argument, which was directed only to the seeking of advice from such bodies.

The Committee rejected the Society's proposal that merit awards should not be confined to clinicians, and agreed with its Executive's view that they should continue to be awarded "on the basis of outstanding clinical ability," in accordance with the relevant recommendation in the Spens Report.

Dr. F. STEEL criticized the Executive's suggestion, in a paragraph headed "Remuneration of Medical Superintendents," that the "exact nature of a medical superintendent's duties can be said to apply equally to the

chairman or other member of the medical staff committee charged with medical administration," and this was accordingly deleted.

After further discussion it was decided that the Executive's document, as amended, should be sent to the Council for approval with the following modified form of preamble suggested by Mr. J. M. MILLOY:

The Council has considered the evidence submitted to the Royal Commission by the Medical Superintendents' Society, and, while in general agreement with its recommendations, desires to offer its comments on certain statements.

Professor G. I. STRACHAN, urging support for this wording, described the medical superintendents as "a worthy body of men who carry large responsibilities which they often discharge very effectively."

Working Party on Hospital Medical Staffing

The CHAIRMAN hoped that regions would stress to their local committees the importance of filling up carefully and accurately the questionnaire which the Executive Committee was about to issue in connexion with the impending review of the medical staffing of hospitals. In reply to Dr. I. RANNIE's criticism that the working party had not yet seen any specialists apart from those in general medicine and surgery, the CHAIRMAN explained that its visits to hospitals had so far been on an experimental basis and that attention would doubtless be given to other specialties in due course. It was hoped that the questionnaire would be distributed before Christmas.

Resolutions of the Representative Body

The Committee accepted its Executive's recommendations on A.R.M. resolutions on remuneration of residents in smaller hospitals. It was felt that no useful purpose would be served by approaching the Ministry for an increase in remuneration over that paid to residents in major and teaching hospitals, as urged by the A.R.M. The Executive had noted the A.R.M.'s condemnation of restrictions on hospital expenditure, but offered no particular observations. The Executive Committee was asked to give further consideration to a resolution on the subject of schemes for withdrawal from the National Health Service after Professor P. C. P. CLOAKE had reported that the G.M.S. Committee had set up a subcommittee to make proposals on the subject in due course. After discussing the Executive's comments on the A.R.M. resolution deploring the difficulty experienced in obtaining locumtenens for principals in general practice and for the hospital services, the Committee adopted a proposal by Professor CLOAKE that the Joint Consultants Committee be asked to suggest to the Minister that regional boards should keep a register of available locums acceptable to the boards.

N.O.T.B.A. Clinics at Industrial Premises

The Committee also accepted its Executive's recommendations (1) that it would not be in the public interest for ophthalmic or other specialist services of a type customarily obtained through the National Health Service to be provided at industrial premises and that the proposal of the N.O.T.B. Association on this subject should not be supported; (2) that it should be suggested to the Occupational Health Committee that the possibility of using visual screening machines operated by a layman under the supervision of the industrial medical officer be explored.

Superannuation on Domiciliary Fees

After some criticism had been made of the existing arrangement whereby the income from domiciliary visits was included in the average income for pension purposes—particularly on the ground that if the number of visits undertaken in the last three years of service were less than in previous years the contributions paid earlier would be lost—it was decided that more information should be sought from regional committees on the subject generally and passed on to the Association's Compensation and Superannuation Committee.

Dr. STEEL said he did not agree with the calculations so far arrived at by the Compensation and Superannuation Committee, and thought that the whole matter needed looking into on an actuarial basis. He thought that the existing arrangement was perfectly satisfactory and certainly would benefit 95% of the whole-time consultants who proposed to do domiciliary visits during the last three years, but there should be some compensation for consultants who, for some reason, were unable to do so.

Filling of Retirement Vacancies

The Committee accepted its Executive's support for the A.R.M. resolution endorsing the principle of filling retirement vacancies in the consultant grade of the National Health Service some time before they occur, the Executive having added the qualification "where practicable and wise."

Regional Committee Conference

The CHAIRMAN said that the conference of chairmen and honorary secretaries of regional consultants committees, held on November 28, had proved a most useful and helpful meeting and would probably become an annual event. A report was to be circulated in due course.

Professor S. J. HARFALL agreed that it had been extremely valuable, enabling those attending to learn in detail of the difficulties of others.

Joint Consultants Committee

The CHAIRMAN, presenting his report on the work of the Joint Consultants Committees, explained first that information was being obtained from all parts of the country on the recent increased charges for hospital private beds, and said that information on any instances of particularly steep rises would be welcomed.

He proposed that the Council's resolution expressing opposition to the scheme for the statutory registration of professions supplementary to medicine should be sent to the Joint Committee for information, pointing out that the Council had adopted the wording "that no scheme would be acceptable which did not give the medical profession a greater influence in the training and ethical standards of supplementary professions." Dr. J. D. ALLAN GRAY, emphasizing the importance of the words in the report, said it had been agreed that the medical representatives should be chosen solely from names suggested by the appropriate medical organizations, said it was sometimes felt that other representatives might not have quite the same acute interest in the matter. The CHAIRMAN explained that that principle had been agreed by the Ministry.

Mr. E. N. WARDLE expressed apprehension about the Joint Consultants Committee going no further than "making strenuous efforts to persuade the Ministry." It ought surely to be abundantly clear to all that such schemes were unworkable. The CHAIRMAN said he did not think the Joint Committee had been left in any doubt at its last meeting about the views of members of the Orthopaedic, Pathologists, Radiologists, and other groups, which had been expressed very forcibly. They would be reinforced by the Council's resolution.

The remaining items of the report covered the subjects of S.H.M.O.s in consultant posts, payment of whole-time consultants for teaching duties, serological tests for V.D., designated posts for time-expired senior registrars, board-and-lodging charges, and income-tax relief in respect of professional expenses.

Working Party on Hospital Staffing

The Committee discussed a protest from the Sheffield Regional Committee about the non-inclusion in the working party of a representative of the staff of a non-teaching hospital and urging that such omission be corrected by co-option. Dr. D. H. RANDALL said that dissatisfaction about the representation had been expressed by the staffs of certain provincial hospitals. Professor CLOAKE pointed out that Dr. Rowland Hill had no appointment at a teaching hospital. Before such criticisms were levelled the facts ought to be ascertained. The ASSISTANT SECRETARY said he believed that the working party, which was appointed by the Minister, had no powers of co-option.

Professor G. I. STRACHAN said that "representation" was not the point; if so, the numbers could be extended to thirty or forty when pathologists and others were taken into account. The matter had been discussed by the Joint Consultants Committee, which had reached the conclusion that it was a very carefully chosen team likely to represent the interests of the profession to the best advantage. The CHAIRMAN said that, now that the working party had started its task, he did not believe that the Ministry would agree to any additional members being appointed. Mr. J. R. BLACKBURN protested that 70% of the country's hospital beds were in provincial non-teaching hospitals and that the major staffing difficulties were found in such places; it was curious that they should not have been asked either to state their views direct to the working party or to send a representative to state them. The CHAIRMAN said that their views would be stated by the evidence that others would give.

Professor CLOAKE said that a great deal of Dr. Rowland Hill's work was at Southend—a provincial non-teaching hospital—and that he had been chairman of a hospital management committee. The CHAIRMAN said the Committee would be on thin ground in saying that provincial non-teaching hospitals were not represented.

It was agreed that no action should be taken on this item.

Remuneration

On the question of the recent Government proposal to make a further interim increase of 4% in the current basic remuneration of doctors and dentists in the National Health Service, Dr. RANNIE said it represented a further addition to differentials. The CHAIRMAN agreed that it would upset one or two differentials, such as those between consultants and S.H.M.O.s, but said he felt quite certain that, for an interim award affecting a few months, the Ministry could not be expected to have regard to differentials.

Mr. J. M. MILLOY asked for an assurance that the increase would be automatically granted to hospital superintendents as well as others; this had not happened on the last two occasions until representations had been made from Committee B.

Princess Louise Hospital for Children

Mr. A. STAVELEY GOUGH said that for more than two years the North-west Metropolitan Board had discussed the

decision of the Board of Governors of the above hospital to convert two of its wards for the treatment of maternity cases. It was agreed that there was an urgent need for obstetric and adult beds.

The CHAIRMAN said it would be necessary to have the views of the regional committee before the matter could be taken further. The item was deferred until the next meeting.

Alternative General Medical Service

It was agreed to refer to the Executive Committee the principles formulated by the Amending Acts Committee for an alternative General Medical Service. The CHAIRMAN said they were straightforward principles of the type which had been previously accepted both by Committee and by the Representative Body. Dr. A. B. DAVIES (Chairman of the G.M.S. Committee) added that a number of the recommendations conformed to recognized Association policy, but two of them were directly contrary to it. As such policy had been the basis upon which evidence had been given to the Royal Commission, both orally and in writing, it would be disastrous if the Association at this juncture, while the Royal Commission was sitting, should alter completely its policy.

The CHAIRMAN pointed out that the two principles Dr. Davies had mentioned specifically concerned general medical services. Dr. WAND, asking that the document be referred to the Executive Committee, said it was clear that the Association would at some future time present the Medical Services Review Committee (*Journal*, December 6, p. 1401) with evidence on many of the points raised in the principles, and it might be that Council would ultimately decide the form of that evidence.

Advice to General Practitioners from Hospital Management Committee

The view that specialists wishing to give professional instruction to their professional colleagues should do so under their own signature and not through the medium of a hospital management committee's staff was expressed by several members when a complaint on this subject was discussed.

Mr. J. R. NICHOLSON-LAILEY said he understood it was the method of conveying the advice that was objected to and not the advice itself. Dr. DAVIES (Chairman of the G.M.S. Committee) said that unless such communications came under the personal signature of the consultant there was no evidence that the consultant had seen them. Professor STRACHAN said that the particular instance referred to had arisen because the obstetricians in charge had said that, for uniformity, they would like a certain line of treatment adopted. They themselves should have advised their general-practitioner colleagues on the matter.

It was decided that further information should be sought.

Membership of the Venereologists Group

A recommendation of the Venereologists Group Committee that the criteria for admission to membership be amended by the deletion of the words "in charge of venereal diseases clinics, although not engaged predominantly in the specialty," and the substitution of "if not engaged predominantly in the specialty, are graded as consultants or senior hospital medical officers in venereology" was agreed to.

Dr. WILCOX said that the change lessened the possibility of admitting consultants engaged in other specialties but who happened to be in charge of a V.D. clinic on a part-time basis. There was no suggestion that any present members should be removed.

Personal Medical Card

The Committee agreed in principle with the view that a form of personal medical card should be devised for the public.

Mr. NICHOLSON-LAILEY said that any doctor faced with the problem of treating an unconscious patient he had never

seen before would appreciate the extreme difficulty involved in diagnosis. The Science Committee considered that, if the profession agreed that it was desirable for such a card to be carried, a suitable form should contain information under the headings of: blood group; transfusions carried out; sera or inoculations received; treatment required (doses of penicillin, cortisone, or insulin); sensitivity or allergy (e.g., penicillin, iodine). "People are getting accustomed to carrying cards," he said. Pregnant women carried them, and he thought certain other classes too, such as haemophiliacs. Under the blood group heading there should be a reminder to all doctors that no matter what group was given it was advisable, before doing a transfusion, to do a direct cross-match if possible.

Mr. T. H. DOCKRELL said that the principle was good enough, but he thought that it was very doubtful whether the free citizens of this country could be persuaded to carry such a card on them. He was not at all sure that they were as used to carrying cards as Mr. Nicholson-Lailey seemed to suggest. Professor H. W. RODGERS said that for such positive points as the indication of a blood group it would be a good thing if people could be persuaded to carry a card, but he did not think that anything like a "medical book" as used in the Army would be appropriate.

Dr. MORGAN said that the medical profession ought to educate the general public in such a matter and also doctors. If the profession thought it a good thing, the proposal ought to be pressed. He thought, however, that the idea should be confined to those cases where it was really needed, the onus being on the patient's own doctor, who had found out that hypersensitivity or some other condition existed, to pass on any information of value to his colleagues. The first step to success was to say, "We will try it because it may be of value." Dr. E. R. CULLINAN said that if cortisone were mentioned it should be indicated whether it had been given recently.

Professor CLOAKE said it was a defeatist policy to assume that any suggested step forward would not work. It seemed that the obligation about such a card—the patient could not be compelled to carry it—was on the doctor, who knew facts of importance to the patient. If the idea could be got over to hospital staffs and general practitioners there would at least have been a step in the right direction. If it saved the lives of half a dozen people, or even of one, it would be worth while.

Dr. E. BERESFORD DAVIES agreed with Professor Cloake, but, as a psychiatrist, he saw people bringing all kinds of things into hospital—interesting if one had time to study their psychopathology but extremely misleading if one was a young and inexperienced house officer. The document should be drawn up in an authoritative way by a properly qualified doctor, whose signature should appear on the appropriate part of the card.

The CHAIRMAN said it appeared that the Committee had given general approval to the idea and had drawn attention to several difficulties which the Science Committee would no doubt examine further.

Advisory Appointments Committees

It was reported that the only instances of dissatisfaction so far expressed over the way in which boards appointed members to advisory appointments committees had come from the Manchester and Eastern Region. The CHAIRMAN said that no action could be taken at present. If other regions had similar complaints they were asked to send their information in.

Telephones for Hospital Staff

It was agreed to refer to Whitley Committee B an anomaly whereby a first-year registrar received a telephone allowance but a second-year registrar did not.

Co-option

It was reported that Mr. A. M. A. Moore had accepted an invitation to serve on the Committee as a co-opted

member. The CHAIRMAN said it was to be regretted that Dr. Russell Brain had felt unable to accept co-option as he was no longer a member of the Joint Consultants Committee, but members would doubtless understand his reasons.

Representation of Royal Colleges

The CHAIRMAN drew attention to the replies, contained in the agenda, which had been received from the Royal Colleges in response to an invitation to be represented on the Committee. Neither the Royal College of Physicians nor the Royal College of Surgeons wished for representation, but the Royal College of Physicians, Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow had accepted. The Royal College of Obstetricians and Gynaecologists had replied that, while appreciating the wishes of the Association and the courtesy of the invitation, it considered that the present liaison through the Joint Consultants Committee was adequate. A reply was still awaited from the Royal College of Surgeons, Edinburgh.

Dr. H. G. H. RICHARDS said that these replies merely indicated how the Royal Colleges, finding that they had considerable power on the Joint Consultants Committee, were quite prepared to leave things as they were. This emphasized how important it was that the Central Consultants and Specialists Committee should try to achieve better representation on the joint body. He hoped that the matter would be taken up with some urgency before the Royal Commission reported.

Representatives in the R.B.

The Committee agreed to accept nominations for the appointment of four members to represent the Committee in the Representative Body, of whom one should be from Scotland. It was decided that the election should be made at the next meeting.

HOSPITAL MEDICAL STAFFS DEFENCE TRUST

It was agreed by the Central Consultants and Specialists Committee, meeting on December 4 in its capacity as Trustees of the Hospital Medical Staffs Defence Trust, that an appeal against the decision of the Lord Chief Justice of Northern Ireland in the case of *J. Norris Whyte v. The Northern Ireland Tuberculosis Authority* should be entered.

Remuneration Claim

Payment of £1,301 in connexion with the preparation of the joint remuneration claim for general practitioners and hospital medical staff was authorized by the Trustees without discussion.

Part-time Consultants and Income Tax

It was reported that the Trustees of the National Insurance Defence Trust had agreed to make £2,000 available as a contribution to the additional expenditure involved in conducting the test cases on the assessment of the hospital income of part-time consultants under Schedule E.

Dr. MORGAN said it was another instance where the general practitioners were being, in a sense, perhaps a little generous towards the consultants and specialists. Professor CLOAKE moved that a vote of thanks be passed for the provisional assistance offered, and this was agreed to. He said he hoped the day might come when the consultants and specialists could reciprocate or perhaps pay back the money.

Publication of Financial Statement

AN ASSISTANT SECRETARY said that the non-appearance of published accounts had been questioned. While it was true that nobody who had asked for a copy would have been denied one, there had in fact been no such applications. After further discussion it was agreed that in future the accounts should be published in the Committee's *Bulletin*.

RADIOLOGISTS GROUP

A meeting of the Radiologists Group was held at B.M.A. House on December 6. Dr. A. ROBINSON THOMAS was in the chair.

"Points" System

The present "points" system for recording the work of x-ray departments came in for a good deal of discussion, and was much criticized. Dr. F. H. KEMP said that the Faculty of Radiologists had achieved some success in an attempt to simplify the system, but had not yet got complete agreement. Dr. E. E. CLAXTON, Assistant Secretary, said that the pathologists had found that the differences in the assessment in different types of laboratories made the whole thing quite impracticable. Dr. H. R. C. HAY moved that radiologists should abandon the scheme, and this was seconded by Dr. J. W. D. BULL.

It was then pointed out that, even though the points system was not greatly admired, the Ministry would nevertheless insist on some system of costing in x-ray and other departments, and that if the present method was turned down the Group would have to suggest something in substitution. Dr. KEMP agreed, adding that, if it wished, the Ministry could work the present system without the co-operation of the radiologists. Even though his own superintendent radiographer might agree with him, she had to take administrative orders from the administrative officer concerned. A cautious policy, therefore, was advisable. Dr. S. D. SCOTT PARK said that a plan had been put to the Department of Health for Scotland for another method, which would give a uniform system of keeping records and with which the points method would tie up. Nothing had since been heard about it.

Dr. B. S. H. STORR did not think it fair to say that the figures were entirely meaningless, but they meant something only if it was known in what conditions they were made. He thought that any basis or comparison for costing was better than none. Although the present system was probably not the best, he was not altogether convinced that a points system was not the most suitable. The present method was wrongly loaded, but if it was overhauled it would probably disclose a great deal about the comparative costs of departments. Rather than abandon the present system, it might be better to try to adjust the loading.

Dr. H. HOWELL remarked that in some departments the system was worked out by a secretary or a clerk, who put "the most fantastic interpretation on the figures." Dr. SCOTT PARK said that when he was a member of the council of the Scottish Radiological Society it had kept records based on the returns of the leading hospitals in Glasgow, Aberdeen, and Edinburgh, the idea at that time being that the figures would be available to the Department of Health for Scotland, which could then have allocated the points in a uniform way. Whether or not that was being pursued he could not say. Dr. KEMP informed the Group that three or four members of the Faculty had reported some favourable progress towards simplification of the points system, following meetings with Ministry representatives. They had also had in mind the incorrect weighting of the present system, and problems arising from the actual recording. It was generally believed, he was sure, that some system of costing had to be accepted, and that there was something to be said for a points system as such.

Dr. HAY, having withdrawn his motion, proposed "That the points system be reconsidered and adjusted to reflect values more fairly."

This was agreed to.

Fees for Examinations

The CHAIRMAN pointed out that there had been one or two complaints that when a fee of two guineas was paid to the hospital for, say, an x-ray examination prior to emigration the hospital deducted one-third for the use of the apparatus and handed only the balance to the radiologist. It had been suggested that the Ministry be asked that the

terms and conditions of service should be modified and that the hospital should collect its own fee for use of equipment and hand the two guineas to the radiologist. He agreed that this would mean a total payment of three guineas. Dr. CLAXTON pointed out that it would entail an alteration in the general fee scale, which was laid down in the regulations. A reconsideration of fees might follow the report of the Royal Commission, and if they tried to do anything at present they would only be told to wait for the Royal Commission's Report.

Dr. KEMP said that it had been represented to the Faculty that the fees were out of date and should be reviewed. He thought that now was the time to examine the various schedules and have ready a reasoned statement for increases and adjustments. When the Royal Commission reported they would then have to be ready with proposals of what they thought their services were worth. All outside costs had gone up, and this alone was a reason for a review of fees. He suggested referring the matter to the Group Committee. It was not only the fees under discussion; the schedule of private fees was also out of date.

It was agreed that the Group Committee should look into the question of increasing the fees generally.

Training of Radiographers

When the meeting came to the training of radiographers, Dr. BULL said that at a special meeting held earlier in the year he had found those representing radiographers not particularly worried about recruitment. Their chief complaint was insufficient pay. Dr. CLAXTON added that the problem was not now that of intake so much as of newly qualified radiographers being attracted elsewhere after entry.

A good deal of objection was taken to a paragraph in the Group Committee's report on the training of radiographers, on the grounds that it tended to give the impression that it recommended a lowering of the technical standards required in favour of somebody who was "nice and handy" with patients. Dr. STORR said that radiographers had the idea that the medical profession did not want a high standard of radiographer but would rather see the basic standard lowered. "I don't think that that is true," he continued. "The Membership of the Society of Radiographers is a good, sound basic qualification, and radiographers generally do not want to see it lowered. Although it is important that radiographers should be trained in handling patients and in minor nursing techniques, the most important thing in their training is that they should be good technicians."

The CHAIRMAN thought that the paragraph had been misunderstood. The "scientific subjects" referred to such things as too much physics and medical photography, and in the new syllabus the time allotted to them had been drastically cut. "Apparatus construction used to be an awful bugbear, and apart from knowing how it worked, there seemed to be no point in students knowing all the intricate technicalities." That, too, had been cut, and a paper inserted on the handling of patients. The whole point of the report was to find reasons for the shortage, and the paragraph merely mentioned what, in the Committee's view, was one of the reasons for the shortage.

The general feeling of the meeting was that, while it approved the underlying reasons given in the paragraph, it felt that the wording was perhaps rather unfortunate. The paragraph was referred back for rephrasing.

Doctors' Secretaries

The status of secretaries to medical staff in hospital departments was then discussed. The CHAIRMAN said that, following the Hall Report on the administrative and other staffing structure of the Health Service (*Supplement*, December 7, 1957, p. 188), attention had been drawn to the need for a career structure on the clinical administrative side, but the report said nothing about departmental secretaries and the like. The Group Committee had

therefore drawn up a memorandum which, he thought, would be favourably considered by Whitley Committee B.

Dr. KEMP said that the subject was one that concerned them all. There had recently been a complete regrading of the clerical staff, which did not include shorthand-typists and the various personnel classified as personal secretaries. They might find girls employed in filing films and the like being graded higher and paid more than the radiologists' secretaries. It was necessary to press the administrators to do something. Although the industrial tribunal had not yet published its findings on secretarial staff, it was known that they would be in a lower grade.

The CHAIRMAN said that the situation had arisen as a result of the Government's implementation of the Hall Report. If it was possible to persuade administrators not to categorize staff at present—and they were not under compulsion to do it yet—it was probable that in the meantime the Whitley Council Report on career structure on the clinical administrative side would have been thrashed out. There certainly was a case for a career structure for secretaries on the clinical side of hospitals, apart from those on the administrative side.

Dr. KEMP expressed his doubts about whether people really had the present situation clearly in their minds. Whatever might or might not be done at Whitley Council level, events had marched ahead of them. For instance, there was already confusion about the meaning of "clerk." Clerks were, in future, to be the higher grade, and he had had definite warning that when the next part of the Report was published it would be found to put secretarial staff on a lower basis than clerks. Secretaries, typists, and the like were not to be included in the clerk category, and it was of vital importance to examine the position at once.

The CHAIRMAN said that it would have to be taken on a very broad basis, as it concerned not only their own secretaries but those in other departments. However, it must be remembered that the Group Committee had started work on this before anyone else had. The co-operation of other Groups could be sought.

Registration of Medical Auxiliaries

A lively discussion followed on the statutory registration of medical auxiliaries. Giving a summary of the history, the CHAIRMAN said that, after a previous report, to which the Group Committee had made recommendations, had not been accepted, the whole thing appeared to be dead. However, some weeks ago the Consultants and Specialists Committee had had a report from the Joint Consultants Committee of a revised provisional scheme by the Ministry for the statutory registration of "professions supplementary to medicine" (*Supplement*, October 18, p. 171). That was the first that the Group Committee had known of such a scheme, and when they had seen a copy of it it looked "very unacceptable." The Ministry scheme envisaged a series of registration boards, one for each of the specialties, with a council governing them all. The radiographers' registration board would consist of seven radiographers, four doctors, one educationist, and one "expert in fields allied to radiography"—probably a physicist. Not only would that result in the doctors being in a minority of four to nine, but not one of the four need be a radiologist. As a specialty they would have absolutely no say on training and on registration. The Chairman felt such a scheme to be wholly unacceptable, but wanted the views of the Group.

Dr. KEMP's immediate reaction was that they should not discuss the matter at all, but just give the Group Committee the meeting's wholehearted support and leave it at that. Dr. PIGOTT felt that the matter could not be dismissed so summarily. There should be registration. At present it was difficult to find from the Society of Radiographers whether or not a radiographer held his diploma. Holding the diploma was not the same as being a member of the Society. Only for holders of the diploma was there a current record. Intervening, the CHAIRMAN said that Dr. Pigott had just put forward one principle with which they might all agree. "Do we want a register of

radiographers?" All were agreed on that. Continuing, Dr. PIGOTT said that the next point was who was to maintain the register, and what was to be the function of the registering body. He thought that control of the register would be largely formal, except for ethics and for discipline. A person satisfying the examiners would be eligible for registration. What should be strongly pressed was that the doctors on the proposed registering body should be radiologists. Their views would then be heard on matters of ethical practice after registration. Though the doctors would be in a numerical minority, he was sure that the registering body would be loath to override medical members on matters of principle in relation to practice.

In the CHAIRMAN'S view doctors should have parity with the radiographers on the registration board. It had been suggested to the Joint Consultants Committee that it would be enough to leave the present constitution of the registration board as it was and merely insist on having a majority of doctors on the co-ordinating council, but he did not think that that would give them the authority where they wanted it.

It was agreed to submit a report to the Joint Consultants Committee.

PRIVATE PRACTICE COMMITTEE

Drugs for Private Patients

Dr. I. M. JONES, Chairman of the Private Practice Committee, explained that the main reason for calling a special meeting of the Committee, held on December 10, was to consider further the question of drugs for private patients. He reported on a meeting between Dr. S. Wand, Dr. A. B. Davies, Dr. Lindsey W. Batten, and himself and Ministry officials on October 28. The Committee also had before it a letter from the Ministry setting out points which arose at the October meeting, and a memorandum on the subject from Dr. O. C. Carter.

Registration of Patients

Dr. Jones said that the Ministry envisaged registration of the private patients on identical terms, broadly speaking, with those of National Health Service patients. Apart from the question of registration, there was more or less agreement between the Ministry and the Association. Therefore the Committee must decide whether it agreed to some form of registration of private patients.

Dr. A. V. RUSSELL (Wolverhampton) said he found difficulty in understanding why registration should be necessary at all. Figures and statistics could be compiled from the use of E.C.10's of a special colour for private patients. Dr. O. C. CARTER said it appeared that the only remaining issue between the Ministry and the Association was the insistence by the former on some sort of registration of private patients, and some agreement or contract to be entered into by doctors with the executive council. He thought that the Ministry's requirements were quite unacceptable. Any agreement with the proposed strings attached would lead to strangulation of private practice. Since this was a matter which mostly concerned those doctors who were purely in private practice, the question could only be settled fairly and satisfactorily by those members exclusively or almost exclusively in private practice. The Private Practice Committee, whose members included a number whose main interest was in N.H.S. practice, was not competent to make a recommendation to Council on it, said Dr. Carter. He proposed that a special meeting of private practitioners be called.

The CHAIRMAN reminded Dr. Carter that the Private Practice Committee was elected by the Representative Body, and constitutionally it had the right and duty of doing what it thought fit. Dr. Carter suggested it should not do. Further, at the request of the purely private practitioners, a subcommittee had been set up, called the Private Practitioners Subcommittee, of 12 members, 3 of whom were nominees of the Private Practice Committee, and the remaining 9

nominees of the purely private practitioners group, with no more influence brought to bear upon them in their selection of who should represent them than that they should have some regard to a reasonable geographical distribution over the country.

Dr. RUSSELL suggested that the interests of the patient should not be lost sight of in standing too much on the rights of the doctor. Dr. L. A. GIBBONS said he was opposed to complete registration of private patients in the same way as in National Health Service lists. Dr. R. HALE-WHITE pointed out that the Ministry wanted to ensure that nobody obtained drugs from more than one doctor, and he would be agreeable to some system of an absolutely minimum nature which gave the Ministry that assurance. That did not mean any kind of list at all, he added, because it was obviously impossible for a private doctor to provide such a list. They would be deceiving themselves if they thought they had this "buttoned up with the Ministry." It would necessarily mean an Amending Act.

Dr. R. GREEN said that the first object was fair treatment for all patients, and that might mean forfeiting some of the jealously held independence of the purely private practitioner. The attitude which might be adopted towards the Ministry and towards the Government was that every patient had a right to use the Health Service, or as much or as little of it as he liked, and those who preferred to pay their doctor a fee should be allowed to do so without any form of financial penalty. If tackled from that angle, it might well be that the private patient, whether his doctor had a State list or not, could get his drugs free if he so wished. Dr. Green was doubtful whether any scheme would be successful which depended on a patient himself making application to the executive council for free drugs. On the other hand if the doctor sent in a card to the effect that the patient wished to receive his drugs free of charge, it would, technically, be registration and the patient would be put to no trouble at all.

Dr. L. W. BATTEN said that in his view the principle of registration must be accepted.

On the motion of Dr. J. O. M. REES, seconded by Dr. RUSSELL, a vote of thanks was accorded to the deputation, which met the Ministry officials, on having achieved a very substantial measure of success.

Dr. CARTER drew attention to his proposition that a special meeting of private practitioners be convened, but as the proposition was not seconded there was no further discussion.

The Committee accepted, with one dissentient, a proposal that the general principle of executive councils maintaining a list of those private patients authorized to receive drugs and appliances on Form E.C.10 be adopted. This was in accordance with the recommendation to the Committee of its Private Practitioners Subcommittee.

The Committee also agreed to recommend to the Council that a letter be sent to the Ministry suggesting that, since agreement had been reached that a scheme was administratively possible, the matter should now be taken up with the Minister.

After some further discussion on administrative details, a suggestion that cards should be issued to private practitioners by executive councils for signature by patients who desired to obtain their drugs through the National Health Service was adopted.

Part-time Prison Medical Officers

The CHAIRMAN recalled that a deputation, consisting of Dr. R. D. Summers, Dr. A. Barker, and himself, was appointed to meet the Prison Commissioners to try to obtain an improvement in the remuneration of part-time prison medical officers. Before the meeting could take place, however, the Prison Commissioners produced a new scale which was to have been put into force on January 1, 1959. Dr. Jones said that the new scale fell short of the scale which the Committee and the prison medical officers agreed was desirable.

It had been indicated to the Prison Commissioners that there would be objections to the new scale, and they had suggested that, since the Treasury was involved, a meeting should be arranged at the Treasury at which both the Association and the Prison Commissioners would be represented. The Association could then put forward its claim.

The Committee agreed to that course.

Cremation Certificates

The Committee received a letter from the National Association of Funeral Directors which gave an assurance that the National Association had never tried nationally to fix the fees for the completion of cremation certificates B and C (see *Supplement*, October 18, 1958, p. 174). "Our Dundee Association has been informed of this and publicity is being given in the National Association of Funeral Directors' publications to this point," concluded the letter.

A.R.M. Resolution

The Committee further considered a resolution from the A.R.M. that hospital medical officers should receive a fee for the completion of Certificate B of the cremation form. At the previous meeting the matter was referred to the Committee's Cremation Subcommittee, it being pointed out that the Joint Consultants Committee had already made unsuccessful representations on this matter.

The Committee agreed to refer to the Central Consultants and Specialists Committee some suggestions which had been made by the Cremation Subcommittee for a new approach to the Ministry.

Membership of Committee

At the beginning of the meeting the CHAIRMAN welcomed Dr. R. Hale-White, who had accepted an invitation to serve as a co-opted member, and Dr. S. Noy Scott, who had been appointed to take the place of Dr. W. Morgan Evans as the representative of the G.M.S. Committee. The Committee unanimously agreed that a letter should be sent to Dr. Morgan Evans expressing gratitude for the invaluable help he had given the Committee in the past.

HOSPITAL SUPPLIES

In its final report¹ the Central Health Services Council's Committee on Hospital Supplies recommends more use of joint contracting arrangements between hospital groups and, in some instances, with local authorities. The committee is against central contracting by the Ministry of Health except on the present limited scale, and it thinks the Ministry should review the scope of its purchase of domestic supplies with a view to devolving part of this work. In matters of importance, national policy should outweigh other considerations, although hospital authorities should be told of the policy reasons for decisions in central supply arrangements. In favouring joint contracting the committee says that the organization must be adopted to serve the needs and resources of the authority concerned and must not be limited by hospital group boundaries or interests.

The committee was set up by the Central Health Services Council in January, 1955, "to investigate and report on the organization of all forms of hospital supplies, including their purchase, storage, and issue throughout the National Health Service." It issued an interim report in June, 1956. The chairman was Sir Frederick Messer, M.P., and the medical member was Lord Cohen of Birkenhead.

¹ Ministry of Health Central Health Services Council, *Final Report of the Committee on Hospital Supplies*, 1958. H.M.S.O., London. Price 3s. 6d. net.

WEEKLY INSURANCE STAMP

PROPORTION GOING TO N.H.S.

At its meeting on November 19 the Association's Public Relations Committee (chairman, Dr. H. Guy Dain) considered the following table showing the changes during the past 10 years in the proportion of the weekly insurance stamp of a male employed person which is contributed to the National Health Service.

Owing to the numerous changes in the contribution rate, the Committee decided that the display of posters and leaflets in doctors' surgeries was an impractical method of publicizing the facts.

	Male Employee				Employer				Total Cost of Stamp for Employed Person	Amount of Total Cost Going to N.H.S.
	National Insurance	Industrial Injuries	National Health Service	Total	National Insurance	Industrial Injuries	National Health Service	Total		
From:	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
July 5, 1948	3 10½	4	8½	4 11	3 8½	4	1½	4 2	9 1	10
October 1, 1951	4 0½	4	8½	5 1	3 10½	4	1½	4 4	9 5	10
June 6, 1955	4 8½	4	8½	5 9	4 5½	5	1½	5 0	10 9	10
September 2, 1957*	5 7½	5	8½	6 9	5 4½	6	1½	6 0	12 9	10
February 3, 1958	5 7½	5	1 4½	7 5	5 4½	6	3½	6 2	13 7	1 8
July 7, 1958	7 4½	8	1 4½	9 5	7 0½	9	3½	8 1	17 6	1 8
	7 4½	8	1 10½	9 11	7 0½	9	5½	8 3	18 2	2 4

* From this date a separate National Health Service Fund has been in existence.

Scottish News

SCOTTISH NUFFIELD PROVIDENT SOCIETY

GROUP SCHEME FOR B.M.A. MEMBERS

The Scottish Council of the B.M.A. has arranged with the Scottish Nuffield Provident Society for the formation of a Group scheme for members of the B.M.A. resident in Scotland which will enable members of the group to obtain the benefits offered by the Provident Society at a reduction of approximately 20% in annual subscriptions. A circular giving details of the scheme will be sent to all members in Scotland in January.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Association for Research in Nervous and Mental Diseases Publication No. 36: *The Brain and Human Behavior*. 1958.
- Blackburn, G., and Lawrie, R. (Editors): *Textbook of Surgery*. 1958.
- British Medical Association: *Medical Practitioners' Handbook*. 1958.
- Britten, J. D.: *Practical Notes on Nursing Procedures*. 1957.
- Calder, R.: *From Magic to Medicine: The Wonderful World of Medicine*. 1957.
- Campbell, J. M.: *From a Trade to a Profession: Byways in Dental History*. 1958.
- Carstairs, G. M.: *The Twice-born: A Study of a Community of High-caste Hindus*. 1957.
- Christensen, P. A.: *South African Snake Venoms and Antivenoms*. 1955.
- Cohen, J.: *Humanistic Psychology*. 1958.
- Council for International Organizations of Medical Sciences: *Bibliography of International Congresses of Medical Sciences*. Prepared by W. J. Bishop. 1958.
- Cramer, H.: *Die Kolposkopie in der Praxis*. 1956.
- Crile, G.: *Cancer and Common Sense*. 1957.
- Crook, F.: *Integration of Science*. 1958.
- Davis, J. E.: *Recovery from Schizophrenia: The Roland Method*. 1957.
- De Rudder, B.: *Kinderärztliche Notfallbibel*. 4 Auflage. 1958.
- Ferguson, A. B.: *Orthopedic Surgery in Infancy and Childhood*. 1957.
- Fordham, M.: *New Developments in Analytical Psychology*. 1957.
- Gelvin, E. P., and McGavack, T. H.: *Obesity: Its Cause, Classification and Care*. 1957.
- General Council and Register of Osteopaths: *Osteopathic Blue Book: The Origin and Development of Osteopathy in Great Britain*. 1958.
- Greenhill, J. P.: *Surgical Gynecology: Including Important Obstetric Operations*. Second edition. 1957.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Fee for Service

SIR.—Your correspondent, Dr. A. M. Goldthorpe (*Supplement*, December 6, p. 242), advocates the payment of general practitioners by a fee per item of service, and cites *The Times* as his champion. Recently (November 8) that paper gave prominence to the views of a Dr. Erich Geiringer, who deplored the capitation fee method of payment and suggested that the public is increasingly unwilling to trust itself to the care of its National Health Service practitioners. Dr. Geiringer's only remedy for what he believes to be the present state of affairs was the abolition of the capitation fee and its replacement by some form of payment for service. Such a suggestion implies that the practitioner in private practice, who is in fact paid on an item of service basis, gives better care. Apparently Dr. Goldthorpe shares these views. In any system of payment there may be an abuse by a minority, but it is no more reasonable to assume that the doctor paid on a capitation fee basis neglects his patients than it is reasonable to assume that one paid on an item of service basis over-visits and over-treats his patients for monetary reward.

It is well to remember that the N.H.S. is intended for patients as well as doctors. The greatest volume of criticism is from doctors themselves: the reason for this would appear to lie not in the method but in the amount of payment. As Dr. Goldthorpe pointed out in these columns earlier this year (*Supplement*, April 19, p. 209), the N.H.S. practitioner's remuneration per item of service under the present system averages about 2s. 6d. This may be a paltry fee, but altering the method of distribution will not increase the amount available, just as cutting a cake into small slices will not make it any bigger.

If Dr. Goldthorpe has so little faith in his profession that he believes that better work will result from a different method of payment, then he must believe that the financial incentive is what really moves the family doctor. If so, let us at least have a financial incentive that reacts to the good of the patient too. If there is an item of service payment, then there is an incentive to do more than is necessary, and the doctor has a vested interest in disease. As it is, the emphasis in general practice to-day has shifted from treatment to preventive medicine and health education. The family doctor still has his patients' best interests at heart, and has in fact a vested interest in their good health. Under the capitation fee system he is encouraged to look after as many patients as possible as well as possible, and in so doing is offered scope for the practice of medicine of the highest standard of which he is capable.—I am, etc.,

London, N.W.1.

J. MARK HODSON.

SIR.—I read with great interest the letter of my old friend, Dr. A. M. Goldthorpe (*Supplement*, December 6, p. 242). It struck me that if a fee were paid to G.P.s for circumcision, be it only ten bob a time, in a few years foreskins would be as rare as snow in the desert.—I am, etc.,

Shoreham-by-Sea, Sussex.

T. H. HARRISON.

Private General Practice

SIR.—Having failed to make an impression on our legislators of either party as to the merits of encouraging private general practice, you now produce further arguments which are compounded of the stale and the revolutionary (*Journal*, November 29, p. 1343). For the first time we hear that "any increase in private practice will lessen the heavy burden now borne by the State and its compulsory taxpayers." Since, by coincidence, the bodies you quote as most clamant for private work are also most vocal for

"free drugs" for private patients, it is difficult to imagine under what conditions you envisage such a saving will be effected. Will the B.U.P.A. not attempt to join the agitation for free drugs; and have the other organizations dropped this claim? Or do you propose a cut in the central pool if the number of private patients increases? I think that the majority of doctors would consider this a rather high cost merely to encourage the "strong individualists," however much we sympathize with them.

It is noteworthy that not even Mr. Bevan tried to legislate against private practice. The possibility has always existed for those who would commit their skill and fortunes to the vagaries of the money market. There is no move to abolish this. The argument against an extension of private practice is not that those with available cash would hog all the national resources of medical manpower and hospital beds, though an extension of individual privilege is always at the expense of the community. In this instance the danger is more sinister. Already too many people are encouraged to believe (and even your article tends to foster this view) that the National Health Service is a second best. It is unfortunately becoming a commonly held view that by paying one can get better medical attention and even jump the queue (*Birmingham Post*, November 15, headlined its report of the West Bromwich Health Executive Council meeting—"10 Years' Wait for Tonsil Operation: 'Easier if You Pay' Allegation").

Where privilege is earned or is sustained on other good grounds (be it age, service to the community, hardship), let the medical profession so arrange and organize its priorities (we already do this in many important fields) that need is the yardstick, and not merely make plans to encourage privilege for cash customers. The "majority of conformists in the N.H.S." (whom you quite gratuitously snub) are equally concerned with the best treatment and the best doctor-patient relationship, and the encouragement that you advocate for private practice can only undermine such relationship for the bulk of the doctors and the bulk of our patients.—I am, etc.,

Birmingham, 11.

B. BARNETT.

Locums and Assistants

SIR.—I am a retired general practitioner, retired on medical grounds, but still vital enough to be able to help colleagues in the town who on account of illness are in extreme difficulty. I often receive appeals from neighbouring districts, especially for holiday locums, but have regretfully to say that I do not do locums but merely help locally for illness.

I am something of a fee problem for those who require my services. The difficulties are primarily that I have to pay income tax on my fees at standard rate; that I provide my own board and lodging; that I must have two telephones; and that my car is too costly to loan at the fee of 3 guineas a week (*Medical Practitioners' Handbook*, £2 2s.). I appreciate their difficulty, for hitherto they have been able to buy a locum (allowing for the rebate claimed on practice expenses) for a little over 36s. a day (and night), inclusive of car allowance of from 3s. 6d. to 5s. a day and board and lodging of 5s. a day.

The principals' difficulties in obtaining locums are very real. I have heard the distress in their requests for help, not only in cases of illness, but when holidays are needed. Other nationalized workers claim holidays with pay, and no worker needs holidays more than the G.P., who works overtime most days. I find the short spells of general practice enjoyable, though I am glad when they end. The work of a locum is very difficult even in a familiar town. In these days of thousands of proprietary drugs he has to turn up the record card of every patient seen. Legibility is not the doctors' strong point and dosage is not always entered. The locum runs a risk in copying the entry which he may be called upon to justify.

The *Medical Practitioners' Handbook* is not very helpful about fees. It says: "No standard fee can be laid down; as in the case of assistantship the rate varies and is governed

to some extent by supply and demand." This is something like the market price of turnips. The *Handbook* is very helpful in its compiled lists of the salaries and increments in many services, but no mention is made of increments for locums and assistants, who appear to have to go on year after year at the same fees. I have read the letters of Dr. D. S. Craig (*Supplement*, October 25, p. 185) and of Dr. C. A. Sharples (*Supplement*, November 15, p. 210) with their tales of a multitude of application letters, journeys and expenses, and wear and tear of cars for interviews, often so futile. This is something the Royal Commission must alter. The whole profession has always rebelled against the position of employer and employee and a salaried service, and yet it allows this for the flotsam and jetsam of locums and assistants. When an application becomes almost a supplication there is something radically wrong. Sometimes unreasonable requests are made. One came to my notice where it was suggested that calls be put through to where the locum was staying, by arrangement with the G.P.O., which implied the provision by him of somebody being always on call, day and night, to take messages. The *Medical Practitioners' Handbook* says that arrangements for the reception of calls is the responsibility of the principal. A pool of locums and assistants should be kept by the B.M.A. and all applications made direct to it. A record will thus be made of principals applying and locums and assistants applied for. Principals should pay according to their use of the service, and locums and assistants should be paid according to their years in circulation, and board and lodging and car allowances should be put on a realistic basis.—I am, etc.,

ALLEN GLENN.

Bradford.

REFERENCE

The Medical Practitioners' Handbook, 1958. B.M.A., London.

H.M. Forces

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel J. A. G. Carmichael has retired, and has been granted the honorary rank of Colonel.

Lieutenant-Colonels A. Bennett and R. D. Bell have retired on retired pay, Reserve liability. Captains R. G. Robinson, J. W. M. Stone, T. W. Brown, B. D. J. Leary, F. C. Shelley, D. H. McFerran, G. C. Wilson, C. G. B. Downie, T. B. Stephens, and L. Tippet to be Majors. *Short Service Commission*.—Captain R. D. H. Parker to be Major.

REGULAR ARMY RESERVE OF OFFICERS

Major-General E. A. Sutton, C.B., C.B.E., M.C., late R.A.M.C., has ceased to belong to the Reserve of Officers. Colonel C. A. Levy, late R.A.M.C., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, and has been granted the honorary rank of Colonel.

ROYAL ARMY MEDICAL CORPS

Major O. C. Dobson, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, and has been granted the honorary rank of Major.

Major W. J. Gourley, from Active List, to be Major. Captain (Honorary Major) T. O. McKane has ceased to belong to the Reserve of Officers, retaining the honorary rank of Major. *Class III*.—Captain (Honorary Major) E. A. Donegan, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, retaining the honorary rank of Major.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Colonels H. K. Meller, M.B.E., T.D., and A. McC. Campbell, D.S.O., O.B.E., T.D., have resigned their commissions, and have been granted the honorary rank of Colonel.

Lieutenant-Colonel (Acting Colonel) J. A. Simons to be Colonel.

Majors (Acting Lieutenant-Colonels) J. G. Reid, M.V.O., and G. S. Crockett to be Lieutenant-Colonels.

Major (Acting Lieutenant-Colonel) A. R. Currie, from T.A., to be Major, relinquishing the acting rank of Lieutenant-Colonel. Major R. C. King has been granted the acting rank of Lieutenant-Colonel.

Captains J. M. Brudenell, P. J. Roffey, R. I. Keen, and E. H. Cooper have been granted the acting rank of Major.

TERRITORIAL ARMY
ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel (Brevet-Colonel) E. H. P. Smith, T.D., has retired.

Lieutenant-Colonels (Acting Colonels) E. H. Hanson, T.D., M. I. Silverton, O.B.E., T.D., and T. P. Sewell, T.D., to be Colonels.

Lieutenant-Colonel E. H. P. Smith, T.D., to be Brevet-Colonel. Majors (Acting Lieutenant-Colonels) D. R. Urquhart, R. B. McConnell, A. L. Stalker, and J. H. Orr to be Lieutenant-Colonels.

Major J. H. Pattison, T.D., having attained the age limit, has retired and has been granted the honorary rank of Major.

Major W. E. Hurford has retired.

Captain (Acting Major) R. J. Howat has been granted the acting rank of Lieutenant-Colonel.

Captains (Acting Majors) R. W. Hutchinson and R. J. Howat to be Majors.

Captains A. E. Wright, G. D. Teague, M. R. Anderson, P. Roberts, and S. R. Wraith to be Majors.

Captains G. Lipp, C. A. Holborow, F. S. Grebbell, T. L. Hobday, J. A. G. Graham, and H. Brown have been granted the acting rank of Major.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel A. T. B. Dickson, O.B.E., T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., and has been granted the honorary rank of Colonel.

Lieutenant-Colonel R. S. Taylor, O.B.E., T.D., from Active List, to be Lieutenant-Colonel.

Majors (Honorary Lieutenant-Colonels) W. H. M. Jones, O.B.E., T.D., and R. O. Brooks, T.D., having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O., retaining the honorary rank of Lieutenant-Colonel.

Majors R. Rutherford, T.D., and D. S. Valentine, T.D., having attained the age limit of liability to recall, have ceased to belong to the Reserve of Officers, and have been granted the honorary rank of Major.

ROYAL AIR FORCE

Air Commodores D. A. Wilson, C.B.E., A.F.C., Q.H.S., and A. Harvey, C.B.E., have retired.

Squadron Leader P. F. King to be Wing Commander.

Squadron Leader K. E. Falkner has relinquished her commission, retaining her rank.

Flight Lieutenants W. E. McCready, H. E. Lewis, R. A. Risley-Prichard, R. T. B. Jones, A. B. Goorney, P. L. Mulrooney, R. F. Stark, R. F. Lowe, and A. J. Lawson to be Squadron Leaders.

Flight Lieutenants W. M. Bond, N. Clarkson, J. Cleland, Y. M. Currie, D. Davies, M. I. H. Isaac, M. S. L. Logan, A. B. Lorne, M. E. MacFetridge, K. E. A. Scott, E. D. L. Simpson, D. Smith, W. J. Symington, and R. M. Taylor have relinquished their commissions, retaining the rank of Squadron Leader.

Flight Lieutenant D. R. Morris has been transferred to the Reserve, retaining the rank of Squadron Leader.

HER MAJESTY'S OVERSEAS CIVIL SERVICE

The following appointments have been announced: E. R. Asregadoo, M.D., D.O., Junior Ophthalmologist, British Guiana; G. K. Cheng, M.B., Tuberculosis Specialist, Hong Kong; E. W. K. Kredel, M.D., M.P.H. (U.S.A.), Medical Officer of Health, British Honduras; M. K. C. Lu, M.D., Thoracic Surgery Specialist, Hong Kong; G. B. Ong, M.B., F.R.C.S., Surgeon, Federation of Nigeria; B. L. C. Phillips, M.B., B.S., M.R.C.P., Medical Specialist, Hong Kong; Yee Kit Poon, M.B., B.S., F.F.A.R.C.S., Specialist in Anaesthetics, Hong Kong; H. L. Wen, M.D., M.C.P.&S., Specialist in Neurosurgery, Hong Kong; W. L. Wong, M.D., D.M.R.D., Specialist in Radiology (Diagnostic), Hong Kong; D. A. Cox, L.M.S.S.A., D. R. Crouch, M.B., B.S., S. C. Naidoo, M.B., B.S., and M. M. Hills, M.B., Ch.B., Medical Officers, Jamaica; I. A. A. de Coutere, M.B., B.S., F. W. Yates, L.M.S.S.A., and F. G. Hunter, M.B., B.S., Medical Officers, Northern Region, Nigeria; V. Clarke, M.B., Ch.B., and Officers, Northern Region, Nigeria; J. R. H. Berrie, M.B., Ch.B., and Chandy, L.M.S.S.A., D.T.M.&H., Medical Officer, British Guiana; B. E. Heine, M.B., Ch.B., D.C.H., Travelling Medical Officer, Sarawak; D. Helbert, M.D., Medical Officer, Hong Kong; L. Massiah, M.B., Ch.B., Medical Officer, Grade C (Inst.), Trinidad; J. P. Stewart, L.R.C.P.&S.I., Resident Medical Officer, Uganda; R. F. Tuckett, M.B., B.Ch., Medical Officer, Tanganyika; J. C. Whitlam, M.B., Ch.B., Medical Officer, Sarawak; G. B. Wylie, M.B., Ch.B., Medical Superintendent, Cunningham Hospital, St. Kitts, Leeward Islands; J. R. H. Berrie, M.B., Ch.B., D.P.H., D.I.H., and J. H. Gerber, M.D., Senior Medical Officers (Admin.), Northern Region, Nigeria; G. R. Benett, M.B., F.R.C.S., Assistant Surgeon, Health Department, Mauritius; Haworth, M.B., Ch.B., D.T.M.&H., D.P.H., Senior Medical Officer, Somaliland; W. L. R. Kenyon, M.B., Ch.B., M.R.C.P., Specialist Officer, Health Department, Zanzibar; J. R. M. Miller, M.B., F.R.C.S., Surgical Specialist, Kenya; P. C. Murray, M.D., M.P.H., D.I.H., Principal Medical Officer, Jamaica; M. A. Rajbally, M.D., Medical Officer, Mauritius; K. E. Schmidt, M.D., D.P.M., Specialist Alienist, Medical Department, Sarawak.

Association Notices

KATHERINE BISHOP HARMAN PRIZE

The Council of the British Medical Association is prepared to consider an award of the Katherine Bishop Harman prize in the year 1959. The value of the prize is £75. The purpose of the prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and child-bearing. It will be awarded for the best contribution (not previously published) submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the prize. Any registered medical practitioner in (a) the British Commonwealth and Empire or the Republic of Ireland and (b) any member of the British Medical Association, wherever resident, is eligible to compete.

Should the Council of the Association decide that no contribution submitted is of sufficient merit, the prize will not be awarded in 1959 but will be offered again in the year next following this decision, and in this event the money value of the prize on the occasion in question shall be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final.

Each contribution must be typewritten or printed in the English language, and must be accompanied by a detachable slip bearing the candidate's name and address. The Council anticipates that contributions should be between 3,000 and 10,000 words, although no definite limits are laid down. Preliminary notice of entry is required and a form for this purpose can be obtained from the Secretary. Essays must be forwarded so as to reach the Secretary, B.M.A. House, Tavistock Square, London, W.C.1, not later than January 31, 1959. Inquiries relative to the prize should be addressed to the Secretary.

PRIZE ESSAY COMPETITION FOR PROVISIONALLY REGISTERED PRACTITIONERS, 1959

The Council of the British Medical Association is prepared to consider the award, in 1959, of prizes to provisionally registered practitioners for essays submitted in open competition. The subject of the essay is: "To what extent are experiments on animals essential for medical progress?"

Any provisionally registered practitioner in the pre-registration year at the time of submission of the essay is eligible to compete for a prize. No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize.

If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. Should the Council decide that no essay entered is of sufficient merit, no award will be made. At least one prize of £50 is offered. In determining the number of prizes to be awarded, the Council will take into consideration the number and standard of essays received.

Essays must not exceed 5,000 words, and must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a note of the name and address of the entrant. Notice of entry for this competition is necessary and a form of application can be obtained from the undersigned.

Essays must be forwarded so as to reach the Secretary of the British Medical Association not later than January 31, 1959. Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1

OCCUPATIONAL HEALTH PRIZE

The Occupational Health Prize was established by the Association for the purpose of encouraging interest and research in the field of occupational health. The Council of the British Medical Association is prepared to consider the award of this prize, which consists of a certificate and £50, in the year 1959. Any member of the Association who is engaged in the practice of occupational health, either whole-time or part-time, is eligible to compete for the prize.

Candidates may select their own subject. Entries should be submitted in a form suitable for publication and must include personal observations and experiences collected by the candidates in the course of their work. If no entry is of sufficient merit no award will be made. Candidates should confine their attention to their own observations rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.

Entries must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than January 31, 1959. No study or essay that has been published in the medical press or elsewhere will be considered eligible for the prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A previous prizewinner is not precluded from entering. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay, the decision of the Council on any such point shall be final.

Preliminary notice of entry for this competition is required on a form of application to be obtained from the Secretary. Each entry must be typewritten or printed on one side of the paper only, and accompanied by a note of the candidate's name and address. The Council anticipates that contributions should be between 3,000 and 10,000 words, although no definite limits are laid down. Inquiries relative to the prize should be addressed to the Secretary.

D. P. STEVENSON,
Secretary.

Diary of Central Meetings

JANUARY

- 7 Wed. Dermatitis Subcommittee, Occupational Health Committee, 10 a.m.
- 7 Wed. Occupational Health Committee, 10.30 a.m.
- 8 Thurs. Executive Subcommittee, Science Committee, 10 a.m.
- 8 Thurs. Medical Members of Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
- 8 Thurs. Assistants and Young Practitioners Subcommittee (G.M.S. Committee), 2 p.m.
- 8 Thurs. Science Committee, 2 p.m.
- 9 Fri. Overseas Committee, 2 p.m.
- 14 Wed. Tuberculosis and Diseases of the Chest Group Committee, 2.15 p.m.
- 15 Thurs. G.M.S. Committee, 10.30 a.m.
- 16 Fri. Pharmaceutical Members of Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
- 20 Tues. Committee on Drug Addiction, 3 p.m.
- 30 Fri. Medical Members of Editorial Subcommittee, Joint Formulary Committee, 11 a.m.

Meetings of Branches and Divisions

CAMBRIDGE AND HUNTS BRANCH

The annual meeting was held on July 23, and the following officers were elected:

President.—Dr. S. H. Pritchard.
President-elect.—Dr. D. H. Fulton.
Vice-presidents.—Dr. J. K. Paterson and Dr. E. V. Bevan.
Honorary Secretary and Treasurer.—Dr. T. B. Anderson.

DERBY DIVISION

The following officers have been elected:

Chairman.—Dr. E. C. Dawson.
Vice-chairman.—Dr. A. W. P. Haine.
Honorary Secretary and Treasurer.—Dr. R. G. Cooke.

EAST SUFFOLK DIVISION

The following officers have been elected:

Chairman.—Dr. P. F. H. Dawney.
Vice-chairman.—Dr. I. S. Staddon.
Honorary Secretary and Treasurer.—Dr. R. A. Leader.

NORTH WALES BRANCH

The following officers have been elected:

President.—Dr. J. Forbes.
President-elect.—Dr. G. Mansell Williams.
Honorary Secretary.—Mr. A. H. Holmes.

NORTHERN COUNTIES BRANCH

The following officers have been elected:

President.—Dr. W. I. A. Fell.
President-elect.—Mr. H. Miller.
Vice-president.—Dr. C. S. Sandeman.
Joint Honorary Secretaries and Treasurers.—Dr. G. F. F. Sinclair and Dr. J. E. Tillotson.

SUPPLEMENT TO THE
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ROYAL COMMISSION ON DOCTORS' AND DENTISTS' REMUNERATION

FURTHER SCOTTISH EVIDENCE

Although the Scottish Medical Practices Committee and the Scottish Association of Executive Councils in written memoranda to the Royal Commission on Doctors' and Dentists' Remuneration considered that the maximum permitted list should be reduced, their witnesses at the Commission's public session in Edinburgh on December 12 agreed that the number a general practitioner could efficiently provide for in fact varied greatly with the individual, some of the best doctors having the maximum list. A number of questions were put on allegations of exploitation of assistants, but from statements made by members of the Commission it was evident that the commissioners appreciate that the relationship of partners is a delicate human one, and that it would be inappropriate to compel anyone to take a particular person as a partner.

SCOTTISH MEDICAL PRACTICES COMMITTEE

Oral evidence on behalf of the Scottish Medical Practices Committee was given by Dr. J. T. Baldwin, its chairman, who works in a partnership of four, Mr. A. I. Millar, a member of the Committee and former Assistant Secretary in the Department of Health for Scotland dealing with general medical services, Mr. A. B. Fairweather, an officer of the department who was formerly secretary of the Committee, and Mr. J. McCallum, its present secretary.

The Committee had been asked by the Commission whether they had formed any impression as to the quality of applicants, particularly as to any changes. On this the Committee did not feel competent to make any comments, since the selection of doctors to succeed to vacant practices in Scotland was a matter for executive councils and it was only when an appeal was made that they were required to consider the merits of any applicants. "It can be stated, however," the memorandum of evidence added, "that generally the doctor selected by the executive council is well qualified and has had good experience both in hospital and in general practice."

Sir HUGH WATSON asked: "What is the Committee's view of the value of hospital experience in general practice?" Dr. BALDWIN, who explained that he was also a member of an executive council and of a local medical committee, replied: "We attach a considerable amount of value to it." They felt that as well as the compulsory pre-registration year in medical and surgical house appointments, it would probably be even better if the doctor had more hospital

experience. "On the other hand, we feel he could have too much hospital experience before entering general practice," Dr. Baldwin explained that too narrow a specialization, such as in neurosurgery or thoracic surgery, would not help, but an additional appointment in obstetrics would be of value. Commented Sir HUGH: "I think we have had exactly the same expression of opinion elsewhere."

Hospital Experience "Undervalued"?

"Would your experience as a member of an executive council lead you to suppose that executive councils undervalue hospital experience?" asked Sir HUGH. "I do not think they do," answered Dr. BALDWIN. "We have had a lot of evidence to the effect that it is difficult to go from one branch of the profession to the other, except in the very initial stages," explained Sir HUGH. "You accept that that is the position?" Dr. BALDWIN did—and that having once obtained a post in general practice it was difficult to obtain another one. "We have had evidence that there is a certain rigidity almost as between the two branches of the profession," Sir HUGH went on. Dr. BALDWIN thought there was too much rigidity.

"How would you suggest it could be improved?" Sir HUGH wanted to know. Dr. BALDWIN replied: "One thing which would be of advantage would be if general practitioners had opportunities to take hospital appointments as clinical assistants, where they would have the opportunity of working with consultants in order to obtain experience which would enable them to take additional qualifications."

The Chairman of the Commission, Sir HARRY PILKINGTON, asked whether there were any factors of remuneration that made it difficult to pass from one branch of the profession to the other. Dr. BALDWIN said there was no theoretical reason why a general practitioner should not undertake an appointment in hospital and still act as a general practitioner, but he had no knowledge of it working in the opposite direction. The CHAIRMAN asked: "Are the levels of remuneration near enough in the two branches not to be a great deterrent to move?" Dr. BALDWIN said he was not competent to give an opinion.

Trainers and Trainees

The procedure for choosing trainers under the trainee scheme in general practice is different in Scotland from that in England and Wales, Dr. BALDWIN told Sir HUGH WATSON. In each Scottish National Health Service Region there was appointed a committee to select trainer practitioners. In

the South-east Region this consisted of a lay chairman and members who were general practitioners appointed by the Secretary of State for Scotland but nominated by local medical committees and representatives of consultants. It met twice every year. A memorandum had been prepared which laid down the criteria which the committee used in considering whether a doctor should be a trainer. Broadly speaking, it was if he had a practice of a size large enough to enable him to devote time to training the trainee assistant—up to 2,500 in an urban practice and 2,000 in a rural one. "Each applicant, I can safely say, is known to several members of the committee personally," added Dr. Baldwin. Valuable help was also obtained from the consultants, who were very well aware of his competence.

It was the practice in the S.E. Region, and he believed in other Scottish regions, that after a period of four or five years it was considered that a trainer should have a rest from training. In any case, a trainer was not appointed for several years in succession if there were others who were capable. The CHAIRMAN: "Is it a mark of being rather a good doctor to be chosen as a trainer?" Dr. BALDWIN agreed that it was.

Dr. Baldwin said that in his practice a partner was a trainer. "We have found it stimulating to us to be trainers. We learned a lot from the trainees, and I understand they learned something from us." He added that when there came their turn not to be trainers they found that they were in fact less busy than when the trainee was there.

Difficulty in Getting Trainees

To Sir HUGH's question: "Is the scheme largely taken advantage of?" Dr. BALDWIN replied that in the S.E. Region there were almost more applicants to be trainers than there were vacancies. But the scheme was not used as much by potential general practitioners as one would have thought. It was well known that there had been difficulty in getting trainees over the last year or two; this was more evident in some parts of the country than in others.

"Do you think the scheme is a good scheme?" asked Sir HUGH. "I do indeed," replied Dr. BALDWIN. There was no doubt in his mind that the standard of work which the assistant found influenced his professional practice throughout his life.

Mrs. K. M. C. BAXTER, a commissioner, pointed out that entering general practice as a trainee assistant ensured that a young man had experience of at least two practices. Dr. BALDWIN told her that at the end of his training an assistant would not get a practice right away. Some thought that they would like to undertake a period of assistantship after their trainee assistantship; others felt a lack and went back to hospital for six months or so. He told of an able man who wanted to practise in the Edinburgh area and had difficulty in obtaining a partnership. Another, who was prepared to go anywhere, obtained an appointment in a North of England industrial practice very soon.

Setting Up in Single-handed Practice

The number of new single-handed practices set up in Scotland has declined, particularly since 1952, Mr. FAIRWEATHER told the Commission. It was pointed out that there was no information as to the number of doctors who before the Health Service set up new single-handed practices.

Areas in Scotland which, in England, would be designated areas are very few. (The memorandum of evidence, stating that the Committee had never deemed it necessary or expedient to "close" particular areas as the English Medical Practices Committee had done, explained: "They have taken the view that every application to enter an area should be individually considered by them, in the light of its own circumstances, and of the conditions prevailing in the area at the time the application is made.") There were very few areas which the Committee considered

to be adequately doctored, but the witnesses pointed out that there was a difference between this and one which was much under-doctored. Figures showed that, generally speaking, the likelihood of a doctor who "put up his plate" being able to build up a practice in three years that would enable him to earn a living in an already developed area (compared with a developing area) was remote. "The average person is not prepared to change his or her doctor." A graph was produced which showed that applications for single-handed practices never rose to more than about 10 in a year, and in 1953 the applications to practise in partnership rose to nearly 60, although generally it appeared that such applications ran at the rate of about 25 to 30 a year.

Dr. BALDWIN gave his personal opinion that the initial practice allowance was sufficient only in those cases where the practitioner was entering a newly developing area. In order to achieve its purpose in other areas it needed to taper off much more slowly. The third-year allowance was very meagre if the doctor had not got many patients.

Each application was considered on its merits. As well as the average number of persons per doctor, other considerations taken into account in determining whether a particular area should attract one or more initial practice allowances were such factors as the type of practice (that a woman's practice should be maintained in that area, for instance), age of doctors, size and geography of district, total population, and distances to be travelled by doctors. "Not many are refused," said Dr. Baldwin.

Exploiting Assistants?

"We have had some suggestion," said Sir HUGH, "without anything very definite put before us, that in some quarters there is a tendency to exploit assistants. Naturally that evidence has come mostly from the assistants' side of the profession. You do sometimes refuse permission for the employment of an assistant? "Very rarely," answered Dr. BALDWIN. "It has not been done since I have been chairman of the Committee."

On what grounds would an application be rejected? Mr. MILLAR said a reason why executive councils refused consent to the employment of an assistant often was that they thought the practitioner should have another partner, rather than an assistant, so they tried to exercise pressure on him to take in a partner. "Of course it is difficult," said Mr. MILLAR, "since we have no power to force him to take a partner. If he refuses he is left with no assistance, and that is not so good for the patients. One has to take the interests of the patients into account, and if one is going to be swayed by that aspect, one gives consent to the employment of an assistant as being better than nothing."

Sir HUGH: "What you are saying is that there are quite a number of cases in which the executive council think a practitioner should not have an assistant but a full partner, which would almost confirm the view that assistants, if not exploited, are made use of in circumstances in which they should not be made use of?" Mr. MILLAR: "Yes, I should think that is a correct statement of what the executive council feels in the matter." Dr. BALDWIN: "My personal view is that if the doctor thinks he should employ an assistant and is prepared to pay his salary out of his own pocket, there is no reason why we should intervene."

Pointing out that there was no scale laid down for assistants, Sir HUGH asked: "Do you think that, circumstances being as they are, there is any reason to suppose that there ought to be such a scale laid down, or does the market find its own level?" Generally speaking, the market found its own level, thought Dr. BALDWIN. The scale for the trainee assistant, which was laid down, acted as a guide, the salary for the assistant being at a rather higher level. "Generally speaking, I think the assistant's salary is fair, at least in the initial stage," Dr. Baldwin said. There should always be a place for an assistant in general practice. It had been recognized for a long time that the best way to get into general practice was to become an assistant with a view.

Mr. J. H. GUNLAKE, who is an actuary, said that the relationship of partner and partner was a human one, and that a person who was acceptable as an assistant was not necessarily acceptable as a partner. Dr. BALDWIN agreed with the commissioner. There were single-handed practitioners who did not wish to have partners, and there were assistants who were content to be assistants, although there were not many of these.

Partnership Agreements

"One has seen agreements which are quite shocking," said Dr. BALDWIN, in the course of answers about the question of fair partnership agreements. He agreed, however, that the practice of going into partnership was now becoming more general, and that by and large doctors were becoming accustomed to the adjustment of reasonable partnership agreements. "It would be to the advantage of junior partners, on the whole, if all agreements were submitted to us." On this the memorandum stated that the probable result of the Committee having power to see all proposed partnership deeds and to grant or refuse certificates in respect of them (which the Committee believed would be an advantage) would be that "in more partnerships than at present the interests of the junior partner would be adequately safeguarded." Of the 85 proposed agreements submitted to the Committee during the five years to June 30, 1958, many received a certificate without question; others received a certificate after certain matters prejudicial to the junior partner had been altered; in the remainder certificates were refused.

Mr. MILLAR pointed out that the statutory provision for the submission of agreements was not to protect the junior partner but to protect the senior partner from being charged with an offence under the Act in regard to the sale of goodwill, "and it might be thought a little illogical to force our services on people who thought they could quite well get on without them." On the other hand, if it was thought a good thing that the junior partner should be protected, it should be stated. It might be arranged that an agreement could not be legal unless submitted. Dr. BALDWIN agreed that the advantage to the junior partner under the present arrangement was incidental, "but we have intervened to prevent an agreement contravening the Act, and by so doing it has been to the advantage of the junior partner."

"When your committee considers the number of doctors in an area and whether it is under-doctored, what information do you have about the private commitments of doctors outside the National Health Service?" asked Sir HUGH. Dr. BALDWIN said there was a column in the form on which executive councils reported to the Committee which asked for hospital and other commitments. In many executive council reports this was left blank. The Committee did not really know what other commitments general practitioners had and therefore paid no attention to it, because such information as they had was not reliable. "It is extremely difficult to obtain this information, I may say," commented Dr. Baldwin.

Size of Lists

Sir HUGH then turned to that part of the memorandum of evidence which he described as "somewhat controversial," that in which the Committee dealt with the size of the maximum permitted list.

"The Committee do not regard the present permitted maximum of 3,500 patients as any proper indication of the number who can be adequately served—with justice to both patient and doctor," it stated. "Even in compact industrial areas such a large commitment represents too heavy a burden. The Committee would stress that a reduction to a lower figure should be regarded as a step which must be taken (a) if a satisfactory standard of service is to be provided by practitioners and (b) if the medical profession is to be allowed a reasonable amount of leisure. . . . At present, the Committee consider as under-doctored any area where the average number of patients is over 2,500, or 2,000 in

areas where other commitments are large, or where a large amount of travelling is undertaken. This leads to the conclusion that the present maximum of 3,500 patients for an individual practice is too high—in any type of area whatsoever."

Sir HUGH: "It is very difficult to be dogmatic about the size of list?" Dr. BALDWIN: "Yes." Sir HUGH: "Is the position that so much depends on the ability, the personality, and the methods of the doctor himself, and naturally on the area, that it is almost impossible to generalize?" Dr. BALDWIN: "I think it probably is." One practitioner with 2,000 patients had asked for an assistant. Another with a list of 3,500 was recognized as having one of the best-organized practices.

Asked about the inducement payments to practise in remote areas, Dr. BALDWIN thought the arrangement was working extremely well indeed. There were 47 inducement payments in Scotland under the National Health Service, and there was no doubt that in many areas there would be no general practitioner were it not for these inducement payments.

Practice Expenses Exceed Income

The Committee asked the Secretary of State to make an inducement payment if it was necessary for a practice to be maintained and where, because of the small number of available patients, it would be impossible to do so without such a payment. Dr. Baldwin mentioned a practice the expenses of which exceeded the income; it was therefore necessary for a substantial sum to be given in order to enable the doctor to live at all. This was one of the Scottish islands on which there must be a doctor and where there were only 170 patients on the list.

The CHAIRMAN asked whether a particular net figure was aimed at? Dr. BALDWIN said it was difficult to justify a substantial amount when a man had only about 200 patients, but the figure of £1,600 was regarded as a net income which it was desirable to achieve. He agreed that in the case of the doctor whose expenditure was greater than his income he would have to be paid more than £1,600; it was an exceptional case.

The CHAIRMAN: "As a system, you have no alterations to suggest so far as remuneration is concerned?" Dr. BALDWIN: "No. So far as I am aware, it is working very well."

SCOTTISH ASSOCIATION OF EXECUTIVE COUNCILS

For the Scottish Association of Executive Councils, whose memorandum, the CHAIRMAN stated, contained a great deal of factual information and figures "and in some cases information we have not otherwise obtained," there appeared Dr. J. M. C. Gill, president of the association and vice-chairman of Aberdeen and Kincardine Executive Council (who works in a partnership of three), Colonel R. S. Weir, vice-president of the association, Mr. T. Hunter, former president, and Mr. A. R. Howie, secretary of the association.

Dr. GILL said the association thought the scheme for initial practice allowances had been successful. "We did think that perhaps the allowances would be a little more generous and perhaps last a little longer than three years," he added. The association had not considered the suggestion made by the witnesses for the Scottish Medical Practices Committee that the allowances should taper off over a longer period.

Single-handed Practice and Partnerships

The association's information about doctors setting up in practice on their own was largely based on the report of the Scottish Medical Practices Committee. Sir HUGH WATSON: "We gather that the average number entering practice in that way is about 10 in Scotland each year. Would you expect that number to be much improved?" Dr. GILL: "We had not considered that, and I really do not know. I

think that would be a fairly good average." The CHAIRMAN: "What do you have in your own district?" Dr. GILL: "Practically no doctors start up on their own in the north-east area." The CHAIRMAN: "Is that because you do not have new towns and rapidly developing suburbs?" Dr. GILL: "That has a lot to do with it, and also in the north-east the average lists are lower."

The association's memorandum, pointing out that, with almost 100% of the population already on doctors' lists, the new doctor must attract patients from his established colleagues, added: "The more ethical his approach, the more difficult his task tends to be."

Mr. A. R. HOWIE said that Dr. Baldwin, for the Scottish Medical Practices Committee, had given the same general indication. If a doctor set up his plate he simply had to wait for patients to come to him. He did not think there was anything the association would say more than was in the memorandum.

The association believed that some consideration should be given to measures to stimulate further the introduction of more "additional" partners. "This might be done," stated the memorandum, "by arranging for the payment to pre-1948 practitioners assuming additional partners of part of their compensation for loss of right to sell goodwill." Mr. GUNLAKE pointed out that that suggestion had been made officially and turned down.

The CHAIRMAN: "You have in Scotland a number of practices which, because of distances, would be difficult to run as partnerships?" Dr. GILL agreed. The CHAIRMAN then noted that if something was paid from the Central Pool as an inducement to form partnerships it was almost inevitably to some extent at the expense of the single-handed practitioner.

Did the association think that the move towards partnerships had not gone fast enough? No, replied Dr. GILL. Figures showed that the movement had gone fast; but the association thought partnership was a good method of doctors helping each other and therefore of improving the service to the public, and so should be encouraged. Mr. HOWIE mentioned that before the Health Service came in the reduction of income following the taking on of a partner was offset by the increase in capital.

Decrease in Advertised Vacancies

At the beginning of the National Health Service, stated the memorandum, it was generally believed that succession to an advertised vacancy would be the most usual means of entry into general practice. With the growth of partnership practice and existing arrangements for the filling of partnership vacancies by consulting with the remaining partners, the number of advertised vacancies was small and apparently would be smaller in the years ahead. What was not contemplated at the beginning of the Service, explained Mr. HOWIE, was that there would be so many partnerships. Dr. GILL thought it a good thing. So far as a partnership was concerned it would be very difficult to practise amicably with someone thrust on one. The CHAIRMAN indicated that both Mr. Gunlake and Sir Hugh Watson, who had partnerships in other professions, would think it essential that a partner should be acceptable.

Supervision of agreements had caused a division of opinion in the association, Mr. HUNTER stated. Certain members thought it would be a good thing; others thought it should be left to the parties themselves to make their arrangements—"that we must assume that the agreement would be a fair agreement."

Employment of Assistants

The association wanted stricter control over the employment of assistants other than trainees introduced. The additional number of patients permitted to a doctor employing an assistant should be considerably limited so as to reduce the possibility of an assistant being employed

solely for the purpose of permitting a large increase of the principal's list. On the other hand, the employment of assistants in approved cases should be facilitated, and consideration might be given to the possibility of providing that the appointment of an assistant should not decrease the amount of the principal's income as calculated for superannuation purposes.

So far as the employment of assistants for a considerable number of years was concerned, the association felt that there might be practices of such a size that they could afford an assistant and not be sufficient to pay two principals.

Commenting on the figures given by the association of sums paid to assistants—which showed that of 221 assistants, 149 were being paid £750-£1,000 a year—Sir HUGH WATSON asked: "Have you any reason to believe that there is anything unfair about the present remuneration of assistants to general practitioners?" "I do not think we have," replied Dr. GILL. Sir HUGH: "On the whole you think that assistants are reasonably well paid?" Dr. GILL: "Yes, I think they are." The CHAIRMAN commented that the average remuneration shown from the appendix to the association's memorandum was less than that stated by the British Medical Association, but Sir HUGH WATSON said that all the B.M.A. was able to tell the Commission was the result of a review of figures in advertisements. The Scottish Association of Executive Councils, in their memorandum, set out a classification of applicants for advertised medical vacancies for the three years to March 31, 1958, classified by completed years since graduation and post held at the time of application.

"Trainer" Practitioner

The arrangements under which practitioners are recognized as "trainer" practitioners were approved in principle, "but there is probably a case for a detailed inquiry as to whether these arrangements are serving the purpose for which they were introduced." And "in order to prevent any abuse," the association was of opinion that it might be desirable to provide that the recognition of a principal as a trainer should not be continued for a period of more than two years without a break, unless it appeared that there was no other suitable trainer available.

Dr. GILL, amplifying this, said the association felt that if a practitioner had a trainee assistant he geared up his work to working with an assistant, and it might be that, if he went longer than two years, when the break came he found it difficult to adjust himself to working single-handed.

"Why does a doctor apply to have a trainee?" the CHAIRMAN asked these witnesses, as he had those from the Scottish Medical Practices Committee. Dr. GILL said there was the trainee grant, and the fact that he had a trainee allowed him a little more leisure. "Also having a trainee is a very stimulating experience—I had a trainee myself for a year, and I found it very good experience for myself as well as for the trainee."

The memorandum of the association, after stating that the association was not directly concerned with rates of remuneration, which should be determined by appropriate negotiating machinery, went on to express the opinion that there were obvious doubts as to the fairness of the present system of remuneration by capitation payments. "It is a convenient method but difficult to defend, as there is no direct relationship between remuneration paid and the standard of professional work."

"Merit Awards" for General Practice

The association would not object to a different system "if some means could be found of recognizing special skill and experience." But as there appeared to be no yardstick with which to measure the skill of a doctor in diagnosis and treatment the association could not suggest a method.

There had been discussion, Dr. GILL reported, on merit

awards, and loading the capitation rates for very old and very young patients, but the association had not devised any system of this sort. It believed that there should be some financial incentive to improved services by the provision of special premises and the employment of nurses or ancillary staff. "At present the doctor with the largest list and the lowest expenses gains most," the memorandum declared.

Sir HUGH: "At the moment, putting it quite crudely, the present system in regard to expenses is an incentive to the doctor with the large list to spend less on expenses, as a result of which he gets his remuneration largely net?" Dr. GILL: "We did think there was something to be said for paying practice expenses separately." What they had in mind was the removal of the present disincentive to expenditure.

The CHAIRMAN asked whether the experience was that the doctor who skimmed on expenses, providing the minimum, lost patients to those with better standards. Mr. HOWIE said: "When one doctor improves his surgery, the others fairly soon follow on." Even really adequate clerical assistance would seem to enhance the actual medical service which a doctor gave.

Desirable Size of List

The desirable size of a list of a single-handed practitioner in an urban area, in the association's opinion, was in the region of 2,000/2,500 and in a rural area 1,500/2,000. Dr. GILL agreed that there was great variation in what a doctor could do. He knew one with an existing maximum list who was known to be first-class; on the other hand, he had a doctor with a list of only 1,300 phoning to say he did not know how he was going to get through his work. There were so many variable factors that it was impossible to lay down a hard-and-fast rule. The CHAIRMAN asked whether the man to whom Dr. Gill had first referred should be compelled to take a thousand less patients than now. Dr. GILL: "That was the view of the association." Mr. HOWIE: "At the moment they have a maximum, and if a maximum is to remain there will be hard cases."

Returning to the question of merit awards, Sir HUGH WATSON asked: "Is it possible, in your view, to evolve a system of merit awards?" The association had not been able to think of any one at all. "Whatever the solution might be," said Mr. HOWIE, "it was quite clear that there was general and quite strong objection against merit awards as these at present operated in the hospital service. The objection seems to be lack of information and a feeling that it might not operate equitably."

Load of Work on General Practitioners

The load of work falling on general practitioners has considerably increased since the National Health Service, stated the association. It was thought that in rural areas the load was probably almost double, and in urban areas, despite readier access to hospital facilities, the increased load was almost as great. Some of the work falling on practitioners might be done by qualified almoners or social workers, and generally a closer co-operation between the medical and social services might be desirable.

The statement about the increased load was described by Sir HUGH WATSON as "the most forthright expression of opinion we have had on this matter." "We have no actual figures," admitted Dr. GILL, "but that was the impression of our constituent councils." Mr. HOWIE said that they had made many unsuccessful attempts to get comparable figures for pre-Health Service days. "It would seem we possibly erred in expressing the opinion that the load of work had almost doubled," continued Mr. Howie. "It now seems that there is little change in the number of items of service that a doctor gives to his National Health Service patients to-day as compared with his panel patient." There had been an increase, which was substantial, in regard to those who prior to 1948 were dependants of insured persons. Dr. GILL

spoke of the increased work which had resulted from the development of scientific medicine. Patients who formerly would have been sent off to hospital were now treated at home. The antenatal work was greater, and nowadays, so far as items of service were concerned, there was a greater responsibility attached to the doctor.

Sir HUGH WATSON, saying he was thinking aloud ("which perhaps I should not"), wondered whether that increased responsibility might be appropriately remunerated on an item-of-service payment. "Yes," agreed Dr. GILL. "I think that would be a good idea."

Prolonged Hospital Experience "Undesirable"

Discussing the relationship between medical practice in hospitals and general practice, the association stated that a minimum of one year's hospital experience was desirable and that hospital midwifery experience was of particular importance. "When considering applications (for vacancies in general practice), care has to be taken to find out what kind of work the applicant has been doing in hospital. Prolonged hospital experience is probably not desirable. After one or two years as a house-surgeon or house-physician, hospital experience tends to become too specialized and less valuable than experience in general practice itself."

Dr. GILL said that in Aberdeen the house-surgeon for malignant diseases also looked after the dental patients and the skin patients: he was explaining that after the pre-registration posts it was possible perhaps for a doctor to look after several of the smaller specialties, and thus broaden his experience.

The association strongly commended the scheme for combined training in general practice and hospital work introduced in Scotland in 1956. It did not seem to have received the support it deserved, but Dr. GILL thought it a good idea, which was working very successfully in Inverness.

Inducement payments were essential, the witnesses thought. The association had not considered whether they were sufficient, because executive councils merely passed over the inducement payment which had been arranged by the local medical committees with the Department of Health.

More Patients with Assistance

The association in written evidence asserted that the permitted increase in a doctor's list in respect of the employment of an assistant should be in the region of 1,000 patients. "I take it that when a doctor first has an assistant he does not immediately get the full list—it takes some years to work up?" queried the CHAIRMAN. Dr. GILL agreed. The CHAIRMAN: "If the maximum he can have is 1,000 you realize that the maximum he can get will probably be just about what he pays out. Would any doctor take an assistant on this basis?" Dr. GILL thought he would, "because it enables him to practise better medicine and take time off." To look after 3,500 probably means devoting one's whole time to work. The man whom he had instanced previously started at eight in the morning and finished at nine at night. It was his sole interest and only hobby. Not all were so hard-working.

After hearing the witnesses from the Scottish Medical Practices Committee and the Association of Executive Councils in Scotland, the Royal Commission went into closed session to hear evidence from the Scottish regional board chairman and senior administrative medical officers.

The Midland Branch of the B.M.A. gave, as is its custom, a luncheon for newly qualified graduates on December 6. Dr. F. E. Gould, president of the Branch, was in the chair, and 18 graduates attended. Dr. L. S. Potter, assistant secretary of the Association, gave a short talk on the functions of the B.M.A. A similar function was held on June 23, and was attended by about 80 graduates, who heard an address by Dr. D. P. Stevenson.

British Medical Association

PROCEEDINGS OF COUNCIL

A.I.D. was again discussed by the Association's Council at its meeting on December 17, when the Chairman of the Science Committee reported on the evidence so far obtained by his committee. The matter of drugs for private patients was taken a stage further. The Council decided to ask the Minister of Transport to meet a Council deputation for a full discussion on the parking problems of practising doctors and on ways and means of overcoming them.

Still a "Difficult Problem"

At the suggestion of the CHAIRMAN, Council deferred again consideration of the A.R.M. resolution that in future negotiations on terms of service within the National Health Service the B.M.A. should take the lead in forming a single negotiating body for the whole profession. "The general feeling among those I have spoken to is that if such a committee could be formed it should be very small, and I think it may be possible to reconsider the matter in January," said Dr. Wand.

Charing Cross Hospital

Dr. F. GRAY, reporting on the conference held under the chairmanship of the Chairman of Council to discuss the proposed transfer of Charing Cross Hospital and Medical School to Fulham, said that the representatives of Charing Cross Hospital, the London Local Medical Committee, and the Chelsea and Fulham, Kensington and Hammersmith, and Westminster and Holborn Divisions of the Association were united against the proposals put forward by the Ministry. The Ministry representative gave an assurance that before any firm decisions regarding the new Charing Cross Hospital were reached a further opportunity for the bodies represented at the conference to discuss the matter would be given. He hoped that the necessary information would be available for such a conference to be arranged in the early part of 1959. He gave an undertaking to discuss the position in the Charing Cross area at the appropriate time.

Southampton Meeting

The CHAIRMAN OF COUNCIL said that a great deal of the credit for the success of the Southampton Clinical Meeting redounded to Dr. R. G. Gibson. Dr. GIBSON, thanking the Chairman, suggested that the Council should record its thanks to Drs. R. S. Russell-Smith, R. P. W. Shackleton, and J. G. McDowell, who pioneered the clinical meeting. He also added a warm word of praise to the Deputy Secretary, Dr. Walter Hedgcock, for his unremitting efforts to make the meeting a success. It was planned to have clinical meetings at Norwich in October, 1959, at Canterbury in April, 1961, and at Sheffield in July, 1961.

Money Matters

Following legal advice, the Council authorized an application to the Commissioners of Inland Revenue for relief from tax in respect of the membership subscriptions of persons assessed under Schedule E, in accordance with the Finance Act, 1958.

The Capital Issues Committee, the Treasurer informed the Council, has again refused to authorize the arrangements which the Association had made with an insurance company to finance the new building programme. The Committee refused the Association's request for an interview nor would it give its reasons. But the Estates Committee was informed that it was possible to borrow money to the extent of

£50,000 without the consent of the Capital Issues Committee, and this avenue was being explored.

Morbidity Statistics

The G.M.S. Committee recommended that the Association should not participate in a project suggested by the National Disease and Therapeutic Index, U.S.A. Dr. A. B. DAVIES, the Committee Chairman, explaining that it involved recording, on a special form, details of all patients seen during a 48-hour period once a quarter, pointed out the work which would be entailed and the difficulty if, for instance, it coincided with an influenza outbreak. The Committee was also influenced by the great volume of work already done in this field by the College of General Practitioners.

Mr. J. R. NICHOLSON-LAILEY suggested deferring a decision on the recommendation until the chairmen of the G.M.S. Committee and the C.C. and S. Committee had discussed the matter. Dr. GIBSON supported this. Dr. J. G. M. HAMILTON thought, reading between the lines of the far from clear memorandum from the American organization, that the object of the exercise was to provide the American pharmaceutical industry with statistics of morbidity in this country. Dr. I. D. GRANT suggested reference to the liaison committee with the College of General Practitioners.

Dr. DAVIES said he would be happy to consult with the chairman of the C.C. and S. Committee and see if some agreement could be achieved. He was equally sure that the G.M.S. Committee would be willing for this to go to the liaison committee with the College of General Practitioners. It was agreed further consultations should take place along those lines.

A.I.D.

Mr. NICHOLSON-LAILEY reported on the evidence already considered by the Science Committee on artificial insemination by donor, including the oral evidence of two practitioners of A.I.D. The Committee proposes to meet again in January. Meanwhile the Committee recommended "that the Association do submit evidence to the Departmental Committee on Artificial Insemination within the terms of the resolution of the Annual Representative Meeting, 1958, and that the Science Committee be authorized to continue to hear evidence and to prepare a memorandum of evidence." (The A.R.M., while making no pronouncement on the non-medical aspects of A.I.D., authorized Council to submit evidence "from the medical point of view.") After the CHAIRMAN had pointed out that what Council had wanted was to have the evidence before they decided whether to submit it or not, Mr. Nicholson-Lailey withdrew the first part of his Committee's recommendation, and the amended recommendation was approved.

Dr. S. F. LOGAN DAHNE moved a rider that the Science Committee should consider the ethical, moral, and medico-legal evidence. The CHAIRMAN said he could see that "ethical" and "medico-legal" came within the terms of the A.R.M. resolution, but he thought "moral" was something which the Representative Body wanted left alone. Dr. DAHNE explained that the purpose of his resolution was that the Council should have all the relevant evidence, and not simply the purely scientific or medical. "If we are going to decide to give evidence it must be based on all the evidence we can obtain from the profession, even if some of it comes in the form of a minority report, although I am doubtful whether the doctors who object on moral, ethical, and religious grounds are in a minority—I think they are in the majority," said Dr. Dahne. "Despite this being a

medical question it does bear on the law, and the law does bear on our patients, and we as doctors must give medico-legal evidence. I know the lawyers are in a turmoil over this."

Dr. A. V. RUSSELL supported the rider. In any inquiry, examination should be made of the ethical, the psychological, and the legal aspects. The mere fact that among practitioners who performed A.I.D. some appeared to make strenuous efforts to preserve secrecy seemed to indicate that they were not altogether happy in their own minds. One of the most important of the psychological effects was that upon the impotent husband. He could imagine that circumstances might arise in which A.I.D. might not only wreck the marriage but wreck the man's mentality.

Mr. NICHOLSON-LAILEY said his committee had already had regard to the medico-legal aspect and was prepared to discuss the ethical, but if the moral was added it would take a long time.

Dr. GRAY pointed out that it would also be a specific alteration from the decision of the A.R.M., which had been carefully considered.

On a vote, Dr. Logan Dahne's rider was lost.

The CHAIRMAN said he took it from the debate that the vote did not mean that the Science Committee must not have regard to the ethical and medico-legal aspects.

There was a resolution before Council in which the Executive Committee of the Liverpool Division asked Council to submit any proposed evidence to Divisions for information. Dr. J. A. L. VAUGHAN JONES, commenting on the fact that this resolution, like that from Liverpool taken at the previous meeting of Council, had come from the Executive, suggested that in a matter of this importance there should be a meeting of the Division. Dr. A. TALBOT ROGERS: "A very valid comment."

Drugs for Private Patients

From the Private Practice Committee came recommendations on drugs for private patients. Dr. I. M. JONES, the Chairman, recalled that discussions between the Association and officials of the Ministry, begun following the statement of Mr. Turton, the then Minister of Health, in 1956, had been to find whether a scheme was administratively possible whereby private patients could obtain drugs under the National Health Service, having regard to the disciplinary procedure on prescribing. When representatives of Council and officials of the Ministry met in October, the latter conceded all the points in the Association's memorandum save one. Indeed, the greater part of the discussion centred round the demand of the Ministry that they should be able to maintain a list of private patients authorized to obtain drugs. It was pointed out to the Ministry representatives that registration would be anathema to private patients and that the administrative cost of maintaining the list would far outweigh any advantage. The Ministry, however, remained adamant. The Subcommittee of the Private Practices Committee composed mainly of practitioners engaged solely in private practice, although supporting the view taken about registration, agreed to the Association's delegation accepting the terms if necessary; this had been endorsed by the Private Practice Committee.

"We believe that it would be to our advantage to concede this point in so far as we agree to the maintenance of a list of private patients authorized to obtain drugs," said Dr. Jones. "If we were to refuse to meet the Ministry on this point, they would be able to put all the blame on us for a failure to implement a scheme for drugs for private patients."

On the recommendation of the Committee the Council decided to accept the Ministry's condition that those private patients authorized to receive drugs and appliances on N.H.S. terms be listed by executive councils. Agreement having thus been reached that a scheme for supplying private patients on E.C.10s was administratively possible, it was further resolved that the Council would welcome an early opportunity to discuss with the Minister the introduction of the necessary legislation. The Chairman of Council, the

chairmen of the Private Practice and G.M.S. Committees, and Dr. L. W. Batten were appointed to be the representatives at the meeting with the Minister and in any subsequent discussions with his officers.

Another recommendation from the Private Practice Committee, which was passed, again requested the Minister of Transport to meet a Council deputation for a full discussion on the parking problems of practising doctors and on ways and means of overcoming them.

Autonomous Bodies: New Proposal

The Professional Co-ordination Committee has no doubt that effective co-ordination was hampered by duplication of discussion in numerous standing and special committees. The Committee did not propose that there should be any change in the present procedure whereby the Liaison Committee of the C.C. and S., G.M.S., and Public Health Committees reported back to the three parent committees. But to avoid the unnecessary establishment of special committees the Committee recommended, and Council agreed, that standing committees be empowered to co-opt additional members to consider matters which would otherwise have been referred to a specially constituted committee. The Committee also made a recommendation in regard to the autonomous committees, where, the report said, "duplication of discussion may be a real handicap to progress and an embarrassment to leaders of the profession at times when speed of action is important." The proposal was that it be referred to the Organization Committee to "examine the possibility of defining the circumstances in which the Representative Body should debate matters within the province of the autonomous committees."

"We have always been a little reluctant to grasp this nettle," said Dr. WAND, as chairman of the Professional Co-ordination Committee, "but we feel the time has come when we must do so." The Organization Committee should be asked to see whether it was possible to avoid spending so much time in the Representative Body discussing minor domestic matters affecting the autonomous bodies.

Dr. VAUGHAN JONES felt the recommendation to be "a thin end of a very dangerous wedge." Doubts about the autonomous bodies had increased through the years, and it had been said that they were tending to become separate organizations subject to the jurisdiction of nobody but themselves and certainly not to the jurisdiction of Council. Anything which limited the extent to which the Representative Body, as the parliament of the profession, had control gave more autonomy to the autonomous bodies and less authority to the Representative Body.

Supporting the recommendation, Dr. GRAY asked whether anything could be more cautious. Dr. A. V. RUSSELL said the autonomous bodies worked well in their present sphere, but it should never be forgotten that the Representative Body was, and should remain, the policy-making body of the Association. "Diarchy is always said to be dangerous," declared Dr. LOGAN DAHNE. "Triarchy would be three times as dangerous."

Dr. WAND replied that the whole point was that there were the autonomous bodies and there was overlapping, which could be dangerous. "What we are trying to do is to flatten out the thick end of the wedge," he said. "The thin end of the wedge is already in." The Committee thought that the time had come to face squarely up to this problem.

The recommendation was carried.

Having reported on the main object of its terms of reference, the Committee on Professional Co-ordination considered that the implementation of its recommendations, and the consideration of any outstanding matters should be referred to the Organization Committee. Council agreed.

Remuneration of University Teachers

The Council left to the Chairman of Council and the Chairman of the C.C. and S. Committee the appointment of a deputation which the University Grants Committee, the Vice-Chancellors' Committee, and the Medical Research Council are to be asked to receive to discuss the report

on the remuneration of whole-time medical teachers and research workers. The Council approved changes recommended for the qualification for membership of the Venereologists Group.

Following the approval of the reconstitution of the C.C. and S. Committee to include representatives from the Royal Colleges and Scottish Corporations, these bodies were invited to appoint members. The Royal Faculty of Physicians and Surgeons of Glasgow and the Royal College of Physicians of Edinburgh were doing so. But the London colleges and the Royal College of Obstetricians and Gynaecologists had declined, on the grounds that membership of the Joint Consultants Committee was adequate.

In Brief

The Council agreed that a deputation jointly with the Trades Union Council should ask to see the Prime Minister to ask the Government to accept responsibility for establishing an occupational hygiene laboratory service as part of a comprehensive health service.

Out of the employee's 9s. 11d. a week for his insurance stamp, 1s. 10d. goes towards the cost of the National Health Service. But Council agreed with its Public Relations Committee that a poster or leaflet campaign to publicize the proportion going to the Health Service was impracticable at the moment. The matter is to be kept under review.

Some results of research on the relation of alcohol to road accidents are now available, and the Alcohol and Road Accidents Committee is revising the Association's report on the subject of alcohol and accidents published in 1935.

The following are the results of the B.M.A. Film Competition, 1958: First prize in the non-commercial category: "The Treatment of Cardiac Arrest"—medical authority, Sir Russell Brock; production authority, Department of Medical Illustration, Guy's Hospital Medical School. First prize in the commercial category: "The Management of Twins in Pregnancy and Labour"—medical authority Professor W. C. W. Nixon and Mr. W. G. MacGregor; production authority, Wellcome Film Unit.

The Central Ethical Committee disapproved of a gummed "Prevent Polio by Immunization" label sent to doctors by Middlesex County Council with a request that it be displayed on their cars, because it might imply that a doctor displaying the label had a special interest in polio.

Australia and New Zealand have issued revised instructions to migrants on the fees which they may expect to pay for medical examination in this country. These come into force as from January 1, 1959.

The Central Consultants and Specialists Committee has proposed to the Joint Consultants Committee that hospital boards should maintain a register of doctors available to undertake locum duties.

Closing the meeting, the last of 1958, the CHAIRMAN OF COUNCIL wished members "a happy Christmas, a prosperous New Year—and a good Royal Commission report."

PUBLIC HEALTH COMMITTEE

MOVE FOR SEPARATE SESSIONS DEFEATED

A proposal to split the Public Health Committee's meetings into two sessions so that matters concerning conditions of service might be discussed separately from those purely concerning public health was rejected at the meeting held on Friday, December 12.

This suggestion was contained in a letter from Dr. E. HUGHES complaining that the Committee spent a great deal of time considering the difficulties of individual medical officers, thus preventing adequate discussion of important matters in the field of preventive medicine. He claimed that the difficulty could be solved by appointing a separate day for the discussion of all matters affecting conditions of service and payment, and that possibly the members who comprised the Staff Side of Whitley Committee "C" might be suitable persons to deal with various individual problems

about salary gradings, etc., even though they might not be sitting officially as the Staff Side of that body at the time in question.

The CHAIRMAN (Dr. J. B. Tilley) said that those who put up their cases to the Public Health Committee did so in the belief that all the members of the Committee were there and not just the Staff Side of Committee C. He disagreed with the view expressed by Dr. H. D. CHALKE that longer and more frequent meetings would provide a solution.

Dr. HUGHES's proposal was rejected, but the Committee agreed to consider whether there would be any advantage in setting up a general purposes subcommittee to which such questions could be referred.

Constitution of the Committee

A full discussion was devoted to a report prepared by Dr. E. GREY-TURNER (Assistant Secretary) since the last meeting, on the subject of the reconstitution and enlargement of the Committee, including increased representation from the Society of Medical Officers of Health. As against the existing total of 25 members, Dr. Grey-Turner's proposal increased the number to 31, providing for 10 *ex-officio* members (4 chief officers, 2 public health members of Council, 4 public health members of the Representative Body); 16 appointed members (2 by the Representative Body, 2 by the Council, 8 by the Society of Medical Officers of Health, and 1 each by the Central Consultants and Specialists, the General Medical Services, the Occupational Health, and the Private Practice Committees), and 5 co-opted members. This would increase the number representing the Society of Medical Officers of Health from 2 to 8. The changes were designed to meet the three main criticisms of the constitution: (a) that it was not sufficiently democratic; (b) that too low a proportion of members were engaged in the Public Health Service; (c) that a balanced representation of all grades and categories of public health medical officers was not obtained. The new proposals, if accepted, would ensure that 20% of the membership was directly elected by those in the Public Health Service, that 70% would be engaged whole-time in that service, and that there would be ample scope for the representation of all grades and categories of public health medical officers, it was claimed in the report.

The CHAIRMAN welcomed the proposals as a better solution than he had thought it would have been possible to find.

Dr. J. KELMAN, asking for the inclusion of a specific number of Scottish members, said that the present representation from Scotland was largely a matter of chance; he thought it should be laid down that three out of the total of 31 should come from Scotland.

Dr. J. T. McCUTCHEON (Assistant Scottish Secretary) pointed out that the C.C. and S. Committee (Scotland) appointed 10 members direct to the corresponding committee in London; the G.M.S. Committee had eight members from Scotland, all of whom were *ex-officio* members of the corresponding Scottish body, but the Public Health Committee (Scotland) had not so far had any particular representation on the main body in London.

Dr. MARY ESSELMONT said that, although a Scot, it was by the purest chance that she happened to be a member of the Committee.

Concern was expressed by several members over the possibility of the increased membership including a large proportion of non-members of the Association. The fear was also expressed that the Society of Medical Officers of Health might represent too large a block in the Committee.

After the ASSISTANT SECRETARY had reminded the meeting that the Association's by-laws provided that all standing committees could include persons who were not members of the Association, Dr. W. G. HARDING expressed strong objection to the use of the term "block." It was inconceivable that there should be any "ganging-up" of non-members of the Association within the Council of the Society, he said, and the "non-membership" point was to be regarded as something of a red herring.

Dr. J. W. PICKUP said that, before approving so large an increase in the number of members from the Society, the Committee should insist on a provision that all such nominees should be members of the Association.

Dr. J. STEVENSON LOGAN said that on a matter of so much importance to the Society it was only proper that their views should be sought. The medical officers of health in the Society had felt that their impact was not large enough.

Sir SELWYN SELWYN-CLARKE said that consultation was provided for under the new agreement between the Society and the Association.

Dr. KELMAN said that one of the reasons for asking the Society to appoint members was because it was a fair and convenient method of selecting the kind of members that the Committee wanted—far better than having regional selections in different categories.

"Although the B.M.A. sometimes falls over backwards to be able to say that it is representing the interests of all doctors," he said, "there are many occasions when we have to remember that we have banded ourselves together in the B.M.A. for certain purposes. The representatives coming from the Society, in my opinion, ought all to be B.M.A. members."

The CHAIRMAN pointed out that it might be embarrassing for the Society to have to ask its nominees whether they were members of the Association.

Dr. PICKUP: "I hope it is embarrassing to them, if necessary."

After further discussion it was decided to accept the proposed figure of 31 as the maximum membership and that the Assistant Secretary should approach the Society for their views before the February meeting of the Committee, with the suggestion that, of the eight Society representatives, one should come from Scotland; that two members should be appointed by the Scottish Public Health Committee; and that to provide for this readjustment the number of co-options be reduced to three.

Medical Examination of Immigrants

A motion by Dr. CHALKE that immigrants should be medically examined either before leaving their country of origin or before arrival in this country was carried after the reception of a document prepared by the Assistant Secretary setting out reports on the subject in connexion with the 1958 A.R.M. resolution calling for a vigorous campaign directed thereto.

Yellow Fever Vaccination

After discussion of a draft circular from the Ministry of Health inviting local health authorities to make arrangements for vaccination against yellow fever under Section 28 of the National Health Service Act and providing for the making of a charge to the individual receiving it, the Committee decided to express strong aversion to any such charge being made.

Psychiatrists Employed by Local Health Authorities

The Committee then considered a report by the Psychological Medicine Group Committee deploring the fact that salary scales for psychiatrists employed by local health authorities were considerably lower than those obtaining in the hospital service, and suggesting that local authority psychiatrists should be transferred to regional hospital boards.

The CHAIRMAN explained that this document had already been before the C.C. and S. Committee, which had requested the views of the Public Health Committee on it. He said the hope might be expressed that the alterations in the salaries of those in the Public Health Service would result in whole-time psychiatrists receiving a salary comparable to that received by those in the hospital service. On the other hand, it was difficult to see how the medical profession could dictate to local authorities as to how they should employ their staff.

Dr. HARDING objected to the proposal on the ground that its acceptance might hamper developments in progressive local health authorities which desired to launch mental

health programmes in areas where the regional hospital boards' psychiatric cover was quantitatively and qualitatively not suited to such developments.

Dr. S. C. GAWNE said that if local health authorities wanted to start a service with people trained in child psychiatry it was up to them to attract such people by paying the proper rate.

Dr. STEVENSON LOGAN said that when a job was of a clinical nature and of consultant status it should be paid for at the proper rate; but the appointments under discussion were primarily administrative posts within the hierarchy of the Public Health Service and the rate was appropriate in relation to the other salaries paid therein.

The Committee agreed: (i) to express the hope that public health salaries would be so increased as to bring them into line with the hospital service; (ii) that where local authorities employed clinical consultants they should pay them at the appropriate rate, and that in some circumstances this was done; (iii) that in view of the expansion that might be expected in the local authorities' mental health services, they should not have to depend on regional hospital boards for the provision of psychiatrists.

School Health Service and Handicapped Pupils Regulations

The Committee examined the Ministry of Education's new draft regulations to replace the School Health Service and Handicapped Pupils Regulations, 1953, and decided to express a preference for the existing wording in certain paragraphs.

Medical Referees of Crematoria

The Committee discussed a note from the Cremation Subcommittee of the Private Practice Committee expressing the view that there was no reason for departing from existing Association policy. This is that cremation should be authorized by independent practitioners, who need not necessarily have any connexion with local authorities. The Cremation Subcommittee further recommended that the medical referee should be a practitioner of at least 10 years' standing and should possess some special qualifications such as experience in forensic medicine.

After discussion the Committee opposed the 10-year provision on the ground that it had no evidence that the existing arrangement was proving unsatisfactory.

INCREASED REMUNERATION OF GENERAL PRACTITIONERS

The following statement has been issued by the Ministry of Health about the distribution of the additional money made available for the payment of general practitioners as a result of the general increase in the basic pay of doctors in the National Health Service by 4%:

1. In reply to a written Parliamentary Question on November 20, the Minister of Health announced that the current basic remuneration of doctors would be increased by 4% from January 1, 1959.

2. The distribution of the additional money made available by the increase in the net remuneration of general medical practitioners has been the subject of discussion between the Ministry of Health and the Department of Health for Scotland, and the representatives of the profession, and it has been agreed that the increase should be effected as follows:

(a) The capitation payment, which doctors receive for each person on their lists, is to go up from 17s. 6d. to 18s. per annum.

The loading, which is an additional payment for each person on the list between 501 and 1,500, is to go up from 11s. 6d. to 12s. per annum.

(b) The fee for the treatment of temporary residents (those patients who are not on a doctor's list and are staying in the area for less than three months) is to go up from 17s. to 18s. (There is an increase from 8s. 6d. to 9s. in the fee paid where the patient is temporarily resident in a convalescent home or

similar institution.) It is proposed to make Regulations to provide for this increase.

(c) The special capitation payment which is paid to some doctors who undertake dispensing for their patients in rural areas is to be increased from 9s. 9d. to 10s. (There is no change for those doctors who are paid, in the same way as retail chemists, for each prescription dispensed; they have received the increase given to retail chemists, whereas the dispensing capitation fee has not been recently changed.)

(d) Initial practice allowances paid to doctors while they are establishing themselves in single-handed practice in areas short of doctors; and other supplementary annual payments and hardship payments are also to be increased by amounts in the order of 4%. These and other details are to be discussed further with the profession and the decisions reached will be announced as soon as possible.

(e) By the payment of a further sum representing 3% of payments under the mileage and for maternity medical services.

3. The intention has been to distribute the increase widely over the different types of payments the general practitioner receives.

4. The present average net income—that is, net remuneration from all professional sources—for general medical practitioners is £2,333. The 4% increase will bring this up to £2,426.

5. Doctors and local executive councils will shortly be receiving copies of notices about the new interim increase.

6. Doctors in general practice last received an increase in their remuneration in May, 1957, when an interim increase of 5% on net remuneration was given. Most of this increase was given by the raising of the capitation payment from 17s. to 17s. 6d. and the "loading" payment from 10s. to 11s. 6d.

7. Steps are being taken to notify hospital authorities of the new rates of salary for various grades of hospital medical and dental staff, and arrangements for distributing the increase to general dental practitioners are being made after consultation with the profession.

8. The total cost of the increases to doctors and dentists will be about £5m. a year, of which nearly £2m. will go to general medical practitioners.

Scottish News

HOSPITAL COSTS IN SCOTLAND

The average weekly cost of a patient in a general hospital in Scotland for the year ended March 31 last was:

	£	s.	d.
Up to 50 beds	17	2	8
51-300 beds	19	4	1
Over 300 beds	19	8	10

Variation according to type of hospital is shown below (out-patient costs excluded):

	£	s.	d.
Teaching hospital	20	12	11
Chronic sick	10	6	1
Maternity	24	4	3
Mental	7	0	3

Each £1 on average went as follows:

	s.	d.
Salaries and wages	11	7
Provisions	2	6
Drugs, dressings, bedding	1	4
Domestic repairs, heating, lighting	2	2
Overheads	2	5

The average weekly cost of provisions per person fed in hospital (taking patients and staff together) was £1 3s. 11d.

The analysis includes this year for the first time a table showing examples of the costs of certain departments and services in a number of hospitals. It has been distributed to all hospital authorities in Scotland, who have been asked to investigate differences in costs of comparable hospitals and to report the results of their investigations.—*Analysis of Running Costs of Hospitals, Year Ended March 31, 1958*, Department of Health for Scotland, H.M.S.O., Edinburgh, 10s. 6d.

Correspondence

Rural Practitioners' Remuneration

SIR.—I note in the press a report that a deputation from the B.M.A. is to propose to the Minister of Health that future increases in doctors' remuneration should be distributed in a manner that takes account, in part at least, of the fact that country doctors' incomes are made up of payments other than capitation fees. I rather think this deputation will find it is pushing at an open door, but it was not the B.M.A. that opened it.

No country doctor should, however, lose sight of the fact that in the past, whenever a retrospective payment has been made, from the Dankwerts Award onwards, it has been distributed on a capitation basis only, and thus he has been denied a part of what was due to him. Furthermore, this injustice has been perpetrated by the Ministry, in agreement with the representatives of the profession, in spite of the fact that the B.M.A. and the G.M.S. Committee have been aware for some years that it was unjust.

I would ask every country doctor to consider very seriously whether his interests are adequately represented.—I am, etc.,

Richmond, Yorks.

A. F. T. ORD.

Distribution of New Money

SIR.—From your report in the *Supplement* of December 6 (p. 239), it would appear that the General Medical Services Committee does not intend to follow established precedent in the distribution of new money.

After the Dankwerts award and the 5% interim award, the new money was largely applied to that part of any given list lying between 501 and 1,500. This was done at the request of the majority of general practitioners, as in this way the small- and medium-list doctors received the greatest possible benefit. As they were the ones most in need of it, this was just and equitable. Now it would appear that a more complicated and less equitable distribution is going to take place.

We in Northern Ireland having, on average, 400-500 less patients than our colleagues in England will be particularly victimized by the present proposed method of distribution, and I wish to protest against the G.M.S. Committee's action, more especially as it departs from the expressed wish of the mass of the profession. Let them think again.—I am, etc.,

Ballywalter, Co. Down.

JOHN R. BRYARS.

Association Notices

Diary of Central Meetings

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8 Thurs.	Executive Subcommittee, Science Committee, 10 a.m.	
8 Thurs.	Medical Members of Editorial Subcommittee, Joint Formulary Committee, 11 a.m.	
8 Thurs.	Medical Staffing Subcommittee (Central Consultants and Specialists Committee), 11.30 a.m.	
8 Thurs.	Assistants and Young Practitioners Subcommittee (G.M.S. Committee), 2 p.m.	
8 Thurs.	Office Committee, 2 p.m.	
9 Fri.	Science Committee, 2 p.m.	
12 Mon.	Overseas Committee, 2 p.m.	
14 Wed.	Armed Forces Committee, 2 p.m.	
14 Wed.	Tuberculosis and Diseases of the Chest Group Committee, 2.15 p.m.	
15 Thurs.	G.M.S. Committee, 10.30 a.m.	
16 Fri.	Pharmaceutical Members of Editorial Subcommittee, Joint Formulary Committee, 11 a.m.	

Branch and Division Meetings to be Held

SOUTHAMPTON DIVISION.—At Mayes Restaurant, Southampton. Thursday, January 1, 8 p.m. to 12 midnight, doctors' families' dance.

FURNESS DIVISION.—At Duke of Edinburgh Hotel, Monday, December 29, 8 p.m., special meeting.

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